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Documentation and Verification of Stres3D, Version 4.0

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DOCUMENTATION AND VERIFICATION OF STRES3D, VERSION 4.0

by

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ABSTRACT

STRES3D is a thermomechanical analysis code for predicting transient temperatures, stresses and displacements in an infinite and semi-infinite, conducting, homogeneous, elastic medium. The heat generated at the sources can be constant or decay exponentially with time. Superposition is used to integrate the effect of heat sources distributed in space and time to simulate the thermomechanical effect of placement of heat generating nuclear waste canisters in an underground repository. Heat sources can be defined by point, lines or plates with numerical integration of the kernel point source solution used to develop the line and plate sources. STRES3D is programmed using FORTRAN77 and is suitable for use on micro or larger computer systems.

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TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
1.0	MATHEMATICAL MODEL AND NUMERICAL METHODS	1-1
1.1	Overall Description	1-1
1.2	Program Structure	1-2
1.3	Numerical Procedure	1-6
1.3.1	Solution of Temperatures, Displacements, and Stresses	1-7
1.3.2	Calculation of Shear Stress on a Free Surface	1-9
1.3.3	Numerical Integration: Line and Plate Heat Sources	1-15
1.4	Application and Assumptions	1-15
1.5	Performance Experience	1-16
2.0	USER'S GUIDE	2-1
2.1	Input Guide	2-1
2.2	System Interface	2-7
2.3	Example Problems	2-8
2.3.1	Effects of Gauss Point Density in Areal Heat Sources	2-8
2.3.2	Repository Model	2-11
3.0	VERIFICATION	3-1
3.1	Verification of Surface Shear Solution	3-1
3.2	Verification of Point Heat Source Solutions	3-6
3.3	Verification of Half-Space Solution Method	3-8
3.4	Benchmark of STRES3D and Thermomechanical Finite Element Analysis	3-15
3.4.1	DOT/VISCOT Thermal-Mechanical Analyses	3-18
3.4.2	STRES3D Thermal-Mechanical Analyses	3-23
3.4.3	Results of STRES3D Versus DOT/VISCOT Benchmark	3-23
4.0	SOURCE CODE LISTING	4-1
5.0	REFERENCES	5-1
APPENDIX A - Temperatures, Displacements, and Stresses Due to a Point Heat Source in an Infinite Body		A-1
APPENDIX B - STRES3D Input and Output Files for Example Problem 1 in Section 2.3.1		B-1
APPENDIX C - STRES3D Input and Output Files for Example Problem 2 in Section 2.3.2		C-1

TABLE OF CONTENTS (Cont'd)

<u>Section</u>	<u>Page</u>
APPENDIX D - Output Files and FORTRAN Program Listing of Program CERR to Compare the Single Point and Distributed Shear Stress Effects on a Location Not on the Free Surface	D-1
APPENDIX E - Input and Output Files for Verification Problem in Section 3.2.....	E-1
APPENDIX F - Input and Output Files for Verification Problem in Section 3.3	F-1
APPENDIX G - DOT and VISCOT Input Files for Verification and Benchmark Problem in Section 3.4	G-1
APPENDIX H - STRES3D Input and Output Files for Verification and Benchmark Problem in Section 3.4	H-1
APPENDIX I - RIB and SEPDB Appendix	I-1

LIST OF TABLES

<u>Table</u>		<u>Page</u>
2-1	Heat Generation From Waste Canisters	2-15
2-2	Elevations of Waste Emplacement Panels (Feet Above Mean Sea Level)	2-17
3-1	A Comparison of the Analytical and Numerical Solutions for a Pulse Point Heat Source in an Infinite, Elastic, Conducting Medium	3-13
3-2	A Comparison of the Analytical and Numerical Solutions for an Infinite Plate Heat Source in a Semi-Infinite, Elastic, Conducting Medium	3-17

LIST OF FIGURES

<u>Figures</u>	<u>Page</u>
1-1. Nesting of Program Units Comprising STRES3D	1-3
1-2. Flowchart for Program STRES3D	1-4
1-3. Flowchart for Subroutine CALC	1-5
1-4. Superposition of a Point Heat Source and Its Image	1-10
1-5. Geometry of Surface Shear Elements for STRES3D	1-12
2-1. Conventions for STRES3D Coordinates	2-2
2-2. Sign Conventions for STRES3D Stresses	2-3
2-3. Conventions for Specifying Geometry of a Plate Heat Source	2-4
2-4. Geometry for Example Problem in Section 2.3.1	2-9
2-5. Results for Example Problem in Section 2.3.1	2-10
2-6. Plan and Profile Views of the Waste Emplacement Panels as Modeled with STRES3D in the Example Problem in Section 2.3.2	2-12
2-7. Discretization of the Free Surface for the Example Problem in Section 2.3.2	2-14
2-8. Waste Emplacement Sequence Used in the Example Problem in Section 2.3.2 (Number on Each Subpanel is the Emplacement Time in Years)	2-16
2-9. Key to Table 2 Listing Elevations of Waste Emplacement Panels as Modeled in Example Problem in Section 2.3.2	2-18
2-10. Integration Points Assigned to the Plate Heat Sources in the STRES3D Model for the Example Problem Given in Section 2.3.2	2-19
2-11. Integration Points Assigned to the Plate Heat Sources for Computation of the Surface Shear Strengths in the STRES3D Model for the Example Problem Given in Section 2.3.2	2-20
2-12. Displacements Along the Shaft for the Example Problem Given in Section 2.3.2	2-22
2-13. Stresses Along the Shaft for the Example Problem Given in Section 2.3.2	2-23

LIST OF FIGURES (Cont'd)

<u>Figures</u>	<u>Page</u>
3-1. Locations for Verification Problem in Section 3.1	3-2
3-2. Results at Location 1 for Verification Problem in Section 3.1	3-3
3-3. Results at Location 2 for Verification Problem in Section 3.1	3-4
3-4. Results at Location 3 for Verification Problem in Section 3.1	3-5
3-5. Verification Problem in Section 3.2 - Pulse Heat Source in an Infinite Medium	3-7
3-6. Temperatures Due to Pulse Heat Source for Verification Problem in Section 3.2 ($t = 10$ years)	3-9
3-7. Hoop Stresses Due to Pulse Heat Source for Verification Problem in Section 3.2 ($t = 10$ years)	3-10
3-8. Radial Stresses Due to Pulse Heat Source for Verification Problem in Section 3.2 ($t = 10$ years)	3-11
3-9. Radial Displacement Due to a Pulse Heat Source for Verification Problem in Section 3.2 ($t = 10$ years)	3-12
3-10. Verification Problem in Section 3.3—Infinite Plate Heat Source	3-14
3-11. Temperatures Profiles at 50 and 100 Years After Heat Generation Begins for Verification Problem in Section 3.3	3-16
3-12. Finite-Element Mesh for DOT/VISCOT Model 1 for the Verification Problem in Section 3.4	3-19
3-13. Finite-Element Mesh for DOT/VISCOT Model 2 for the Verification Problem in Section 3.4	3-20
3-14. Region Modeled by DOT/VISCOT Model 1 for the Verification Problem in Section 3.4	3-21
3-15. Region Modeled by DOT/VISCOT Model 2 for the Verification Problem in Section 3.4	3-22
3-16. STRES3D Model 1 for Verification of the Problem in Section 3.4	3-24
3-17. STRES3D Model 2 for the Verification Problem in Section 3.4 with the Number of Free Surface Elements Increased from 100 to 400	3-25

LIST OF FIGURES (Cont'd)

<u>Figures</u>	<u>Page</u>
3-18. STRES3D Model 3 for the Verification Problem in Section 3.4 Showing the Areal Extent of the Free Surface Increased to 4000 Meters by 4000 Meters	3-26
3-19. Results of STRES3D Versus LOT/VISCOT Benchmark for Verification Problem in Section 3.4	3-27
3-20. Results of STRES3D Versus DOT/VISCOT Benchmark for Verification Problem in Section 3.4	3-28
3-21. Vertical Displacements for the Verification Problem in Section 3.4	3-29
3-22. Horizontal Displacements for the Verification Problem in Section 3.4	3-30

1.0 MATHEMATICAL MODEL AND NUMERICAL METHODS

1.1 Overall Description

STRES3D is a thermomechanical analysis code for predicting transient temperatures, stresses, and displacements in infinite and semi-infinite, conducting, homogeneous, elastic media. The code is based on thermoelastic analytic solutions for point heat sources in an infinite body. A semi-infinite body is treated by superposition of source and sink terms coupled with relief of surface shear stresses by numerical integration. In a recent development, numerical integration of the point heat source solution has been applied so that line or plate heat sources can be represented at improved accuracy and reduced computational effort. This development has proved useful when modeling large-scale nuclear waste repository layouts. To facilitate such modeling, the capability of representing the thermal output of high-level waste as a summation of constant or exponentially decaying components is provided. An important feature of the code is that time is dealt with analytically, which means that a solution for any instant in time may be obtained for equal computational effort and cost.

STRES3D is specifically intended for investigation of the repository-scale effects of nuclear waste emplacement. Inherent in its mathematical formulation are a number of assumptions that limit its validity. These are:

- the host rock must be homogeneous, isotropic, and be characterized by temperature and time-independent material properties;
- the host rock must be linearly elastic;
- the surface above the repository must be horizontal; and
- the stress concentrations caused by excavation must be insignificant at the scale of investigation.

STRES3D requires a small data set to define the computer model of a repository. Input typically consists of the following:

- the mechanical and thermal properties of the elastic media;
- the initial conditions for the temperature and stresses;
- the location, strength, and decay characteristics of the heat source(s)—the heat sources can be point, line or rectangular area sources;
- the location of surface elements for relief of surface shears; and
- the location and timing at which temperature, stress, and displacements are to be computed.

STRES3D generates printouts, at user selected times, of temperatures, stresses, and displacements at prescribed locations within the elastic media. In addition, data necessary for generating contour and profile plots and intermediate information on the surface shear calculations are created.

This report documents version 4.0 of STRES3D. This version is derived from the original development at the University of Minnesota, by St. John and Christianson (1980). Version 2.0 added line and plate heat sources and corrected minor errors in the original code. Version 3.0 modified the plate source solution and removed the limitation that individual line or plate heat sources must be within a horizontal plane. Version 4.0 was developed to address quality assurance requirements and correct a minor coding error introduced in Version 3.0. With the exception of two compiler specific calls to timing and date utilities, Version 4.0 is written in FORTRAN77, as described in the American National Standards Institute (ANSI) X3.9-1978 standard.

1.2 Program Structure

The program consists of a main program together with 15 subprograms. Figure 1-1 shows the nesting of the program units comprising STRES3D. The functions of each of these components are described briefly below.

Program STRES3D--STRES3D is the main program. It controls all input, formatting of output, and program flow. Figure 1-2 flowcharts the main program module of STRES3D.

Subroutine PAGE--This subroutine prints the title, the program version number, and the input file name and date of analysis at the top of the two output files.

Subroutine DATED--This subroutine is compiler and hardware dependent and returns the system date.

Subroutine SECOND--This subroutine is compiler and hardware dependent and returns the time of day in seconds. It is used to calculate the execution time in elapsed seconds.

Subroutine CALC--This subroutine calculates temperature, displacements, and stresses at a sample point due to all heat sources, taking account of the presence of a free surface by including image sources and calling CERUTI or CERUT1 for surface shear removal. The manner in which this is accomplished is illustrated in Figure 1-3. The key items are:

- calculation of analytic function for each component of each heat source at a point;
- substitution of these functions into the appropriate equations for the induced temperature, displacement, and stress; and
- removal of the effect of remaining shear stresses at the free surface.

The last process is carried out using either CERUTI or CERUT1, depending on the proximity of the sample point to the free surface.

Subroutine SHEAR--This subroutine is called from the main program and returns the total shear forces at the center of each zone on the free surface. It essentially functions as Subroutine CALC, in that it computes the effect of every heat source on each surface shear zone. However, only shear stresses are evaluated at the center of the zone.

Subroutines QCON and QDEC--QCON and QDEC calculate analytic functions for constant and exponentially decaying heat sources. The equations used are given in Section 1.3.1 and Appendix A. QDEC uses the following function ($wofz$), which is not generally available from a computer system library.

Figure 1-1. Nesting of Program Units Comprising STRES3D

Figure 1-2. Flowchart for Program STRES3D

Figure 1-3. Flowchart for Subroutine CALC

Function WOFZ--This function subprogram evaluates the value of the complex error function $w(z)$, defined as:

$$w(z) = \exp(-z^2) * \operatorname{erfc}(-iz),$$

in which erfc is the complementary error function.

Subroutine CERUTI--The solution for the effect of a point shear force is used to determine displacements and stresses resulting from negation of the surface shear stresses, which are assumed to be constant over the area of individual surface zones. Input to this subroutine consists of tractions in the x and y directions and the position of the applied tractions relative to the sample point.

Subroutine CERUT1--CERUT1 replaces CERUTI when calculating for sample points closer than a specified distance from the surface. The surface tractions input to CERUT1 are assumed to be uniformly distributed over the surface zone. CERUT1 is computationally slower than CERUTI.

Subroutine WTF--This subroutine assigns the weighting factors for the selected Gauss quadrature integration of line and plate heat sources.

Function WEIGHT--This function picks the weighting factors previously assigned by Subroutine WTF.

Subroutine AREALW--This subroutine computes the Gauss quadrature weighting factors for a plate source.

Subroutine ZINC--This subroutine stores the roots of the Legendre polynomials for the order of Gauss quadrature integration used for line and plate heat sources.

Subroutine COORD2--This subroutine performs translation and rotation of the x-y axes in a given x-y plane.

Function ERF--This function computes the error function

$$1 - \frac{2}{\sqrt{\pi}} \int_x^\infty e^{-\zeta^2} d\zeta.$$

Subroutine VERIF1--This subroutine creates the input file for running the pulse point heat source verification problem given in Section 3.2.

Subroutine VERIF2--This subroutine creates the input file for running the infinite plate heat source in a semi-infinite solid verification problem given in Section 3.3.

1.3 Numerical Procedure

STRES3D has been referred to as a semi-analytical model because it makes use of several analytical solutions in constructing the solution for a complex problem that cannot be handled directly.

Basically, STRES3D performs two main tasks. It solves for temperatures, displacements, and stresses at points within an infinite or semi-infinite, conducting, elastic media and it eliminates the effect of induced shear stresses that violate the boundary conditions of a free surface (if it exists).

In particular, use is made of component models for constant and exponentially decaying point, line, or plate heat sources and also for shear forces either concentrated at the center of, or distributed over, a rectangular region on a free surface. Equations and derivations for these solutions are given in Sections 1.3.1 and 1.3.2 and Appendix A. The numerical integration methods used in the representation of line and plate heat sources are given in Section 1.3.3.

Alternatives embedded within STRES3D to represent the heat generating source include the point, line or plate heat sources, and two alternatives to (point or distributed) shear forces to maintain the surface shear-free boundary. Alternate mathematical or numerical solutions were not considered in the development of STRES3D. Alternative solutions to similar problems in three dimensions are possible using finite-element and finite difference methods.

1.3.1 Solution for Temperatures, Displacements, and Stresses

The temperatures, displacements, and stresses due to a point heat source in an infinite body, as used in STRES3D, are given by Equations 1-1 through 1-16. Equations 1-1 through 1-13 apply for a point heat source of constant strength. Equations 1-1 through 1-10, together with Equations 1-14 through 1-16, apply for an exponentially decaying point heat source. The derivation of all these equations is given in Crouch and McClain (1978), and is reproduced in Appendix A for completeness.

$$T = \frac{V_3}{\pi^{3/2}} \quad (1-1)$$

$$u_x = \frac{mx}{2\pi R^2} \left\{ \frac{V_2}{\sqrt{\pi}} - \frac{V_1}{2R} \right\} \quad (1-2)$$

$$u_y = \frac{my}{2\pi R^2} \left\{ \frac{V_2}{\sqrt{\pi}} - \frac{V_1}{2R} \right\} \quad (1-3)$$

$$u_z = \frac{mz}{2\pi R^2} \left\{ \frac{V_2}{\sqrt{\pi}} - \frac{V_1}{2R} \right\} \quad (1-4)$$

$$\sigma_{xx} = \frac{mG}{2\pi R^3} \left\{ - \left[1 - \frac{3x^2}{R^2} \right] V_1 + \frac{2R}{\sqrt{\pi}} \left[1 - \frac{3x^2}{R^2} \right] V_2 + \frac{4R}{\sqrt{\pi}} [R^2 - x^2] V_3 \right\} \quad (1-5)$$

$$\sigma_{yy} = \frac{mG}{2\pi R^3} \left\{ - \left[1 - \frac{3y^2}{R^2} \right] V_1 + \frac{2R}{\sqrt{\pi}} \left[1 - \frac{3y^2}{R^2} \right] V_2 + \frac{4R}{\sqrt{\pi}} [R^2 - y^2] V_3 \right\} \quad (1-6)$$

$$\sigma_{zz} = \frac{mG}{2\pi R^3} \left\{ \left[2 - \frac{3r^2}{R^2} \right] V_1 - \frac{2R}{\sqrt{\pi}} \left[2 - \frac{3r^2}{R^2} \right] V_2 + \frac{4R}{\sqrt{\pi}} r^2 V_3 \right\} \quad (1-7)$$

$$\sigma_{xy} = \frac{3mG}{2\pi R^5} xy \left\{ V_1 - \frac{2R}{\sqrt{\pi}} V_2 - \frac{4R^3}{3\sqrt{\pi}} V_3 \right\} \quad (1-8)$$

$$\sigma_{xz} = \frac{x}{r} \sigma_{rz} \quad (1-9)$$

$$\sigma_{yz} = \frac{y}{r} \sigma_{rz} \quad (1-10)$$

In these equations

$$\sigma_{rz} = \frac{3mG}{2\pi R^5} r z \left[V_1 - \frac{2RV_2}{\sqrt{\pi}} - \frac{4R^3V_3}{2\sqrt{\pi}} \right],$$

$$R = \sqrt{(x^2 + y^2 + z^2)},$$

$$r = \sqrt{(x^2 + y^2)},$$

$$G = \text{shear modulus,}$$

$$m = \frac{(1 + \nu)}{(1 - \nu)} \alpha_t,$$

$$\nu = \text{Poisson's ratio, and}$$

$$\alpha_t = \text{coefficient of thermal expansion.}$$

V_1 through V_3 are analytic functions in which the radial distance, R , and the time, t , are the independent variables.

For a constant strength heat source of magnitude Q_c , these V functions are defined by:

$$V_1(R, t) = Q_c \left\{ t \cdot \operatorname{erf} \frac{R}{\sqrt{4\kappa t}} - \frac{R^2}{2\kappa} \cdot \operatorname{erfc} \frac{R}{\sqrt{4\kappa t}} + \sqrt{\frac{t}{\pi\kappa}} \cdot R \cdot \exp\left(\frac{-R^2}{4\kappa t}\right) \right\}; \quad (1-11)$$

$$V_2(R, t) = Q_c \left\{ \sqrt{\frac{t}{\kappa}} \cdot \exp\left(\frac{-R^2}{4\kappa t}\right) - \frac{\sqrt{\pi}}{2\kappa} \cdot R \cdot \operatorname{erfc}\left(\frac{R}{\sqrt{4\kappa t}}\right) \right\}; \text{ and} \quad (1-12)$$

$$V_3(R, t) = Q_c \frac{\sqrt{\pi}}{4\kappa} \cdot \frac{1}{R} \cdot \operatorname{erfc}\left(\frac{R}{\sqrt{4\kappa t}}\right); \quad (1-13)$$

where κ is the thermal diffusivity, and the complementary error function $\operatorname{erfc}(z)$ is defined by

$$\operatorname{erfc}(z) = 1 - \operatorname{erf}(z).$$

For an exponentially decaying heat source of magnitude $Q e^{-At}$, the V functions are defined by:

$$V_1(R, t) = Q_e \left\{ -\frac{1}{A} \cdot \exp(-At) + \frac{1}{A} \left[\operatorname{erf}\left(\frac{R}{\sqrt{4\kappa t}}\right) + \exp\left(\frac{-R^2}{4\kappa t}\right) \cdot \operatorname{Re} \left\{ w \left(\sqrt{At} + i \frac{R}{\sqrt{4\kappa t}} \right) \right\} \right] \right\}; \quad (1-14)$$

$$V_2(R, t) = Q_e \cdot \frac{\sqrt{\pi}}{\sqrt{4\kappa t}} \cdot \exp\left(\frac{-R^2}{4\kappa t}\right) \cdot \text{Im}\left\{w\left(\sqrt{At} + i \frac{R}{\sqrt{4\kappa t}}\right)\right\}; \text{ and} \quad (1-15)$$

$$V_3(R, t) = Q_e \cdot \frac{\sqrt{\pi}}{\sqrt{4\kappa t}} \cdot \exp\left(\frac{-R^2}{4\kappa t}\right) \cdot \text{Re}\left\{w\left(\sqrt{At} + i \frac{R}{\sqrt{4\kappa t}}\right)\right\}. \quad (1-16)$$

The complex error function $w(z)$ is defined by

$$w(z) = \frac{2iz}{\pi} \int_0^\infty \frac{e^{-t^2}}{z^2 - t^2} dt > 0,$$

and $\text{Re}\{z\}$ and $\text{Im}\{z\}$ denote the "real part of z " and the "imaginary part of z ," respectively. In addition to providing a complete solution for a point shear source in an infinite medium, these equations are the kernel for all calculations for the line and plate heat sources discussed in Section 1.3.3. Further, the temperatures, displacements, and stresses due to sources in a semi-infinite body can be found from the solution for an infinite body by superposition of image sources. The application of the method of images to a heat source in a semi-infinite medium is illustrated in Figure 1-4. For the temperature part of the solution, the boundary condition is that there must be no temperature change at the free surface. This condition is satisfied if a source of opposite sign is positioned so that the free surface would be exactly halfway between the source and its "image." The initial condition within the medium can be added to complete the solution.

For displacements and stresses, use of the method of images provides only a partial solution. Addition of the image source of opposite sign ensures that there are no normal stresses on the plane corresponding to the free surface. However, as discussed in more detail in Appendix A and the next section, there remain shear stresses that violate the condition that both normal and shear stresses vanish at the free surface. The induced surface shear stresses can be "relieved" numerically. In particular, the free surface can be discretized and a shear stress, which is equal in magnitude but opposite in sign to the shear induced by the point heat source and its image, can then be applied to each zone. Since the shear stress varies inversely with the fourth power of the distance from the source, surface discretization can be restricted to an area of the free surface that is relatively close to the heat sources. Details of the calculation performed for each of those zones is described in the next section.

1.3.2 Calculation of Shear Stress on a Free Surface

In STRES3D either the solution for a point shear force on the surface of a half-space or a distributed shear traction over a square element on the surface of a half-space is used to relieve the thermally-induced surface shears. The problem of a tangential force at a point on the surface of a half-space was first solved by V. Cerruti in 1882. In the first of the methods used in STRES3D, Cerruti's solution is used directly by calculating the shear stress at the center of each surface zone, multiplying that value by the area of the zone, and applying the resulting traction at the zone centroid. This approach is simple, but has the disadvantage that the solution is singular at the point of application of the traction. A better solution can be obtained by considering the shear traction to be distributed uniformly over each zone. The necessary equations for the case can be obtained through area integration of the solution of Cerruti's problem.

On the free surface, the temperature change equals zero, normal stress equals zero, shear stress equals zero.

Figure 1-4. Superposition of a Point Heat Source and Its Image

The analytic solutions for either a point shear force or a distributed shear force acting over a square surface area are employed repeatedly during the calculation procedure employed by STRES3D, to ensure that the free surface is effectively free of shear stresses. First, the free surface above and in the vicinity of the heat sources is discretized into small square zones in the manner illustrated in Figure 1-5. Second, the shear stresses induced by all point sources and their images at the centroid of each zone are computed. Third, either point forces or uniformly distributed forces equal in magnitude, but opposite in sign, to that which acts at the zone centroid are applied over each zone. Fourth, the resulting condition at points of interest are computed as the sum of the initial condition, the changes induced by each point source, the changes induced by each image source, and the changes induced by each surface shear element.

Solutions for both the point and distributed shear tractions are embedded within STRES3D. Whenever the depth of a sample point from the surface is greater than the width of one surface element, the point shear traction solution (Subroutine CERUTI) is used. At more shallow depths, the solution for uniform shear is used (Subroutine CERUT1). Use of the point source solution has been retained because of reduced computational effort and equivalence of the two solutions, except close to the free surface. This equivalence is demonstrated in Verification Problem 1 presented in Section 3.1.

Equations 1-17 through 1-25 comprise the complete solution for the stresses and displacements induced by two orthogonal point shear forces, T_x and T_y , acting on the free surface of a semi-infinite body. These equations can be obtained directly from those given by Westergaard (1952) by addition of the separate solutions for the orthogonal forces.

$$u_x = \frac{-T_x}{4\pi GR} \left\{ 1 + \frac{x^2}{R^2} + (1-2\nu) \left[\frac{R}{(R+z)} - \frac{x^2}{(R+z)^2} \right] \right\} - \frac{T_y}{4\pi GR} \left\{ \frac{xy}{R^2} - \frac{(1-2\nu)}{(R+z)^2} xy \right\} \quad (1-17)$$

$$u_y = \frac{-T_x}{4\pi GR} \left\{ \frac{xy}{R^2} - \frac{(1-2\nu)}{(R+z)^2} xy \right\} - \frac{T_y}{4\pi GR} \left\{ 1 + \frac{y^2}{R^2} + (1-2\nu) \left[\frac{R}{(R+z)} - \frac{y^2}{(R+z)^2} \right] \right\} \quad (1-18)$$

$$u_z = \frac{-T_x}{4\pi GR} \left\{ \frac{xz}{R^2} + \frac{(1-2\nu)}{(R+z)} x \right\} - \frac{T_y}{4\pi GR} \left\{ \frac{yz}{R^2} + \frac{(1-2\nu)}{(R+z)} y \right\} \quad (1-19)$$

$$\begin{aligned} \sigma_{xx} = & \frac{T_x x}{2\pi R^3} \left\{ \frac{3x^2}{R^2} - \frac{(1-2\nu)}{(R+z)^2} \left[R^2 - y^2 - \frac{2Ry^2}{(R+z)} \right] \right\} \\ & + \frac{T_y y}{2\pi R^3} \left\{ \frac{3x^2}{R^2} - \frac{(1-2\nu)}{(R+z)^2} \left[3R^2 - y^2 - \frac{2Ry^2}{(R+z)} \right] \right\} \end{aligned} \quad (1-20)$$

$$\begin{aligned} \sigma_{yy} = & \frac{T_x x}{2\pi R^3} \left\{ \frac{3y^2}{R^2} - \frac{(1-2\nu)}{(R+z)^2} \left[3R^2 - x^2 - \frac{2Rx^2}{(R+z)} \right] \right\} \\ & + \frac{T_y y}{2\pi R^3} \left\{ \frac{3y^2}{R^2} - \frac{(1-2\nu)}{(R+z)^2} \left[R^2 - x^2 - \frac{2Rx^2}{(R+z)} \right] \right\} \end{aligned} \quad (1-21)$$

$$\sigma_{zz} = \frac{3z^2}{2\pi R^5} \{ T_x x + T_y y \} \quad (1-22)$$

PLACEMENT OF SURFACE SHEAR ELEMENT IN VICINITY OF HEAT SOURCES

DETAILS OF SURFACE SHEAR ELEMENTS

Figure 1-5. Geometry of Surface Shear Elements for STRES3D

$$\begin{aligned}\sigma_{xy} = & \frac{T_x y}{2\pi R^3} \left\{ \frac{3x^2}{R^2} - \frac{(1-2\nu)}{(R+z)^2} \left[-R^2 + x^2 + \frac{2Rx^2}{(R+z)} \right] \right\} \\ & + \frac{T_y x}{2\pi R^3} \left\{ \frac{3y^2}{R^2} - \frac{(1-2\nu)}{(R+z)^2} \left[-R^2 + y^2 + \frac{2Ry^2}{(R+z)} \right] \right\}\end{aligned}\quad (1-23)$$

$$\sigma_{yz} = \frac{3}{2\pi R^5} \{T_x xyz + T_y y^2 z\} \quad (1-24)$$

$$\sigma_{zx} = \frac{3}{2\pi R^5} \{T_x x^2 z + T_y xyz\} \quad (1-25)$$

R , G and ν were defined in Section 1.3.1.

Note that within STRES3D, T_x and T_y are defined to be the values of the tangential forces induced by the heat sources and their images. They can be derived directly from Equations 1-9 and 1-10 and the area of the zone within which they act. To negate the effects of these tangential forces, it is necessary to apply forces $-T_x$ and $-T_y$ at the surface.

Equations 1-26 through 1-38 comprise the corresponding solution for a shear force distributed uniformly over a surface element. These equations are derived by the integration of the point shear force equations (Equations 1-17 through 1-25) over the area of a surface element. In general, the integration is evaluated between the limits $x = x - a$ to $x = x + a$ and $y = y - b$ to $y = y + b$, where $2a$ is the dimension of the surface element in the x direction and $2b$ is the dimension of the element in the y direction. However, in Version 4.0 of STRES3D, the surface elements are square, so $a = b$. These equations are reproduced from St. John and Christianson (1980).

$$\begin{aligned}u_x = & \frac{P_x}{4\pi G} \{2(1-\nu)x \ln(y+R) + 2y \ln(x+R) + z^2(I_2 + I_4) - (1-2\nu)zxI_1\} \\ & - \frac{P_y}{4\pi G} \{2\nu R + (1-2\nu)z \ln(z+R)\}\end{aligned}\quad (1-26)$$

$$\begin{aligned}u_y = & \frac{-P_x}{4\pi G} \{2\nu R + (1-2\nu)z \ln(z+R)\} + \frac{P_y}{4\pi G} \{2(1-\nu) \cdot y \ln(x+R) \\ & + 2x \ln(y+R) + z^2(I_2 + I_4) - (1-2\nu)zyI_3\}\end{aligned}\quad (1-27)$$

$$\begin{aligned}u_z = & \frac{P_x}{4\pi G} \{(1-2\nu)(y \ln(z+R) + x^2 I_1) - 2\nu z \ln(y+R)\} \\ & + \frac{P_y}{4\pi G} \{(1-2\nu)(x \ln(z+R) + y^2 I_3) - 2\nu z \ln(x+R)\}\end{aligned}\quad (1-28)$$

$$\sigma_{xx} = \frac{-P_x}{2\pi} \left\{ \frac{((1-2\nu)Rz^2 - zx^2 - 2\nu Rx^2)y}{(x^2 + z^2)(z+R)R} - 2\ln(y+R) \right\} - \frac{P_y}{2\pi} \left\{ \frac{(2\nu R + z)x}{(z+R)R} - 2\nu \ln(x+R) \right\} \quad (1-29)$$

$$\sigma_{yy} = \frac{-P_x}{2\pi} \left\{ \frac{(2\nu R + z)y}{(z+R)R} - 2\nu \ln(y+R) \right\} - \frac{P_y}{2\pi} \left\{ \frac{((1-2\nu)Rz^2 - zy^2 - 2\nu Ry^2)x}{(y^2 + z^2)(z+R)R} - 2\ln(x+R) \right\} \quad (1-30)$$

$$\sigma_{zz} = \frac{P_x}{2\pi} \left\{ \frac{yz^2}{(x^2 + z^2)R} \right\} + \frac{P_y}{2\pi} \left\{ \frac{z^2x}{(y^2 + z^2)R} \right\} \quad (1-31)$$

$$\sigma_{xy} = \frac{-P_x}{2\pi} \left\{ \frac{(z + 2\nu R)x}{(z+R)R} - \ln(x+R) \right\} - \frac{P_y}{2\pi} \left\{ \frac{(z + 2\nu R)y}{(z+R)R} - \ln(y+R) \right\} \quad (1-32)$$

$$\sigma_{yz} = \frac{-P_x z}{2\pi R} - \frac{P_y}{2\pi} \left\{ \tan^{-1} \frac{xy}{zR} - \frac{xyz}{(y^2 + z^2)R} \right\} \quad (1-33)$$

$$\sigma_{zx} = \frac{-P_x}{2\pi} \left\{ \tan^{-1} \frac{xy}{zR} - \frac{xyz}{(x^2 + z^2)R} \right\} - \frac{P_y z}{2\pi R} \quad (1-34)$$

R and G were defined in Section 1.3.1. P_x and P_y are shear force densities and are equal to T_x/A and T_y/A , in which A is the area of the surface zone. They can be derived directly from Equations 1-9 and 1-10.

The functions I_1 through I_4 in Equations 1-26 through 1-28 are defined by:

$$I_1 = \frac{1}{|x|} \left\{ \frac{\pi}{2} - \sin^{-1} \left[\frac{x^2 + z^2 + zR}{(R+z)\sqrt{x^2 + z^2}} \right] \right\}, \quad (1-35)$$

$$I_2 = \frac{1}{|z|} \left\{ \frac{\pi}{2} - \sin^{-1} \left[\frac{x^2 + z^2 + xR}{(R+x)\sqrt{x^2 + z^2}} \right] \right\}, \quad (1-36)$$

$$I_3 = \frac{1}{|y|} \left\{ \frac{\pi}{2} - \sin^{-1} \left[\frac{y^2 + z^2 + zR}{(R+z)\sqrt{y^2 + z^2}} \right] \right\}, \text{ and} \quad (1-37)$$

$$I_4 = \frac{1}{|z|} \left\{ \frac{\pi}{2} - \sin^{-1} \left[\frac{y^2 + z^2 + yR}{(R+y)\sqrt{y^2 + z^2}} \right] \right\}. \quad (1-38)$$

1.3.3 Numerical Integration: Line and Plate Heat Sources

The solutions for line and plate heat sources are computed in STRES3D by numerical integration of the solution for a point heat source. The numerical integration technique utilized in the computations is the Gauss-Legendre quadrature (Carnahan, et al., 1969). With this integration procedure, the integration interval is subdivided into unequally spaced integration points, none of which are located at the ends of the integration interval. The function to be integrated is evaluated at each of the integration points and is assigned a weight of one or less. The integral of the function is proportional to the sum of the products of the weights and the values of the functions at the integration points:

$$\int_a^b F(z) dz = .5 * (b - a) * \sum_{i=0}^n w_i F(z_i) . \quad (1-39)$$

This integration would be appropriate for a line source extending from $z = a$ to $z = b$. For a plate source the necessary double integral becomes:

$$\int_c^d \int_a^b F(x, y) dx dy = .25 * (b - a)(d - c) * \sum_{j=0}^n \sum_{i=0}^n w_i w_j F(x_i, y_j) . \quad (1-40)$$

The values of the weighting functions, w_i , depend on n , the order of integration. For second order integration, i.e., for $n = 2$, the three weighting factors are .5556, .8889, and .5556. The corresponding locations of the integration points (Gauss points) for second order integration are at points at $[\pm .3873 * (\text{integration interval}) + \text{midpoint of integration interval}]$ and at the midpoint of the integration interval. The Gauss-Legendre quadrature gives the exact solution for functions which are polynomials of order $(2n + 1)$ or less, where n is the order of integration. The error, thus, is of the order $O(\Delta^{2n})$, where Δ is the point spacing.

The functions which describe the temperatures, stresses, and displacements due to point heat sources are not polynomials. As recorded in Section 1.3.1, the functions consist of products and sums of exponential functions, error functions, logarithmic functions, polynomials, and inverse trigonometric functions. Despite this complexity, they may be approximated piecewise as polynomials. Hence, the temperatures, stresses, and displacements due to a line heat source can be found from the weighted values of the point solutions at integration points along the line. The locations of the points and the weights assigned to the point solutions are those prescribed by the Gauss-Legendre procedure. Similarly, the functions which describe the perturbations due to an areal heat source can be found from an evaluation of the point source functions at prescribed points over the surface of the source. Thus, the basic routines for computing the heat flow, stresses, and deformations are identical for point, line, and areal sources.

1.4 Application and Assumptions

Application of the code to a problem implies accepting a number of approximations and simplifications. The more important of these are:

- the rock mass is continuous, homogeneous and linearly elastic, and has properties that are stress, temperature, and time independent;

- one-hundred percent of heat from sources is transferred to the rock;
- heat sources are energy sources at a point, along a line or in a finite plane;
- pore water/groundwater movements can be ignored; and
- the free surface is isothermal, stress free, and horizontal.

In addition, for semi-infinite bodies, a user must define a surface region beyond which it is assumed it is acceptable that the boundary conditions are only partially satisfied.

Despite these limitations, the program has proved to be extremely useful for a wide variety of purposes. In particular, it has been used to conduct repository-scale, room-scale and canister-scale studies, and has been used extensively to carry out scoping studies intended to assist in the design of test facilities and repositories.

1.5 Performance Experience

There are no known conditions under which the model provides poor results. The calculations appear to be robust, despite the fact that embedded analytical solutions are singular at point sources and at the location of application of concentrated and distributed shear tractions. These singularities can be avoided by sensible selection of points at which temperatures, displacement, and stresses are calculated.

For problems in which a free surface exists, the extent of the free surface should generally be at least twice as large as the region being modeled. Temperatures, displacements, and stresses are affected if the free surface is too small, with the displacements most affected. The verification problem in Section 3.4 is one example of the effect of the areal extent of the free surface on the computed displacements.

The accuracy of the solutions "close" to a line or areal heat source can be dependent on the order of integration of the source. There is no way to say how close is "close" because the results are also highly dependent on source strength and the material properties of the solid. The example problem in Section 2.3.1 illustrates one such case for a plate heat source. The user is strongly urged to run test analyses similar to this example problem using their own material properties for solutions near a heat source to determine what gauss point density is optimum.

2.0 USER'S GUIDE

The code STRES3D is based on closed-form analytic solutions for the temperatures, displacement, and stresses induced by heat sources in an infinite, conducting, elastic, homogeneous, isotropic material. By including image sources and by relieving shear stresses on the surface numerically, the boundary conditions for a semi-infinite region can be simulated. This section of the report provides information on use of the code. General information and a guide to the input for STRES3D is provided in Section 2.1, computer requirements are given in Section 2.2, and two example problems are given in Section 2.3. New users are advised to run the sample problems in Section 2.3 as well as the verification problems presented in Section 3.0. This will not only provide a simple introduction to STRES3D, but will verify that the code is functioning correctly on the particular computer system. New users are also advised to familiarize themselves with the theoretical basis of STRES3D, since only then can informed judgements be made during model definition.

It is important that the conventions used in model definition be clearly understood. The sign conventions used for the coordinate directions are those shown in Figure 2-1, while the sign conventions for the stresses are those shown in Figure 2-2. Note that the sign convention for the stresses is such that compressive stresses are positive. Shear stresses σ_{ij} are positive if they act in the positive j direction and if the outward normal of the plane points in the negative i direction. To be consistent with the stresses, the sign convention for displacements is that a displacement in a positive coordinate direction is negative. The convention for specifying the geometry of a plate heat source is given by Figure 2-3. All other conventions are described in the input guide itself.

It is also important to note that plate and line heat sources should only be slightly inclined relative to the horizontal free surface. This is a recommended rather than a fundamental restriction, and is justified by the fact that lengths and areal power densities are specified with reference to the projected horizontal length or area.

2.1 Input Guide

All of the input is list directed (free format). Numeric input may be separated by commas, spaces or carriage returns. A detailed guide to the input listed below is provided within the code listing that is reproduced in Section 4.0. That listing also provides information on the seven data files used by STRES3D. Any consistent set of engineering units can be used in input.

INPUT INSTRUCTIONS. LIST DIRECTED (FREE-FORMAT).
THE LIMITS FOR THE NUMBERS OF HEAT SOURCE, OUTPUT LOCATIONS, AND SURFACE SHEAR ELEMENTS ARE DEFINED
IN THE ARRAY DIMENSION OF THE "PARAMETER" STATEMENT.

INPUT 1 QUALITY ASSURANCE NUMBER, FOR THIS VERSION THIS MUST BE 'AGAPITO 4.0'.
(THIS MUST BE ON LINE 1).

INPUT 2 TITLE (THIS MUST BE ON LINE 2).
TITLE - 80 CHARACTER TITLE FOR OUTPUT.

INPUT 3A THERMAL PROPERTIES AND INITIAL TEMPERATURES.
DIFF - THERMAL DIFFUSIVITY [L²/T].
TSURF - SURFACE TEMPERATURE [DEG.].
NGRAD - NUMBER OF TEMPERATURE GRADIENTS.
(NGRAD CAN EQUAL ZERO, IN WHICH CASE, THE INITIAL TEMPERATURES ARE
UNIFORM AND EQUAL TO 'TSURF'. IF 'NGRAD' IS GREATER THAN 1 THEN THE
TEMPERATURE AT A DEPTH 'Z' IS:
 $T = (Z - DGRAD(I-1)) * TGRAD(I) + (\text{TEMPERATURE AT } DGRAD(I-1)) - TSURF$.

INPUT 3B INITIAL TEMPERATURE GRADIENTS (SPECIFY 'NGRAD' OF THESE).
TGRAD(I) - GEOTHERMAL GRADIENT [DEG./L].
DGRAD(I) - GREATEST DEPTH FOR WHICH 'TGRAD(I)' [L]
APPLIES.

NOTE: IF ONLY ONE GRADIENT IS GIVEN, IT APPLIES TO
ALL DEPTHS. IF ANY POINT IS AT A DEPTH GREATER
THAN 'DGRAD(NGRAD)', THEN THE TEMPERATURE GRADIENT
'TGRAD(NGRAD)' IS ASSUMED TO APPLY.

Figure 2-1. Conventions for STRES3D Coordinates

Figure 2-2. Sign Conventions for STRES3D Stresses

a. Orientation and size of source

b. Subdivision into multiple sources

Figure 2-3. Conventions for Specifying Geometry of a Plate Heat Source

INPUT 3C ELASTIC PROPERTIES AND INITIAL STRESSES.

E - MODULUS OF ELASTICITY [F/(L*L)].

PR - POISSON'S RATIO.

ALPHA - COEFFICIENT OF THERMAL EXPANSION [L/(I*DEG.)].

DEN - SPECIFIC WEIGHT OF OVERBURDEN (COMPRESSION POSITIVE) [F/(L*L*L)]
 (THE VERTICAL STRESS = 'DEN'*DEPTH).

SIG01- INITIAL MAX. HORZ. STRESS AT GROUND SURFACE
 (COMPRESSION POSITIVE) [F/(L*L)].

SIG02- INITIAL MIN. HORZ. STRESS AT GROUND SURFACE
 (COMPRESSION POSITIVE) [F/(L*L)].

RATIO1 - RATIO OF MAX. HORZ. STRESS GRADIENT TO VERTICAL STRESS GRADIENT
 (THE VERTICAL STRESS GRADIENT EQUALS 'DEN').

RATIO2 - RATIO OF MIN. HORZ. STRESS GRADIENT TO VERTICAL STRESS GRADIENT
 (THE VERTICAL STRESS GRADIENT EQUALS 'DEN').

BEAR - BEARING OF THE MAX. HORIZ. STRESS [DEGREES]
 MEASURED CLOCKWISE FROM THE X-AXIS IN THE X-Y PLANE
 NOTE THAT 'SIG01' AND 'SIG02' ARE NORMAL TO ONE ANOTHER.

INPUT 4A HEAT SOURCES AND FREE SURFACE BOUNDARY ELEMENTS.

NCANN - NUMBER OF CANISTERS OR POINT SOURCES ('NCANN' MAY EQUAL ZERO).

NASORC - NUMBER OF AREAL SOURCES ('NASORC' MAY EQUAL ZERO).

NLSORC - NUMBER OF LINE SOURCES ('NLSORC' MAY EQUAL ZERO).

NTYPE - NUMBER OF DIFFERENT TYPES OF HEAT SOURCES. THIS VARIABLE DETERMINES
 THE NUMBER OF INPUTS 5 AND 6 THAT ARE TO BE READ.

NTIMES - NUMBER OF TIMES FOR COMPUTER OUTPUT. SOLUTIONS AT LOCATIONS
 DESCRIBED IN INPUT 11 WILL BE CALCULATED AT EACH TIME. TIMES ARE
 READ IN INPUT 10.

NLINES - NUMBER OF LINES ALONG WHICH OUTPUT IS COMPUTED. DETERMINES THE
 NUMBER OF LINES OF INPUT 11 TO BE READ.

NBISO - SWITCH DESCRIBING THE PLANE Z = 0.
 A.) WHEN THE PLANE IS AN ISOTHERMAL SURFACE, 'NBISO' = +-1 OR +- 2.
 'ABS(NBISO)' = 1 IN MOST CASES.
 'ABS(NBISO)' = 2 FOR THE CASE THAT THE STRENGTHS OF THE
 SURFACE ELEMENTS HAVE ALREADY BEEN
 COMPUTED FROM A PREVIOUS RUN AND ARE STORED
 ON THE FILE "SHEAR.DAT" (REFER TO DESCRIPTION
 OF FILE 11 AT THE END OF THE INPUT GUIDE
 FOR MORE DETAILS). 'NBISO' = 2 CAUSES STRES3D TO
 READ THE STRENGTHS FROM THIS FILE RATHER THAN
 TO RECOMPUTE THEM. 'NBISO' = 2 ONLY WHEN BOTH THE
 FOLLOWING CONDITIONS ARE TRUE:
 1. MULTIPLE RUNS FOR THE SAME
 TIME OF INTEREST AND INVOLVING THE SAME
 HEAT SOURCES ARE BEING MADE.
 2. THE CURRENT RUN IS NOT THE FIRST
 RUN IN THE SEQUENCE OF MULTIPLE RUNS.
 'NBISO' IS NEGATIVE WHEN ONE ZONE OF NEIGHBORING SURFACE
 ELEMENTS IS TO BE FURTHER SUBDIVIDED INTO FINER ELEMENTS
 (REFER TO INPUT4B FURTHER BELOW). 'NBISO' IS POSITIVE WHEN
 ALL THE SURFACE SHEAR ELEMENTS ARE THE SAME SIZE.

B.) FOR NO FREE SURFACE, 'NBISO' = 0.

C.) NOTE THAT REGARDLESS OF THE VALUE OF 'NBISO', THE FOLLOWING
 INPUTS MUST ALSO BE READ.

NROW - NUMBER OF ROWS OF SURFACE SHEAR ELEMENTS (MUST BE AN EVEN NUMBER).

NCOL - NUMBER OF COLUMNS OF SURFACE SHEAR ELEMENTS (MUST BE AN EVEN NUMBER).

SW - HALF WIDTH OF SURFACE SHEAR ELEMENTS (SURFACE ELEMENTS ARE SQUARE BUT
 THE FREE SURFACE DOES NOT HAVE TO BE).

XC - X COORDINATE OF CENTER OF SURFACE ELEMENT GRID.

YC - Y COORDINATE OF CENTER OF SURFACE ELEMENT GRID.

XDATUM- REFERENCE COORDINATE TO BE ADDED TO ALL X-COORDINATES
 OF ALL HEAT SOURCES AND TO ALL X-COORDINATES OF POINTS OF
 INTEREST. 'XDATUM' IS USED FOR PRINT OUT PURPOSES ONLY ON
 FILES 7, 8 AND 9. 'XDATUM' CAN EQUAL ZERO IN WHICH CASE THE X
 COORDINATE SYSTEM IS USED.

YDATUM- REFERENCE COORDINATE TO BE ADDED TO ALL Y-COORDINATES
 OF ALL HEAT SOURCES AND TO ALL Y-COORDINATES OF POINTS
 OF INTEREST. 'YDATUM' IS USED FOR PRINT OUT PURPOSES ONLY
 ON FILES 7, 8 AND 9. 'YDATUM' CAN EQUAL ZERO IN WHICH CASE THE Y
 COORDINATE SYSTEM IS USED.

ELEVS - ELEVATION OF THE GROUND SURFACE. 'ELEVS' IS USED FOR PRINTOUT
 PURPOSES ONLY ON FILES 7, 8, AND 9. ON THESE FILES, THE ELEVATIONS
 OF ALL POINTS OF INTEREST ARE PRINTED OUT. IF 'ELEVS' IS ZERO
 THEN ALL POINTS OF INTEREST WILL HAVE NEGATIVE ELEVATIONS BECAUSE
 THE Z-COORDINATE SYSTEM IS POSITIVE DOWNWARD.

INPUT 4B FREE SURFACE ELEMENTS - FINE DISCRETIZATION (SKIP THIS INPUT WHEN 'NBISO'.GE.0).

IBEGIN - BEGINNING I COORDINATE (ROW NUMBER) OF REGION TO BE SUBDIVIDED INTO CLOSELY SPACED SURFACE ELEMENTS.

IEND - ENDING I COORDINATE (ROW NUMBER) OF REGION TO BE SUBDIVIDED.

JBEGIN - BEGINNING J COORDINATE (COLUMN NUMBER) OF REGION TO BE SUBDIVIDED.

JEND - ENDING J COORDINATE (COLUMN NUMBER) OF REGION TO BE SUBDIVIDED (NOTE: I VARIES FROM 1 TO 'NROW', J FROM 1 TO 'NCOL', Y AND I SHARE THE SAME AXIS, X AND J SHARE THE SAME AXIS).

SW2 - HALF-WIDTH OF THE FINELY DIVIDED SURFACE ELEMENTS ('SW/SW2' SHOULD BE AN INTEGER).

NOTE: THE CORRECTION OF A CODING ERROR IN SUBROUTINE CERUT1 (SEE ENTRY NUMBER 16 IN THE UPDATE HISTORY AT THE TOP OF THIS PROGRAM) HAS ELIMINATED THE NEED FOR THE FINE DISCRETIZATION OPTION BUT THE OPTION IS STILL AVAILABLE FOR COMPATIBILITY WITH PREVIOUS VERSIONS.

INPUTS 5 AND 6 ARE A SET. THERE WILL BE 'NTYPE' SETS OF THESE.

INPUT 5 GEOMETRIC CHARACTERISTICS OF EACH TYPE OF HEAT SOURCE.

I - NUMBER TO BE IDENTIFIED WITH HEAT SOURCE (NUMBER HEAT SOURCE TYPES CONSECUTIVELY FROM ONE TO 'NTYPE').

CLEN(I) - A.) IF HEAT SOURCE IS A CANISTER, 'CLEN(I)' = LENGTH OF CANISTER (FOR A SINGLE POINT SOURCE 'CLEN(I)'=1.0.

B.) IF HEAT SOURCE IS A LINE SOURCE, INPUT ANY NON-ZERO NUMBER. THE ACTUAL LENGTH IS COMPUTED FROM THE BEGINNING AND END POINTS OF THE LINE AND ARE GIVEN IN INPUT 9B.

C.) IF HEAT SOURCE IS A PLATE SOURCE, INPUT ANY NON-ZERO NUMBER. THE DIMENSIONS OF THE PLATE ARE SPECIFIED IN INPUT 8B.

NSORC(I) - A.) IF THE SOURCE IS A CANISTER OR POINT SOURCE, 'NSORC(I)' IS THE NUMBER OF EQUALLY SPACED POINT SOURCES WHICH REPRESENT THE CANISTER.

B.) IF THE SOURCE IS A LINE SOURCE OR A PLATE SOURCE, THEN 'NSORC(I)' MUST EQUAL 1 !

NCOMP(I) - NUMBER OF COMPONENTS FOR THIS SOURCE TYPE. 'NCOMP(I)' DETERMINES THE NUMBER OF VALUES TO READ IN INPUT 6.

DEPTH(I) - A.) IF SOURCE IS A CANISTER OR POINT SOURCE, 'DEPTH(I)' IS THE DEPTH OF THE MID-POINT BELOW THE GROUND SURFACE.

B.) IF THE SOURCE IS A LINE SOURCE OR A PLATE SOURCE, INPUT ANY VALUE. THE DEPTH IS DETERMINED IN INPUT 9B OR 8B BY THE COORDINATES OF THE SOURCE.

INPUT 6 HEAT GENERATION FOR EACH COMPONENT OF SOURCE TYPE I ('NCOMP(I)' OF THESE).

QTA(I,J) - TIME AFTER EMPLACEMENT AT WHICH THIS COMPONENT STARTS.

QCA(I,J) - INITIAL STRENGTH OF COMPONENT J. IF THE SOURCE IS A CANISTER OR A LINE SOURCE THEN THE UNITS OF 'QCA' ARE $[\text{POWER}/(\text{DENSITY} \times \text{SPECIFIC HEAT}) = \text{DEGREES} \times \text{L} \times \text{L}/\text{T}]$.

IF THE SOURCE IS AN AREAL SOURCE, THEN THE UNITS ARE $[\text{POWER}/(\text{AREA} \times \text{DENSITY} \times \text{SPECIFIC HEAT}) = \text{DEGREES} \times \text{L}/\text{T}]$.

QEXPA(I,J) - DECAY CONSTANT (0 OR +). UNITS ARE $[1./\text{T}]$.

INPUT 7 POSITION OF CANISTERS. ('NCANN' OF THESE. SKIP IF 'NCANN' EQUALS ZERO.)

ITYPE(I) - TYPE OF CANISTER. REFERS TO VARIABLE 'I' IN INPUT 5.

XS(I) - X COORDINATE.

YS(I) - Y COORDINATE.

TIMO(I) - TIME OF PLACEMENT.

INPUT 8A AREAL HEAT SOURCE (SKIP IF THERE ARE NO AREAL SOURCES (IF 'NASORC'=0)).

NORDRA - ORDER OF NUMERICAL INTEGRATION TO BE USED WHEN COMPUTING THE INFLUENCE OF THE AREAL HEAT SOURCES (PERMISSIBLE VALUES: 0,1,2,3,4,5,9,14). WHEN 'NORDRA' EQUALS N, THE AREAL SOURCE IS REPRESENTED BY (N+1)*(N+1) INTEGRATION POINTS, WHICH ARE NOT EQUALLY SPACED AND ARE NOT EQUALLY WEIGHTED, BUT ARE SPACED AND WEIGHTED ACCORDING TO GAUSS-LEGENDRE QUADRATURE, A STANDARD NUMERICAL INTEGRATION PROCEDURE. IT IS RECOMMENDED THAT 'NORDRA' BE LESS THAN OR EQUAL TO 3. ENTER 1 VALUE OF 'NORDRA' ONLY FOR ALL PLATE SOURCES OF TYPE 'ITYPE(I)'

INPUT 8B POSITION OF AREAL SOURCES (NASORC OF THESE; SKIP IF NASORC=0).

ITYPE(I) - TYPE OF AREAL SOURCE. REFERS TO VARIABLE 'I' IN INPUT 5.

TIMO(I) - TIME OF EMPLACEMENT OF THE AREAL SOURCE.

XC(I) - X-COORDINATE OF POINT 1 OF THE SOURCE. (SEE FIG. 2-3, USERS GUIDE)

YC(I) - Y-COORDINATE OF POINT 1 OF THE SOURCE. (SEE FIG. 2-3, USERS GUIDE)

ZC(I) - ELEVATION OF POINT 1 OF THE SOURCE. (SEE FIG. 2-3, USERS GUIDE)

ANGLE(I) - ANGLE WHICH THE AREAL SOURCE MAKES WITH THE X-AXIS IN THE X-Y PLANE (MEASURED CLOCKWISE FROM THE X-AXIS; REFER TO FIGURE 2-3 OF THE USER'S GUIDE FOR THE CONVENTION).

ALENG1(I)-LENGTH OF SIDE ONE OF THE SOURCE IN THE X-Y PLANE (REFER TO FIG. 2-3 OF THE USERS GUIDE FOR DEFINITION OF SIDES ONE AND TWO).
 ALENG2(I)-LENGTH OF SIDE TWO OF THE SOURCE.
 NOTE: IT IS IMPORTANT TO EMPHASIZE THAT ANGLE(I), ALENG1(I), AND ALENG2(I) REFER TO THE PROJECTED VALUES ONTO THE X-Y PLANE. FOR PLATE SOURCES WHICH ARE INCLINED MORE THAN A FEW DEGREES, ADJUSTMENTS MUST BE MADE TO THE TOTAL POWER OF THE PLATE TO COMPENSATE FOR THE LARGER AREA IN THE TRUE PLANE OF THE PLATE.
 ZC1 -ELEVATION OF THE FAR-END POINT OF SIDE 1. (SEE FIG. 2-3, USERS GUIDE)
 ZC2 -ELEVATION OF THE FAR-END POINT OF SIDE 2. (SEE FIG. 2-3, USERS GUIDE)
 NSORC1(I)-NUMBER OF EQUALLY SPACED PLATE SOURCES INTO WHICH SIDE ONE OF THE SOURCE SHOULD BE SUBDIVIDED (USED TO INCREASE THE NUMBER OF INTEGRATION POINTS PER SOURCE; REFER TO THE USER'S GUIDE, FIGURE 2-3).
 NSORC2(I)-NUMBER OF EQUALLY SPACED PLATE SOURCES INTO WHICH SIDE TWO OF THE SOURCE SHOULD BE SUBDIVIDED (SEE FIG. 2-3, USERS GUIDE).

INPUT 9A LINE HEAT SOURCE (SKIP IF THERE ARE NO LINE SOURCES (IF 'NLSORC'=0)
 NORDRL - ORDER OF NUMERICAL INTEGRATION TO BE USED WHEN COMPUTING THE INFLUENCE OF THE LINE HEAT SOURCES (PERMISSIBLE VALUES:0,1,2,3,4,5,9,14). WHEN 'NORDRL' EQUALS N, EACH SEGMENT OF LINE SOURCE IS REPRESENTED BY (N+1) INTEGRATION POINTS, WHICH ARE NOT EQUALLY SPACED AND ARE NOT EQUALLY WEIGHTED, BUT ARE SPACED AND WEIGHTED ACCORDING TO GAUSS-LEGENDRE QUADRATURE, A STANDARD NUMERICAL INTEGRATION PROCEDURE. IT IS RECOMMENDED THAT 'NORDRL' BE LESS THAN OR EQUAL TO 3. ENTER 1 VALUE OF 'NORDRL' ONLY FOR ALL LINE SOURCES OF TYPE 'ITYPE(I)'

INPUT 9B POSITION OF LINE SOURCES ('NLSORC' OF THESE; SKIP IF 'NLSORC'=0)
 ITYPE(I) -TYPE OF LINE SOURCE. REFERS TO VARIABLE 'I' IN INPUT 5.
 NPTSL(I) -TOTAL NUMBER OF INTEGRATION POINTS ON THE LINE (SHOULD BE DIVISIBLE BY 'NORDRL'+1, WHERE 'NORDRL' IS DEFINED IN INPUT 9A). IN STRES3D, THE LINE SOURCE IS SUBDIVIDED INTO '(NPTSL/([NORDRL+1]))' EQUALLY SPACED SEGMENTS EACH CONTAINING 'NORDRL+1' INTEGRATION POINTS.
 XS1(I) -THE X-COORDINATE OF THE FIRST END OF THE LINE (NOTE: EITHER END OF THE LINE SOURCE MAY BE BE DESIGNATED AS THE FIRST END).
 YS1(I) -THE Y-COORDINATE OF THE FIRST END OF THE LINE.
 ZS1(I) -THE Z-COORDINATE OF THE FIRST END OF THE LINE.
 XS2(I) -THE X-COORDINATE OF THE SECOND END OF THE LINE.
 YS2(I) -THE Y-COORDINATE OF THE SECOND END OF THE LINE.
 ZS2(I) -THE Z-COORDINATE OF THE SECOND END OF THE LINE.
 TIMO(I) -TIME OF EMPLACEMENT OF THE LINE SOURCE.

INPUT 10 TIMES FOR OUTPUT ('NTIMES' ARE TO BE READ IN. MORE THAN ONE TIME CAN BE READ ON A GIVEN LINE).
 TIM(I)- TIME AT WHICH SOLUTION IS TO BE PRINTED.

INPUT 11 LINES FOR OUTPUT ('NLINES' OF THESE).
 NPOINT - NUMBER OF POINTS ALONG LINE.
 XB - X COORDINATE FOR START OF LINE (M).
 YB - Y COORDINATE FOR START OF LINE (M).
 ZB - ELEVATION FOR START OF LINE (M).
 XE - X COORDINATE FOR END OF LINE (M).
 YE - Y COORDINATE FOR END OF LINE (M).
 ZE - ELEVATION FOR END OF LINE (M).

INPUT 12 STOP CARD
 "STOP" (WITH NO LEADING BLANK SPACES) TERMINATES THE PROGRAM. IF A NEW SET OF DATA IS TO BE READ, REPLACE THIS WITH THE NEXT TITLE CARD. THIS CARD MUST APPEAR ON THE NEXT LINE FOLLOWING THE LAST INPUT OF INPUT 11 (NO PRECEDING BLANK LINES).

2.2 System Interface

STRES3D is written in FORTRAN 77 that conforms to the ANSI X3.9-1978 standard. The listing given in Section 2.1 compiles using Silicon Valley Software (SVS) FORTRAN v.2.8. The executable code runs on a Definicon Systems DSI board based on a Motorola 68020 CPU with a math chip. Experience suggests that porting the program to other computing environments offering a full implementation of FORTRAN77 will require minimum code modifications. Specifically, the meta commands on lines 1 and 2 of the listing and the system dependent subroutines "SECOND"

and "DATED," which return the system time of day in seconds and the date, will need to be changed. In addition, the array dimension defined in the PARAMETER statement may need adjusting for a system with very limited memory.

The listing in Section 2.1 includes both SUBROUTINE SECOND and SUBROUTINE DATED, and the meta commands used with the SVS FORTRAN compiler. The SVS FORTRAN compiler uses a real variable length of 32 bits, which gives a single precision variable range of approximately $\pm 1.0 \times 10^{\pm 38}$, and precision of about 6 decimal places. Integer variables default to 32 bits, but a compiler switch to 16 bit integers is permissible providing that no integer values exceed ± 32767 (including dimension statements).

2.3 Example Problems

2.3.1 Effects of Gauss Point Density in Areal Heat Sources

This problem was designed to illustrate the effects of gauss point density in an areal or plate heat source on the solutions near the heat source. The input and output files for this problem are given in Appendix B.

The problem geometry is shown in Figure 2-4. A 10 ft by 10 ft areal heat source is located in an infinite solid. The thermal and mechanical properties of the solid are as follows:

thermal diffusivity	=	289.3 ft ² /year
Young's modulus	=	3.171×10^8 psf
Poisson's ratio	=	.22
thermal expansion coefficient	=	4.889×10^{-6} ft/ft °F.

The heat source has a constant strength of 2000.0 ft °F/yr and is turned on at time equals zero years.

The coordinates shown in Figure 2-4 are merely for reference in setting up the problem and location points for output. Solutions were calculated in a plane parallel to the heat source and 1 ft away at a time of 20 years. Solutions were calculated at 420 locations in a 40 ft by 40 ft area centered over the plate. Three STRES3D analyses were run which differed only in the order of numerical integration used when computing the influence of the heat source. Variable NORDA in Input 8A of the User's Guide in Section 2.1 defines the integration order to be used. The values of NORDA used for the 3 analyses were 0, 1, and 3 corresponding to 1 gauss point on each side of the plate, 2 gauss points on each side, and 4 gauss points on each side, respectively. The gauss point locations are shown in Figure 2-5 along with contours of temperature, the x direction component of stress, the z direction component of stress, and the z direction displacements.

As evidenced by the contour plots in Figure 2-5, there is a smoothing of the results when the number of gauss points is increased. Note, however, that contour lines which are not directly over the heat source are in good agreement for all three cases exemplifying the localization of the effect. Users are urged to test their models to be certain that solutions near the heat source are not being affected by their proximity to the gauss points.

Figure 2-4. Geometry for Example Problem in Section 2.3.1

Figure 2-5. Results for Example Problem in Section 2.3.1

2.3.2 Repository Model

This sample problem concerns a vertical shaft connecting the ground surface with a hypothetical nuclear waste repository. This sample problem exercises most of the program's capability. The material properties, repository layout, and emplacement sequence do not necessarily reflect the current design. The input and output files for this problem are given in Appendix C.

The general layout of the repository is shown in Figure 2-6 and is based on the SCP-CDR. Results from this analysis were calculated along a shaft at x coordinate = 766337 and y coordinate = 563918 to a depth of approximately 1100 ft, 100 years after waste emplacement operations were initiated.

The repository contains 32 panels which will house the waste canisters. The heated panels are each located at different depths relative to the surface and have waste emplaced at different times. Figure 2-6 shows plan and profile views of the waste emplacement panels as modeled with STRES3D. In this study, the heated area of each panel was modeled as a horizontal plate heat source.

The temperature at the ground surface above the repository is 54.9 °F. The temperature increases with depth but the gradient varies over five depth ranges as follows:

Depth (ft)	Temperature Gradient
0 to 250	.00546
250 to 500	.0108
500 to 1000	.0090
1000 to 1500	.0112
1500 to 2000	.0162

The thermal and mechanical properties used in this analysis are listed below. The English units will be used in this analysis.

Young's modulus	15,200 MPa	3.171×10^8 psf
Poisson's ratio	0.22	0.22
thermal expansion coefficient	8.8×10^{-6} 1/°C	4.889×10^{-6} 1/°F
thermal diffusivity	8.518×10^{-7} m ² /s	289.3 ft ² /year
thermal capacitance	2.16×10^6 J/m ³ °C	25033.0 lb-ft/ft ³ °F

Referring to the User's Guide in Section 2.1 and to the example input files in Appendix C, the discussion thus far completes Inputs 1 through 3c. By setting the density equal to zero in Input 3c, no initial stresses are calculated and the remainder of Input 3c regarding initial stresses is not used. The stress calculated will be the induced stress only.

In order to ensure that the ground surface was free of shear stress at all times, special surface elements were utilized. Without these elements, some of the surface shears would have a significant impact on the results. A rectangular grid of 80 by 120 surface elements was used; each element had a width of 200 feet. The centroid of these elements was located at the approximate centroid of the waste panels (x = 764,000 ft, y = 561,000 ft).

Figure 2-6. Plan and Profile Views of the Waste Emplacement Panels as Modeled with STRES3D in the Example Problem in Section 2.3.2

The input file in Appendix C, page C-2 was used to generate the free surface and to calculate and write to an output file the surface shear stress values. The discretization of the free surface, Input 4a, is shown in Figure 2-7. Note that in Appendix C, page C-2 the value of NBISO in Input 4A is set to 1 and in Appendix C, page C-1 NBISO equals two. This flag describes whether the surface shear stresses are calculated or read from a file during a STRES3D run (see the User's Guide in Section 2.1).

The values XDATUM, YDATUM, and ELEVS in Input 4A are simply x, y, and z coordinate translations and are used as a convenience for describing heat source and output locations relative to a local map grid.

All 32 of the waste panels in this problem contain the same type of waste and so only one set of Inputs 5 and 6 from the User's Guide (Section 2.1) are required. Note that NSORC in Input 5 must equal 1 for plate heat sources.

At the time of emplacement, the average local areal power density is projected to be approximately 85 kW/acre over each of the 32 waste panels. The power generation will decay exponentially with time. The normalized coefficients, time exponents, and component strength for Input 6, describing the power decay, are summarized in Table 2-1. These components represent a mix of PWR and BWR fuel rods aged 8.55 years out of the reactor before repository emplacement.

The waste emplacement will take place over a 25 year period. The emplacement schedule used in this study is that given in Figure 2-8.

The heat source strengths for the panels is calculated from the local areal power density of 85 kW/acre which must be converted to English units. As described in Input 6 of the User's Guide given in Section 2.1, the power density in STRES3D for a plate source must be given as

$$\frac{\text{power}}{(\text{area})(\text{density})(\text{specific heat})} = \frac{\text{power}}{(\text{area})(\text{thermal capacitance})},$$

which gives a total strength of 1811.0 °F-ft/year.

Description of the waste emplacement panels is given in Inputs 8A and 8B of the User's Guide for plate heat sources. Table 2-2 lists the panel coordinates for the panel corners shown in Figure 2-9. Each waste panel was represented by one or more plate heat sources in the STRES3D model. The total number of integration points—and, in general, the accuracy of the solution—increases with the number of plates which represent each waste panel. However, the computational effort needed to solve the problem also increases linearly with the number of panels. The number of integration points per plate heat source is controlled by NORDA on Input 8A and by NSORC1 and NSORC2 in Input 8B (see input files in Appendix C, pages C-1 and C-2).

The panel discretization used to compute the influence of the waste on the shaft in the repository is shown in Figure 2-10. A total of 206 plate elements were analyzed with 3296 integration points (see the input file in Appendix C, page C-1). A lesser number of integration points will give the same accuracy at large distances from the waste panels. The relatively coarse panel discretization, shown in Figure 2-11, was used when computing the influence of the waste panels at the surface elements. This coarser panel discretization saved considerable computational effort, with no penalty in accuracy. The input file for the coarse panel discretization is given in Appendix C, page C-2.

Figure 2-7. Discretization of the Free Surface for the Example Problem in Section 2.3.2

TABLE 2-1

HEAT GENERATION FROM WASTE CANISTERS

Waste Component	Time Exponent (years) b_i	Proportion of Normalized Strength for 8.55 Year Old Waste a_i	Strength Component for 8.55 Year Old Waste QCA_i
1	0.0013539	.155821	282.2
2	0.019142	.598060	1083.1
3	0.051888	.152276	275.8
4	0.43768	.093844	169.9

Total = 1.000

Total = 1811.0

$$QCA_i = 1811(c_i)$$

Local Power Density at time t (years) after replacement: $P = 1811 \sum_{i=1}^4 a_i e^{-b_i(t)}$

Figure 2-8. Waste Emplacement Sequence Used in the Example Problem in Section 2.3.2 (Number on Each Subpanel is the Emplacement Time in Years)

TABLE 2-2**ELEVATIONS OF WASTE EMPLACEMENT PANELS
(FEET ABOVE MEAN SEA LEVEL)**

Panel	Corner 1	Corner 2	Corner 3	Corner 4
1a	3045	3045	3045	3045
1b	2995	2995	2995	2995
2a	3015	3015	3015	3015
2b	3020	3020	3020	3020
3a	3055	3055	3055	3055
3b	3075	3075	3075	3075
4a	3105	3105	3105	3105
4b	3155	3155	3155	3155
5a	3215	3215	3215	3215
5b	3275	3275	3275	3275
6a	3340	3340	3340	3340
6b	3400	3400	3400	3400
7a	3470	3470	3470	3470
7b	3535	3535	3535	3535
8a	3595	3595	3595	3595
8b	3655	3655	3655	3655
9	3710	3710	3710	3710
10a	3660	3660	3660	3660
10b	3700	3700	3700	3700
11a	3570	3570	3570	3570
11b	3615	3615	3615	3615
12a	3470	3470	3470	3470
12b	3520	3520	3520	3520
13a	3375	3375	3375	3375
13b	3420	3420	3420	3420
14a	3295	3295	3295	3295
14b	3330	3330	3330	3330
15a	3235	3235	3235	3235
15b	3275	3275	3275	3275
16a	3205	3205	3205	3205
16b	3225	3225	3225	3225
17	3190	3190	3190	3190

Areal heat sources

Figure 2-9. Key to Table 2 Listing Elevations of Waste Emplacement Panels as Modeled in Example Problem in Section 2.3.2

Figure 2-10. Integration Points Assigned to the Plate Heat Sources in the STRES3D Model for the Example Problem Given in Section 2.3.2

Figure 2-11. Integration Points Assigned to the Plate Heat Sources for Computation of the Surface Shear Strengths in the STRES3D Model for the Example Problem Given in Section 2.3.2

When the surface shear stresses are calculated separately as in this problem, the times for output must be the same for the surface shear stresses and for the output locations since the heat, and therefore, the temperatures and stresses are time-dependent.

The condensed output file of the final results along the shaft is given in Appendix C. The displacements are plotted in Figure 2-12 and the stresses are plotted in Figure 2-13. The elevation of the waste panels nearest the shaft is approximately 3020 feet.

Figure 2-12. Displacements Along the Shaft for the Example Problem Given in Section 2.3.2

STRESSES AT 100 YEARS

Figure 2-13. Stresses Along the Shaft for the Example Problem Given in Section 2.3.2

3.0 Verification

Sections 3.1 through 3.4 present the results of studies intended to demonstrate that the equations upon which STRES3D is based have been correctly implemented in Version 4.0 of the code and that solutions obtained satisfy all boundary and other conditions. The problems in Sections 3.1 through 3.3 are designed to check a portion of the codes computations. Section 3.4 comprises a benchmark of STRES3D against a thermal-mechanical, finite-element solution.

3.1 Verification of Surface Shear Solution

For problems in which a stress-free surface exists, the shear stresses resulting from a heat source at depth and its image must be calculated at the free surface and relieved (subtracted from the problem). As discussed in Section 1.3.2, STRES3D does this in two ways. For sample points located more than one surface element width from the free surface, the solution used is that of a point shear force located at the center of a surface element. For sample points closer than one surface element width from the free surface, the solution used is that of a shear force distributed uniformly over the area of a surface element.

To compare the two methods, Subroutines CERUTI and CERUT1 were extracted from program STRES3D and placed into the FORTRAN program, CERR, which is listed in Appendix D. Program CERR makes calls to CERUTI and CERUT1 passing identical input and generating tabular output for comparisons of the two methods at coincident points. Program CERR reads in the locations for the interest of output, the extent for the shear surface, the values of uniform tangential forces along the shear surface, and the column and row numbers of the surface shear element. The center of the shear surface is located in the origin by default. The shear surface is descretized only for the CERUTI calculation. As for CERUT1, only one surface shear element is used for calculation.

The configuration investigated is illustrated by Figure 3-1, which shows a region of a free surface 20 ft by 20 ft that is subdivided into 25 square zones. The solutions based on the concentrated shear forces were calculated in Subroutine CERUTI along the lines denoted locations 1, 2 and 3 in Figure 3-1, using this 5 by 5 grid. The solutions based on the distributed shear force were calculated in Subroutine CERUT1 along the same three lines, with the shear stress over the entire 20 ft by 20 ft surface modeled by a single element. Total shear traction of 10,000 lbf per square foot was applied to the free surface in the x direction. No other forces were applied.

The material properties for the solid are coded into program CERR and are listed below.

$$\begin{aligned}\text{Young's modulus (E)} &= 3.171 \times 10^8 \text{ lb-ft/ft}^2 \\ \text{Poisson's ratio (v)} &= 0.22 \\ \text{shear modulus (G)} &= E/2(1 + v) \text{ lbf/ft}^2\end{aligned}$$

Figures 3-2, 3-3, and 3-4 show plots of both the x displacement and the shear stress σ_{zx} versus distance from the free surface for Locations 1, 2 and 3, respectively. As can be seen in these graphs, the agreement between the point solution and the distributed solution is excellent providing that the sample point lies beyond one element width of the free surface (as modeled using the point source solution). The cutoff for use of CERUT1 of twice the semi-width of the surface element is currently coded into STRES3D and can be found in Subroutine CALC. The reason for using the point source solution for lower depths is that it is computationally approximately twice as fast as the distributed solution, and calculation of the effect of surface shear represents a significant proportion of the total computational effort.

The output files from program CERR for the three locations are listed in Appendix D.

Figure 3-1. Locations for Verification Problem in Section 3.1

Figure 3-2. Results at Location 1 for Verification Problem in Section 3.1

LOCATION 2

LOCATION 2

Figure 3-3. Results at Location 2 for Verification Problem in Section 3.1

Figure 3-4. Results at Location 3 for Verification Problem in Section 3.1

3.2 Verification of Point Heat Source Solutions

This problem concerns a point heat source in an infinite elastic medium and checks that the induced temperatures, stresses, and displacements due to a heat source in an infinite medium are correct. The medium has an initial uniform temperature of zero and is unstressed. At time $t = 0$, a quantity of heat Q is instantaneously released from a point source located at the origin (refer to Figure 3-5). The transient temperatures and quasi-static stresses induced by the heat source are described by the following analytic solution derived by Nowacki (1962):

$$T = \frac{Q}{(4\pi\kappa t)^{3/2}} \exp\left(-\frac{R^2}{4\kappa t}\right)$$

$$\sigma_{rr} = -\frac{mQ\mu}{\pi R^3} \left[\operatorname{erf}\left(\frac{R}{\sqrt{4\kappa t}}\right) - \frac{2R}{\sqrt{4\pi\kappa t}} \exp\left(-\frac{R^2}{4\kappa t}\right) \right]$$

$$\sigma_{\theta\theta} = \frac{mQ\mu}{2\pi R^3} \left[\operatorname{erf}\left(\frac{R}{\sqrt{4\kappa t}}\right) - \frac{2R}{\sqrt{4\pi\kappa t}} \left(1 + \frac{2R^2}{4\kappa t}\right) \exp\left(-\frac{R^2}{4\kappa t}\right) \right]$$

$$U_r = \frac{mQ}{4\pi R^2} \left[\operatorname{erf}\left(\frac{R}{\sqrt{4\kappa t}}\right) - \frac{2R}{\sqrt{4\pi\kappa t}} \exp\left(-\frac{R^2}{4\kappa t}\right) \right]$$

where: T = temperature
 σ_{rr} = radial stress
 $\sigma_{\theta\theta}$ = hoop stress
 U_r = radial displacement
 c = specific heat capacity
 E = Young's modulus
 erf = error function
 $= 1 - \frac{2}{\sqrt{\pi}} \int_x^\infty e^{-\zeta^2} d\zeta$
 $m = \left(\frac{1+\nu}{1-\nu}\right) \alpha_t$
 Q = amount of heat released, normalized with respect to the quantity (ρc)
 R = radial distance
 t = time
 α_t = coefficient of thermal expansion
 κ = thermal diffusivity
 μ = shear modulus = $E/2(1+\nu)$
 ν = Poisson's ratio
 ρ = density

The STRES3D code was verified against the analytical solution for one particular case with the following characteristics:

Figure 3-5. Verification Problem in Section 3.2—Pulse Heat Source in an Infinite Medium

$$\begin{aligned}
E &= 1.01 \times 10^9 \text{ Pa} \\
Q/\rho c &= 58.56^\circ\text{C m}^3 \\
\alpha_t &= 5.4 \times 10^{-6} \text{ m}/(\text{m } ^\circ\text{C}) \\
\kappa &= 0.01 \text{ m}^2/\text{year} \\
\nu &= 0.20 \\
\rho c &= 1.0 \text{ J}/(\text{m}^3 \text{ } ^\circ\text{C})
\end{aligned}$$

The temperatures, stresses, and displacements for this case are denoted by the solid lines in Figures 3-6 through 3-9. These results pertain to a time of 10 years after release of the heat. At this time t , the heat has diffused to a radial distance of approximately 1.5 meters. The maximum temperature for this time is 41.63°C . Aside from the singularity at the origin, the minimum hoop stress is equal to $-9,800 \text{ Pa}$; the maximum hoop stress of $18,600 \text{ Pa}$ occurs at a radial distance of 0.06 m from the point source. Like the hoop stress, the radial stress is also singular at the origin. The singularity only affects a small region: the radial stress at the origin is infinitely large, while at a radial distance of 0.05 m , the stress has decayed to $193,000 \text{ Pa}$. The radial stress decays gradually from $193,000 \text{ Pa}$ to $7,900 \text{ Pa}$ as the radial distance changes from 0.05 to 2.00 meters. The radial displacement, like the radial stress, is singular at the origin. A very short distance from the origin, $.03 \text{ m}$ away, the displacement decreases to 3.8×10^{-6} meters. Then it increases to a peak displacement of $4.04 \times 10^{-5} \text{ m}$ at a distance of $.61$ meters.

The STRES3D code was verified against the above analytic solution for a pulse heat source. During the STRES3D simulation, the pulse heat source was treated as a continuous heat source which acted for a short period of time. The total amount of heat which was released between time 0.0 and time 0.10 years was equal to that released instantaneously for the analytical solution. The temperatures, stresses, and displacements for this case are also given in Figures 3-6 through 3-9. (In these figures, the solid lines denote the analytic solution and the circles denote the numerical solution as computed by STRES3D.) The differences between the two solutions are tabulated in Table 3-1 for radial distances up to 1.5 m , which is the extent of the detectable thermal disturbance. The maximum difference in temperature between the numerical solution and the analytical solution is 1.7 percent, while the maximum differences in hoop stress and radial stress are 5.7 and 0.7 percent, respectively. The maximum difference between the STRES3D solution and the analytic solution for radial displacements is less than one percent. Thus, the solution computed with STRES3D is in good agreement with the analytic solution. The STRES3D input and output files are listed in Appendix E.

3.3 Verification of Half-Space Solution Method

This problem concerns the thermal-mechanical solution of a plate source in a semi-infinite medium and tests the code's ability to analyze the effects of a plate source. It also serves as a check that the coding for an isothermal-free surface is correct. The plate source is parallel to the free surface, and is located at a depth d . The plate source is of thickness $2l$, and it is of infinite lateral extent (refer to Figure 3-10). Initially, the medium is stress-free, and it has a uniform temperature of zero. At time $t = 0$, the source begins to generate heat at a constant rate.

The analytical solution for the temperatures is that derived from a solution given by Carslaw and Jaeger (1980):

$$T = \frac{2\kappa A_o t}{k} [(f(x-l) - f(x+l)) - (f[2(d-l) - (x-l)] - f[2(d-l) - (x+l)])]$$

Figure 3-6. Temperatures Due to Pulse Heat Source for Verification Problem in Section 3.2 ($t = 10$ years)

Figure 3-7. Hoop Stresses Due to Pulse Heat Source for Verification Problem in Section 3.2 ($t = 10$ years)

Figure 3-8. Radial Stresses Due to Pulse Heat Source for Verification Problem in Section 3.2 ($t = 10$ years)

Figure 3-9. Radial Displacement Due to a Pulse Heat Source for Verification Problem in Section 3.2 ($t = 10$ years)

Table 3-1**A Comparison of the Analytical and Numerical Solutions for a Pulse Point Heat Source in an Infinite, Elastic, Conducting Medium**

Radial Distance (m)	Difference in Computed Temperatures (percentage)*	Difference in Computed Hoop Stress (percentage)*	Difference in Computed Radial Stress (percentage)*	Difference in Computed Radial Displacement (percentage)*
0.10	.73	.82	.53	.57
0.20	.71	.71	.71	.73
0.30	.65	.61	.68	.66
0.40	.55	.48	.63	.63
0.50	.44	.34	.58	.55
0.60	.29	.11	.55	.50
0.70	.15	.27	.43	.42
0.80	.06	1.01	.36	.36
0.90	.27	3.86	.28	.29
1.00	.48	5.69	.22	.21
1.10	.77	1.87	.15	.14
1.20	.87	1.00	.14	.12
1.30	1.40	.69	.06	.06
1.40	1.70	.44	.07	.06
1.50	.22	.16	.11	.11

* *Analytic solution minus STRES3D solution, normalized with respect to the analytic solution.*

a) Schematic

b) Cross-Section

Figure 3-10. Verification Problem in Section 3.3—Infinite Plate Heat Source

where:

$$\begin{aligned}
A_o &= \text{heat generation rate per unit volume} \\
d &= \text{depth of source below free surface} \\
k &= \text{thermal conductivity} \\
l &= \text{half-thickness of plate source} \\
t &= \text{time} \\
x &= \text{distance from the center of the source} \\
\kappa &= \text{thermal diffusivity} \\
f(\zeta) &= i^2 \operatorname{erfc} \left(\frac{\zeta}{2\sqrt{\kappa t}} \right) \\
i^2 \operatorname{erfc}(y) &= \text{second integral of the error function} \\
&= \frac{1}{4} \left[(1 + 2y^2) \operatorname{erfc} - \frac{2}{\sqrt{\pi}} y e^{-y^2} \right] \\
\operatorname{erfc}(y) &= \text{complementary error function} \\
&= \frac{2}{\sqrt{\pi}} \int_y^\infty e^{-\zeta^2} d\zeta
\end{aligned}$$

The particular solution for the following geometry and thermal properties is shown in Figure 3-11.

$$\begin{aligned}
A_o &= 3.043 \times 10^6 \text{ ft-lb/}(\text{yr ft}^3) & (57 \text{ kW/acre areal power density}) \\
d &= 500 \text{ ft} \\
k &= 7.251 \times 10^6 \text{ ft-lb/}(\text{year } ^\circ\text{F ft}) & (1.841 \text{ J/}(\text{ } ^\circ\text{C second m})) \\
l &= 5 \text{ ft} \\
\kappa &= 289.3 \text{ ft}^2/\text{year} \quad (26.9 \text{ m}^2/\text{year})
\end{aligned}$$

Also shown in Figure 3-11 is the numerical solution as computed by STRES3D; the numerical solution is denoted by circles and crosses, while the analytic solution is denoted by solid lines. Selected data is also presented in Table 3-2. Generally, there is a good agreement between the two solutions. Although, the numerical solution does begin to deviate from the analytical solution close to the source. This may be anticipated since the closed-form solution considers that the heat source is distributed uniformly throughout a layer of finite thickness while STRES3D approximates sources distributed on a plate.

Several approximations are required in order to simulate the heat source with STRES3D. A very large plate heat source rather than an infinite source was considered. For this verification problem, a square plate, 10,000 ft on each side, was assumed. The plate was subdivided into 100 equal sized plate sources. The strength of plate source was set to be equal to that of the distributed source represented in the analytical solution. In view of the fact that the analytical solution treats the source as distributed through a finite layer, as opposed to being concentrated at a series of points within a plane, some deviation between the two solutions may be anticipated close to the source. The STRES3D input and the condensed output files are listed in Appendix F.

3.4 Benchmark of STRES3D Versus Thermomechanical Finite Element Analysis

The benchmark described in this section allows a comparison of the temperatures, displacements and stresses calculated using STRES3D with those obtained using the thermal and

Figure 3-11. Temperature Profiles at 50 and 100 Years After Heat Generation Begins for Verification Problem in Section 3.3

Table 3-2

A Comparison of the Analytical and Numerical Solutions for an Infinite Plate Heat Source in a Semi-Infinite, Elastic, Conducting Medium

Depth (ft)	Analytic Temperature at 50 Years (°F)	STRES3D Temperature at 50 Years (°F)	Analytic Temperature at 100 Years (°F)	STRES3D Temperature at 100 Years (°F)
50.0	0.7863	0.7509	8.194	11.94
100.0	2.208	2.179	18.14	19.91
150.0	5.178	5.086	31.70	32.37
200.0	11.16	11.13	50.85	50.61
250.0	22.41	22.61	77.76	77.45
300.0	42.09	43.50	114.7	115.2
350.0	74.12	79.29	163.8	167.8
400.0	122.8	136.4	227.2	239.4
450.0	192.1	211.5	306.5	324.0

thermal-mechanical finite element analysis codes DOT (INTERA Environmental Consultants, Inc., 1983) and VISCOT (J. F. T. Agapito & Associates, Inc., 1987). This problem will also make an example of the effects of the areal extent of the free surface on the computed results in STRES3D. To simplify the presentation, the results of the analyses conducted during the benchmark are described in turn. First, in Section 3.4.1, the thermal analysis program DOT and its application in the benchmark are described. Next, the thermal-mechanical analysis program VISCOT and its application is described. Then the STRES3D analysis is described in Section 3.4.2 and a discussion and comparison of all results follows in Section 3.4.3. Input files for programs DOT and VISCOT are listed in Appendix G. The input and output files for the STRES3D analyses are listed in Appendix H.

3.4.1 DOT/VISCOT Thermal-Mechanical Analyses

Program DOT (determination of temperature) is a nonlinear heat transfer code intended for analysis of two-dimensional planar and axisymmetric structures. In this instance, DOT was used to calculate the temperature distribution due to constant heat sources in a semi-infinite solid. Data files, comprising nodal point temperatures, are prepared automatically by DOT in a form suitable for input to VISCOT.

Two finite-element meshes, which will be referred to as DOT/VISCOT Model 1 and DOT/VISCOT Model 2 were used in this study. These are shown in Figures 3-12 and 3-13, respectively. Figure 3-14 shows the actual modeled region of DOT/VISCOT Model 1 due to lines of symmetry imposed on the left, right, and bottom of the mesh. Figure 3-15 shows the actual modeled region of DOT/VISCOT Model 2 due to the same symmetry conditions. The DOT/VISCOT Model 2 mesh was created and analyzed to eliminate the boundary condition effects in Model 1 which could not be reproduced with STRES3D. These effects are discussed in Section 3.4.3.

A transient analysis was run for each mesh for a period of 20 years. Plate heat sources of constant strength were simulated using nodal point sources along a line or lines. Location of the heat sources within the meshes are shown in Figures 3-12 and 3-13. The implied locations of the heat sources due to lines of symmetry are shown in Figures 3-14 and 3-15. The top edge of both models is the ground surface and has a fixed temperature of 0°C. The thermal properties for the solid were assumed to be as follows:

$$\begin{aligned}\text{thermal conductivity} &= 1.0 \times 10^7 \text{ J/yr} \times \text{m} \times ^\circ\text{C} \\ \text{specific heat} &= 2.0 \text{ J/kg } ^\circ\text{C} \\ \text{density} &= 1000 \text{ kg/m}^3\end{aligned}$$

The total power per unit volume for each plate source is $3.0 \times 10^6 \text{ w/m}^3$ and is distributed as a function of distance between nodes and the number of nodes describing the plate.

Program VISCOT is a two-dimensional and axisymmetric nonlinear, transient, thermo-viscoelastic and thermoviscoplastic finite element code. In this problem VISCOT was used to calculate the thermal-induced stress and displacement due to a temperature change in the elastic, semi-infinite solid. Identical finite-element meshes were used for DOT and VISCOT which allowed input of the DOT nodal temperatures directly into VISCOT. No other external loads were applied in the VISCOT analyses. In both meshes, DOT/VISCOT Model 1 and DOT/VISCOT Model 2, the top of the mesh was stress free and unrestrained, the left and right edges were held fixed laterally and the bottom edge was fixed vertically. The properties for the solid were assumed to be as follows:

$$\begin{aligned}\text{Young's modulus (E)} &= 10,000 \text{ MPa} \\ \text{Poisson's ratio (v)} &= 0.20 \\ \text{thermal expansion coefficient} &= 1.0 \times 10^{-6} \text{ m/m}^\circ\text{C}\end{aligned}$$

DOT/VISCOT FINITE ELEMENT MESH

Figure 3-12. Finite-Element Mesh for DOT/VISCOT Model 1 for the Verification Problem in Section 3.4

DOT/VISCOT FINITE ELEMENT MESH

Figure 3-13. Finite-Element Mesh for DOT/VISCOT Model 2 for the Verification Problem in Section 3.4

Figure 3-15. Region Modeled by DOT/VISCOT Model 2 for the Verification Problem in Section 3.4

3.4.2 STRES3D Thermal-Mechanical Analyses

Figures 3-16, 3-17 and 3-18 depict the three STRES3D models used in this benchmark and are referred to as STRES3D Models 1, 2 and 3, respectively. The models differ only in the discretization and extent of the free surface. The three models were used to demonstrate the effects of the free surface on the final results and are discussed in Section 3.4.3.

Remembering that the DOT/VISCOT analyses are two-dimensional, the x-z plane in STRES3D was chosen to be equivalent to the x-y plane in DOT/VISCOT. Three areal heat sources were simulated in the STRES3D models. Each plate source, measured one meter thick in the vertical direction by 100 m thick in the STRES3D x-z plane horizontal direction by 1000 m long in the STRES3D y-z plane horizontal direction. The 1000 m length in the STRES3D y-z plane direction was chosen to approximate the infinite out-of-plane length of the point source arrays modeled in DOT.

The thermal and mechanical properties used in the STRES3D models are as follows:

thermal diffusivity	=	5000 m ² /year
Young's modulus (<i>E</i>)	=	10,000 MPa
Poisson's ratio (<i>ν</i>)	=	0.20
thermal expansion coefficient	=	1.0 × 10 ⁻⁶ m/m°C
specific heat (<i>c</i>)	=	2.0 J/kg°C
density (<i>ρ</i>)	=	1000 kg/m ³

As in DOT/VISCOT, the heat sources were modeled as constant strength and equal to $3.0 \times 10^6 \text{ W/m}^3$. For an areal heat source in STRES3D, the power is input as

$$QCA = \frac{P}{A} \times \frac{1}{pc} = 3.0 E^6 \times \frac{1}{(1000.)(2.)} = 1500 \frac{m^\circ C}{yr}$$

where $\frac{P}{A}$ = is the power per unit area.

3.4.3 Results of STRES3D Versus DOT/VISCOT Benchmark

Several steps were taken to check the agreement between STRES3D and the DOT/VISCOT temperatures, displacements and stresses. The sequence of analyses and results are given here in outline form to simplify this discussion.

- Step 1 -- Set up and run DOT/VISCOT Model 1 (see Figures 3-13 and 3-14).
- Step 2 -- Set up and run STRES3D Model 1 (see Figure 3-16).
- Step 3 -- Contours of temperature and stress are shown in Figures 3-19 and 3-20 for DOT/VISCOT Model 1 and STRES3D Model 1 (and other models), and the agreement is very good. Vertical and horizontal displacements are plotted along Line 1 in Figures 3-21 and 3-22, respectively. The location of line 1 is shown in Figures 3-12 through 3-18. The differences in vertical and horizontal displacements is quite large for DOT/VISCOT Model 1 and STRES3D Model 1.

Figure 3-16. STRES3D Model 1 for Verification of the Problem in Section 3.4

Figure 3-17. STRES3D Model 2 for the Verification Problem in Section 3.4 with the Number of Free Surface Elements Increased from 100 to 400

Figure 3-18. STRES3D Model 3 for the Verification Problem in Section 3.4 Showing the Areal Extent of the Free Surface Increased to 4000 Meters by 4000 Meters

Figure 3-19. Results of STRES3D Versus DOT/VISCOT Benchmark for Verification Problem in Section 3.4

Figure 3-20. Results of STRES3D Versus DOT/VISCOT Benchmark for Verification Problem in Section 3.4

VERTICAL DISPLACEMENT ALONG LINE 1

Figure 3-21. Vertical Displacements for the Verification Problem in Section 3.4

HORIZONTAL DISPLACEMENT ALONG LINE 1

Figure 3-22. Horizontal Displacements for the Verification Problem in Section 3.4

- Step 4 -- To improve the agreement in displacements between DOT/VISCOT Model 1 and STRES3D Model 1, STRES3D Model 2 was set up and run in which the free surface is rediscritized from 100 elements to 400 elements (see Figure 3-17). The areal extent of the free surface was still 2000 meters by 2000 meters. This analysis produced results nearly identical to those from STRES3D Model 1 and showed that reducing the size of the free surface elements does not affect the stresses and displacements in this problem. The temperature and stress contours for STRES3D Model 2 were not presented.
- Step 5 -- Next, the free surface was rediscritized again so that the areal extent is now 4000 meters by 4000 meters (see Figure 3-18), producing STRES3D Model 3. The temperature and stress contours from STRES3D Model 3 in Figures 3-19 and 3-20 show very good agreement with the other analyses. The vertical displacements in Figure 3-21 also are now in good agreement with the DOT/VISCOT Model 1 analysis, but the horizontal displacements in Figure 3-22 still disagree. Referring back to Figure 3-12 and the discussion of the VISCOT boundary conditions in Section 3.4.1, the left and right edges of Line 1 in the DOT/VISCOT Model 1 must have a horizontal displacement equal to 0.0 as shown in Figure 3-22.
- Intuitively, the right end of Line 1 for this problem is not a line of symmetry in the STRES3D models with respect to the horizontal displacement, and therefore, as modeled, the horizontal displacements along Line 1 for the DOT/VISCOT Model 1 and the STRES3D Models 1, 2, or 3 should not agree.
- Step 6 -- Finally, to be sure that the free surface is not still affecting the horizontal displacements in STRES3D Model 3, a second DOT/VISCOT mesh referred to as DOT/VISCOT Model 2 was created and run (see Figures 3-13 and 3-14). Now the horizontal displacements in Figure 3-22 for STRES3D Model 3 and DOT/VISCOT Model 2 are in good agreement as are the vertical displacements in Figure 3-21 and temperatures and stresses in Figures 3-19 and 3-20.

The comparison of DOT/VISCOT Model 2 and STRES3D Model 3 indicate good agreement between the two numerical methods, and thereby provide some assurance that the STRES3D code is performing adequately. This benchmark exercise emphasizes that care must be exercised in defining the geometry and boundary conditions in modeling a problem using two different numerical techniques.

\$FLOAT
\$SHAREOU

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C
STRESS3D VERSION 4.0 (MAY 1989)

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STRESS3D VERSION 4.0 (MAY 1989)

THERMO-ELASTIC ANALYSIS OF HEATER ASSEMBLY
J.F.T. AGAPITO & ASSOCIATES, INC.
715 HORIZON DRIVE, SUITE 340
GRAND JUNCTION, COLORADO 81506
303(242-4220)

ORIGINAL CODING BY CHRISTOPHER ST. JOHN AND MARK CHRISTIANSON
REFERENCE: ST. JOHN, C.M. AND M. CHRISTIANSON
'STRES3D, A COMPUTER PROGRAM FOR DETERMINING
TEMPERATURES, STRESSES, AND DISPLACEMENTS
AROUND SINGLE OR ARRAYS OF CONSTANT OR
DECAYING HEAT SOURCES'. UNIVERSITY OF
MINNESOTA, DEPARTMENT OF CIVIL & MINERAL
ENGINEERING. PREPARED FOR ROCKWELL INTERNATIONAL
UNDER CONTRACT NO. DE-AC06-77RL01030. 1980.

UPDATE HISTORY

```

C 1 NUMERICAL INTEGRATION OF AREAL SOURCES ADDED 1/88 - MIA
C 2 INPUT AND OUTPUT CLEANED UP 3/88 - MIA
C 3 POWER OUTPUT FOR AREAL SOURCES IN UNITS OF POWER/AREA 3/88 - MIA
C 4 THE TWO INITIAL HORZ. PRINC. STRESSES CAN NOW DIFFER 3/88 - MIA
C 5 OFFSET OF SURFACE SHEAR ELEMENTS CORRECTED 4/88 - MIA
C 6 DISPLACEMENTS IN CERUT1 CORRECTED 5/88 - MIA
C 7 AREAL WEIGHTING FUNCTIONS NOW STORED AND NOT RECOMPUTED EACH STEP 7/88 - MIA
C 8 OPTION ADDED FOR LOCALIZED FINE DISCRETIZATION OF SURFACE SHEAR ELEMENTS 7/88 - MIA
C 9 OPTION FOR SLIGHTLY INCLINED PLATE SOURCES ADDED 10/88 MIA
C   NOTE: THE AREAL POWER DENSITY FOR THESE INCLINED SOURCES IS EQUAL TO
C   THE TOTAL POWER DIVIDED BY THE PROJECTED AREA OF THE SOURCE ONTO A
C   HORIZONTAL PLANE. ALSO NOTE THAT THIS OPTION NOW REQUIRES THAT THE
C   ELEVATIONS OF THE PANEL CORNER POINTS BE INPUT, RATHER THAN THE Z-COORDINATES
C   OF THE PANELS BE INPUT. 11/88 - MIA
C 10 ELEVATIONS OF POINTS OF INTEREST, RATHER THAN Z COORDINATES OF POINTS OF
C   INTEREST ARE NOW USED IN INPUT 11. 11/88 - MIA
C 11 CHANGED ALL LETTERS (EXCEPT THE WORD stop LINE 317) TO UPPERCASE 2/89 - MIA
C 12 LEFT-JUSTIFIED MARGINS OF INPUT GUIDE 2/89 - MIA
C 13 CHANGED VERSION NUMBER AND DATE 2/89 - MIA
C 14 CHANGED VERSION NUMBER AND DATE IN FORMAT STATEMENT.
C   CODE NOW WRITES NAME OF INPUT FILE ON BOTH THE OUTPUT FILE AND CONDENSED
C   OUTPUT FILE. MESSAGES WRITTEN TO SCREEN TO SHOW PROGRESS OF ANALYSIS.
C   3/89 - RRG
C 15 EXPANDED INPUT GUIDE. 5/1/89 RRG.
C 16 CHANGED CALCULATION OF DISPLACEMENTS U AND V IN CERUT1 BACK TO THE ORIGINAL
C   CODING. THIS CORRECTED ERRORS FOUND WHILE RUNNING VERIFICATION PROBLEMS.
C   5/4/89 RRG.
C 17 VERSION 4.0, 5/9/89, RRG
C 18 WRITE QA NUMBER TO HEADINGS IN SUBROUTINE PAGE AND MODIFIED COMMON/PAGIN/.
C   ADDED QA NUMBER CHECK TO LINE 1 OF INPUT FILE. 5/9/89, RRG.
C 19 OPEN ALL 'NEW' FILES AS 'UNKNOWN'. NOTE THAT THIS NOW CAUSES PREVIOUS FILES
C   TO BE OVERWRITTEN. 5/9/89, RRG.
C 20 INSERTED 'REWIND 11' NEAR THE COMMENT 'INITIALIZE CALC AND SHEAR' TO ALLOW
C   MULTIPLE RUNS TO READ IN THE SAME PRE-CALCULATED SURFACE SHEARS. 5/9/89 RRG.
C 21 ADDED 'SUBROUTINE DATE' TO THE PROGRAM AND 'CALL DATE' TO SUBROUTINE PAGE WHERE THE
C   CURRENT MONTH, DAY, AND YEAR ARE PRINTED TO THE OUTPUT FILES. 5/15/89 RRG.
C 22 PRINT COLUMN HEADINGS TO THE CONDENSED OUTPUT FILE. 5/15/89, RRG.
C 23 ADDED OPTION TO RUN VERIFICATION PROBLEMS EMBEDDED WITHIN THIS PROGRAM BY CALLING
C   SUBROUTINES VERIF1 OR VERIF2. IF THE NAME OF THE INPUT FILE GIVEN IS 'VERIF1'
C   THEN STRES3D WILL RUN THE PROBLEM TITLED "VERIFICATION PROBLEM 1 - PULSE POINT"
C   "HEAT SOURCE". IF THE NAME OF THE INPUT FILE IS 'VERIF2' THEN STRES3D WILL RUN
C   THE PROBLEM TITLED "INFINITE PLATE SOURCE IN A SEMI-INFINITE MEDIUM - 100 YEARS"
C   5/15/89, RRG.

```

INPUT INSTRUCTIONS. LIST DIRECTED (FREE-FORMAT).

THE LIMITS FOR THE NUMBERS OF HEAT SOURCE, OUTPUT LOCATIONS, AND SURFACE SHEAR ELEMENTS ARE DEFINED IN THE ARRAY DIMENSION OF THE "PARAMETER" STATEMENT.

```

INPUT 1  QUALITY ASSURANCE NUMBER, FOR THIS VERSION THIS MUST BE 'AGAPITO 4.0'.
          (THIS MUST BE ON LINE 1).

```

INPUT 2 TITLE (THIS MUST BE ON LINE 2).
TITLE - 80 CHARACTER TITLE FOR OUTPUT.

INPUT 3A THERMAL PROPERTIES AND INITIAL TEMPERATURES.
 DIFF - THERMAL DIFFUSIVITY [L²/T].
 TSURF - SURFACE TEMPERATURE [DEG.].
 NGRAD - NUMBER OF TEMPERATURE GRADIENTS.
 ('NGRAD' CAN EQUAL ZERO, IN WHICH CASE, THE INITIAL TEMPERATURES ARE
 UNIFORM AND EQUAL TO 'TSURF'. IF 'NGRAD' IS GREATER THAN 1 THEN THE
 TEMPERATURE AT A DEPTH 'Z' IS:

$$T = (Z - DGRAD(I-1)) * TGRAD(I) + (TEMPERATURE \text{ AT } DGRAD(I-1)) + TSURF.$$

INPUT 3B INITIAL TEMPERATURE GRADIENTS (SPECIFY 'NGRAD' OF THESE).
 TGRAD(I) - GEOTHERMAL GRADIENT [DEG./L].
 DGRAD(I) - GREATEST DEPTH FOR WHICH 'TGRAD(I)' [L]
 APPLIES.
 NOTE: IF ONLY ONE GRADIENT IS GIVEN, IT APPLIES TO
 ALL DEPTHS. IF ANY POINT IS AT A DEPTH GREATER
 THAN 'DGRAD(NGRAD)', THEN THE TEMPERATURE GRADIENT
 'TGRAD(NGRAD)' IS ASSUMED TO APPLY.

INPUT 3C ELASTIC PROPERTIES AND INITIAL STRESSES.
 E - MODULUS OF ELASTICITY [F/(L*L)].
 PR - POISSON'S RATIO.
 ALPHA - COEFFICIENT OF THERMAL EXPANSION [L/(L*DEG.)].
 DEN - SPECIFIC WEIGHT OF OVERBURDEN (COMPRESSION POSITIVE) [F/(L*L*L)]
 (THE VERTICAL STRESS = 'DEN'*DEPTH).
 SIGO1 - INITIAL MAX. HORZ. STRESS AT GROUND SURFACE
 (COMPRESSION POSITIVE) [F/(L*L)].
 SIGO2 - INITIAL MIN. HORZ. STRESS AT GROUND SURFACE
 (COMPRESSION POSITIVE) [F/(L*L)].
 RATIO1 - RATIO OF MAX. HORZ. STRESS GRADIENT TO VERTICAL STRESS GRADIENT
 (THE VERTICAL STRESS GRADIENT EQUALS 'DEN').
 RATIO2 - RATIO OF MIN. HORZ. STRESS GRADIENT TO VERTICAL STRESS GRADIENT
 (THE VERTICAL STRESS GRADIENT EQUALS 'DEN').
 BEAR - BEARING OF THE MAX. HORIZ. STRESS [DEGREES]
 MEASURED CLOCKWISE FROM THE X-AXIS IN THE X-Y PLANE
 NOTE THAT 'SIGO1' AND 'SIGO2' ARE NORMAL TO ONE ANOTHER.

INPUT 4A HEAT SOURCES AND FREE SURFACE BOUNDARY ELEMENTS.
 NCANN - NUMBER OF CANISTERS OR POINT SOURCES ('NCANN' MAY EQUAL ZERO).
 NASORC - NUMBER OF AREAL SOURCES ('NASORC' MAY EQUAL ZERO).
 NLSORC - NUMBER OF LINE SOURCES ('NLSORC' MAY EQUAL ZERO).
 NTYPE - NUMBER OF DIFFERENT TYPES OF HEAT SOURCES. THIS VARIABLE DETERMINES
 THE NUMBER OF INPUTS 5 AND 6 THAT ARE TO BE READ.
 NTIMES - NUMBER OF TIMES FOR COMPUTER OUTPUT. SOLUTIONS AT LOCATIONS
 DESCRIBED IN INPUT 11 WILL BE CALCULATED AT EACH TIME. TIMES ARE
 READ IN INPUT 10.
 NLINES - NUMBER OF LINES ALONG WHICH OUTPUT IS COMPUTED. DETERMINES THE
 NUMBER OF LINES OF INPUT 11 TO BE READ.
 NBISO - SWITCH DESCRIBING THE PLANE Z = 0.
 A.) WHEN THE PLANE IS AN ISOTHERMAL SURFACE, 'NBISO' = +-1 OR +- 2.
 'ABS(NBISO)' = 1 IN MOST CASES.
 'ABS(NBISO)' = 2 FOR THE CASE THAT THE STRENGTHS OF THE
 SURFACE ELEMENTS HAVE ALREADY BEEN
 COMPUTED FROM A PREVIOUS RUN AND ARE STORED
 ON THE FILE "SHEAR.DAT" (REFER TO DESCRIPTION
 OF FILE 11 AT THE END OF THE INPUT GUIDE
 FOR MORE DETAILS). 'NBISO' = 2 CAUSES STRES3D TO
 READ THE STRENGTHS FROM THIS FILE RATHER THAN
 TO RECOMPUTE THEM. 'NBISO' = 2 ONLY WHEN BOTH THE
 FOLLOWING CONDITIONS ARE TRUE:
 1. MULTIPLE RUNS FOR THE SAME
 TIME OF INTEREST AND INVOLVING THE SAME
 HEAT SOURCES ARE BEING MADE.
 2. THE CURRENT RUN IS NOT THE FIRST
 RUN IN THE SEQUENCE OF MULTIPLE RUNS.
 'NBISO' IS NEGATIVE WHEN ONE ZONE OF NEIGHBORING SURFACE
 ELEMENTS IS TO BE FURTHER SUBDIVIDED INTO FINER ELEMENTS
 (REFER TO INPUT4B FURTHER BELOW). 'NBISO' IS POSITIVE WHEN
 ALL THE SURFACE SHEAR ELEMENTS ARE THE SAME SIZE.
 B.) FOR NO FREE SURFACE, 'NBISO' = 0.
 C.) NOTE THAT REGARDLESS OF THE VALUE OF 'NBISO', THE FOLLOWING
 INPUTS MUST ALSO BE READ.
 NROW - NUMBER OF ROWS OF SURFACE SHEAR ELEMENTS (MUST BE AN EVEN NUMBER).
 NCOL - NUMBER OF COLUMNS OF SURFACE SHEAR ELEMENTS (MUST BE AN EVEN NUMBER).
 SW - HALF WIDTH OF SURFACE SHEAR ELEMENTS (SURFACE ELEMENTS ARE SQUARE BUT
 THE FREE SURFACE DOES NOT HAVE TO BE).
 XC - X COORDINATE OF CENTER OF SURFACE ELEMENT GRID.
 YC - Y COORDINATE OF CENTER OF SURFACE ELEMENT GRID.
 XDATUM - REFERENCE COORDINATE TO BE ADDED TO ALL X-COORDINATES

OF ALL HEAT SOURCES AND TO ALL X-COORDINATES OF POINTS OF INTEREST. 'XDATUM' IS USED FOR PRINT OUT PURPOSES ONLY ON FILES 7, 8 AND 9. 'XDATUM' CAN EQUAL ZERO IN WHICH CASE THE X COORDINATE SYSTEM IS USED.

YDATUM- REFERENCE COORDINATE TO BE ADDED TO ALL Y-COORDINATES OF ALL HEAT SOURCES AND TO ALL Y-COORDINATES OF POINTS OF INTEREST. 'YDATUM' IS USED FOR PRINT OUT PURPOSES ONLY ON FILES 7, 8 AND 9. 'YDATUM' CAN EQUAL ZERO IN WHICH CASE THE Y COORDINATE SYSTEM IS USED.

ELEVS - ELEVATION OF THE GROUND SURFACE. 'ELEVS' IS USED FOR PRINTOUT PURPOSES ONLY ON FILES 7,8, AND 9. ON THESE FILES, THE ELEVATIONS OF ALL POINTS OF INTEREST ARE PRINTED OUT. IF 'ELEVS' IS ZERO THEN ALL POINTS OF INTEREST WILL HAVE NEGATIVE ELEVATIONS BECAUSE THE Z-COORDINATE SYSTEM IS POSITIVE DOWNWARD.

INPUT 4B FREE SURFACE ELEMENTS - FINE DISCRETIZATION (SKIP THIS INPUT WHEN 'NBISO'.GE.0).

IBEGIN - BEGINNING I COORDINATE (ROW NUMBER) OF REGION TO BE SUBDIVIDED INTO CLOSELY SPACED SURFACE ELEMENTS.

IEND - ENDING I COORDINATE (ROW NUMBER) OF REGION TO BE SUBDIVIDED.

JBEGIN - BEGINNING J COORDINATE (COLUMN NUMBER) OF REGION TO BE SUBDIVIDED.

JEND - ENDING J COORDINATE (COLUMN NUMBER) OF REGION TO BE SUBDIVIDED (NOTE: I VARIES FROM 1 TO 'NROW', J FROM 1 TO 'NCOL', Y AND I SHARE THE SAME AXIS, X AND J SHARE THE SAME AXIS).

SW2 - HALF-WIDTH OF THE FINELY DIVIDED SURFACE ELEMENTS ('SW/SW2' SHOULD BE AN INTEGER).

NOTE: THE CORRECTION OF A CODING ERROR IN SUBROUTINE CERUT1 (SEE ENTRY NUMBER 16 IN THE UPDATE HISTORY AT THE TOP OF THIS PROGRAM) HAS ELIMINATED THE NEED FOR THE FINE DISCRETIZATION OPTION BUT THE OPTION IS STILL AVAILABLE FOR COMPATIBILITY WITH PREVIOUS VERSIONS.

INPUTS 5 AND 6 ARE A SET. THERE WILL BE 'NTYPE' SETS OF THESE.

INPUT 5 GEOMETRIC CHARACTERISTICS OF EACH TYPE OF HEAT SOURCE.

I - NUMBER TO BE IDENTIFIED WITH HEAT SOURCE (NUMBER HEAT SOURCE TYPES CONSECUTIVELY FROM ONE TO 'NTYPE').

CLEN(I) - A.) IF HEAT SOURCE IS A CANISTER, 'CLEN(I)' = LENGTH OF CANISTER (FOR A SINGLE POINT SOURCE 'CLEN(I)'=1.0.
B.) IF HEAT SOURCE IS A LINE SOURCE, INPUT ANY NON-ZERO NUMBER. THE ACTUAL LENGTH IS COMPUTED FROM THE BEGINNING AND END POINTS OF THE LINE AND ARE GIVEN IN INPUT 9B.
C.) IF HEAT SOURCE IS A PLATE SOURCE, INPUT ANY NON-ZERO NUMBER. THE DIMENSIONS OF THE PLATE ARE SPECIFIED IN INPUT 8B.

NSORC(I)- A.) IF THE SOURCE IS A CANISTER OR POINT SOURCE, 'NSORC(I)' IS THE NUMBER OF EQUALLY SPACED POINT SOURCES WHICH REPRESENT THE CANISTER.
B.) IF THE SOURCE IS A LINE SOURCE OR A PLATE SOURCE, THEN 'NSORC(I)' MUST EQUAL 1 !

NCOMP(I) - NUMBER OF COMPONENTS FOR THIS SOURCE TYPE. 'NCOMP(I)' DETERMINES THE NUMBER OF VALUES TO READ IN INPUT 6.

DEPTH(I) -A.) IF SOURCE IS A CANISTER OR POINT SOURCE, 'DEPTH(I)' IS THE DEPTH OF THE MID-POINT BELOW THE GROUND SURFACE.
B.) IF THE SOURCE IS A LINE SOURCE OR A PLATE SOURCE, INPUT AN VALUE. THE DEPTH IS DETERMINED IN INPUT 9B OR 8B BY THE COORDINATES OF THE SOURCE.

INPUT 6 HEAT GENERATION FOR EACH COMPONENT OF SOURCE TYPE I ('NCOMP(I)' OF THESE).

QTA(I,J) - TIME AFTER EMPLACEMENT AT WHICH THIS COMPONENT STARTS.

QCA(I,J) - INITIAL STRENGTH OF COMPONENT J. IF THE SOURCE IS A CANISTER OR A LINE SOURCE THEN THE UNITS OF 'QCA' ARE $[POWER/(DENSITY*SPECIFIC\ HEAT) = DEGREES*L*L/L/T]$. IF THE SOURCE IS AN AREAL SOURCE, THEN THE UNITS ARE $[POWER/(AREA*DENSITY*SPECIFIC\ HEAT)=DEGREES*L/T]$.

QKPA(I,J)-DECAY CONSTANT (0 OR +). UNITS ARE $[1./T]$.

INPUT 7 POSITION OF CANISTERS. ('NCANN' OF THESE. SKIP IF 'NCANN' EQUALS ZERO.)

ITYPE(I) - TYPE OF CANISTER. REFERS TO VARIABLE 'I' IN INPUT 5.

XS(I) - X COORDINATE.

YS(I) - Y COORDINATE.

TIME(I) - TIME OF PLACEMENT.

INPUT 8A AREAL HEAT SOURCE (SKIP IF THERE ARE NO AREAL SOURCES (IF 'NASORC'=0).

NORDRA - ORDER OF NUMERICAL INTEGRATION TO BE USED WHEN COMPUTING THE INFLUENCE OF THE AREAL HEAT SOURCES (PERMISSIBLE VALUES:0,1,2,3,4,5,9,14). WHEN 'NORDRA' EQUALS N, THE AREAL SOURCE IS REPRESENTED BY (N-1)*(N-1) INTEGRATION POINTS, WHICH ARE NOT EQUALLY SPACED AND ARE NOT EQUALLY WEIGHTED, BUT ARE SPACED AND WEIGHTED ACCORDING TO GAUSS-LEGENDRE

QUADRATURE, A STANDARD NUMERICAL INTEGRATION PROCEDURE.
IT IS RECOMMENDED THAT 'NORDRA' BE LESS THAN OR EQUAL TO 3.
ENTER 1 VALUE OF 'NORDRA' ONLY FOR ALL PLATE SOURCES OF TYPE
'ITYPE(I)'

INPUT 8B POSITION OF AREAL SOURCES (NASORC OF THESE; SKIP IF NASORC=0).
ITYPE(I) - TYPE OF AREAL SOURCE. REFERS TO VARIABLE 'I' IN INPUT 5.
TMO(I) - TIME OF EMPLACEMENT OF THE AREAL SOURCE.
XC(I) - X-COORDINATE OF POINT 1 OF THE SOURCE. (SEE FIG. 2-3, USERS GUIDE)
YC(I) - Y-COORDINATE OF POINT 1 OF THE SOURCE. (SEE FIG. 2-3, USERS GUIDE)
ZC(I) - ELEVATION OF POINT 1 OF THE SOURCE. (SEE FIG. 2-3, USERS GUIDE)
ANGLE(I) - ANGLE WHICH THE AREAL SOURCE MAKES WITH THE X-AXIS IN
THE X-Y PLANE (MEASURED CLOCKWISE FROM THE X-AXIS; REFER TO FIGURE
2-3 OF THE USER'S GUIDE FOR THE CONVENTION).
ALENG1(I) - LENGTH OF SIDE ONE OF THE SOURCE IN THE X-Y PLANE (REFER TO FIG. 2-3
OF THE USERS GUIDE FOR DEFINITION OF SIDES ONE AND TWO).
ALENG2(I) - LENGTH OF SIDE TWO OF THE SOURCE.
NOTE: IT IS IMPORTANT TO EMPHASIZE THAT ANGLE(I), ALENG1(I), AND ALENG2(I)
REFER TO THE PROJECTED VALUES ONTO THE X-Y PLANE. FOR PLATE SOURCES
WHICH ARE INCLINED MORE THAN A FEW DEGREES, ADJUSTMENTS MUST BE MADE TO
THE TOTAL POWER OF THE PLATE TO COMPENSATE FOR THE LARGER AREA IN THE
TRUE PLANE OF THE PLATE.
ZC1 - ELEVATION OF THE FAR-END POINT OF SIDE 1. (SEE FIG. 2-3, USERS GUIDE)
ZC2 - ELEVATION OF THE FAR-END POINT OF SIDE 2. (SEE FIG. 2-3, USERS GUIDE)
NSORC1(I) - NUMBER OF EQUALLY SPACED PLATE SOURCES INTO WHICH SIDE
ONE OF THE SOURCE SHOULD BE SUBDIVIDED (USED TO INCREASE
THE NUMBER OF INTEGRATION POINTS PER SOURCE; REFER TO THE
USER'S GUIDE, FIGURE 2-3).
NSORC2(I) - NUMBER OF EQUALLY SPACED PLATE SOURCES INTO WHICH SIDE TWO OF THE
SOURCE SHOULD BE SUBDIVIDED (SEE FIG. 2-3, USERS GUIDE).

INPUT 9A LINE HEAT SOURCE (SKIP IF THERE ARE NO LINE SOURCES (IF 'NLSORC'=0)
NORDRL - ORDER OF NUMERICAL INTEGRATION TO BE USED WHEN
COMPUTING THE INFLUENCE OF THE LINE HEAT SOURCES
(PERMISSIBLE VALUES:0,1,2,3,4,5,9,14). WHEN 'NORDRL'
EQUALS N, EACH SEGMENT OF LINE SOURCE IS REPRESENTED
BY (N+1) INTEGRATION POINTS, WHICH ARE NOT
EQUALLY SPACED AND ARE NOT EQUALLY WEIGHTED, BUT ARE
SPACED AND WEIGHTED ACCORDING TO GAUSS-LEGENDRE
QUADRATURE, A STANDARD NUMERICAL INTEGRATION PROCEDURE.
IT IS RECOMMENDED THAT 'NORDRL' BE LESS THAN OR EQUAL TO 3.
ENTER 1 VALUE OF 'NORDRL' ONLY FOR ALL LINE SOURCES OF TYPE
'ITYPE(I)'

INPUT 9B POSITION OF LINE SOURCES ('NLSORC' OF THESE; SKIP IF 'NLSORC'=0)
ITYPE(I) - TYPE OF LINE SOURCE. REFERS TO VARIABLE 'I' IN INPUT 5.
NPTSL(I) - TOTAL NUMBER OF INTEGRATION POINTS ON THE LINE
(SHOULD BE DIVISIBLE BY 'NORDRL'+1, WHERE 'NORDRL' IS
DEFINED IN INPUT 9A). IN STRESS3D, THE LINE
SOURCE IS SUBDIVIDED INTO 'NPTSL/([NORDRL+1])' EQUALLY
SPACED SEGMENTS EACH CONTAINING 'NORDRL+1' INTEGRATION
POINTS.
XS1(I) - THE X-COORDINATE OF THE FIRST END OF THE LINE
(NOTE: EITHER END OF THE LINE SOURCE MAY BE
BE DESIGNATED AS THE FIRST END).
YS1(I) - THE Y-COORDINATE OF THE FIRST END OF THE LINE.
ZS1(I) - THE Z-COORDINATE OF THE FIRST END OF THE LINE.
XS2(I) - THE X-COORDINATE OF THE SECOND END OF THE LINE.
YS2(I) - THE Y-COORDINATE OF THE SECOND END OF THE LINE.
ZS2(I) - THE Z-COORDINATE OF THE SECOND END OF THE LINE.
TIMO(I) - TIME OF EMPLACEMENT OF THE LINE SOURCE.

INPUT 10 TIMES FOR OUTPUT ('NTIMES' ARE TO BE READ IN. MORE THAN
ONE TIME CAN BE READ ON A GIVEN LINE).
TIM(I) - TIME AT WHICH SOLUTION IS TO BE PRINTED.

INPUT 11 LINES FOR OUTPUT ('NLines' OF THESE).
NPOINT - NUMBER OF POINTS ALONG LINE.
XB - X COORDINATE FOR START OF LINE (M).
YB - Y COORDINATE FOR START OF LINE (M).
ZB - ELEVATION FOR START OF LINE (M).
XE - X COORDINATE FOR END OF LINE (M).
YE - Y COORDINATE FOR END OF LINE (M).
ZE - ELEVATION FOR END OF LINE (M).

INPUT 12 STOP CARD
"STOP" (WITH NO LEADING BLANK SPACES) TERMINATES THE PROGRAM.
IF A NEW SET OF DATA IS TO BE READ, REPLACE THIS WITH THE
NEXT TITLE CARD. THIS CARD MUST APPEAR ON THE NEXT LINE FOLLOWING
THE LAST INPUT OF INPUT 11 (NO PRECEDING BLANK LINES).


```

C
C INPUT/OUTPUT FILES
C
C FILE 0 = SCREEN
C
C FILE 5 = INPUT FILE (SPECIFIED INTERACTIVELY AT RUN TIME).
C
C FILE 6 = OUTPUT FILE (SPECIFIED INTERACTIVELY AT RUN TIME).
C
C FILE 7 = FILE CONTAINING THE X-Y-Z COORDINATES OF THE INTEGRATION POINTS FOR AREAL
C          HEAT SOURCES (FILENAME = 'GAUSS.PTS'). THIS FILE IS CREATED BY STRES3D FOR
C          CONVENIENCE IN PLOTTING THE DISCRETIZATION OF EACH AREAL HEAT SOURCE.
C          THIS FILE IS REWRITTEN FOR EACH ANALYSIS
C
C FILE 8 = FILE CONTAINING THE X-Y-Z COORDINATES OF THE CORNER POINTS
C          OF EACH AREAL HEAT SOURCE (FILENAME = 'CORNER.PTS'). THIS
C          FILE IS CREATED BY STRES3D FOR CONVENIENCE IN PLOTTING LOCATIONS
C          OF EACH AREAL HEAT SOURCE AND IS REWRITTEN FOR EACH ANALYSIS.
C
C FILE 9 = FILE CONTAINING A CONDENSED VERSION OF THE OUTPUT ---NO COMMENTS AND
C          NO INPUT LISTING--- FOR EACH OF THE POINTS AND TIMES OF INTEREST
C          (FILENAME = 'CONDEN.OUT'). THIS FILE IS CREATED BY STRES3D FOR CONVEN-
C          IENCE IN PLOTTING THE OUTPUT AND IS REWRITTEN FOR EACH ANALYSIS.
C
C FILE 11= FILE CONTAINING THE STRENGTHS OF THE SURFACE ELEMENTS WHEN A ISOTHERMAL
C          FREE SURFACE IS PRESENT (FILENAME = 'SHEAR.DAT'). FOR MULTIPLE RUNS FOR THE
C          SAME TIME THIS FILE SHOULD BE BACKED UP UNDER ANOTHER NAME FOR SAFE KEEPING
C          AND RE-READ PRIOR TO EACH RUN TO ELIMINATE THE NEED TO RECALCULATE THE
C          SHEAR STRESSES ON THE FREE SURFACE. IF 'NBISO' = +-1 THEN THE FILE
C          'SHEAR.DAT' WILL BE OPENED AND WRITTEN OVER IF IT ALREADY EXISTS. IF 'NBISO'
C          = +-2 THEN 'SHEAR.DAT' IS OPENED AS 'OLD' AND THE FREE SURFACE SHEAR STRESSES
C          READ IN
C
C FILE 12= FILE CONTAINING THE LOCATIONS OF THE SURFACE ELEMENTS WHEN
C          A FREE ISOTHERMAL SURFACE IS PRESENT (FILENAME = 'SHEAR.LOC')
C          THIS FILE IS ONLY OPENED AND WRITTEN TO IF 'NBISO' = +-1.
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C          ARRAY LIST
C
C TIM(I)      TIMES FOR OUTPUT
C DEPTH(I)    DEPTH OF SOURCE
C ITYPE(I)    SOURCE TYPE SEQUENCE NUMBER
C NCOMP(I)    NUMBER OF COMPONENTS FOR THIS SOURCE TYPE
C NSORC(I)    NUMBER OF POINT SOURCES IN A CANISTER
C QCA(I,J)    INITIAL STRENGTH FOR SOURCE (I) AND COMPONENT (J)
C QEXPA(I,J)  DECAY CONSTANT FOR SOURCE (I) AND COMPONENT (J)
C QTA(I,J)    TIME ON FOR SOURCE (I) AND COMPONENT (J)
C SIGMA(6)    TEMPORARY STORAGE FOR 6 COMPONENTS OF STRESS FOR A LOCATION
C SPACE(I)    FRACTION OF TOTAL POWER AT A SOURCE
C TIMO(I)     TIME OF EMPLACEMENT OF A SOURCE
C TOP(I)      DEPTH TO TOP OF A CANISTER
C TX(I)       X SHEAR FORCE ON FREE SURFACE
C TY(I)       Y SHEAR FORCE ON FREE SURFACE
C XP(I)       X LOCATION FOR OUTPUT
C YP(I)       Y LOCATION FOR OUTPUT
C ZP(I)       Z LOCATION FOR OUTPUT
C XS(I)       X LOCATION FOR CANISTER
C YS(I)       Y LOCATION FOR CANISTER
C ZS(I)       Z LOCATION FOR CANISTER
C XSURF(I)    X LOCATION FOR CENTER OF SURFACE ELEMENTS
C YSURF(I)    Y LOCATION FOR CENTER OF SURFACE ELEMENTS
C XSURFT(I)   X LOCATION FOR CENTER OF FINE SURFACE ELEMENTS
C YSURFT(I)   Y LOCATION FOR CENTER OF FINE SURFACE ELEMENTS
C WT(I)       WEIGHT FACTORS FOR GAUSS LEGENDRE QUADRATURE LINE SOURCE
C WT2(I)      WEIGHT FACTORS FOR GAUSS LEGENDRE QUADRATURE FOR PLATE SOURCE
C ZGAUS(I)    GAUSS POINT LOCATIONS ALONG LINE
C TGRAD(I)    GEOTHERMAL GRADIENTS
C DGRAD(I)    DEPTHS FOR GRADIENTS
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C          PARAMETER (LIMIT1=4500,LIM2=350,LIM3=20000)
C
C          COMMON /MATROP/      ALPHA,      DIFF,      E,
C          1      G,      PR
C          COMMON/PAGIN/TITLE,QANUM
C          COMMON DEPTH(LIMIT1), ITYPE(LIMIT1), NBISO,      NCANN,
C          1      NCOL,      NCOMP(LIMIT1), NROW,      NSORC(LIMIT1),
C          2      QCA(LIMIT1,10), QEXPA(LIMIT1,10),QTA(LIMIT1,10),SIGMA(6),

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3 SPACE(LIMIT1), SW, T, TIMO(LIMIT1),
4 TOP(LIMIT1), TX(LIM3), TY(LIM3), U,
5 V, W, XC, XO,
6 XP(LIMIT1), XS(LIMIT1), XSURF(LIM3), YC,
7 YO, YP(LIMIT1), YS(LIMIT1), YSURF(LIM3),
8 ZP(LIMIT1)
COMMON/DEPTHL/ZS(LIMIT1)
COMMON/GAUSSL/NASORC,NLSORC,NPTSL,NORDRL,NICANN,NORDRA,WT(15),
. WT2(196)
COMMON/PTS/ZGAUSS(15)
COMMON/SSHEARS/NTOT,NCOL1,NCOL2,NROW1,NROW2,SW1,SW2
C
C DIMENSION XSURFT(LIM3),YSURFT(LIM3),TGRAD(20),DGRAD(20),TIM(50)
C
C CHARACTER*80 TITLE
C CHARACTER*64 FILEN,INPUT
C CHARACTER*11 QA,QANUM
C CHARACTER*4 HALT,HALT1
C
C DATA HALT,HALT1/'STOP','stop'/
C QANUM='AGAPITO 4.0'
C HALFPI=2.*ATAN(1.0)
C
C CALL SECOND(T00)
C
C READ THE INPUT FILE NAME
C
C NOTE: IF THE TITLE READ IS 'VERIF1' OR 'VERIF2' THEN STRES3D WILL
C AUTOMATICALLY RUN VERIFICATION PROBLEM 1 OR 2 FROM THE USERS GUIDE.
C IN THIS CASE NO INPUT FILE IS REQUIRED.
C
C WRITE(0,11)
11 FORMAT(' INPUT FILE NAME?')
C READ(0,12) INPUT
C
C CHECK TO SEE IF VERIFICATION RUN IS DESIRED
C
C IF(INPUT.EQ.'VERIF1'.OR.INPUT.EQ.'verif1')THEN
C CALL VERIF1
C GO TO 10
C ENDIF
C
C IF(INPUT.EQ.'VERIF2'.OR.INPUT.EQ.'verif2')THEN
C CALL VERIF2
C GO TO 10
C ENDIF
C
12 FORMAT(A)
C OPEN(UNIT=5,FILE=INPUT,STATUS='OLD')
C
10 WRITE(0,13)
13 FORMAT(' OUTPUT FILE NAME?')
C READ(0,12) FILEN
C OPEN(UNIT=6,FILE=FILEN,STATUS='UNKNOWN')
C
C FILEN='GAUSS.PTS'
C OPEN(UNIT=7,FILE=FILEN,STATUS='UNKNOWN')
C FILEN='CORNER.PTS'
C OPEN(UNIT=8,FILE=FILEN,STATUS='UNKNOWN')
C FILEN='CONDEN.OUT'
C OPEN(UNIT=9,FILE=FILEN,STATUS='UNKNOWN')
C
C SET DEFAULT VALUES FOR NUMERICAL INTEGRATION
C
C NICANN=0
C NCANN=0
C NASORC=0
C NLSORC=0
C NORDRA=0
C NORDRL=0
C NPTSL=0
C
C ADDED CHECK FOR QA NUMBER ON LINE1 OF INPUT FILE
C
C READ (5,1140)QA
C IF(QA.NE.QANUM)THEN
C WRITE(0,1141)QA,QANUM
1141 FORMAT(/' WRONG QA NUMBER' /
. ' NUMBER READ IS.....',A11/
. ' NUMBER SHOULD BE.....',A11/)
C STOP

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      ENDIF
C
C      READ TITLE
C
1010  CONTINUE
      PLIM=64
      READ (5,1140) TITLE
C
      IF (TITLE.EQ.HALT.OR.TITLE.EQ.HALT1) THEN
          CALL SECOND(T01)
          T02=T01-T00
          WRITE(0,11111)T02
          WRITE(6,11111)T02
11111  FORMAT(// 'TOTAL RUN TIME = ',F15.5,' SECONDS.//')
          STOP
      ENDIF
C
C      PUT HEADING ON OUTPUT FILES AND BEGIN READING MODEL INPUT
C
      CALL PAGE(0,INPUT)
      CALL PAGE(6,INPUT)
      READ(5,*)DIFF,TSURF,NGRAD
      IF(NGRAD.GE.1)THEN
          DO 1011 I=1,NGRAD
              READ(5,*)TGRAD(I),DGRAD(I)
1011   CONTINUE
          ENDIF
          READ(5,*)E,PR,ALPHA,DEN,SIG01,SIG02,RATIO1,RATIO2,BEAR
          WRITE(6,1160)DIFF,TSURF
          IF(NGRAD.GE.1)THEN
              WRITE(6,1161)
              DO 1012 I=1,NGRAD
                  WRITE(6,1162)TGRAD(I),DGRAD(I)
1012   CONTINUE
              ELSE
                  WRITE(6,1163)
              ENDIF
          WRITE(6,1164)E,PR,ALPHA,DEN,SIG01,SIG02,RATIO1,RATIO2,BEAR
          BEAR=ATAN(1.)*BEAR/45.
          G=E/(2.0+2.0*PR)
C
C      READ MODEL CONTROL INFORMATION
C
      READ (5,*) NCANN,NASORC,NLSORC,NTYPE,NTIMES,NLINES,NBISO,
          NROW,NCOL,SW,XC,YC,XDATUM,YDATUM,ELEVS
      NICANN=NCANN
      WRITE (6,1180)NCANN,NASORC,NLSORC,NTYPE,NTIMES,NLINES,NROW,NCOL,
          SW,XC,YC
C
      NROW AND NCOL MUST BE EVEN
C
      IF (MOD(NROW,2).NE.0.OR.MOD(NCOL,2).NE.0) STOP 'NROW OR NCOL ODD'
C
      IF (ABS(NBISO).GT.2) NBISO=0
      IF (ABS(NBISO).EQ.1.OR.ABS(NBISO).EQ.2) WRITE (6,1190)
      IF (NBISO.EQ.0) WRITE (6,1200)
      NROW1=NROW
      NCOL1=NCOL
      SW1=SW
      NROW2=0
      NCOL2=0
      SW2=0.
      IF (NBISO.LT.0)READ(5,*)IBEGIN,IEND,JBEGIN,JEND,SW2
      NTOT=NROW*NCOL
C
C      INITIALIZE CALC AND SHEAR
C
      ICCUNT=1
      CALL CALC (A,N,ICOUNT)
      ICCUNT=100
      IF (NBISO.EQ.0) GO TO 1020
      IF (ABS(NBISO).EQ.1)THEN
          OPEN(11,FILE='SHEAR.DAT',FORM='FORMATTED',STATUS='UNKNOWN')
          OPEN(12,FILE='SHEAR.LOC',FORM='FORMATTED',STATUS='UNKNOWN')
      ENDIF
      IF (ABS(NBISO).EQ.2)THEN
C
C      A REWIND BEFORE A FILE IS OPENED IS PERMISSIBLE. THE PURPOSE IS TO
C      ALLOW MULTIPLE RUNS FOR THE SAME TIME ON THE SAME INPUT FILE TO READ
C      IN THE SAME PRE-CALCULATED SURFACE SHEAR STRESSES. 5/9/89, RRG.
C

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        REWIND 11
        OPEN (11, FILE='SHEAR.DAT', FORM='FORMATTED', STATUS='OLD')
    ENDIF
    INIT=1
    CALL SHEAR (A, INIT)

C
C
C   DETERMINE THE LOCATION OF THE FINE SURFACE SHEAR ELEMENTS
C
    IF (NBISO.LT.0) THEN
C
C   PUT SET OF COARSE SURFACE SHEAR ELEMENTS INTO TEMPORARY STORAGE
C
        DO 1016 I=1, NROW*NCOL
            XSURFT(I)=XSURF(I)
            YSURFT(I)=YSURF(I)
1016    CONTINUE
C
C   STORE ROWS AND COLUMNS FOR COARSE AND FINE SURFACE ELEMENTS
C
        NROW1=NROW
        NCOL1=NCOL
        SW1=SW
        NDIV=SW/SW2
        NDIV=MAX0(NDIV, 1)
        SW2=SW/FLOAT(NDIV)
        NROW2=(IEND-IBEGIN+1)*NDIV
        NCOL2=(JEND-JBEGIN+1)*NDIV
        NROW=NROW2
        NCOL=NCOL2
        SW=SW2

C
C   FIND CENTROID OF FINELY DISCRETIZED ELEMENTS
C
        K1=(IBEGIN-1)*NCOL1+JBEGIN
        K2=(IEND-1)*NCOL1+JEND
        XC2=.5*(XSURF(K1)+XSURF(K2))
        YC2=.5*(YSURF(K1)+YSURF(K2))
        XC=XC2
        YC=YC2

C
C   FIND LOCATIONS OF FINE SURFACE SHEAR ELEMENTS AND PUT THEM INTO
C   TEMPORARY STORAGE BEHIND THE SET OF COARSE ELEMENTS
C
        NSET1=NROW1*NCOL1
        CALL SHEAR(A, INIT)
        DO 1017 I=1, NROW2*NCOL2
            XSURFT(I+NSET1)=XSURF(I)
            YSURFT(I+NSET1)=YSURF(I)
1017    CONTINUE
C
C   NOW PUT ALL SURFACE ELEMENT LOCATIONS INTO PERMANENT STORAGE
C
        NROW=NROW1
        NCOL=NCOL1
        SW=SW1
        DO 1018 I=1, NROW1*NCOL1+NROW2*NCOL2
            XSURF(I)=XSURFT(I)
            YSURF(I)=YSURFT(I)
1018    CONTINUE
        NTOT=NROW1*NCOL1+NROW2*NCOL2
    ENDIF

C
    INIT=100
1020 DO 1040 JN=1, NTYPE
        READ (5, *) J, CLEN, NSORC(J), NCOMP(J), DEPTH(J)
        WRITE (6, 1220) J, CLEN, NSORC(J), NCOMP(J), DEPTH(J)
        FNS=FLOAT(NSORC(J))
        TOP(J)=DEPTH(J)-CLEN/2.0
        SPACE(J)=CLEN/FNS
        WRITE (6, 1230)
        NCOJ=NCOMP(J)
        READ (5, *) (QTA(J, I), QCA(J, I), QEXPA(J, I), I=1, NCOJ)
        WRITE (6, 1250) (QTA(J, I), QCA(J, I), QEXPA(J, I), I=1, NCOJ)

C
C   REDUCE SOURCE STRENGTH FOR DISTRIBUTION
C

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DO 1030 I=1, NCOJ
  QCA(J,I)=QCA(J,I)/FNS
1030 CONTINUE
1040 CONTINUE
C
C      READ CANISTER COORDINATES
C
IF(NCANN.GE.1) THEN
  READ (5,*) (ITYPE(I),XS(I),YS(I),TIMO(I),I=1,NCANN)
  WRITE (6,1280)
  DO 1060 I=1,NCANN
    WRITE (6,1270) I,ITYPE(I),XS(I),YS(I),TIMO(I)
1050 CONTINUE
    IF(1.LT.NCANN)WRITE (6,1280)
1060 CONTINUE
  ENDIF
C
C      READ AREAL SOURCE GEOMETRY
C
NTSARC=NASARC
NASARC=0
IF(NTSARC.GE.1) THEN
  READ(5,*) NORDRA
  CALL WTF(NORDRA)
  CALL AREALW
  DO 1066 K=1,NTSARC
    READ(5,*) ICTYPE,TIMEON,XC,YC,ZC,ANGLE,ALENG1,ALENG2,ZC1,ZC2,
      NSORC1,NSORC2
    ZC=ELEVS-ZC
    ZC1=ELEVS-ZC1
    ZC2=ELEVS-ZC2
    WRITE(6,1281)K,ICTYPE,TIMEON
    IF((NORDRA.GE.0.AND.NORDRA.LE.5).OR.
      (NORDRA.EQ.9.OR.NORDRA.EQ.14)) THEN
      ELSE
1061 WRITE(*,1061)NTSARC,NORDRA
      FORMAT(' AREAL SOURCE NO. =',I4,/,
        ' ORDER OF INTEGRATION =',I4,' IS NOT ALLOWED',/,
        ' ORDER OF INTEGRATION CAN EQUAL 0 TO 5,9,14')
      STOP
    ENDIF
    CALL ZINC(NORDRA)
    DEL1=ALENG1/FLOAT(NSORC1)
    DEL2=ALENG2/FLOAT(NSORC2)
    NSUBA=0
    DO 1066 LOOP2=1,NSORC2
      Y1=DEL2*FLOAT(LOOP2-1)
      Y2=DEL2*FLOAT(LOOP2)
      DO 1066 LOOP1=1,NSORC1
        X1=DEL1*FLOAT(LOOP1-1)
        X2=DEL1*FLOAT(LOOP1)
        CALL COORD2(X1,Y1,ANGLE,XC,YC,X1P,Y1P)
        CALL COORD2(X2,Y1,ANGLE,XC,YC,X2P,Y2P)
        CALL COORD2(X2,Y2,ANGLE,XC,YC,X3P,Y3P)
        CALL COORD2(X1,Y2,ANGLE,XC,YC,X4P,Y4P)
        IF(LOOP1.EQ.1.AND.LOOP2.EQ.1) THEN
C
C      COMPUTE COEFFS. (AP,BP AND CP) OF NORMAL TO PLANE
C      CONTAINING THE PLATE HEAT SOURCE:
C      
$$AP*(X-XC) - BP*(Y-YC) + CP*(Z-ZC) = 0$$

C
        HALFPI=2.*ATAN(1.0)
        ANG1=ANGLE*HALFPI/90.
        DX2=ALENG1*COS(ANG1)
        DY2=ALENG1*SIN(ANG1)
        DZ2=ZC1-ZC
        DX3=ALENG2*COS(ANG1+HALFPI)
        DY3=ALENG2*SIN(ANG1+HALFPI)
        DZ3=ZC2-ZC
        AP=DY2*DZ3-DY3*DZ2
        BP=DX2*DZ3-DX3*DZ2
        CP=DX2*DY3-DX3*DY2
      ENDIF
      ELP1=-AP/CP*(X1P-XC)+BP/CP*(Y1P-YC)+ZC
      ELP2=-AP/CP*(X2P-XC)+BP/CP*(Y2P-YC)+ZC
      ELP3=-AP/CP*(X3P-XC)+BP/CP*(Y3P-YC)+ZC
      ELP4=-AP/CP*(X4P-XC)+BP/CP*(Y4P-YC)+ZC
      X1P=X1P+XDATUM
      X2P=X2P+XDATUM
      X3P=X3P+XDATUM
      X4P=X4P+XDATUM

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Y1P=Y1P+YDATUM
Y2P=Y2P+YDATUM
Y3P=Y3P+YDATUM
Y4P=Y4P+YDATUM
WRITE(8,1282)X1P,Y1P,ELP1,X2P,Y2P,ELP2,X3P,Y3P,ELP3,X4P,Y4P,
.   ELP4,X1P,Y1P,ELP1
NSUBA=NSUBA+1
NASORC=NASORC+1
C
C   CONVERT POWER DENSITY TO TOTAL POWER
C
NTYPE=NTYPE+1
IF (NTYPE.GT.LIM2) THEN
1062   WRITE(0,1062)LIM2
      FORMAT(' MODIFY STRES3D TO INCREASE PARAMETER "LIM2" FROM'
.         ,I4,/, ' TO (NO. OF SUB-AREAL SOURCES)+(NO. OF LINE',
.         , ' SOURCES/[NPTSL/(NORDRL+1)])',/,
.         , ' +(NO. OF CANISTERS)')
      STOP
ENDIF
NSORC (NTYPE)=NSORC (ICTYPE)
NCOMP (NTYPE)=NCOMP (ICTYPE)
DEPTH (NTYPE)=DEPTH (ICTYPE)
TOP (NTYPE)= TOP (ICTYPE)
SPACE (NTYPE)=SPACE (ICTYPE)
DO 1063 I=1,NCOMP (NTYPE)
  QTA (NTYPE,II)= QTA (ICTYPE,II)
  QCA (NTYPE,II)= QCA (ICTYPE,II)*DEL1*DEL2
  QEXPA (NTYPE,II)=QEXPA (ICTYPE,II)
1063 CONTINUE
C
NGPT=0
WRITE(6,1283)NSUBA
C
C   CALCULATE COORDINATES OF GAUSS POINTS IN THE PLATE
C   (HORIZONTAL OR INCLINED)
C
DO 1065 J=1,NORDRA+1
  YROW=.5*(ZGAUSS(J)*(Y2-Y1) + Y1 + Y2)
DO 1065 I=1,NORDRA+1
  NCANN=NCANN+1
  IF (NCANN.GT.LIMIT1) THEN
1064   WRITE(*,1064)
      FORMAT(' TOO MANY SOURCES: INCREASE PARAMETER "LIMIT1"',/,
.         , ' IN STRES3D AND RECOMPILE')
      STOP
  ENDIF
  XSORC=.5*(ZGAUSS(I)*(X2-X1) + X1 + X2)
  YSORC=YROW
  CALL COORD2 (XSORC,YSORC,ANGLE,XC,YC,XS (NCANN),YS (NCANN))
  ZS (NCANN)=-AP/CP*(XS (NCANN)-XC)+BP/CP*(YS (NCANN)-YC)+ZC
  ITYPE (NCANN)=NTYPE
  TIMO (NCANN)=TIMEON
  NGPT=NGPT+1
  WRITE(6,1284)NGPT,XS (NCANN),YS (NCANN),ZS (NCANN)
  XSP=XS (NCANN)+XDATUM
  YSP=YS (NCANN)+YDATUM
  ELEVP=ELEVS-ZS (NCANN)
  WRITE(7,1240)XSP,YSP,ELEVP
1065 CONTINUE
1066 CONTINUE
ENDIF
C
C   READ LINE SOURCE GEOMETRY
C
IF (NLSORC.GE.1) THEN
  READ(5,*)NORDRL
  DO 1074 K=1,NLSORC
    READ(5,*)ILTYPE,NPTSL,XS1,YS1,ZS1,XS2,YS2,ZS2,TIMEON
    WRITE(6,1285)K,ILTYPE,TIMEON
    IF ((NORDRL.GE.0.AND.NORDRL.LE.5).OR.
.      (NORDRL.EQ.9.OR.NORDRL.EQ.14)) THEN
      ELSE
1071   WRITE(*,1071)NLSORC,NORDRL
      FORMAT(' LINE SOURCE NO. =',I4,/,
.         , ' ORDER OF INTEGRATION =',I4, ' IS NOT ALLOWED',/,
.         , ' ORDER OF INTEGRATION CAN EQUAL 0 TO 5,9,14')
      STOP
    ENDIF
    CALL ZINC (NORDRL)
    NSEG=NPTSL/(NORDRL+1)

```

```

NSEG=MAX0(NSEG,1)
NPTSL=NSEG*(NORDRL+1)
DELX=(XS2-XS1)/FLOAT(NSEG)
DELY=(YS2-YS1)/FLOAT(NSEG)
DELZ=(ZS2-ZS1)/FLOAT(NSEG)
XSA=XS1-DELX
XSB=XS1
YSA=YS1-DELY
YSB=YS1
ZSA=ZS1-DELZ
ZSB=ZS1
DO 1074 I=1,NSEG
WRITE(6,1286) I
XSA=XSB
YSA=YSB
ZSA=ZSB
XSB=XSB+DELX
YSB=YSB+DELY
ZSB=ZSB+DELZ
NGPT=0
C
C      CALCULATE COORDINATES OF GAUSS POINTS ALONG THE LINE
C
DO 1073 J=1,NORDRL+1
NCANN=NCANN+1
IF(NCANN.GT.LIMIT1) THEN
WRITE(*,1062)
STOP
ENDIF
XS(NCANN)=.5*(ZGAUSS(J)*(XSB-XSA) + XSB + XSA)
YS(NCANN)=.5*(ZGAUSS(J)*(YSB-YSA) + YSB + YSA)
ZS(NCANN)=.5*(ZGAUSS(J)*(ZSB-ZSA) + ZSB + ZSA)
NGPT=NGPT+1
WRITE(6,1284) NGPT,XS(NCANN),YS(NCANN),ZS(NCANN)
ITYPE(NCANN)=ILTYPE
TIMO(NCANN)=TIMEON
1073 CONTINUE
1074 CONTINUE
ENDIF
C
C      READ TIMES AND STRESS LINE COORDINATES
C
READ(5,*) (TIM(I),I=1,NTIMES)
WRITE(6,1300) (TIM(I),I=1,NTIMES)
IJ=0
DO 1082 I=1,NLINES
READ(5,*) NPOINT,XB,YB,ZB,XE,YE,ZE
NPT=NPOINT-1
XD=(XE-XB)/FLOAT(NPT)
YD=(YE-YB)/FLOAT(NPT)
ZB=ELEVS-ZB
ZE=ELEVS-ZE
ZD=(ZE-ZB)/FLOAT(NPT)
DO 1080 J=1,NPOINT
IJ=IJ+1
FRAC=FLOAT(J-1)
XP(IJ)=XF+FRAC*XD
YP(IJ)=YB+FRAC*YD
ZP(IJ)=ZB+FRAC*ZD
1080 CONTINUE
1082 CONTINUE
NPOINT=IJ
C
C      OBTAIN OUTPUT FOR EACH TIME REQUIRED
C
CALL PAGE(9,INPUT)
DO 1130 I=1,NTIMES
WRITE(6,1320) TIM(I)
WRITE(9,1320) TIM(I)
TM=TIM(I)
IF(NBISO.EQ.0) GO TO 1100
C
C      START BY CALCULATING THE SURFACE SHEAR LOADS DUE TO
C      ALL OF THE CANISTERS
C

```

```

C          INITIALIZE SHEAR FORCE VECTORS
C
DO 1090 K=1,NTOT
  TX(K)=0.0
  TY(K)=0.0
1090  CONTINUE
C
CALL SHEAR (TM,INIT)
IF(NBISO.LT.0)THEN
DO 1092 KJ=JBEGIN,JEND
DO 1092 KI=IBEGIN,IEND
KN=(KI-1)*NCOLL+KJ
TX(KN)=0.
TY(KN)=0.
1092  CONTINUE
ENDIF
C
1100  WRITE (6,1330)
      WRITE (9,1331)
C
C          CALL CALC FOR EACH STRESS POINT
C
CLOSE(UNIT=11)
DO 1120 J=1,NPOINT
  WRITE(0,1103)TM,J,NPOINT
1103  FORMAT(' TIME=',F10.2,', CALCULATING PT. ',I4,' OF ',I4)
C
C          INITIALIZE TEMPERATURES, DISPLACEMENTS, STRESSES
C
  IF (NGRAD.LE.0) THEN
    T=TSURF
    GO TO 1102
  ENDIF
  IF (NGRAD.EQ.1) THEN
    T=TSURF+TGRAD(1)*ZP(J)
  ELSE
    T=TSURF
    DTOP=0.
    DO 1101 II=1,NGRAD
      IF (ZP(J).GE.DGRAD(II)) THEN
        T=T+(DGRAD(II)-DTOP)*TGRAD(II)
        DTOP=DGRAD(II)
      ELSE
        T=T+(ZP(J)-DTOP)*TGRAD(II)
        GO TO 1102
      ENDIF
    ENDIF
1101  CONTINUE
    T=T+(ZP(J)-DTOP)*TGRAD(NGRAD)
  ENDIF
1102  CONTINUE
  SP=ZP(J)*DEN
  SPH1=SP*RATIO1+SIGO1
  SPH2=SP*RATIO2+SIGO2
  U=0.0
  V=0.0
  W=0.0
C
C          COMPUTE INITIAL STRESSES FROM INITIAL PRINCIPAL STRESSES
C          AND DIRECTION COSINES (PRINCIPAL STRESSES ARE HORIZONTAL AND VERT.)
C          REFERENCE:ROCK MECHANICS AND THE DESIGN OF STRUCTURES IN ROCK.
C          LEONARD OBERT AND WILBUR I. DUVALL, JOHN WILEY & SONS, INC.
C          1967, EQN. 1.5.20, P. 25.
C
  CL1=COS(-BEAR)
  CM1=COS(-HALFPI-BEAR)
  CL2=COS(HALFPI-BEAR)
  CM2=COS(-BEAR)
  SIGMA(1)=CL1*CL1*SPH1+CM1*CM1*SPH2
  SIGMA(2)=CL2*CL2*SPH1+CM2*CM2*SPH2
  SIGMA(3)=SP
  SIGMA(4)=CL1*CL2*SPH1+CM1*CM2*SPH2
  SIGMA(5)=0.0
  SIGMA(6)=0.0
  CALL CALC (TM,J,ICOUNT)
  WRITE (6,1340) J,XP(J),YP(J),ZP(J),T,U,V,W,(SIGMA(K),K=1,6)
  XPP=XP(J)+XDATUM
  YPP=YP(J)+YDATUM
  ELP=ELEVS-ZP(J)
  WRITE (9,1340) J,XPP,YPP,ELP,T,U,V,W,(SIGMA(K),K=1,6)
1120  CONTINUE

```



```

1130     CONTINUE
        GO TO 1010
C
1140     FORMAT (A)
1150     FORMAT (E10.0,2F5.0,E10.0,F5.0,E10.0,F10.0,F5.0,E10.0)
1160     FORMAT (58H THERMO-ELASTIC ANALYSIS OF RADIO-ACTIVE WASTE REPOSITO
1161 1RY /15H DIFFUSIVITY ,E12.4/15H SURFACE TEMP ,E12.4)
1161     FORMAT (' TEMPERATURE GRADIENT(S)',/, ' GRADIENT', ' DEPTH')
1162     FORMAT (1F10.6,1F10.3)
1163     FORMAT (' UNIFORM INITIAL TEMPERATURE')
1164     FORMAT ( 15H ELASTIC MOD. ,E12.4/15H POISSON RATIO ,E12.4/15H
. COEFF OF EXPAN,E12.4/15H ROCK SP. WT. ,E12.4/, ' INITIAL MAX. H',
. ' ORZ. STRESS',1E12.4,/, ' INITIAL MIN. HORZ. STRESS',E12.4,/,
. ' MAX. HORZ. STRESS GRAD./VERT. STRESS GRAD.',1F6.3/,
. ' MIN. HORZ. STRESS GRAD./VERT. STRESS GRAD.',1F6.3/,
. ' BEARING (DEG.) OF MAX. HORZ. STRESS W.R.T. X-AXIS'1F6.2/)
1170     FORMAT (7I5,3F10.0)
1180     FORMAT (' NUMBER OF CANISTERS ,I10/
1 ' NUMBER OF AREAL SOURCES ,I10/
1 ' NUMBER OF LINE SOURCES ,I10/
1 ' NUMBER OF CANISTER TYPES ,I10/
1 ' NUMBER OF TIMES FOR OUTPUT ,I10/
1 ' NUMBER OF LINES FOR OUTPUT ,I10/
2 ' NUMBER OF SURFACE SHEAR ROWS ,I10/
3 ' NUMBER OF SURFACE SHEAR COLUMNS ,I10/
4 ' HALF WIDTH OF SURFACE ELEMENTS ,F10.2/
4 ' CENTER OF SURFACE GRID (XCOORD) ,F10.2/
5 ' CENTER OF SURFACE GRID (YCOORD) ,F10.2/)
1190     FORMAT (25H ISOTHERMAL FREE SURFACE )
1200     FORMAT (' NO FREE SURFACE ')
1210     FORMAT (I5,F5.0,2I5,F10.0)
1220     FORMAT (//, ' CANISTER TYPE ,I10,/,
1' -----,/,
2' CANISTER LENGTH ,F10.2,/,
3' NUMBER OF POINT SOURCES ,I10,/,
4' NUMBER OF COMPONENTS ,I10,/,
5' DEPTH BELOW SURFACE ,F10.2)
1230     FORMAT (20H CANISTER COMPONENTS)
1240     FORMAT (3F10.0)
1250     FORMAT (22H SOURCE DATA - TIME ON,F15.2,9H STRENGTH,E12.4,6H EXP (-
1,E12.4,1H))
1260     FORMAT (I5,3F10.0)
1270     FORMAT (I5,I9,3F8.2)
272     FORMAT (I6,I8,4F10.2)
280     FORMAT (//20H CANISTER PLACEMENT ,/,38H CANISTER TYPE XCOORD YCO
1OR TIME ON,/,41H -----)
1281     FORMAT (//, ' AREAL SOURCE NO. ',I4, ' SOURCE TYPE =',I4,
. ' TIME ON =',1E12.5)
1282     FORMAT(3F10.1)
1283     FORMAT (' SUB-AREAL SOURCE NO. ',I4,/, ' GAUSS PT. XCOORD',
1' YCOORD ZCOORD',/, ' -----',
2' -----')
1284     FORMAT (I6,5X,3F10.2)
1285     FORMAT (//, ' LINE SOURCE NO. ',I4, ' SOURCE TYPE =',I4,
. ' TIME ON =',1E12.5)
1286     FORMAT (' LINE SEGMENT NO. ',I4,/, ' GAUSS PT. XCOORD',
1' YCOORD ZCOORD',/, ' -----',
2' -----')
1290     FORMAT (5F10.0)
1300     FORMAT (//24H TIMING FOR OUTPUT (YRS)/(3X,10F10.2))
1310     FORMAT (I5,6F10.0)
1320     FORMAT (' TEMPERATURES DISPLACEMENTS AND STRESSES AT TIME ',1E12.5)
1330     FORMAT (// PT XCOORD YCOORD ZCOORD TEMP U',
1' V W SIGXX SIGYY SIGZZ SIGXY',
2' SIGYZ SIGZX'//)
1331     FORMAT (// PT XCOORD YCOORD ELEV TEMP U',
1' V W SIGXX SIGYY SIGZZ SIGXY',
2' SIGYZ SIGZX'//)
1340     FORMAT (I4,1X,2F9.1,1F8.1,10E10.4)
        END
C
C -----
C
        SUBROUTINE PAGE(IUNIT,INPUT)
C
C     THIS SUBROUTINE WRITES THE HEADING AT THE TOP OF EACH PAGE
C
        COMMON/PAGIN/TITLE,QANUM
        CHARACTER*80 TITLE
        CHARACTER*64 INPUT
        CHARACTER*11 QANUM

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C      CHARACTER*8 DDDATE
C
C      CALL DATE(DDDATE)
C      WRITE (IUNIT,1010)
C      WRITE (IUNIT,1020)TITLE
C      WRITE (IUNIT,1025)QANUM
C      WRITE (IUNIT,1030)INPUT,DDDATE
C      RETURN
C
C
1010  FORMAT (29X,' STRES3D VERSION 4.0 (MAY 1989)'/
1      23X,' J.F.T. AGAPITO AND ASSOCS. (303)242 4220'/)
1020  FORMAT (1X,A/)
1025  FORMAT ('      QA NUMBER: ',A11)
1030  FORMAT ('      INPUT FILE: ',A64/
      '      DATE: ',A8/)
      END
C
C -----
C
C      SUBROUTINE CALC (TM,IZ,ICOUNT)
C
C          CALCULATES TEMPERATURE, DISPLACEMENTS, AND STRESSES AT A
C          POINT DUE TO ALL REAL AND IMAGE SOURCES
C
C      DIMENSION          CSIG(6)
C      PARAMETER (LIMIT1=4500,LIM2=350,LIM3=20000)
C      COMMON /MATROP/     ALPHA,          DIFF,          E,
1      G,          PR
C      COMMON DEPTH(LIMIT1), ITYPE(LIMIT1), NBISO,          NCANN,
1      NCOL,          NCOMP(LIMIT1), NROW,          NSORC(LIMIT1),
2      QCA(LIMIT1,10), QEXPA(LIMIT1,10),QTA(LIMIT1,10),SIGMA(6),
3      SPACE(LIMIT1),     SW,          T,          TIMO(LIMIT1),
4      TOP(LIMIT1),       TX(LIM3),     TY(LIM3),     U,
5      V,          W,          XC,          XO,
6      XP(LIMIT1),       XS(LIMIT1),     XSURF(LIM3),     YC,
7      YO,          YP(LIMIT1),     YS(LIMIT1),     YSURF(LIM3),
8      ZP(LIMIT1)
C      COMMON/DEPTH/LZS(LIMIT1)
C      COMMON/GAUSSL/NASORC,NLSORC,NPTSL,NORDRL,NICANN,NORDRA,WT(15),
      WT2(196)
C      COMMON/SSHEARS/NTOT,NCOL1,NCOL2,NROW1,NROW2,SW1,SW2
C      DATA PI1,PI2/0.564189583547756,0.179587122125166/
C      C1=(ALPHA*(1.0+PR)/(1.0-PR))*0.159154943091895
C      C2=C1*G
C      IF(ICOUNT.EQ.1) GO TO 1110
C
C          SUM THE EFFECTS OF EACH HEAT SOURCE
C
C      ILOCAL=0
C      DO 1060 I=1,NCANN
C          X=XP(IZ)-XS(I)
C          Y=YP(IZ)-YS(I)
C          TM1=TM-TIMO(I)
C
C          CONSTANTS RELATING TO DISTANCES
C
C          X2=X*X
C          Y2=Y*Y
C          RS2=X2+Y2
C          IT=ITYPE(I)
C          DEPT=TOP(IT)-SPACE(IT)*0.5
C          NSIT=NSORC(IT)
C          IF(I.GT.NICANN) THEN
C              NSIT=1
C              DEPT=ZS(I)
C          ENDIF
C
C          ADD THE EFFECT OF POINT OR INTEGRATION POINT SOURCE REPRESENTING
C          THE COMPLETE HEAT SOURCE
C
C      DO 1050 J=1,NSIT
C
C          DEPTH OF POINT SOURCE BEING ADDED
C
C          IF(I.LE.NICANN)THEN
C              DEPT=DEPT+SPACE(IT)
C          ENDIF
C
C          LOOP SO THAT CALCULATION IS CARRIED FOR SOURCE AND IMAGE

```

```

PM=-1
DO 1040 K=1,2
  IF (K.EQ.2.AND.NBISO.EQ.0) GO TO 1040
  PM=-PM

  DISTANCE BETWEEN SURFACE AND SOURCE OR IMAGE

  Z=ZP(IZ)-PM*DEFT
  R2=RS2+Z*Z
  IF (R2.LT..0001) R2=.0001
  R=SQRT(R2)
  R3=R2*R
  R5=R2*R3

  ACCUMULATE CONTRIBUTIONS OF ALL COMPONENTS OF THE SOURCES

  V1=0.0
  V2=0.0
  V3=0.0
  NCIT=NCOMP(IT)

  WEIGHT THE CONTRIBUTIONS FROM EACH SOURCE

  SCALE=1.0
  IF (NASORC.GE.1.AND.I.GT.NICANN) THEN
    IF (I.LE.(NICANN+NASORC*(NORDRA+1)*(NORDRA+1))) THEN

      AREAL SOURCES
      DO NOT UPDATE LOCAL COORDINATE FOR IMAGE SOURCES

      IF (K.EQ.1) THEN
        ILOCAL=ILOCAL+1
        IF (ILOCAL.GT.((NORDRA+1)*(NORDRA+1))) ILOCAL=1
      ENDIF
      SCALE=.25*WT2(ILOCAL)
    ENDIF
  ENDIF

  IF (NLSORC.GE.1.AND.
  1.GT.(NICANN+NASORC*(NORDRA+1)*(NORDRA+1))) THEN

    LINE SOURCES

    IF (I.EQ.(1+NICANN+(NASORC*(NORDRA+1)*(NORDRA+1))))
      CALL WTF(NORDRL)
    ILINE=(I-NICANN-(NASORC*(NORDRA+1)*(NORDRA+1)))/NPTSL
    ILOCAL=(I-NICANN-(NASORC*(NORDRA+1)*(NORDRA+1))
      -(ILINE*NPTSL)
    SCALE=.5*WEIGHT(ILOCAL,NPTSL,NORDRL)
  ENDIF
DO 1030 JS=1,NCIT
  TMM=TMM-QTA(IT,JS)
  IF (TMM.LE.0.0) GO TO 1030
  QC=QCA(IT,JS)

  USE FULL STRENGTH SOURCE FOR AN AREAL SOURCE

  IF (I.GT.NICANN) THEN
    QC=QC*NSORC(IT)

  USE (FULL STRENGTH)/(NO. OF SEGMENTS) FOR A LINE SOURCE

  IF (I.GT.(NICANN+NASORC*(NORDRA+1)*(NORDRA+1)))
    QC=QC/FLOAT(NPTSL/(NORDRL+1))
  ENDIF

  QEXP=QEXPA(IT,JS)
  IF (QEXP.GT.0.0) GO TO 1010

  CONSTANT SOURCE

  CALL QCON (QC,TMM,R,DIFF,VV1,VV2,VV3)
  GO TO 1020

  DECAYING SOURCE

1010 CALL QDEC (QC,QEXP,TMM,R,DIFF,VV1,VV2,VV3)
1020 V1=V1+VV1
      V2=V2+VV2
      V3=V3+VV3
1030 CONTINUE

```

```

C
C      CALCULATE TEMPERATURE
C
C      EQUATION (1)
C
C      T=T+PM*PI2*V3*SCALE
C
C      CALCULATE THE DISPLACEMENTS
C
C      VAL=(PI1*V2-V1/(R+R))*C1/R2
C
C      EQUATION (2)
C
C      U=U+PM*X*VAL*SCALE
C
C      EQUATION (3)
C
C      V=V+PM*Y*VAL*SCALE
C
C      EQUATION (4)
C
C      W=W+PM*Z*VAL*SCALE
C
C      CALCULATE THE STRESSES
C
C      S1=2.0*R*PI1
C      S2=3.0/R2
C      S3=2.0*S1
C      S4=C2/R3
C      S5=1.0-S2*X2
C
C      EQUATION (5)
C
C      SIGMA(1)=SIGMA(1)+PM*S4*(-S5*V1+S1*S5*V2+S3*(R2-X2)*V3)
C          *SCALE
C      S5=1.0-S2*Y2
C
C      EQUATION (6)
C
C      SIGMA(2)=SIGMA(2)+PM*S4*(-S5*V1+S1*S5*V2+S3*(R2-Y2)*V3)
C          *SCALE
C      S5=2.0-S2*RS2
C
C      EQUATION (7)
C
C      SIGMA(3)=SIGMA(3)+PM*S4*(S5*V1-S1*S5*V2+S3*RS2*V3)
C          *SCALE
C      VAL=PM*3.0*C2/R5*(V1-S1*V2-S3*R2*V3/3.0)
C
C      EQUATION (8)
C
C      SIGMA(4)=SIGMA(4)+X*Y*VAL*SCALE
C
C      EQUATION (9)
C
C      SIGMA(5)=SIGMA(5)+Y*Z*VAL*SCALE
C
C      EQUATION (10)
C
C      SIGMA(6)=SIGMA(6)+Z*X*VAL*SCALE
1040      CONTINUE
1050      CONTINUE
1060      CONTINUE
      IF (NBISO.EQ.0) GO TO 1100
C
C      NOW REMOVE THE SURFACE SHEARS
C      NOTE THAT THERE IS A CUT OFF ON THE REMOVAL OF SHEAR ON
C      THE SURFACE. DO IT TO THE LIMITS OF CALCULATION OF
C      SURFACE SHEARS.
C
C
N=0
SW=SW1
DO 1090 I=1,NTOT
IF (I.GT.NROW1*NCOL1) SW=SW2
N=N+1
X1=XP(IZ)-XSURF(N)
Y1=YP(IZ)-YSURF(N)
IF (ZP(IZ).GE.SW*2.) THEN
CALL CERUTI (TX(N),TY(N),X1,Y1,ZP(IZ),SW,CU,CV,CW,CSIG)
ELSE
CALL CERUT1 (TX(N),TY(N),X1,Y1,ZP(IZ),SW,CU,CV,CW,CSIG)

```

```

        ENDIF
        U=U+CU
        V=V+CV
        W=W+CW
        DO 1070 L=1,6
            SIGMA(L)=SIGMA(L)+CSIG(L)
1070     CONTINUE
1080     CONTINUE
1090     CONTINUE
1100     CONTINUE
1110     RETURN
        END

C
C -----
C
        SUBROUTINE QCON (QC,T,R,DIFF,V1,V2,V3)
C
C         EVALUATE INTEGRALS FOR CONSTANT HEAT SOURCE
C
        DATA SQPI,RSQPI/1.77245,0.56419/
C
        X1=QC
        X2=T
        X3=R
        X4=DIFF
C
        RDIFF=1.0/(2.0*X4)
        C1=X3*X3/(4.0*X4*X2)
        C2=SQRT(C1)
        C3=SQRT(X2/X4)
C
C         EXPONENTIAL FUNCTION
C
        EX=0.0
C
C         KEEP EXPONENTIAL FUNCTION WITHIN RANGE OF 32 BIT REAL VARIABLE
C
        IF (C1.LT.75.) EX=EXP(-C1)
C
C         ERROR FUNCTION
C
        BERF=ERF(C2)
C
C         COMPLEMENTED ERROR FUNCTION
C
        ERFC=1.0-BERF
C
C         EQUATION (11)
C         EQUATION (12)
C         EQUATION (13)
C
        X5=X1*(X2*BERF-X3*X3*RDIFF*ERFC+C3*X3*RSQPI*EX)
        X6=X1*(C3*EX-X3*SQPI*RDIFF*ERFC)
        X7=X1*SQPI*RDIFF*ERFC/(2.0*X3)
C
        V1=X5
        V2=X6
        V3=X7
        RETURN
        END

C
C -----
C
        SUBROUTINE QDEC (QC,QEXP,T,R,DIFF,V1,V2,V3)
C
C         EVALUATE INTEGRALS FOR EXPONENTIALLY DECAYING SOURCE
C
        COMPLEX VAL,WOFZ
        DATA SPI/1.77245/
        X1=QC
        X2=QEXP
        X3=T
        X4=R
        X5=DIFF
        CON=X2*X3
        R2=X4*X4/(4.0*X5*X3)
        R1=SQRT(R2)
        E1=0.0
        EX2=C.0
C
C         KEEP EXPONENTIAL FUNCTION WITHIN RANGE OF 32 BIT REAL VARIABLE
C

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```

C      IF (CON.LT.75.) EX1=EXP(-CON)
C      IF (R2.LT.75.) EX2=EXP(-R2)
C      VAL=CMPLX(SQRT(CON),R1)
C      VAL=WOFZ(VAL)
C      C1=REAL(VAL)
C      C2=AIMAG(VAL)

C      EQUATION (14)
C      EQUATION (15)
C      EQUATION (16)
C
C      X6=X1/X2*(-EX1+ERF(R1)+EX2*C1)
C      X7=X1*SPI/SQRT(4.0*X5*X2)*EX2*C2
C      X8=X1*SPI/(4.0*X5*X4)*EX2*C1
C      V1=X6
C      V2=X7
C      V3=X8
C      RETURN
C      END

C
C -----
C
C      COMPLEX FUNCTION WOFZ(Z)
C
C      WOFZ EVALUATES  $\exp(-Z^2) \cdot \text{ERFC}(-I \cdot Z)$  FOR  $Z=X+I \cdot Y$  IN THE FIRST
C      QUADRANT OF THE COMPLEX PLANE. ERFC(ARG) IS THE ERROR FUNCTION
C      COMPLEMENT,  $2.0/\text{SQRT}(\pi) \cdot \text{INTEGRALFROM}(\text{ARG}) \text{ TO } (\text{INFINITY}) \exp(-T^2) \text{ DT.}$ 
C      SEE COMMUNICATIONS OF THE ACM, VOL. 12, NO. 11 (NOV., 1969), P. 635
C      AND VOL. 15, NO. 6 (JUNE, 1972), P. 465, AND SIAM JOURNAL OF
C      NUMERICAL ANALYSIS, VOL. 7, NO. 1 (MAR., 1970), PP. 187-198.
C
C      TRANSLATED FROM ALGOL TO FORTRAN ON MAR. 22, 1977 BY
C      MICHAEL J. FRISCH
C      UNIVERSITY COMPUTER CENTER
C      UNIVERSITY OF MINNESOTA
C      227 EXPERIMENTAL ENGINEERING BUILDING
C      208 UNION STREET SOUTHEAST
C      MINNEAPOLIS, MN 55455
C      PHONE 612/376-1636
C
C      COMPLEX Z
C      LOGICAL B
C
C      DATA CON/1.128379/
C
C      X=REAL(Z)
C      Y=AIMAG(Z)
C      ALAMBD=0.0
C      IF (Y.LT.4.29.AND.X.LT.5.33) GO TO 1010
C      H=0.0
C      ICAPN=0
C      NU=8
C      GO TO 1020
1010  S=(1.0-Y/4.29)*SQRT(1.0-X*X/28.41)
C      H=1.6*S
C      H2=2.0*H
C      ICAPN=6.0+23.0*S
C      ALAMBD=H2**ICAPN
C      NU=9.0+21.0*S
C
C      IN THE FOLLOWING 2 STATEMENTS, ALAMBD=0 COVERS THE
C      UNDERFLOW CASE WHEN H.GT.0 IS VERY SMALL.
C
1020  B=.FALSE.
C      IF (H.EQ.0.0.OR.ALAMBD.EQ.0.0) B=.TRUE.
C      S2=0.0
C      S1=S2
C      R2=S1
C      R1=R2
C      NUP1=NU+1
C      DO 1040 NN=1,NUP1
C          N=NUP1-NN
C          NP1=N+1
C          T1=Y+H+FLOAT(NP1)*R1
C          T2=X-FLOAT(NP1)*R2
C          C=0.5/(T1*T1+T2*T2)
C          R1=C*T1
C          R2=C*T2
C          IF (H.GT.0.0.AND N.LE.ICAPN) GO TO 1030
C          GO TO 1040

```

```

1030    T1=ALAMBD+S1
        S1=R1*T1-R2*S2
        S2=R2*T1+R1*S2
        ALAMBD=ALAMBD/H2
1040    CONTINUE
        RE=S1
        IF (B) RE=R1
        RE=CON*RE
        IF (Y.EQ.0.0) RE=EXP(-X*X)
        AIM=S2
        IF (B) AIM=R2
        WOFZ=CMPLX(RE,CON*AIM)
        RETURN
        END

C
C -----
C
C      SUBROUTINE SHEAR (TM,INIT)
C
C      CALCULATES SHEAR FORCES TO BE APPLIED AT THE FREE SURFACE
C
C      CALCULATES SHEAR FORCES TO BE APPLIED AT THE FREE SURFACE
C      TO REMOVE SHEAR STRESSES DUE TO SOURCE AND IMAGE
C
        PARAMETER (LIMIT1=4500,LIM2=350,LIM3=20000)
        COMMON /MATROP/      ALPHA,      DIFF,      E,
1      G,      PR
        COMMON DEPTH(LIMIT1),      ITYPE(LIMIT1), NBISO,      NCANN,
1      NCOL,      NCOMP(LIMIT1), NROW,      NSORC(LIMIT1),
2      QCA(LIMIT1,10), QEXPA(LIMIT1,10),QTA(LIMIT1,10),SIGMA(6),
3      SPACE(LIMIT1),      SW,      T,      TIMO(LIMIT1),
4      TOP(LIMIT1),      TX(LIM3),      TY(LIM3),      U,
5      V,      W,      XC,      XO,
6      XP(LIMIT1),      XS(LIMIT1),      XSURF(LIM3),      YC,
7      YO,      YP(LIMIT1),      YS(LIMIT1),      YSURF(LIM3),
8      ZP(LIMIT1)
        COMMON/DEPTH/LS(LIMIT1)
        COMMON/GAUSSL/NASORC,NLSORC,NPTSL,NORDRL,NICANN,NORDRA,WT(15),
        WT2(196)
        COMMON/SSHEARS/NTOT,NCOL1,NCOL2,NROW1,NROW2,SW1,SW2
        DATA C1/1.12837916709551/
        RM=ALPHA*(1.0+PR)/(1.0-PR)
        C2=2.0*C1/3.0
        IF(INIT.NE.1) GO TO 1000
        XO=-1.*FLOAT(NCOL-1)*SW+XC
        YO=-1.*FLOAT(NROW-1)*SW+YC

C
C      CALCULATE GRID LOCATION DATA
C
        DO 1010 I=1,NROW
            DO 1010 J=1,NCOL
                N=(I-1)*NCOL+J
                YSURF(N)=1.*FLOAT(2*I-2)*SW+YO
                XSURF(N)=1.*FLOAT(2*J-2)*SW+XO
1010    CONTINUE
        GO TO 1080

C
C      CALCULATE THE SHEAR STRESSES TAU RZ DUE TO SOURCE ALONE
C
1000    CONTINUE
        IF(ABS(NBISO).EQ.2) THEN
            WRITE(0,1001)
1001    FORMAT(' READING SHEAR STRESSES')
            DO 1012 N=1,NTOT
                READ(11,*)TX(N),TY(N)
1012    CONTINUE
            GO TO 1080
        ENDIF
        DO 1070 N=1,NTOT
            IF(MOD(N,10).EQ.0)WRITE(0,1014)N,NTOT
1014    FORMAT(' SURFACE ELEMENT ',I5,' OF ',I5,' IS UNDER',
            ' CONSIDERATION')

C
C      ACCUMULATE CONTRIBUTIONS OF ALL CANISTERS
C
        ILOCAL=0
        DO 1050 K=1,NCANN
            IT=ITYPE(K)
            IF(K.LE.NICANN) THEN
                CON=3.0*G*RM*DEPTH(IT)*0.159154943091895

```

```

      D=DEPTH(IT)
      ELSE
      CON=3.0*G*RM*ZS(K)*0.159154943091895
      D=ZS(K)
    ENDIF
    NCOP=NCOMP(IT)
    V1=0.0
    V2=0.0
    V3=0.0
    Y=YSURF(N)-YS(K)
    X=XSURF(N)-XS(K)
    RS=SQRT(X*X+Y*Y)
    R=SQRT(RS*RS+D*D)
    TM1=TM-TIMO(K)

C
C      ACCUMULATE CONTRIBUTIONS OF ALL COMPONENTS OF THE SOURCES
C
DO 1040 JS=1,NCOP
  TMM=TM1-QTA(IT,JS)
  IF (TMM.LE.0.0) GO TO 1040

C
C      FOR SHEAR STRESS CALCULATION ASSUME CANISTER IS ONE SOURCE
C
    QC=QCA(IT,JS)*NSORC(IT)
    WEIGHT THE CONTRIBUTIONS FROM EACH SOURCE
    SCALE=1.0
    IF (NASORC.GE.1.AND.K.GT.NICANN) THEN
      IF (K.LE.(NICANN+NASORC*(NORDRA+1)*(NORDRA+1))) THEN
C
        AREAL SOURCES
        ILOCAL=ILOCAL+1
        IF (ILOCAL.GT.((NORDRA+1)*(NORDRA+1))) ILOCAL=1
        SCALE=.25*WT2(ILOCAL)
      ENDIF
    ENDIF

C
    IF (NLSORC.GE.1.AND.
      K.GT.(NICANN+NASORC*(NORDRA+1)*(NORDRA+1))) THEN
C
C      LINE SOURCES
C
      IF (K.EQ.(1+NICANN+(NASORC*(NORDRA+1)*(NORDRA+1))))
        CALL WTF(NORDRI)
      ILINE=(K-NICANN-(NASORC*(NORDRA+1)*(NORDRA+1)))/NPTSL
      ILOCAL=(K-NICANN-(NASORC*(NORDRA+1)*(NORDRA+1))
        -(ILINE*NPTSL)
      SCALE=.5*WEIGHT(ILOCAL,NPTSL,NORDRI)
    ENDIF
    QEXP=QEXPA(IT,JS)
    IF (QEXP.GT.0.0) GO TO 1020

C
C      CONSTANT SOURCE
C
    CALL QCON(QC,TMM,R,DIFF,VV1,VV2,VV3)
    GC TO 1030

C
C      DECAYING SOURCE
C
1020    CALL QDEC(QC,QEXP,TMM,R,DIFF,VV1,VV2,VV3)
1030    V1=V1+VV1*SCALE
    V2=V2+VV2*SCALE
    V3=V3+VV3*SCALE
1040    CONTINUE
    TAURZ=CON*(V1-C1*R*V2-C2*R**3*V3)/R**5

C
C      FORCES OF OPPOSITE SIGN TO THE STRESS
C      TOTAL DUE TO SOURCE AND IMAGE.
C
    TX(N)=TX(N)+2.0*TAURZ*X
    TY(N)=TY(N)+2.0*TAURZ*Y
    CONTINUE
1050    CONTINUE
1060    CONTINUE
1070    CONTINUE
    DO 1072 N=1,NTOT
      WRITE(11,*)TX(N),TY(N)
      WRITE(12,*)XSURF(N),YSURF(N)
1072    CONTINUE
1080    RETURN
    END

```



```

C      SUBROUTINE CERUTI (TX,TY,XL,YL,ZL,SW,U,V,W,SIG)
C
C      SUBROUTINE TO EVALUATE DISPLACEMENTS AND STRESSES
C      RESULTING FROM SURFACE SHEARS (POINT SOLUTION).
C
C      DIMENSION          SIG(6)
COMMON /MATROP/          ALPHA,          DIFF,          E,
1      G,                  PR
      AREA=4.0*SW*SW
      X=XL
      Y=YL
      Z=ZL
      CON=1.0-2.0*PR
      PX=TX*0.159154943091895*AREA
      PY=TY*0.159154943091895*AREA
      X2=X*X
      Y2=Y*Y
      Z2=Z*Z
      R2=X2+Y2+Z2
      IF (R2.EQ.0.0) GO TO 1010
      R=SQRT(R2)
      R3=R*R2
      R5=R2*R3
      RZ=R+Z
      RZ2=RZ*R2
      GR2=2.0*G*R
C
C      EQUATION (17)
C
C      U=(-PX*(1.0+X2/R2+CON*(R/RZ-X2/RZ2))-PY*(X*Y/R2-CON*X*Y/RZ2))/GR2
C
C      EQUATION (18)
C
C      V=(-PX*(X*Y/R2-CON*X*Y/RZ2)-PY*(1.0+Y2/R2+CON*(R/RZ-Y2/RZ2)))/GR2
C
C      EQUATION (19)
C
C      W=(-PX*(X2/R2+CON*X/RZ)-PY*(Y2/R2+CON*Y/RZ))/GR2
C
C      EQUATION (20)
C
C      SIG(1)=(PX*X*(3.0*X2/R2-CON/RZ2*(R2-Y2-2.0*R*Y2/RZ))+PY*Y*(3.0*X2/
1010 R2-CON/RZ2*(3.0*R2-Y2-2.0*R*Y2/RZ)))/R3
C
C      EQUATION (21)
C
C      SIG(2)=(PX*X*(3.0*Y2/R2-CON/RZ2*(3.0*R2-X2-2.0*R*X2/RZ))+PY*Y*(3.0
1010 *Y2/R2-CON/RZ2*(R2-X2-2.0*R*X2/RZ)))/R3
C
C      EQUATION (22)
C
C      SIG(3)=3.0*Z2*(PX*X+PY*Y)/R5
C
C      EQUATION (23)
C
C      SIG(4)=(PX*Y*(3.0*X2/R2-CON/RZ2*(-R2+X2+2.0*R*X2/RZ))+PY*X*(3.0*Y2
1010 /R2-CON/RZ2*(-R2+Y2+2.0*R*Y2/RZ)))/R3
C
C      EQUATION (24)
C
C      SIG(5)=3.0*(X*Y*Z*PX+Y2*Z*PY)/R5
C
C      EQUATION (25)
C
C      SIG(6)=3.0*(X2*Z*PX+X*Y*Z*PY)/R5
1010 RETURN
1020 WRITE (6,1020)
      STOP
C
1020 FORMAT (38H ILLEGAL TO CALCULATE FOR FREE SURFACE)
      END
C
C      -----
C
C      SUBROUTINE CERUT1 (TX,TY,XL,YL,ZL,SW,U,V,W,SIG)
C
C      SUBROUTINE TO EVALUATE DISPLACEMENTS AND STRESSES
C      RESULTING FROM SURFACE SHEAR STRESSES CONSIDERED AS ACTING
C      UNIFORMLY OVER EACH SURFACE SHEAR ELEMENT.
C
C      DIMENSION          PX(2),          PY(2),          SIG(6)

```

```

COMMON /MATROP/      ALPHA,      DIFF,      E,
1      G,      PR
DATA PX(1),PX(2),PY(1),PY(2),ONE/-1.,1.,-1.,1.,1./
PR3=2.*PR
PR1=1.-PR3
PR2=1.+PR1
PI2=2.*ATAN(1.0)
G1=-1./(2.*G)
SX=TX/(4.0*PI2)
SY=TY/(4.0*PI2)
DX=SX*G1
DY=SY*G1
U=0.0
V=0.0
W=0.0
DO 1010 I=1,6
1010   SIG(I)=0.0
X0=XL
Y0=YL
Z=ZL
Z2=Z*Z

C
C      INTEGRATE OVER THE ELEMENT
C
DO 1050 I=1,2
  X=X0+SW*PX(I)
  X2=X*X
  AX=SIGN(ONE,X)
  DO 1040 J=1,2
    Y=Y0+SW*PY(J)
    AY=SIGN(ONE,Y)

C
C      FIRST EVALUATE THE EXPRESSIONS THAT ARE REPEATEDLY USED IN
C      COMPUTING DISPLACEMENTS AND STRESSES.
C
    PXY=PX(I)*PY(J)
    Y2=Y*Y
    R2=X2+Y2+Z2
    R=SQRT(R2)
    RI=1./R
    RMX=R*X
    RMY=R*Y
    RMZ=R*Z
    ZRI=Z*RI
    XR=X+R
    YR=Y+R
    ZR=Z+R
    XY=X*Y
    YZ=Y*Z
    ZX=Z*X
    XYZ=XY*Z
    Y2Z2=Y2+Z2
    X2Z2=X2+Z2
    XRLOG=ALOG(XR)
    YRLOG=ALOG(YR)
    ZRLOG=ALOG(ZR)
    THETA=(X2Z2+RMZ)/(SQRT(X2Z2)*ZR)
    IF (ABS(THETA).GT.1.0) THETA=THETA/ABS(THETA)

C
C      EQUATION (35)
C
    F11=(PI2-ASIN(THETA))*AY
    THETA=(Y2Z2+RMZ)/(SQRT(Y2Z2)*ZR)
    IF (ABS(THETA).GT.1.0) THETA=THETA/ABS(THETA)

C
C      EQUATION (37)
C
    F13=(PI2-ASIN(THETA))*AX
    IF (Z.EQ.0) GO TO 1020
    THETA=(X2Z2+RMX)/(SQRT(X2Z2)*XR)
    IF (ABS(THETA).GT.1.0) THETA=THETA/ABS(THETA)

C
C      EQUATION (36)
C
    F12=(PI2-ASIN(THETA))*AY
    THETA=(Y2Z2+RMY)/(SQRT(Y2Z2)*YR)
    IF (ABS(THETA).GT.1.0) THETA=THETA/ABS(THETA)

C
C      EQUATION (38)
C
    F14=(PI2-ASIN(THETA))*AX

```

```

      FI5=ATAN(XY/RMZ)
      GO TO 1030
1020  FI2=-PI2
      FI4=-PI2
      FI5=SIGN(PI2,XY)
1030  XR=1./(XR*R)
      YR=1./(YR*R)
      ZR=1./(ZR*R)
      X2Z2=1./X2Z2
      Y2Z2=1./Y2Z2
      THETA=(PR3*R+Z)*ZR
C
C      THEN COMPUTE THE DISPLACEMENTS AND STRESSES.
C
      BB=ABS(Z)
C
      EQUATION (26)
C
      U=U+(DX*(PR2*X*YRLOG+2.*Y*XRLOG+BB*(FI2+FI4)-PR1*Z*FI1*AX)-DY*
1      (PR3*R+PR1*Z*ZRLOG))*PXY
C
      EQUATION (27)
C
      V=V-(DX*(PR3*R*PR1*Z*ZRLOG)-DY*(PR2*Y*XRLOG+2.*X*YRLOG+BB*(FI2
1      +FI4)-PR1*Z*FI3*AY))*PXY
C
      EQUATION (28)
C
      W=W+(DX*(PR1*(Y*ZRLOG+X*AX*FI1)-PR3*Z*YRLOG)+DY*(PR1*(X*ZRLOG+
1      Y*AY*FI3)-PR3*Z*XRLOG))*PXY
C
      EQUATION (29)
C
      SIG(1)=SIG(1)+(SX*(X2Z2*ZR*(PR1*R*Z2-Z*X2-PR3*R*X2)*Y-2.*YRLOG
1      )+SY*(THETA*X-PR3*XRLOG))*PXY
C
      EQUATION (30)
C
      SIG(2)=SIG(2)+(SX*(THETA*Y-PR3*YRLOG)+SY*(Y2Z2*ZR*(PR1*R*Z2-Z*
1      Y2-PR3*R*Y2)*X-2.*XRLOG))*PXY
C
      EQUATION (31)
C
      SIG(3)=SIG(3)-ZRI*(SX*YZ*X2Z2+SY*ZX*Y2Z2)*PXY
C
      EQUATION (32)
C
      SIG(4)=SIG(4)+(SX*(THETA*X-XRLOG)+SY*(THETA*Y-YRLOG))*PXY
C
      EQUATION (33)
C
      SIG(5)=SIG(5)+(SX*ZRI+SY*(FI5-XYZ*Y2Z2*RI))*PXY
C
      EQUATION (34)
C
      SIG(6)=SIG(6)+(SX*(FI5-XYZ*X2Z2*RI)+SY*ZRI)*PXY
1040  CONTINUE
1050  CONTINUE
      RETURN
      END
C
C -----
C
      FUNCTION ERF(X)
C
      EVALUATE THE ERROR FUNCTION
C
      G=.39894
      Y = X*1.41421
      P = 0.0
      IF (ABS(Y).GT.6.2) GO TO 40
      T = Y*Y
      IF (T.LT.30.) GO TO 30
      DE = 1.0
      MM = NINT(AMIN1(40.,T))
      DO 26 LL=1,MM,2
      V = LL
      P = P+DE
26  DE = -V*DE/T
      P = (P+DE*.5)*G*EXP(-.5*T)/ABS(Y)
      GO TO 40

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```

30 P = .5
   DE = -G*ABS(Y)
   DO 31 LL=2,130,2
     P = P+DE
     IF (ABS(DE).LT.1E-16) GO TO 40
     V = LL
31  DE = -DE*T/V*(V-1.)/(V+1.0)
40  IF (Y.GT.0.) P = 1.0-P
     ERF = 2.0*P-1.0
     RETURN
     END

```

```

C
C -----
C
C      SUBROUTINE ZINC(IORDER)
C
C      NOTE: NUMBER OF INTEGRATION POINTS = IORDER + 1
C
C      COMMON/PTS/Z(15)
C
C      INITIALIZE COORDINATES
C
C      DO 5 I=1,15
C        Z(I)=0.
5     CONTINUE
C
C      IF (IORDER.EQ.0) THEN
C        Z(1)=0.
C      ENDIF
C      IF (IORDER.EQ.1) THEN
C        Z(1) = -.5773502692
C        Z(2) = .5773502692
C      ENDIF
C      IF (IORDER.EQ.2) THEN
C        Z(1) = -.7745966692
C        Z(2) = .0000000000
C        Z(3) = .7745966692
C      ENDIF
C      IF (IORDER.EQ.3) THEN
C        Z(1) = -.8611363116
C        Z(2) = -.3399810436
C        Z(3) = .3399810436
C        Z(4) = .8611363116
C      ENDIF
C      IF (IORDER.EQ.4) THEN
C        Z(1) = -.9061798459
C        Z(2) = -.5384693101
C        Z(3) = .0000000000
C        Z(4) = .5384693101
C        Z(5) = .9061798459
C      ENDIF
C      IF (IORDER.EQ.5) THEN
C        Z(1) = -.9324695142
C        Z(2) = -.6612093865
C        Z(3) = -.2386191861
C        Z(4) = .2386191861
C        Z(5) = .6612093865
C        Z(6) = .9324695142
C      ENDIF
C      IF (IORDER.EQ.9) THEN
C        Z(1) = -.9739065285
C        Z(2) = -.8650633667
C        Z(3) = -.6794095683
C        Z(4) = -.4333953941
C        Z(5) = -.1488743390
C        Z(6) = .1488743390
C        Z(7) = .4333953941
C        Z(8) = .6794095683
C        Z(9) = .8650633667
C        Z(10) = .9739065285
C      ENDIF
C      IF (IORDER.EQ.14) THEN
C        Z(1) = -.9879925180
C        Z(2) = -.9372733924
C        Z(3) = -.8482065834
C        Z(4) = -.7244177314
C        Z(5) = -.5709721726
C        Z(6) = -.3941513471
C        Z(7) = -.2011940939
C        Z(8) = .0000000000
C        Z(9) = .2011940939

```

```

      Z(10) = .3941513471
      Z(11) = .5709721726
      Z(12) = .7244177314
      Z(13) = .8482065834
      Z(14) = .9372733924
      Z(15) = .9879925180
    ENDIF
    RETURN
  END

C
C -----
C
C   SUBROUTINE WTF(IORDER)
C
C     ASSIGN WEIGHTING FACTORS FOR GAUSS LEGENDRE QUADRATURE
C
C     COMMON/GAUSSL/NASORC,NLSORC,NPTSL,NORDRL,NICANN,NORDRA,WT(15),
C       WT2(196)
C     IF(IORDER.EQ.0) THEN
C       WT(1)=2.
C     ENDIF
C     IF(IORDER.EQ.1) THEN
C       WT(1)= 1.000000000
C       WT(2)= 1.000000000
C     ENDIF
C     IF(IORDER.EQ.2) THEN
C       WT(1)= .5555555556
C       WT(2)= .8888888888
C       WT(3)= .5555555556
C     ENDIF
C     IF(IORDER.EQ.3) THEN
C       WT(1)= .3478548451
C       WT(2)= .6521451549
C       WT(3)= .6521451549
C       WT(4)= .3478548451
C     ENDIF
C     IF(IORDER.EQ.4) THEN
C       WT(1)= .2369268850
C       WT(2)= .4786286705
C       WT(3)= .5688888889
C       WT(4)= .4786286705
C       WT(5)= .2369268850
C     ENDIF
C     IF(IORDER.EQ.5) THEN
C       WT(1)= .1713244923
C       WT(2)= .3607615730
C       WT(3)= .4679139346
C       WT(4)= .4679139346
C       WT(5)= .3607615730
C       WT(6)= .1713244923
C     ENDIF
C     IF(IORDER.EQ.9) THEN
C       WT(1)= .0666713443
C       WT(2)= .1494513492
C       WT(3)= .2190863625
C       WT(4)= .2692667193
C       WT(5)= .2955242247
C       WT(6)= .2955242247
C       WT(7)= .2692667193
C       WT(8)= .2190863625
C       WT(9)= .1494513492
C       WT(10)=.0666713443
C     ENDIF
C     IF(IORDER.EQ.14) THEN
C       WT(1)= .0307532420
C       WT(2)= .0703660475
C       WT(3)= .1071592205
C       WT(4)= .1395706779
C       WT(5)= .1662692058
C       WT(6)= .1861610001
C       WT(7)= .1984314853
C       WT(8)= .2025782419
C       WT(9)= .1984314853
C       WT(10)=.1861610001
C       WT(11)=.1662692058
C       WT(12)=.1395706779
C       WT(13)=.1071592205
C       WT(14)=.0703660475
C       WT(15)=.0307532420
C     ENDIF
    RETURN
  
```

```

C      END
C
C -----
C      FUNCTION WEIGHT(I,IMAX,IORDER)
C      COMMON/GAUSSL/NASORC,NLSORC,NPTSL,NORDRL,NICANN,NORDRA,WT(15),
C      .      WT2(196)
C
C      FIND THE APPROPRIATE WEIGHT FUNCTION WITHIN A GIVEN LINE SEGMENT
C      I = LOCAL POINT ON THE LINE, IMAX = MAX. NO. OF POINTS ON A GIVEN
C      SEGMENT, IORDER = ORDER OF THE INTEGRATION SCHEME
C
C      ISEG=I/(IORDER+1)
C      II=I-ISEG*(IORDER+1)
C      IF (II.EQ.0) II=IORDER+1
C      WEIGHT=WT(II)
C      RETURN
C      END
C
C -----
C      SUBROUTINE COORD2(XLOCAL,YLOCAL,ANGLE,X0,Y0,XPRIME,YPRIME)
C
C      CHANGE COORDINATE SYSTEMS IN X-Y PLANE
C
C      THETA=ANGLE*ATAN(1.0)/45.
C
C      FIRST ROTATE
C
C      XPRIME= XLOCAL*COS(THETA)-YLOCAL*SIN(THETA)
C      YPRIME=XLOCAL*SIN(THETA)+YLOCAL*COS(THETA)
C
C      THEN TRANSLATE
C
C      XPRIME=XPRIME+X0
C      YPRIME=YPRIME+Y0
C      RETURN
C      END
C
C -----
C      SUBROUTINE AREALW
C
C      COMPUTE THE WEIGHTING FUNCTIONS FOR AN AREAL SOURCE BASED ON THOSE
C      FOR A LINE SOURCE
C
C      COMMON/GAUSSL/NASORC,NLSORC,NPTSL,NORDRL,NICANN,NORDRA,WT(15),
C      .      WT2(196)
C      ILOCAL=0
C      DO 100 J=1,NORDRA+1
C      DO 100 I=1,NORDRA+1
C      ILOCAL=ILOCAL+1
C      WT2(ILOCAL)=WT(I)*WT(J)
100  CONTINUE
C      RETURN
C      END
C
C -----
C      SUBROUTINE SECOND(TTIME)
C
C      FOR SVS FORTRAN V2.8
C      NOTE: MUST LINK WITH OBJECT MODULE 'DATIM28.OBJ' PROVIDED BY DIFINICON
C      SYSTEMS, INC.
C
C      EXTERNAL TIME
C      CHARACTER*8 TIMES
C      CHARACTER*1 CHAR
C
C      TIMES='00:00:00'
C
C      CALL TIME(TIMES)
C      READ(TIMES,'(I2,A1,I2,A1,I2)') IHR,CHAR,MIN,CHAR,ISEC
C      TTIME=FLOAT(3600*IHR+60*MIN+ISEC)
C      RETURN
C      END
C
C -----
C      SUBROUTINE DATED(CDATE)

```

```

C FOR SVS FORTRAN V2.8
C NOTE: MUST LINK WITH OBJECT MODULE 'DATIM28.OBJ' PROVIDED BY DIFINICON
C       SYSTEMS, INC.
C
C       EXTERNAL DATE
C       CHARACTER*8 CDATE
C
C       CDATE='00/00/00'
C
C       CALL DATE(CDATE)
C       RETURN
C       END
C
C -----
C
C       SUBROUTINE VERIF1
C
C       VERIFICATION PROBLEM NUMBER 1 FROM USERS GUIDE
C
C       VERIFICATION PROBLEM 1 - PULSE POINT HEAT SOURCE
C
C       OPEN(5,STATUS='SCRATCH')
C       WRITE(5,10)
10      FORMAT('AGAPITO 4.0' /
C             . 'VERIFICATION PROBLEM 1 - PULSE POINT HEAT SOURCE' /
C             . '01 .00 0' /
C             . '1.01E9 .20 5.4E-6 .00 0. 0. 0. 0. 0. 0.' /
C             . '1 0 1 1 1 0 0 0 .00 .00 .00 .0 .0 .0' /
C             . '1 1.0 1 2 1000.' /
C             . '00 585.6 .00' /
C             . '10 -585.6 .00' /
C             . '1 .00 .00 .00' /
C             . '10.' /
C             . '40 .05 .0 -1000. 2. .00 -1000.' /
C             . 'STOP')
C       REWIND 5
C       RETURN
C       END
C
C -----
C
C       SUBROUTINE VERIF2
C
C       VERIFICATION PROBLEM NUMBER 2 FROM USERS GUIDE
C
C       INFINITE PLATE SOURCE IN A SEMI-INFINITE MEDIUM - 100 YEARS
C
C       OPEN(5,STATUS='SCRATCH')
C       WRITE(5,10)
10      FORMAT('AGAPITO 4.0' /
C             . 'INFINITE PLATE SOURCE IN A SEMI-INFINITE MEDIUM - 100 YEARS ' /
C             . '289.3 0. 0' /
C             . '3.171E8 .22 4.889E-6 0. 0. 0. 1. 1. 0.' /
C             . '0 1 0 1 1 1 1 100 100 100. 0. 0. 0. 1000.' /
C             . '1 1.00 1 1 .0' /
C             . '0. 1214.4 0.' /
C             . '3' /
C             . '1 0. 5000. -5000. 500. 90. 10000. 10000. 500. 500. 10 10' /
C             . '100.' /
C             . '9 0. 0. 50. 0. 0. 450.' /
C             . 'STOP')
C       REWIND 5
C       RETURN
C       END

```

5.0 REFERENCES

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APPENDIX A

Temperatures, Displacements, and Stresses Due to a Point Heat Source in an Infinite Body

APPENDIX A¹

A.1 THERMAL EFFECTS; HEAT SOURCES AT FINITE DEPTH

A.1.1 Introduction

A quantity of radioactive waste generates heat as it decays. The effect of this heat in the repository will be to raise the temperature of the rock mass and to induce thermal stresses and displacements. The following discussion is concerned with calculating the thermal effects due to an arbitrary distribution of time-varying heat sources along a single plane in a semi-infinite rock mass.

A.1.2 Instantaneous Heat Source in an Infinite Body

The solution for an arbitrary distribution of time-varying heat sources along a single plane surface is developed by superposition from the solution for a single source with a given heat generation rate. This basic solution, in turn, is found by integration from the well-known solution for a single, instantaneous heat source in an infinite, linearly elastic body. An instantaneous heat source is one that liberates a finite quantity of heat in a single "pulse." The strength Q of the source is the temperature to which this quantity of heat would raise a unit volume of material with fixed thermal properties.

The temperature field produced by an instantaneous heat source at point $(x, y, z) = (0, 0, 0)$ in an infinite body (Nowacki, 1962) is:

$$T(R, t) = \frac{Q}{(\pi\beta)^{3/2}} \exp\left(\frac{-R^2}{\beta}\right), \quad (\text{A-1})$$

where $\beta = 4\kappa t$, in which κ is the thermal diffusivity, and R is the distance from the source to an arbitrary point in the body, $R^2 = x^2 + y^2 + z^2 = r^2 + z^2$. This temperature field represents a change, which, of course, must be added to the initial value T_o to find the total temperature. The displacements and stresses (positive for compression) due to the point source are found from the thermoelastic potential (Nowacki, 1962)

$$\Phi(R, t) = \frac{mQ}{4\pi R} \operatorname{erf}\left(\frac{R}{\sqrt{\beta}}\right), \quad (\text{A-2})$$

where $\operatorname{erf}(z) = \frac{2}{\sqrt{\pi}} \int_0^z e^{-\eta^2} d\eta$ is the error function and $m = \alpha(1 + \nu)/(1 - \nu)$, in which α is the coefficient of thermal expansion of the body. The displacements and stresses in the body are given by the formulas (Nowacki, 1962)

$$u_i = \Phi_{,i} \quad (\text{A-3})$$

$$\sigma_{ij} = 2G [\Phi_{,ij} - \delta_{ij} \Phi_{,kk}]$$

¹ Appendix A is taken nearly verbatim from Crouch and McClain, 1978, Section 2.4, beginning on page 26. Printing errors found in some of the equations have been corrected.

where, in the usual notation, for $i = x, y, \text{ or } z$ a comma indicates differentiation with respect to the index or indices following it, repeated indices imply summation, and δ_{ij} is the Kronecker delta symbol ($\delta_{ij} = 1$ for $i = j$; $\delta_{ij} = 0$ for $i \neq j$). It can easily be verified that $\Phi(R, t)$ satisfies the Poisson equation

$$\nabla^2 \Phi = \Phi_{,kk} = -mT, \quad (\text{A-4})$$

where $T = T(R, t)$ is the temperature field given by Equation A-1.

For numerical simulation of the waste disposal problem, it is necessary to obtain the solution or a time-varying heat source in the semi-infinite body $z \geq 0$. The following two sections are concerned with developing these results. The half-space solution or an instantaneous heat source is obtained in the next section, after which the results are generalized to include sources with both constant and exponentially decaying heat generation rates. The half-space solution is found by the method of images while the effects of time-dependent heat sources $Q(\tau)$ are computed effectively by replacing Equations A-1 and A-2 with:

$$T(R, t) = \frac{1}{(4\pi\kappa)^{3/2}} \int_0^t Q(\tau) (t - \tau)^{-3/2} \exp\left[\frac{R^2}{4\kappa(t - \tau)}\right] d\tau, \quad (\text{A-5})$$

$$\Phi(R, t) = \frac{m}{4\pi R} \int_0^t Q(\tau) \operatorname{erf}\left[\frac{R}{\sqrt{4\kappa(t - \tau)}}\right] d\tau.$$

A.1.3 Instantaneous Heat Source in a Semi-Infinite Body

The solution to the problem of an instantaneous heat source at the point (ϵ, η, H) in the semi-infinite region $z \geq 0$ is given by Nowacki (1962). The boundary conditions for the problem are:

$$\sigma_{zz} = 0, \sigma_{rz} = 0, T = 0 \quad \text{on } z = 0. \quad (\text{A-6})$$

The first and last of these conditions are satisfied by placing a positive instantaneous heat source at the point (ϵ, η, H) in the infinite mass and a negative source of the same type at $(\epsilon, \eta, -H)$. The temperature field and the thermoelastic potential for this system of sources, then, are given by (cf. Equations A-1 and A-2):

$$T(r, z, t) = \frac{Q}{(\pi\beta)^{3/2}} \left[\exp\left(\frac{\bar{R}^2}{\beta}\right) - \exp\left(\frac{\bar{\bar{R}}^2}{\beta}\right) \right], \quad (\text{A-7})$$

$$\Phi(r, z, t) = \frac{Qm}{4\pi} \left[\frac{1}{\bar{R}} \operatorname{erf}\left(\frac{\bar{R}}{\sqrt{\beta}}\right) - \frac{1}{\bar{\bar{R}}} \operatorname{erf}\left(\frac{\bar{\bar{R}}}{\sqrt{\beta}}\right) \right], \quad (\text{A-8})$$

where $\bar{R} = [(x - \epsilon)^2 + (y - \eta)^2 + (z - H)^2]^{1/2} = [r^2 + (z - H)^2]^{1/2}$ and $\bar{\bar{R}} = [r^2 + (z + H)^2]^{1/2}$. The displacements and stresses in $z \geq 0$ are computed directly from Equations A-3 and A-7. The traction components on planes $z = \text{constant}$ are of particular interest for present purposes. Using a notation similar to that introduction in Section 2.2.2 (of Crouch & McClain, 1978), these are (Nowacki, 1962):

$$\begin{aligned}
\bar{\sigma}_{zz} + \bar{\sigma}_{zz} = & \frac{QmG}{2\pi\bar{R}^3} \left[\left(2 - \frac{3r^2}{\bar{R}^2} \right) \operatorname{erf} \left(\frac{\bar{R}}{\sqrt{\beta}} \right) \right. \\
& \left. - \frac{2\bar{R}}{\sqrt{\pi\beta}} \exp \left(\frac{-\bar{R}^2}{\beta} \right) \left\{ 2 - \frac{3r^2}{\bar{R}^2} \left(1 + \frac{2\bar{R}^2}{3\beta} \right) \right\} \right] \\
& - \frac{Qmg}{2\pi\bar{R}^3} \left[\left(2 - \frac{3r^2}{\bar{R}^2} \right) \operatorname{erf} \left(\frac{\bar{R}}{\sqrt{\beta}} \right) \right. \\
& \left. - \frac{2\bar{R}}{\sqrt{\pi\beta}} \exp \left(\frac{-\bar{R}^2}{\beta} \right) \left\{ 2 - \frac{3r^2}{\bar{R}^2} \left(1 + \frac{2\bar{R}^2}{3\beta} \right) \right\} \right],
\end{aligned} \tag{A-9}$$

$$\begin{aligned}
\bar{\sigma}_{rz} + \bar{\sigma}_{rz} = & \frac{3QmGr(z-H)}{2\pi\bar{R}^5} \left[\operatorname{erf} \left(\frac{\bar{R}}{\sqrt{\beta}} \right) \right. \\
& \left. - \frac{2\bar{R}}{\sqrt{\pi\beta}} \left(1 + \frac{2\bar{R}^2}{3\beta} \right) \exp \left(\frac{-\bar{R}^2}{\beta} \right) \right] \\
& - \frac{3QmGr(z+H)}{2\pi\bar{R}^5} \left[\operatorname{erf} \left(\frac{\bar{R}}{\sqrt{\beta}} \right) \right. \\
& \left. - \frac{2\bar{R}}{\sqrt{\pi\beta}} \left(1 + \frac{2\bar{R}^2}{3\beta} \right) \exp \left(\frac{-\bar{R}^2}{\beta} \right) \right].
\end{aligned} \tag{A-10}$$

Shearing stress components in Cartesian coordinates are computed from Equation A-10 by the relations

$$\begin{aligned}
\bar{\sigma}_{xz} + \bar{\sigma}_{xz} &= \frac{(x-\xi)}{r} (\bar{\sigma}_{rz} + \bar{\sigma}_{rz}) \\
&= \cos \theta (\bar{\sigma}_{rz} + \bar{\sigma}_{rz}) \\
\bar{\sigma}_{yz} + \bar{\sigma}_{yz} &= \frac{(y-\eta)}{r} (\bar{\sigma}_{rz} + \bar{\sigma}_{rz}) \\
&= \sin \theta (\bar{\sigma}_{rz} + \bar{\sigma}_{rz}).
\end{aligned} \tag{A-11}$$

It may be seen from Equation A-9 that $\bar{\sigma}_{zz} + \bar{\sigma}_{zz} \equiv 0$ on $z = 0$, as asserted earlier. The shear stresses, on the other hand, do not vanish on the surface of the half-space and, similar to Section 2.2.2 (of Crouch & McClain, 1978), must be removed by superimposing the solution to the following boundary value problem for the half-space $z \geq 0$:

$$\sigma_{rz}^* = -(\bar{\sigma}_{rz} + \bar{\sigma}_{rz}), \quad \sigma_{zz}^* = 0 \quad \text{on } z = 0. \tag{A-12}$$

In STRESSD the surface components of shearing stress is removed by applying, in pointwise fashion, Cerruti's solution for concentrated shear forces on the surface of a half-space or alternatively the equivalent solution, called CERUT1, for uniformly distributed shear tractions over a square element. The magnitudes and directions of the forces or surface tractions are chosen to negate, at each point of the surface and at each time of the analysis, the values of $\bar{\sigma}_{xz} + \bar{\sigma}_{zx}$ and $\bar{\sigma}_{yz} + \bar{\sigma}_{zy}$. The stress σ_{zz}^* at $z = H$ is of particular interest here; it is given by

$$\sigma_{zz}^* = \frac{3H^2}{2\pi[(x - \xi)^2 + (y - \eta)^2 + H^2]^{5/2}} [(x - \xi)T_x + (y - \eta)T_y]. \quad (A-13)$$

A.1.4 Evaluation of Integrals for Constant and Exponentially Decaying Heat Sources

The expressions in the previous section from Appendix B (of Crouch & McClain, 1978) can be extended, by integration of the form noted in Equation A-5, to the case of continuous heat sources. It may be seen that all of the results are expressible in terms of the following three integrals:

$$I_1(R, t) = \int_0^t Q(\tau) \operatorname{erf}\left(\frac{R}{\sqrt{\beta}}\right) d\tau \quad (A-14)$$

$$I_2(R, t) = \int_0^t Q(\tau) \beta^{-1/2} \exp\left(\frac{-R^2}{\beta}\right) d\tau \quad (A-15)$$

$$I_3(R, t) = \int_0^t Q(\tau) \beta^{-3/2} \exp\left(\frac{-R^2}{\beta}\right) d\tau, \quad (A-16)$$

where $\beta = 4\kappa(t - \tau)$ and R is $\bar{R}$ or $\bar{\bar{R}}$, defined as for Equations A-7 and A-8. For example, the temperature field for a continuously variable heat source in a semi-infinite body is, according to Equation A-7,

$$T(r, z, t) = \pi^{-3/2} [I_3(\bar{R}, t) - I_3(\bar{\bar{R}}, t)], \quad (A-17)$$

while the stress components in Equations A-9 and A-10 become:

$$\begin{aligned} \bar{\sigma}_{zz} + \bar{\bar{\sigma}}_{zz} = & \frac{mG}{2\pi\bar{R}^3} \left[\left(2 - \frac{3r^2}{\bar{R}^2} \right) I_1(\bar{R}, t) \right. \\ & - \frac{2\bar{R}}{\sqrt{\pi}} \left(2 - \frac{3r^2}{\bar{R}^2} \right) I_2(\bar{R}, t) + \frac{4\bar{R}r^2}{\sqrt{\pi}} I_3(\bar{R}, t) \Big] \\ & - \frac{mG}{2\pi\bar{\bar{R}}^3} \left[\left(2 - \frac{3r^2}{\bar{\bar{R}}^2} \right) I_1(\bar{\bar{R}}, t) \right. \\ & - \frac{2\bar{\bar{R}}}{\sqrt{\pi}} \left(2 - \frac{3r^2}{\bar{\bar{R}}^2} \right) I_2(\bar{\bar{R}}, t) + \frac{4\bar{\bar{R}}r^2}{\sqrt{\pi}} I_3(\bar{\bar{R}}, t) \Big], \end{aligned} \quad (A-18)$$

$$\begin{aligned} \bar{\sigma}_{rz} + \bar{\sigma}_{rz} = \frac{3mGr(z-H)}{2\pi\bar{R}^5} & \left[I_1(\bar{R}, t) - \frac{2\bar{R}}{\sqrt{\pi}} I_2(\bar{R}, t) - \frac{4\bar{R}^3}{3\sqrt{\pi}} I_3(\bar{R}, t) \right] \\ & - \frac{3mGr(z+H)}{2\pi\bar{R}^5} \left[I_1(\bar{R}, t) - \frac{2\bar{R}}{\sqrt{\pi}} I_2(\bar{R}, t) - \frac{4\bar{R}^3}{3\sqrt{\pi}} I_3(\bar{R}, t) \right]. \end{aligned} \quad (A-19)$$

The integrals defined in Equations A-14 through A-16 have been evaluated for two cases: a constant heat source, $Q(\tau) = Q_c$, and an exponentially decaying heat source, $Q(\tau) = Q_e \exp(-A\tau)$. The results, which are tabulated below, were obtained by making use of some integrals given by Gautschi (1972).

Constant heat source, $Q(\tau) = Q_c$

$$\begin{aligned} I_1(R, t) = Q_c t \operatorname{erf}\left(\frac{R}{\sqrt{4\kappa t}}\right) - Q_c \frac{R^2}{2\kappa} \operatorname{erfc}\left(\frac{R}{\sqrt{4\kappa t}}\right) \\ + Q_c \sqrt{\frac{t}{\pi\kappa}} R \exp\left(\frac{-R^2}{4\kappa t}\right). \end{aligned} \quad (A-20)$$

$$I_2(R, t) = Q_c \sqrt{\frac{t}{\kappa}} \exp\left(\frac{-R^2}{4\kappa t}\right) - Q_c \frac{\sqrt{\pi}}{2\kappa} R \operatorname{erfc}\left(\frac{R}{\sqrt{4\kappa t}}\right) \quad (A-21)$$

$$I_3(R, t) = \frac{\sqrt{\pi} Q_c}{4\kappa R} \operatorname{erfc}\left(\frac{R}{\sqrt{4\kappa t}}\right). \quad (A-22)$$

In these equations, $\operatorname{erfc}(z) = 1 - \operatorname{erf}(z)$ is the complementary error function.

Exponentially decaying heat source, $Q(\tau) = Q_e \exp(-A\tau)$

$$I_1(R, t) = -\frac{Q_e}{A} \exp(-At) \quad (A-23)$$

$$+ \frac{Q_e}{A} \left[\operatorname{erf}\left(\frac{R}{\sqrt{4\kappa t}}\right) + \exp\left(\frac{-R^2}{4\kappa t}\right) \operatorname{Re} \left\{ w \left(\sqrt{At} + i \frac{R}{\sqrt{4\kappa t}} \right) \right\} \right]$$

$$I_2(R, t) = \frac{Q_e \sqrt{\pi}}{\sqrt{4\kappa A}} \exp\left(\frac{-R^2}{4\kappa t}\right) \operatorname{Im} \left\{ w \left(\sqrt{At} + i \frac{R}{\sqrt{4\kappa t}} \right) \right\} \quad (A-24)$$

$$I_3(R, t) = \frac{Q_e \sqrt{\pi}}{4\kappa R} \exp\left(\frac{-R^2}{4\kappa t}\right) \operatorname{Re} \left\{ w \left(\sqrt{At} + i \frac{R}{\sqrt{4\kappa t}} \right) \right\}. \quad (A-25)$$

In these equations, $w(z)$ is the complex error function defined by

$$w(z) = \frac{2iz}{\pi} \int_0^\infty \frac{e^{-tsuper^2}}{z^2 - t^2} dt, Im\{z\} > 0,$$

and $Re\{z\}$ and $Im\{z\}$ denote the "real part of z " and the "imaginary part of z " respectively.

APPENDIX B

STRES3D Input and Output Files for Example Problem 1 in Section 2.3.1


```

AGAPITO 4.0
EXAMPLE, 10 BY 10 PLATE SOURCE IN AN INFINITE MEDIUM, ORDER=0
289.3 0.0
3.171E8 .22 4.889E-6 0.0 0.0 0.0 0.0 0.0 0.0
0 1 0 1 1 21 0 0 0 0 0 0 0 0 0
1 1.00 1 1 .0
0. 2000. 0.
0
1 0. 5. -5. -500. 90. 10. 10. -500. -500. 1 1
20.
20 -20. -20. -499. 20. -20. -499.
20 -20. -18. -499. 20. -18. -499.
20 -20. -16. -499. 20. -16. -499.
20 -20. -14. -499. 20. -14. -499.
20 -20. -12. -499. 20. -12. -499.
20 -20. -10. -499. 20. -10. -499.
20 -20. -8. -499. 20. -8. -499.
20 -20. -6. -499. 20. -6. -499.
20 -20. -4. -499. 20. -4. -499.
20 -20. -2. -499. 20. -2. -499.
20 -20. 0. -499. 20. 0. -499.
20 -20. 2. -499. 20. 2. -499.
20 -20. 4. -499. 20. 4. -499.
20 -20. 6. -499. 20. 6. -499.
20 -20. 8. -499. 20. 8. -499.
20 -20. 10. -499. 20. 10. -499.
20 -20. 12. -499. 20. 12. -499.
20 -20. 14. -499. 20. 14. -499.
20 -20. 16. -499. 20. 16. -499.
20 -20. 18. -499. 20. 18. -499.
20 -20. 20. -499. 20. 20. -499.
STOP

```

```

AGAPITO 4.0
EXAMPLE, 10 BY 10 PLATE SOURCE IN AN INFINITE MEDIUM, ORDER=1
289.3 0.0
3.171E8 .22 4.889E-6 0.0 0.0 0.0 0.0 0.0 0.0
0 1 0 1 1 21 0 0 0 0 0 0 0 0 0
1 1.00 1 1 .0
0. 2000. 0.
1
1 0. 5. -5. -500. 90. 10. 10. -500. -500. 1 1
20.
20 -20. -20. -499. 20. -20. -499.
20 -20. -18. -499. 20. -18. -499.
20 -20. -16. -499. 20. -16. -499.
20 -20. -14. -499. 20. -14. -499.
20 -20. -12. -499. 20. -12. -499.
20 -20. -10. -499. 20. -10. -499.
20 -20. -8. -499. 20. -8. -499.
20 -20. -6. -499. 20. -6. -499.
20 -20. -4. -499. 20. -4. -499.
20 -20. -2. -499. 20. -2. -499.
20 -20. 0. -499. 20. 0. -499.
20 -20. 2. -499. 20. 2. -499.
20 -20. 4. -499. 20. 4. -499.
20 -20. 6. -499. 20. 6. -499.
20 -20. 8. -499. 20. 8. -499.
20 -20. 10. -499. 20. 10. -499.
20 -20. 12. -499. 20. 12. -499.
20 -20. 14. -499. 20. 14. -499.
20 -20. 16. -499. 20. 16. -499.
20 -20. 18. -499. 20. 18. -499.
20 -20. 20. -499. 20. 20. -499.
STOP

```

```

AGAPITO 4.0
EXAMPLE, 10 BY 10 PLATE SOURCE IN AN INFINITE MEDIUM, ORDER=3
289 3 0. 0. 4.889E-6 0. 0. 0. 0. 0. 0. 0.
3.171E8 .22 0 1 1 21 0 0 0 0. 0. 0. 0.
0 1 0 1 1 21 0 0 0 0. 0. 0. 0.
1 1.00 1 1 .0
0. 2000. 0.
3
1 0. 5. -5. -500. 90. 10. 10. -500. -500. 1 1
20.
20. -20. -20. -499. 20. -20. -499.
20. -20. -18. -499. 20. -18. -499.
20. -20. -16. -499. 20. -16. -499.
20. -20. -14. -499. 20. -14. -499.
20. -20. -12. -499. 20. -12. -499.
20. -20. -10. -499. 20. -10. -499.
20. -20. -8. -499. 20. -8. -499.
20. -20. -6. -499. 20. -6. -499.
20. -20. -4. -499. 20. -4. -499.
20. -20. -2. -499. 20. -2. -499.
20. -20. 0. -499. 20. 0. -499.
20. -20. 2. -499. 20. 2. -499.
20. -20. 4. -499. 20. 4. -499.
20. -20. 6. -499. 20. 6. -499.
20. -20. 8. -499. 20. 8. -499.
20. -20. 10. -499. 20. 10. -499.
20. -20. 12. -499. 20. 12. -499.
20. -20. 14. -499. 20. 14. -499.
20. -20. 16. -499. 20. 16. -499.
20. -20. 18. -499. 20. 18. -499.
20. -20. 20. -499. 20. 20. -499.
STOP

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STRESS3D VERSION 4.0 (MAY 1989)
J. F. T. AGAPITO AND ASSOCS. (303)242 4220

EXAMPLE. 10 BY 10 PLATE SOURCE IN AN INFINITE MEDIUM, ORDER=0

QA NUMBER: AGAPITO 4 0
INPUT FILE: EXAMPL-0.IN
DATE: 05/24/89

THERMO-ELASTIC ANALYSIS OF RADIO-ACTIVE WASTE REPOSITORY

DIFFUSIVITY: 2893E+03
SURFACE TEMP: .0000E+00
UNIFORM INITIAL TEMPERATURE
ELASTIC MOD: .3171E+09
POISSON RATIO: 2200E+00
COEFF OF EXPAN: 4889E-05
ROCK SF. WT.: .0000E+00
INITIAL MAX. HORZ. STRESS: .0000E+00
INITIAL MIN. HORZ. STRESS: .0000E+00
MAX. HORZ. STRESS GRAD./VERT. STRESS GRAD.: .000
MIN. HORZ. STRESS GRAD./VERT. STRESS GRAD.: .000
BEARING (DEG.) OF MAX. HORZ. STRESS W.R.T. X-AXIS: .00

NUMBER OF CANISTERS: 0
NUMBER OF AREAL SOURCES: 1
NUMBER OF LINE SOURCES: 0
NUMBER OF CANISTER TYPES: 1
NUMBER OF TIMES FOR OUTPUT: 1
NUMBER OF LINES FOR OUTPUT: 21
NUMBER OF SURFACE SHEAR ROWS: 0
NUMBER OF SURFACE SHEAR COLUMNS: 0
HALF WIDTH OF SURFACE ELEMENTS: .00
CENTER OF SURFACE GRID (XCOORD): .00
CENTER OF SURFACE GRID (YCOORD): .00

NO FREE SURFACE

CANISTER TYPE: 1
CANISTER LENGTH: 1.00
NUMBER OF POINT SOURCES: 1
NUMBER OF COMPONENTS: 1
DEPTH BELOW SURFACE: .00
CANISTER COMPONENTS: .00
SOURCE DATA - TIME ON: .00 STRENGTH 2.000E+04 EXP(-.0000E+00)

AREAL SOURCE NO. 1 SOURCE TYPE = 1 TIME ON = .00000E+00
SUB-AREAL SOURCE NO. 1
GAUSS PT. XCOORD YCOORD ZCOORD
1 .00 .00 500.00

TIMING FOR OUTPUT (YRS)

TEMPERATURES DISPLACEMENTS AND STRESSES AT TIME 20.000E+02

FT	XCOORD	YCOORD	ZCOORD	TEMP	U	V	W	SIGXX	SIGYY	SIGZZ	SIGXY	SIGYZ	SIGXZ
1	-20.0	-20.0	499.0	1540E+01	1280E-03	1280E-03	6399E-05	2361E+04	2361E+04	1401E+04	9627E+03	4814E+02	4814E+02
2	-17.9	-20.0	499.0	1645E+01	1217E-03	1360E-03	6798E-05	2404E+04	2629E+04	1505E+04	1008E+04	5636E+02	5042E+02
3	-15.8	-20.0	499.0	1753E+01	1139E-03	1443E-03	7214E-05	2430E+04	2926E+04	1613E+04	1040E+04	6584E+02	5198E+02
4	-13.7	-20.0	499.0	1864E+01	1045E-03	1527E-03	7637E-05	2436E+04	3250E+04	1723E+04	1047E+04	7654E+02	5237E+02
5	-11.6	-20.0	499.0	1973E+01	9330E-04	1612E-03	8058E-05	2419E+04	3593E+04	1832E+04	1047E+04	8824E+02	5109E+02
6	-9.5	-20.0	499.0	2078E+01	8014E-04	1692E-03	8459E-05	2383E+04	3941E+04	1937E+04	9519E+03	1005E+03	4759E+02
7	-7.4	-20.0	499.0	2173E+01	6500E-04	1764E-03	8821E-05	2331E+04	4275E+04	2031E+04	8286E+03	1124E+03	4143E+02
8	-5.3	-20.0	499.0	2251E+01	4801E-04	1824E-03	9122E-05	2274E+04	4566E+04	2110E+04	6478E+03	1231E+03	3239E+02
9	-3.2	-20.0	499.0	2308E+01	2949E-04	1868E-03	9339E-05	2225E+04	4783E+04	2167E+04	4141E+03	1311E+03	2071E+02
10	-1.1	-20.0	499.0	2338E+01	9950E-05	1891E-03	9453E-05	2197E+04	4900E+04	2196E+04	1426E+03	1355E+03	7132E+01
11	1.0	-20.0	499.0	2338E+01	9950E-05	1891E-03	9453E-05	2197E+04	4900E+04	2196E+04	1426E+03	1355E+03	7132E+01
12	3.2	-20.0	499.0	2308E+01	2949E-04	1868E-03	9339E-05	2225E+04	4783E+04	2167E+04	4141E+03	1311E+03	2071E+02
13	5.3	-20.0	499.0	2251E+01	4801E-04	1824E-03	9122E-05	2274E+04	4566E+04	2110E+04	6478E+03	1231E+03	3239E+02
14	7.4	-20.0	499.0	2173E+01	6500E-04	1764E-03	8821E-05	2331E+04	4275E+04	2031E+04	8286E+03	1124E+03	4143E+02
15	9.5	-20.0	499.0	2078E+01	8014E-04	1692E-03	8459E-05	2383E+04	3941E+04	1937E+04	9519E+03	1005E+03	4759E+02
16	11.6	-20.0	499.0	1973E+01	9330E-04	1612E-03	8058E-05	2419E+04	3593E+04	1832E+04	1047E+04	7654E+02	5237E+02
17	13.7	-20.0	499.0	1864E+01	1045E-03	1527E-03	7637E-05	2436E+04	3250E+04	1723E+04	1047E+04	8824E+02	5109E+02
18	15.8	-20.0	499.0	1753E+01	1139E-03	1443E-03	7214E-05	2430E+04	2926E+04	1613E+04	1040E+04	6584E+02	5198E+02
19	17.9	-20.0	499.0	1645E+01	1217E-03	1360E-03	6798E-05	2404E+04	2629E+04	1505E+04	1008E+04	5636E+02	5042E+02
20	20.0	-20.0	499.0	1540E+01	1280E-03	1280E-03	6399E-05	2361E+04	2361E+04	1401E+04	9627E+03	4814E+02	4814E+02
21	-20.0	-18.0	499.0	1639E+01	1356E-03	1220E-03	6778E-05	2615E+04	2402E+04	1499E+04	1006E+04	5032E+02	5592E+02
22	-17.9	-18.0	499.0	1762E+01	1297E-03	1304E-03	7246E-05	2684E+04	2697E+04	1621E+04	1073E+04	5996E+02	5961E+02
23	-15.8	-18.0	499.0	1891E+01	1222E-03	1394E-03	7742E-05	2735E+04	3031E+04	1750E+04	1128E+04	7141E+02	6264E+02
24	-13.7	-18.0	499.0	2026E+01	1130E-03	1486E-03	8258E-05	2762E+04	3406E+04	1884E+04	1160E+04	8479E+02	6446E+02
25	-11.6	-18.0	499.0	2162E+01	1017E-03	1581E-03	8781E-05	2730E+04	3815E+04	2021E+04	1157E+04	9996E+02	6430E+02
26	-9.5	-18.0	499.0	2296E+01	8803E-04	1672E-03	9292E-05	2738E+04	4243E+04	2154E+04	1103E+04	1164E+03	6127E+02
27	-7.4	-18.0	499.0	2419E+01	7194E-04	1757E-03	9763E-05	2722E+04	4666E+04	2278E+04	9809E+03	1331E+03	5449E+02
28	-5.3	-18.0	499.0	2523E+01	5349E-04	1829E-03	1016E-04	2602E+04	5046E+04	2382E+04	7814E+03	1485E+03	4341E+02
29	-3.2	-18.0	499.0	2600E+01	3302E-04	1882E-03	1046E-04	2539E+04	5377E+04	2459E+04	5066E+03	1604E+03	2814E+02
30	-1.1	-18.0	499.0	2640E+01	1117E-04	1910E-03	1061E-04	2500E+04	5496E+04	2499E+04	1758E+03	1670E+03	9766E+01
31	1.0	-18.0	499.0	2640E+01	1117E-04	1910E-03	1061E-04	2500E+04	5496E+04	2499E+04	1758E+03	1670E+03	9766E+01
32	3.2	-18.0	499.0	2600E+01	3302E-04	1882E-03	1046E-04	2539E+04	5377E+04	2459E+04	5066E+03	1604E+03	2814E+02
33	5.3	-18.0	499.0	2523E+01	5349E-04	1829E-03	1016E-04	2602E+04	5046E+04	2382E+04	7814E+03	1485E+03	4341E+02
34	7.4	-18.0	499.0	2419E+01	7194E-04	1757E-03	9763E-05	2722E+04	4666E+04	2278E+04	9809E+03	1331E+03	5449E+02
35	9.5	-18.0	499.0	2296E+01	8803E-04	1672E-03	9292E-05	2738E+04	4243E+04	2154E+04	1103E+04	1164E+03	6127E+02
36	11.6	-18.0	499.0	2162E+01	1017E-03	1581E-03	8781E-05	2730E+04	3815E+04	2021E+04	1157E+04	9996E+02	6430E+02
37	13.7	-18.0	499.0	2026E+01	1130E-03	1486E-03	8258E-05	2762E+04	3406E+04	1884E+04	1160E+04	8479E+02	6446E+02
38	15.8	-18.0	499.0	1891E+01	1222E-03	1394E-03	7742E-05	2735E+04	3031E+04	1750E+04	1128E+04	7141E+02	6264E+02
39	17.9	-18.0	499.0	1762E+01	1297E-03	1304E-03	7246E-05	2684E+04	2697E+04	1621E+04	1073E+04	5996E+02	5961E+02
40	20.0	-18.0	499.0	1639E+01	1356E-03	1220E-03	6778E-05	2615E+04	2402E+04	1499E+04	1006E+04	5032E+02	5592E+02
41	-20.0	-16.0	499.0	1742E+01	1434E-03	1147E-03	7172E-05	2895E+04	2428E+04	1602E+04	1037E+04	5187E+02	6483E+02
42	-17.9	-16.0	499.0	1885E+01	1312E-03	1235E-03	7720E-05	3001E+04	2748E+04	1744E+04	1127E+04	6300E+02	7046E+02
43	-15.8	-16.0	499.0	2040E+01	1131E-03	1330E-03	8312E-05	3089E+04	3121E+04	1899E+04	1277E+04	7670E+02	7569E+02
44	-13.7	-16.0	499.0	2205E+01	1224E-03	1431E-03	8943E-05	3150E+04	3551E+04	2063E+04	1277E+04	9333E+02	7983E+02
45	-11.6	-16.0	499.0	2376E+01	1112E-03	1536E-03	9600E-05	3175E+04	4036E+04	2235E+04	1309E+04	1130E+03	8179E+02
46	-9.5	-16.0	499.0	2548E+01	9718E-04	1641E-03	1026E-04	3158E+04	4565E+04	2511E+04	1373E+04	1354E+03	9016E+02
47	-7.4	-16.0	499.0	2712E+01	8020E-04	1741E-03	1088E-04	3101E+04	5108E+04	2571E+04	1173E+04	1592E+03	9887E+02
48	-5.3	-16.0	499.0	2854E+01	6015E-04	1828E-03	1143E-04	3017E+04	5614E+04	2714E+04	9579E+03	1820E+03	5987E+02
49	-3.2	-16.0	499.0	2960E+01	3737E-04	1894E-03	1184E-04	2933E+04	6015E+04	2821E+04	6329E+03	2004E+03	3956E+02
50	-1.1	-16.0	499.0	3018E+01	1269E-04	1929E-03	1205E-04	2879E+04	6238E+04	2878E+04	2219E+03	2108E+03	1387E+02
51	1.0	-16.0	499.0	3018E+01	1269E-04	1929E-03	1205E-04	2879E+04	6238E+04	2878E+04	2219E+03	2108E+03	1387E+02
52	3.2	-16.0	499.0	2960E+01	3737E-04	1894E-03	1184E-04	2933E+04	6015E+04	2821E+04	6329E+03	2004E+03	3956E+02
53	5.3	-16.0	499.0	2854E+01	6015E-04	1828E-03	1143E-04	3017E+04	5614E+04	2714E+04	9579E+03	1820E+03	5987E+02

54	7.4	-16.0	499.0	2712E+01	0020E+04	1741E+03	1088E+04	3101E+04	5108E+04	2521E+04	1173E+04	1592E+03	1100E+03
55	9.5	-16.0	499.0	2548E+01	4718E+04	1641E+03	1026E+04	3158E+04	4565E+04	2407E+04	1283E+04	1354E+03	8016E+02
56	11.6	-16.0	499.0	2376E+01	1112E+03	1538E+03	9600E+05	3175E+04	4036E+04	2235E+04	1309E+04	1130E+03	8179E+02
57	13.7	-16.0	499.0	2205E+01	1224E+03	1431E+03	8943E+05	3150E+04	3551E+04	2063E+04	1277E+04	9333E+02	7983E+02
58	15.8	-16.0	499.0	2040E+01	1312E+03	1300E+03	8312E+05	3089E+04	3121E+04	1899E+04	1211E+04	7670E+02	7569E+02
59	17.9	-16.0	499.0	1885E+01	1381E+03	1235E+03	7720E+05	3001E+04	2748E+04	1744E+04	1127E+04	6300E+02	7046E+02
60	20.0	-16.0	499.0	1742E+01	1444E+03	1147E+03	7172E+05	2995E+04	2428E+04	1602E+04	1017E+04	5187E+02	6483E+02
61	20.0	-16.0	499.0	1647E+01	1515E+03	1060E+03	6574E+05	3200E+04	2436E+04	1706E+04	1048E+04	5240E+02	7486E+02
62	17.9	-14.0	499.0	2014E+01	1470E+03	1150E+03	8213E+05	3355E+04	2778E+04	1873E+04	1163E+04	6500E+02	8308E+02
63	15.8	-14.0	499.0	2199E+01	1408E+03	1249E+03	8920E+05	3496E+04	3187E+04	2057E+04	1281E+04	8111E+02	9147E+02
64	13.7	-14.0	499.0	2401E+01	1326E+03	1357E+03	9693E+05	3610E+04	3674E+04	2259E+04	1389E+04	1015E+03	9925E+02
65	11.6	-14.0	499.0	2617E+01	1218E+03	1473E+03	1052E+05	3693E+04	4245E+04	2476E+04	1470E+04	1270E+03	1070E+03
66	9.5	-14.0	499.0	2842E+01	1078E+03	1506E+03	1138E+04	3701E+04	4490E+04	2702E+04	1493E+04	1573E+03	1076E+03
67	7.4	-14.0	499.0	3064E+01	9012E+04	1619E+03	1229E+04	3558E+04	4628E+04	2924E+04	1415E+04	1921E+03	1011E+03
68	5.3	-14.0	499.0	3263E+01	6839E+04	1819E+03	1299E+04	3588E+04	4839E+04	3125E+04	1195E+04	2271E+03	1039E+02
69	3.2	-14.0	499.0	3417E+01	4289E+04	1901E+03	1358E+04	3645E+04	4859E+04	3280E+04	8114E+03	2570E+03	5796E+02
70	1.1	-14.0	499.0	3502E+01	1464E+04	1947E+03	1391E+04	3367E+04	4718E+04	3365E+04	2888E+03	2744E+03	2063E+02
71	1.1	-14.0	499.0	3502E+01	1464E+04	1947E+03	1391E+04	3367E+04	4718E+04	3365E+04	2888E+03	2744E+03	2063E+02
72	3.2	-14.0	499.0	3417E+01	4289E+04	1901E+03	1358E+04	3645E+04	4859E+04	3280E+04	8114E+03	2570E+03	5796E+02
73	5.3	-14.0	499.0	3263E+01	6839E+04	1819E+03	1299E+04	3588E+04	4839E+04	3125E+04	1195E+04	2271E+03	1039E+02
74	7.4	-14.0	499.0	3064E+01	9012E+04	1619E+03	1229E+04	3558E+04	4628E+04	2924E+04	1415E+04	1920E+03	1011E+03
75	9.5	-14.0	499.0	2842E+01	1078E+03	1506E+03	1138E+04	3701E+04	4490E+04	2702E+04	1493E+04	1573E+03	1076E+03
76	11.6	-14.0	499.0	2617E+01	1218E+03	1473E+03	1052E+05	3683E+04	4245E+04	2476E+04	1470E+04	1270E+03	1070E+03
77	13.7	-14.0	499.0	2401E+01	1326E+03	1357E+03	9693E+05	3610E+04	3674E+04	2259E+04	1389E+04	1015E+03	9925E+02
78	15.8	-14.0	499.0	2199E+01	1408E+03	1249E+03	8920E+05	3496E+04	3187E+04	2057E+04	1281E+04	8111E+02	9147E+02
79	17.9	-14.0	499.0	2014E+01	1470E+03	1150E+03	8213E+05	3355E+04	2778E+04	1873E+04	1163E+04	6500E+02	8308E+02
80	20.0	-12.0	499.0	1885E+01	1381E+03	1235E+03	7720E+05	3001E+04	2748E+04	1744E+04	1127E+04	6300E+02	7983E+02
81	20.0	-12.0	499.0	1742E+01	1444E+03	1147E+03	7172E+05	2995E+04	2428E+04	1602E+04	1017E+04	5187E+02	6483E+02
82	17.9	-12.0	499.0	1647E+01	1515E+03	1060E+03	6574E+05	3200E+04	2436E+04	1706E+04	1048E+04	5240E+02	7486E+02
83	15.8	-12.0	499.0	2014E+01	1470E+03	1150E+03	8213E+05	3355E+04	2778E+04	1873E+04	1163E+04	6500E+02	8308E+02
84	13.7	-12.0	499.0	2199E+01	1408E+03	1249E+03	8920E+05	3496E+04	3187E+04	2057E+04	1281E+04	8111E+02	9147E+02
85	11.6	-12.0	499.0	2401E+01	1326E+03	1357E+03	9693E+05	3610E+04	3674E+04	2259E+04	1389E+04	1015E+03	9925E+02
86	9.5	-12.0	499.0	2617E+01	1218E+03	1473E+03	1052E+05	3693E+04	4245E+04	2476E+04	1470E+04	1270E+03	1070E+03
87	7.4	-12.0	499.0	2842E+01	1078E+03	1506E+03	1138E+04	3701E+04	4490E+04	2702E+04	1493E+04	1573E+03	1076E+03
88	5.3	-12.0	499.0	3064E+01	9012E+04	1619E+03	1229E+04	3558E+04	4628E+04	2924E+04	1415E+04	1921E+03	1011E+03
89	3.2	-12.0	499.0	3263E+01	6839E+04	1819E+03	1299E+04	3588E+04	4839E+04	3125E+04	1195E+04	2271E+03	1039E+02
90	1.1	-12.0	499.0	3417E+01	4289E+04	1901E+03	1358E+04	3645E+04	4859E+04	3280E+04	8114E+03	2570E+03	5796E+02
91	1.1	-12.0	499.0	3502E+01	1464E+04	1947E+03	1391E+04	3367E+04	4718E+04	3365E+04	2888E+03	2744E+03	2063E+02
92	3.2	-12.0	499.0	3417E+01	4289E+04	1901E+03	1358E+04	3645E+04	4859E+04	3280E+04	8114E+03	2570E+03	5796E+02
93	5.3	-12.0	499.0	3263E+01	6839E+04	1819E+03	1299E+04	3588E+04	4839E+04	3125E+04	1195E+04	2271E+03	1039E+02
94	7.4	-12.0	499.0	3064E+01	9012E+04	1619E+03	1229E+04	3558E+04	4628E+04	2924E+04	1415E+04	1920E+03	1011E+03
95	9.5	-12.0	499.0	2842E+01	1078E+03	1506E+03	1138E+04	3701E+04	4490E+04	2702E+04	1493E+04	1573E+03	1076E+03
96	11.6	-12.0	499.0	2617E+01	1218E+03	1473E+03	1052E+05	3683E+04	4245E+04	2476E+04	1470E+04	1270E+03	1070E+03
97	13.7	-12.0	499.0	2401E+01	1326E+03	1357E+03	9693E+05	3610E+04	3674E+04	2259E+04	1389E+04	1015E+03	9925E+02
98	15.8	-12.0	499.0	2199E+01	1408E+03	1249E+03	8920E+05	3496E+04	3187E+04	2057E+04	1281E+04	8111E+02	9147E+02
99	17.9	-12.0	499.0	2014E+01	1470E+03	1150E+03	8213E+05	3355E+04	2778E+04	1873E+04	1163E+04	6500E+02	8308E+02
100	20.0	-10.0	499.0	1885E+01	1381E+03	1235E+03	7720E+05	3001E+04	2748E+04	1744E+04	1127E+04	6300E+02	7983E+02
101	20.0	-10.0	499.0	1742E+01	1444E+03	1147E+03	7172E+05	2995E+04	2428E+04	1602E+04	1017E+04	5187E+02	6483E+02
102	17.9	-10.0	499.0	1647E+01	1515E+03	1060E+03	6574E+05	3200E+04	2436E+04	1706E+04	1048E+04	5240E+02	7486E+02
103	15.8	-10.0	499.0	2014E+01	1470E+03	1150E+03	8213E+05	3355E+04	2778E+04	1873E+04	1163E+04	6500E+02	8308E+02
104	13.7	-10.0	499.0	2199E+01	1408E+03	1249E+03	8920E+05	3496E+04	3187E+04	2057E+04	1281E+04	8111E+02	9147E+02
105	11.6	-10.0	499.0	2401E+01	1326E+03	1357E+03	9693E+05	3610E+04	3674E+04	2259E+04	1389E+04	1015E+03	9925E+02
106	9.5	-10.0	499.0	2617E+01	1218E+03	1473E+03	1052E+05	3693E+04	4245E+04	2476E+04	1470E+04	1270E+03	1070E+03
107	7.4	-10.0	499.0	2842E+01	1078E+03	1506E+03	1138E+04	3701E+04	4490E+04	2702E+04	1493E+04	1573E+03	1076E+03
108	5.3	-10.0	499.0	3064E+01	9012E+04	1619E+03	1229E+04	3558E+04	4628E+04	2924E+04	1415E+04	1921E+03	1011E+03
109	3.2	-10.0	499.0	3263E+01	6839E+04	1819E+03	1299E+04	3588E+04	4839E+04	3125E+04	1195E+04	2271E+03	1039E+02
110	1.1	-10.0	499.0	3417E+01	4289E+04	1901E+03	1358E+04	3645E+04	4859E+04	3280E+04	8114E+03	2570E+03	5796E+02
111	1.1	-10.0	499.0	3502E+01	1464E+04	1947E+03	1391E+04	3367E+04	4718E+04	3365E+04	2888E+03	2744E+03	2063E+02
112	3.2	-10.0	499.0	3417E+01	4289E+04	1901E+03	1358E+04	3645E+04	4859E+04	3280E+04	8114E+03	2570E+03	5796E+02
113	5.3	-10.0	499.0	3263E+01	6839E+04	1819E+03	1299E+04	3588E+04	4839E+04	3125E+04	1195E+04	2271E+03	1039E+02
114	7.4	-10.0	499.0	3064E+01	9012E+04	1619E+03	1229E+04	3558E+04	4628E+04	2924E+04	1415E+04	1920E+03	1011E+03
115	9.5	-10.0	499.0	2842E+01	1078E+03	1506E+03	1138E+04	3701E+04	4490E+04	2702E+04	1493E+04	1573E+03	1076E+03
116	11.6	-10.0	499.0	2617E+01	1218E+03	1473E+03	1052E+05	3683E+04	4245E+04	2476E+04	1470E+04	1270E+03	1070E+03
117	13.7	-10.0	499.0	2401E+01	1326E+03	1357E+03	9693E+05	3610E+04	3674E+04	2259E+04	1389E+04	1015E+03	9925E+02
118	15.8	-10.0	499.0	2199E+01	1408E+03	1249E+03	8920E+05	3496E+04	3187E+04	2057E+04	1281E+04	8111E+02	9147E+02
119	17.9	-10.0	499.0	2014E+01	1470E+03	1150E+03	8213E+05	3355E+04	2778E+04	1873E+04	1163E+04	6500E+02	8308E+02
120	20.0	-10.0	499.0	1885E+01	1381E+03	1235E+03	7720E+05	3001E+04	2748E+04	1744E+04	1127E+04	6300E+02	7983E+02
121	20.0	-8.0	499.0	1742E+01	1444E+03	1147E+03	7172E+05	2995E+04	2428E+04	1602E+04	1017E+04	5187E+02	6483E+02
122	17.9	-8.0	499.0	1647E+01	1515E+03	1060E+03	6574E+05	3200E+04	2436E+04	1706E+04	1048E+04	5240E+02	7486E+02
123	15.8	-8.0	499.0	2014E+01	1470E+03	1150E+03	8213E+05	3355E+04	2778E+04	1873E+04	1163E+04	6500E+02	8308E+02
124	13.7	-8.0	499.0	2199E+01	1408E+03	1249E+03	8920E+05	3496E+04	3187E+04	2057E+04	1281E+04	8111E+02	9147E+02
125	11.6	-8.0	499.0	2401E+01	1326E+03	1357E+03	9693E+05	3610E+04	3674E+04	2259E+04	1389E+04	1015E+03	9925E+02
126	9.5	-8.0	499.0	2617E+01	1218E+03	1473E+03	1052E+05	3693E+04	4245E+04	2476E			

170	-1.1	-4.0	499.0	-1252E+02	5093E-04	1935E-03	4838E-04	1310E+05	2366E+05	1302E+05	2986E+04	2837E+04	7465E+03
171	1.1	-4.0	499.0	-1252E+02	5093E-04	1935E-03	4838E-04	1310E+05	2366E+05	1302E+05	2986E+04	2837E+04	7465E+03
172	3.2	-4.0	499.0	-1018E+02	1246E-03	1578E-03	3946E-04	1388E+05	1623E+05	1038E+05	4928E+04	1561E+04	1232E+04
173	5.3	-4.0	499.0	-7821E+01	1601E-03	1217E-03	3042E-04	1270E+05	1056E+05	7821E+04	3850E+04	7315E+03	9625E+03
174	7.4	-4.0	499.0	-6108E+01	1759E-03	9548E-04	2387E-04	1087E+05	7388E+04	6026E+04	2676E+04	3630E+03	6690E+03
175	9.5	-4.0	499.0	-4817E+01	1830E-03	7727E-04	1932E-04	9200E+04	5545E+04	4802E+04	1878E+04	1982E+03	4695E+03
176	11.6	-4.0	499.0	-4069E+01	1861E-03	6429E-04	7855E-04	4380E+04	3938E+04	3183E+04	1363E+04	1171E+03	3408E+03
177	13.7	-4.0	499.0	-3442E+01	1872E-03	5471E-04	1368E-04	6792E+04	3586E+04	3306E+04	1025E+04	7488E+03	2562E+03
178	15.8	-4.0	499.0	-2965E+01	1871E-03	4740E-04	1185E-04	5947E+04	3013E+04	2825E+04	7941E+03	5030E+02	1985E+03
179	17.9	-4.0	499.0	-2590E+01	1864E-03	4167E-04	1042E-04	5265E+04	2581E+04	2449E+04	6315E+03	3529E+02	1579E+03
180	20.0	-4.0	499.0	-2288E+01	1853E-03	3706E-04	9264E-05	4707E+04	2243E+04	2147E+04	5132E+03	2566E+02	1283E+03
181	20.0	-2.0	499.0	-2328E+01	1883E-03	1883E-04	9415E-05	4861E+04	2207E+04	2187E+04	2681E+03	1340E+02	1340E+03
182	17.9	-2.0	499.0	-2644E+01	1902E-03	2125E-04	1063E-04	5477E+04	2531E+04	2503E+04	3334E+03	1863E+02	1667E+03
183	15.8	-2.0	499.0	-3043E+01	1919E-03	2430E-04	1215E-04	6250E+04	2944E+04	2904E+04	4255E+03	2695E+02	2128E+03
184	13.7	-2.0	499.0	-3561E+01	1934E-03	2826E-04	1413E-04	7243E+04	3486E+04	3425E+04	5611E+03	4100E+02	2805E+03
185	11.6	-2.0	499.0	-4258E+01	1945E-03	3359E-04	1680E-04	8565E+04	4230E+04	4130E+04	7717E+03	6665E+02	3859E+03
186	9.5	-2.0	499.0	-5244E+01	1949E-03	4114E-04	2057E-04	1040E+05	5314E+04	5136E+04	1123E+04	1185E+03	5614E+03
187	7.4	-2.0	499.0	-6737E+01	1936E-03	5255E-04	2627E-04	1306E+05	7039E+04	6680E+04	1764E+04	2394E+03	8821E+03
188	5.3	-2.0	499.0	-9213E+01	1881E-03	7148E-04	3574E-04	1019E+05	1019E+05	9314E+04	3076E+04	5845E+03	1538E+04
189	3.2	-2.0	499.0	-1381E+02	1684E-03	1066E-03	5331E-04	2300E+05	1736E+05	1453E+05	5957E+04	1886E+04	2979E+04
190	1.1	-2.0	499.0	-2185E+02	8847E-04	1681E-03	8405E-04	2560E+05	3606E+05	2521E+05	7618E+04	7237E+04	3809E+04
191	1.1	-2.0	499.0	-2185E+02	8847E-04	1681E-03	8405E-04	2560E+05	3606E+05	2521E+05	7618E+04	7237E+04	3809E+04
192	3.2	-2.0	499.0	-1381E+02	1684E-03	1066E-03	5331E-04	2300E+05	1736E+05	1453E+05	5957E+04	1886E+04	2979E+04
193	5.3	-2.0	499.0	-9213E+01	1881E-03	7148E-04	3574E-04	1019E+05	1019E+05	9314E+04	3076E+04	5845E+03	1538E+04
194	7.4	-2.0	499.0	-6737E+01	1936E-03	5255E-04	2627E-04	1306E+05	7039E+04	6680E+04	1764E+04	2394E+03	8821E+03
195	9.5	-2.0	499.0	-5244E+01	1949E-03	4114E-04	2057E-04	1040E+05	5314E+04	5136E+04	1123E+04	1185E+03	5614E+03
196	11.6	-2.0	499.0	-4258E+01	1945E-03	3359E-04	1680E-04	8565E+04	4230E+04	4130E+04	7717E+03	6665E+02	3859E+03
197	13.7	-2.0	499.0	-3561E+01	1934E-03	2826E-04	1413E-04	7243E+04	3486E+04	3425E+04	5611E+03	4100E+02	2805E+03
198	15.8	-2.0	499.0	-3043E+01	1919E-03	2430E-04	1215E-04	6250E+04	2944E+04	2904E+04	4255E+03	2695E+02	2128E+03
199	17.9	-2.0	499.0	-2644E+01	1902E-03	2125E-04	1063E-04	5477E+04	2531E+04	2503E+04	3334E+03	1863E+02	1667E+03
200	20.0	-2.0	499.0	-2328E+01	1883E-03	1883E-04	9415E-05	4861E+04	2207E+04	2187E+04	2681E+03	1340E+02	1340E+03
201	20.0	0.0	499.0	-2644E+01	1902E-03	2125E-04	1063E-04	5477E+04	2531E+04	2503E+04	3334E+03	1863E+02	1667E+03
202	17.9	0.0	499.0	-3043E+01	1919E-03	2430E-04	1215E-04	6250E+04	2944E+04	2904E+04	4255E+03	2695E+02	2128E+03
203	15.8	0.0	499.0	-3561E+01	1934E-03	2826E-04	1413E-04	7243E+04	3486E+04	3425E+04	5611E+03	4100E+02	2805E+03
204	13.7	0.0	499.0	-4258E+01	1945E-03	3359E-04	1680E-04	8565E+04	4230E+04	4130E+04	7717E+03	6665E+02	3859E+03
205	11.6	0.0	499.0	-5244E+01	1949E-03	4114E-04	2057E-04	1040E+05	5314E+04	5136E+04	1123E+04	1185E+03	5614E+03
206	9.5	0.0	499.0	-6737E+01	1936E-03	5255E-04	2627E-04	1306E+05	7039E+04	6680E+04	1764E+04	2394E+03	8821E+03
207	7.4	0.0	499.0	-9213E+01	1881E-03	7148E-04	3574E-04	1019E+05	1019E+05	9314E+04	3076E+04	5845E+03	1538E+04
208	5.3	0.0	499.0	-1381E+02	1684E-03	1066E-03	5331E-04	2300E+05	1736E+05	1453E+05	5957E+04	1886E+04	2979E+04
209	3.2	0.0	499.0	-2185E+02	8847E-04	1681E-03	8405E-04	2560E+05	3606E+05	2521E+05	7618E+04	7237E+04	3809E+04
210	1.1	0.0	499.0	-2185E+02	8847E-04	1681E-03	8405E-04	2560E+05	3606E+05	2521E+05	7618E+04	7237E+04	3809E+04
211	1.1	0.0	499.0	-1381E+02	1684E-03	1066E-03	5331E-04	2300E+05	1736E+05	1453E+05	5957E+04	1886E+04	2979E+04
212	3.2	0.0	499.0	-9213E+01	1881E-03	7148E-04	3574E-04	1019E+05	1019E+05	9314E+04	3076E+04	5845E+03	1538E+04
213	5.3	0.0	499.0	-6737E+01	1936E-03	5255E-04	2627E-04	1306E+05	7039E+04	6680E+04	1764E+04	2394E+03	8821E+03
214	7.4	0.0	499.0	-5244E+01	1949E-03	4114E-04	2057E-04	1040E+05	5314E+04	5136E+04	1123E+04	1185E+03	5614E+03
215	9.5	0.0	499.0	-4258E+01	1945E-03	3359E-04	1680E-04	8565E+04	4230E+04	4130E+04	7717E+03	6665E+02	3859E+03
216	11.6	0.0	499.0	-3561E+01	1934E-03	2826E-04	1413E-04	7243E+04	3486E+04	3425E+04	5611E+03	4100E+02	2805E+03
217	13.7	0.0	499.0	-3043E+01	1919E-03	2430E-04	1215E-04	6250E+04	2944E+04	2904E+04	4255E+03	2695E+02	2128E+03
218	15.8	0.0	499.0	-2644E+01	1902E-03	2125E-04	1063E-04	5477E+04	2531E+04	2503E+04	3334E+03	1863E+02	1667E+03
219	17.9	0.0	499.0	-2328E+01	1883E-03	1883E-04	9415E-05	4861E+04	2207E+04	2187E+04	2681E+03	1340E+02	1340E+03
220	20.0	0.0	499.0	-2644E+01	1902E-03	2125E-04	1063E-04	5477E+04	2531E+04	2503E+04	3334E+03	1863E+02	1667E+03
221	20.0	0.0	499.0	-3043E+01	1919E-03	2430E-04	1215E-04	6250E+04	2944E+04	2904E+04	4255E+03	2695E+02	2128E+03
222	17.9	0.0	499.0	-3561E+01	1934E-03	2826E-04	1413E-04	7243E+04	3486E+04	3425E+04	5611E+03	4100E+02	2805E+03
223	15.8	0.0	499.0	-4258E+01	1945E-03	3359E-04	1680E-04	8565E+04	4230E+04	4130E+04	7717E+03	6665E+02	3859E+03
224	13.7	0.0	499.0	-5244E+01	1949E-03	4114E-04	2057E-04	1040E+05	5314E+04	5136E+04	1123E+04	1185E+03	5614E+03
225	11.6	0.0	499.0	-6737E+01	1936E-03	5255E-04	2627E-04	1306E+05	7039E+04	6680E+04	1764E+04	2394E+03	8821E+03
226	9.5	0.0	499.0	-9213E+01	1881E-03	7148E-04	3574E-04	1019E+05	1019E+05	9314E+04	3076E+04	5845E+03	1538E+04
227	7.4	0.0	499.0	-1381E+02	1684E-03	1066E-03	5331E-04	2300E+05	1736E+05	1453E+05	5957E+04	1886E+04	2979E+04
228	5.3	0.0	499.0	-2185E+02	8847E-04	1681E-03	8405E-04	2560E+05	3606E+05	2521E+05	7618E+04	7237E+04	3809E+04
229	3.2	0.0	499.0	-2185E+02	8847E-04	1681E-03	8405E-04	2560E+05	3606E+05	2521E+05	7618E+04	7237E+04	3809E+04
230	1.1	0.0	499.0	-1381E+02	1684E-03	1066E-03	5331E-04	2300E+05	1736E+05	1453E+05	5957E+04	1886E+04	2979E+04
231	1.1	0.0	499.0	-9213E+01	1881E-03	7148E-04	3574E-04	1019E+05	1019E+05	9314E+04	3076E+04	5845E+03	1538E+04
232	3.2	0.0	499.0	-6737E+01	1936E-03	5255E-04	2627E-04	1306E+05	7039E+04	6680E+04	1764E+04	2394E+03	8821E+03
233	5.3	0.0	499.0	-5244E+01	1949E-03	4114E-04	2057E-04	1040E+05	5314E+04	5136E+04	1123E+04	1185E+03	5614E+03
234	7.4	0.0	499.0	-4258E+01	1945E-03	3359E-04	1680E-04	8565E+04	4230E+04	4130E+04	7717E+03	6665E+02	3859E+03
235	9.5	0.0	499.0	-3561E+01	1934E-03	2826E-04	1413E-04	7243E+04	3486E+04	3425E+04	5611E+03	4100E+02	2805E+03
236	11.6	0.0	499.0	-3043E+01	1919E-03	2430E-04	1215E-04	6250E+04	2944E+04	2904E+04	4255E+03	2695E+02	2128E+03
237	13.7	0.0	499.0	-2644E+01	1902E-03	2125E-04	1063E-04	5477E+04	2531E+04	2503E+04	3334E+03	1863E+02	1667E+03
238	15.8	0.0	499.0	-2328E+01	1883E-03	1883E-04	9415E-05	4861E+04	2207E+04	2187E+04	2681E+03	1340E+02	1340E+03
239	17.9	0.0	499.0	-2644E+01	1902E-03	2125E-04	1063E-04	5477E+04	2531E+04	2503E+04	3334E+03	1863E+02	1667E+03
240	20.0	0.0	499.0	-3043E+01	1919E-03	2430E-04	1215E-04	6250E+04	2944E+04	2904E+04	4255E+03	2695E+02	2128E+03
241	20.0	0.0	499.0	-3561E+01	1934E-03	2826E-04	1413E-04	7243E+04	3486E+04	3425E+04	5611E+03	4100E+02	2805E+03
242	17.9	0.0	499.0	-4258E+01	1945E-03	3359E-04	1680E-04	8565E+04	4230E+04	4130E+04	7717E+03	6665E+02	3859E+03
243	15.8	0.0	499.0	-5244E+01	1949								

286	-9.5	8.0	499.0	.4015E+01	.1503E-03	.1270E-03	.1587E-04	.6404E+04	.5673E+04	.3884E+04	.2152E+04	.2271E+03	2690E+03
287	-7.4	8.0	499.0	.4630E+01	.1342E-03	.1457E-03	.1822E-04	.6744E+04	.7151E+04	.4508E+04	.2473E+04	.3356E+03	3091E+03
288	-5.3	8.0	499.0	.5306E+01	.1095E-03	.1664E-03	.2081E-04	.6835E+04	.9058E+04	.5200E+04	.2578E+04	.4899E+03	3223E+03
289	-3.2	8.0	499.0	.5946E+01	.7343E-04	.1860E-03	.2325E-04	.6614E+04	.1116E+05	.5859E+04	.2127E+04	.6736E+03	2659E+03
290	-1.1	8.0	499.0	.6359E+01	.2614E-04	.1986E-03	.2483E-04	.6297E+04	.1269E+05	.6286E+04	.8563E+03	.8135E+03	1070E+03
291	1.1	8.0	499.0	.6359E+01	.2614E-04	.1986E-03	.2483E-04	.6297E+04	.1269E+05	.6286E+04	.8563E+03	.8135E+03	1070E+03
292	3.2	8.0	499.0	.5946E+01	.7343E-04	.1860E-03	.2325E-04	.6614E+04	.1116E+05	.5859E+04	.2127E+04	.6736E+03	2659E+03
293	5.3	8.0	499.0	.5306E+01	.1095E-03	.1664E-03	.2081E-04	.6835E+04	.9058E+04	.5200E+04	.2578E+04	.4899E+03	3223E+03
294	7.4	8.0	499.0	.4630E+01	.1342E-03	.1457E-03	.1822E-04	.6744E+04	.7151E+04	.4508E+04	.2473E+04	.3356E+03	3091E+03
295	9.5	8.0	499.0	.4015E+01	.1503E-03	.1270E-03	.1587E-04	.6404E+04	.5673E+04	.3884E+04	.2152E+04	.2271E+03	2690E+03
296	11.6	8.0	499.0	.3492E+01	.1606E-03	.1110E-03	.1387E-04	.5945E+04	.4582E+04	.3356E+04	.1802E+04	.1557E+03	2253E+03
297	13.7	8.0	499.0	.3057E+01	.1670E-03	.9764E-04	.1221E-04	.5458E+04	.3777E+04	.2388E+04	.1493E+04	.1091E+03	1866E+03
298	15.8	8.0	499.0	.2697E+01	.1709E-03	.8661E-04	.1083E-04	.4991E+04	.3174E+04	.2356E+04	.1528E+04	.1116E+03	1528E+03
299	17.9	8.0	499.0	.2397E+01	.1732E-03	.7744E-04	.9680E-05	.4562E+04	.2711E+04	.2256E+04	.1034E+04	.5780E+02	1293E+03
300	20.0	8.0	499.0	.2146E+01	.1744E-03	.6975E-04	.8718E-05	.4178E+04	.2348E+04	.2005E+04	.8716E+03	.4358E+02	1089E+03
301	20.0	10.0	499.0	.2053E+01	.1672E-03	.8362E-04	.8362E-05	.3855E+04	.2394E+04	.1911E+04	.9741E+03	.4870E+02	9741E+02
302	17.9	10.0	499.0	.2275E+01	.1648E-03	.9217E-04	.9212E-05	.4151E+04	.2759E+04	.2133E+04	.1131E+04	.6319E+02	1131E+03
303	15.8	10.0	499.0	.2053E+01	.1672E-03	.8362E-04	.8362E-05	.3855E+04	.2394E+04	.1911E+04	.9741E+03	.4870E+02	9741E+02
304	13.7	10.0	499.0	.2834E+01	.1533E-03	.1135E-03	.1135E-04	.4773E+04	.3799E+04	.2693E+04	.1528E+04	.1116E+03	1528E+03
305	11.6	10.0	499.0	.3181E+01	.1468E-03	.1268E-03	.1268E-04	.5060E+04	.4544E+04	.3043E+04	.1756E+04	.1516E+03	1756E+03
306	9.5	10.0	499.0	.3576E+01	.1344E-03	.1419E-03	.1419E-04	.5282E+04	.5494E+04	.3441E+04	.1965E+04	.2074E+03	1965E+03
307	7.4	10.0	499.0	.4007E+01	.1167E-03	.1584E-03	.1584E-04	.5382E+04	.6672E+04	.3876E+04	.2081E+04	.2824E+03	2081E+03
308	5.3	10.0	499.0	.4442E+01	.9211E-04	.1750E-03	.1750E-04	.5317E+04	.8023E+04	.4317E+04	.1970E+04	.3743E+03	1970E+03
309	3.2	10.0	499.0	.4815E+01	.5977E-04	.1893E-03	.1893E-04	.5117E+04	.9326E+04	.4697E+04	.1476E+04	.4675E+03	1476E+03
310	1.1	10.0	499.0	.5037E+01	.2082E-04	.1978E-03	.1978E-04	.4930E+04	.1017E+05	.4924E+04	.5576E+03	.5297E+03	5576E+03
311	1.1	10.0	499.0	.5037E+01	.2082E-04	.1978E-03	.1978E-04	.4930E+04	.1017E+05	.4924E+04	.5576E+03	.5297E+03	5576E+03
312	3.2	10.0	499.0	.4815E+01	.5977E-04	.1893E-03	.1893E-04	.5117E+04	.9326E+04	.4697E+04	.1476E+04	.4675E+03	1476E+03
313	5.3	10.0	499.0	.4442E+01	.9211E-04	.1750E-03	.1750E-04	.5317E+04	.8023E+04	.4317E+04	.1970E+04	.3743E+03	1970E+03
314	7.4	10.0	499.0	.4007E+01	.1167E-03	.1584E-03	.1584E-04	.5382E+04	.6672E+04	.3876E+04	.2081E+04	.2824E+03	2081E+03
315	9.5	10.0	499.0	.3576E+01	.1344E-03	.1419E-03	.1419E-04	.5282E+04	.5494E+04	.3441E+04	.1965E+04	.2074E+03	1965E+03
316	11.6	10.0	499.0	.3181E+01	.1468E-03	.1268E-03	.1268E-04	.5060E+04	.4544E+04	.3043E+04	.1756E+04	.1516E+03	1756E+03
317	13.7	10.0	499.0	.2834E+01	.1533E-03	.1135E-03	.1135E-04	.4773E+04	.3799E+04	.2693E+04	.1528E+04	.1116E+03	1528E+03
318	15.8	10.0	499.0	.2533E+01	.1611E-03	.1020E-03	.1020E-04	.4461E+04	.3217E+04	.2392E+04	.1316E+04	.8333E+02	1316E+03
319	17.9	10.0	499.0	.2275E+01	.1648E-03	.9212E-04	.9212E-05	.4151E+04	.2759E+04	.2133E+04	.1131E+04	.6319E+02	1131E+03
320	20.0	10.0	499.0	.2053E+01	.1672E-03	.8362E-04	.8362E-05	.3855E+04	.2394E+04	.1911E+04	.9741E+03	.4870E+02	9741E+02
321	20.0	10.0	499.0	.2053E+01	.1672E-03	.8362E-04	.8362E-05	.3855E+04	.2394E+04	.1911E+04	.9741E+03	.4870E+02	9741E+02
322	17.9	12.0	499.0	.2146E+01	.1744E-03	.6975E-04	.8718E-05	.4178E+04	.2348E+04	.2005E+04	.8716E+03	.4358E+02	1089E+03
323	15.8	12.0	499.0	.2053E+01	.1672E-03	.8362E-04	.8362E-05	.3855E+04	.2394E+04	.1911E+04	.9741E+03	.4870E+02	9741E+02
324	13.7	12.0	499.0	.2834E+01	.1533E-03	.1135E-03	.1135E-04	.4773E+04	.3799E+04	.2693E+04	.1528E+04	.1116E+03	1528E+03
325	11.6	12.0	499.0	.3181E+01	.1468E-03	.1268E-03	.1268E-04	.5060E+04	.4544E+04	.3043E+04	.1756E+04	.1516E+03	1756E+03
326	9.5	12.0	499.0	.3576E+01	.1344E-03	.1419E-03	.1419E-04	.5282E+04	.5494E+04	.3441E+04	.1965E+04	.2074E+03	1965E+03
327	7.4	12.0	499.0	.4007E+01	.1167E-03	.1584E-03	.1584E-04	.5382E+04	.6672E+04	.3876E+04	.2081E+04	.2824E+03	2081E+03
328	5.3	12.0	499.0	.4442E+01	.9211E-04	.1750E-03	.1750E-04	.5317E+04	.8023E+04	.4317E+04	.1970E+04	.3743E+03	1970E+03
329	3.2	12.0	499.0	.4815E+01	.5977E-04	.1893E-03	.1893E-04	.5117E+04	.9326E+04	.4697E+04	.1476E+04	.4675E+03	1476E+03
330	1.1	12.0	499.0	.5037E+01	.2082E-04	.1978E-03	.1978E-04	.4930E+04	.1017E+05	.4924E+04	.5576E+03	.5297E+03	5576E+03
331	1.1	12.0	499.0	.5037E+01	.2082E-04	.1978E-03	.1978E-04	.4930E+04	.1017E+05	.4924E+04	.5576E+03	.5297E+03	5576E+03
332	3.2	12.0	499.0	.4815E+01	.5977E-04	.1893E-03	.1893E-04	.5117E+04	.9326E+04	.4697E+04	.1476E+04	.4675E+03	1476E+03
333	5.3	12.0	499.0	.4442E+01	.9211E-04	.1750E-03	.1750E-04	.5317E+04	.8023E+04	.4317E+04	.1970E+04	.3743E+03	1970E+03
334	7.4	12.0	499.0	.4007E+01	.1167E-03	.1584E-03	.1584E-04	.5382E+04	.6672E+04	.3876E+04	.2081E+04	.2824E+03	2081E+03
335	9.5	12.0	499.0	.3576E+01	.1344E-03	.1419E-03	.1419E-04	.5282E+04	.5494E+04	.3441E+04	.1965E+04	.2074E+03	1965E+03
336	11.6	12.0	499.0	.3181E+01	.1468E-03	.1268E-03	.1268E-04	.5060E+04	.4544E+04	.3043E+04	.1756E+04	.1516E+03	1756E+03
337	13.7	12.0	499.0	.2834E+01	.1533E-03	.1135E-03	.1135E-04	.4773E+04	.3799E+04	.2693E+04	.1528E+04	.1116E+03	1528E+03
338	15.8	12.0	499.0	.2533E+01	.1611E-03	.1020E-03	.1020E-04	.4461E+04	.3217E+04	.2392E+04	.1316E+04	.8333E+02	1316E+03
339	17.9	12.0	499.0	.2275E+01	.1648E-03	.9212E-04	.9212E-05	.4151E+04	.2759E+04	.2133E+04	.1131E+04	.6319E+02	1131E+03
340	20.0	12.0	499.0	.2053E+01	.1672E-03	.8362E-04	.8362E-05	.3855E+04	.2394E+04	.1911E+04	.9741E+03	.4870E+02	9741E+02
341	20.0	14.0	499.0	.2014E+01	.1470E-03	.1150E-03	.8213E-05	.3355E+04	.2778E+04	.1873E+04	.1048E+04	.5240E+02	7486E+02
342	17.9	14.0	499.0	.2199E+01	.1408E-03	.1249E-03	.8920E-05	.3496E+04	.3187E+04	.2057E+04	.1281E+04	.8111E+02	9147E+02
343	15.8	14.0	499.0	.2401E+01	.1326E-03	.1357E-03	.9693E-05	.3610E+04	.3674E+04	.2259E+04	.1389E+04	.1015E+03	9925E+02
344	13.7	14.0	499.0	.2615E+01	.1218E-03	.1473E-03	.1391E-04	.3667E+04	.4276E+04	.2476E+04	.1493E+04	.1270E+03	1050E+03
345	11.6	14.0	499.0	.2842E+01	.1078E-03	.1594E-03	.1138E-04	.3701E+04	.4696E+04	.2707E+04	.1493E+04	.1270E+03	1050E+03
346	9.5	14.0	499.0	.3064E+01	.9012E-04	.1712E-03	.1223E-04	.3655E+04	.5599E+04	.2924E+04	.1415E+04	.1921E+03	1011E+03
347	7.4	14.0	499.0	.3263E+01	.6839E-04	.1819E-03	.1299E-04	.3558E+04	.6289E+04	.3125E+04	.1195E+04	.2271E+03	8539E+02
348	5.3	14.0	499.0	.3417E+01	.4289E-04	.1901E-03	.1358E-04	.3445E+04	.6859E+04	.3280E+04	.8114E+03	.2570E+03	5796E+02
349	3.2	14.0	499.0	.3502E+01	.1464E-04	.1947E-03	.1391E-04	.3367E+04	.7187E+04	.3365E+04	.2888E+03	.2744E+03	2063E+02
350	1.1	14.0	499.0	.3502E+01	.1464E-04	.1947E-03	.1391E-04	.3367E+04	.7187E+04	.3365E+04	.2888E+03	.2744E+03	2063E+02
351	1.1	14.0	499.0	.3417E+01	.4289E-04	.1901E-03	.1358E-04	.3445E+04	.6859E+04	.3280E+04	.8114E+03	.2570E+03	5796E+02
352	3.2	14.0	499.0	.3263E+01	.6839E-04	.1819E-03	.1299E-04	.3558E+04	.6289E+04	.3125E+04	.1195E+04	.2271E+03	8539E+02
353	5.3	14.0	499.0	.3064E+01	.9012E-04	.1712E-03	.1223E-04	.3655E+04	.5599E+04	.2924E+04	.1415E+04	.1920E+03	1011E+03
354	7.4	14.0	499.0	.2842E+01	.1078E-03	.1594E-03	.1138E-04	.3701E+04	.4696E+04	.2702E+04	.1493E+04	.1270E+03	1050E+03
355	9.5	14.0	499.0	.2615E+01	.1218E-03	.1473E-03	.1391E-04	.3667E+04	.4276E+04	.2476E+04	.1493E+04	.1270E+03	1050E+03
356	11.6	14.0	499.0	.2401E+01	.1326E-03	.1357E-03	.9693E-05	.3610E+04	.3674E+04	.2259E+04	.1389E+04	.1015E+03	9925E+02
357	13.7	14.0	499.0	.2199E+01	.1408E-03	.1249E-03	.8920E-05	.3496E+04	.3187E+04	.2057E+04	.1281E+04	.8111E+02	9147E+02
358	15.8	14.0	499.0	.2014E+01	.1470E-03	.1150E-03	.8213E-05	.3355E+04	.2778E+04	.1873E+04	.1048E+04	.5240E+02	7486E+02

402	-17.9	20.0	499.0	.1645E+01	.1217E-03	.1360E-03	.6798E-05	.2404E+04	.2629E+04	.1505E+04	.1008E+04	.5636E+02	.5042E+02
403	-15.8	20.0	499.0	.1753E+01	.1139E-03	.1443E-03	.7214E-05	.2430E+04	.2926E+04	.1613E+04	.1040E+04	.6584E+02	.5198E+02
404	-13.7	20.0	499.0	.1864E+01	.1045E-03	.1527E-03	.7637E-05	.2436E+04	.3250E+04	.1723E+04	.1047E+04	.7654E+02	.5237E+02
405	-11.6	20.0	499.0	.1973E+01	.9330E-04	.1612E-03	.8058E-05	.2419E+04	.3593E+04	.1832E+04	.1072E+04	.8824E+02	.5109E+02
406	-9.5	20.0	499.0	.2078E+01	.8014E-04	.1692E-03	.8459E-05	.2383E+04	.3941E+04	.1937E+04	.9519E+03	.1005E+03	.4758E+02
407	-7.4	20.0	499.0	.2173E+01	.6500E-04	.1764E-03	.8821E-05	.2331E+04	.4275E+04	.2031E+04	.8286E+03	.1124E+03	.4143E+02
408	-5.3	20.0	499.0	.2251E+01	.4801E-04	.1824E-03	.9122E-05	.2274E+04	.4566E+04	.2110E+04	.6478E+03	.1231E+03	.3239E+02
409	-3.2	20.0	499.0	.2308E+01	.2949E-04	.1868E-03	.9339E-05	.2225E+04	.4783E+04	.2167E+04	.4141E+03	.1311E+03	.2071E+02
410	-1.1	20.0	499.0	.2338E+01	.9950E-05	.1891E-03	.9453E-05	.2197E+04	.4900E+04	.2196E+04	.1426E+03	.1355E+03	.7132E+01
411	1.1	20.0	499.0	.2338E+01	.9950E-05	.1891E-03	.9453E-05	.2197E+04	.4900E+04	.2196E+04	.1426E+03	.1355E+03	.7132E+01
412	3.2	20.0	499.0	.2308E+01	.2949E-04	.1868E-03	.9339E-05	.2225E+04	.4783E+04	.2167E+04	.4141E+03	.1311E+03	.2071E+02
413	5.3	20.0	499.0	.2251E+01	.4801E-04	.1824E-03	.9122E-05	.2274E+04	.4566E+04	.2110E+04	.6478E+03	.1231E+03	.3239E+02
414	7.4	20.0	499.0	.2173E+01	.6500E-04	.1764E-03	.8821E-05	.2331E+04	.4275E+04	.2031E+04	.8286E+03	.1124E+03	.4143E+02
415	9.5	20.0	499.0	.2078E+01	.8014E-04	.1692E-03	.8459E-05	.2383E+04	.3941E+04	.1937E+04	.9519E+03	.1005E+03	.4758E+02
416	11.6	20.0	499.0	.1973E+01	.9330E-04	.1612E-03	.8058E-05	.2419E+04	.3593E+04	.1832E+04	.1072E+04	.8824E+02	.5109E+02
417	13.7	20.0	499.0	.1864E+01	.1045E-03	.1527E-03	.7637E-05	.2436E+04	.3250E+04	.1723E+04	.1047E+04	.7654E+02	.5237E+02
418	15.8	20.0	499.0	.1753E+01	.1139E-03	.1443E-03	.7214E-05	.2430E+04	.2926E+04	.1613E+04	.1040E+04	.6584E+02	.5198E+02
419	17.9	20.0	499.0	.1645E+01	.1217E-03	.1360E-03	.6798E-05	.2404E+04	.2629E+04	.1505E+04	.1008E+04	.5636E+02	.5042E+02
420	20.0	20.0	499.0	.1540E+01	.1280E-03	.1280E-03	.6399E-05	.2361E+04	.2361E+04	.1401E+04	.9627E+03	.4814E+02	.4814E+02

TOTAL RUN TIME = 22.00000 SECONDS.

STRESS3D VERSION 4.0 (MAY 1989)
J.F.T. AGAPITO AND ASSOCS. (303)242 4220

EXAMPLE, 10 BY 10 PLATE SOURCE IN AN INFINITE MEDIUM, ORDER=1

QA NUMBER: AGAPITO 4.0
INPUT FILE: EXAMP1-1.IN
DATE: 05/24/89

THERMO-ELASTIC ANALYSIS OF RADIO-ACTIVE WASTE REPOSITORY

DIFFUSIVITY .2893E+03
SURFACE TEMP .0000E+00
UNIFORM INITIAL TEMPERATURE
ELASTIC MOD. .3171E+09
POISSON RATIO .2200E+00
COEFF OF EXPAN .4889E-05
ROCK SF. WT. .0000E+00
INITIAL MAX. HORZ. STRESS .0000E+00
INITIAL MIN. HORZ. STRESS .0000E+00
MAX. HORZ. STRESS GRAD./VERT. STRESS GRAD. .000
MIN. HORZ. STRESS GRAD./VERT. STRESS GRAD. .000
BEARING (DEG.) OF MAX. HORZ. STRESS W.R.T. X-AXIS .00

NUMBER OF CANISTERS 0
NUMBER OF AREAL SOURCES 1
NUMBER OF LINE SOURCES 0
NUMBER OF CANISTER TYPES 1
NUMBER OF TIMES FOR OUTPUT 1
NUMBER OF LINES FOR OUTPUT 21
NUMBER OF SURFACE SHEAR ROWS 0
NUMBER OF SURFACE SHEAR COLUMNS 0
HALF WIDTH OF SURFACE ELEMENTS .00
CENTER OF SURFACE GRID (XCOORD) .00
CENTER OF SURFACE GRID (YCOORD) .00

NO FREE SURFACE

CANISTER TYPE 1
CANISTER LENGTH 1.00
NUMBER OF POINT SOURCES 1
NUMBER OF COMPONENTS 1
DEPTH BELOW SURFACE .00
CANISTER COMPONENTS
SOURCE DATA - TIME ON .00 STRENGTH .2000E+04 EXP(-.0000E+00)

AREAL SOURCE NO.	SUB-AREAL SOURCE NO.	GAUSS FT.	XCOORD	YCOORD	ZCOORD
1	2	89	-2.89	500.00	
2	2	89	-2.89	500.00	
3	2	89	-2.89	500.00	
4	2	89	-2.89	500.00	

TIMING FOR OUTPUT (YRS)

20.00
TEMPERATURES DISPLACEMENTS AND STRESSES AT TIME .20000E+02

PT	XCOORD	YCOORD	ZCOORD	TEMP	U	V	W	SIGXX	SIGYY	SIGZZ	SIGXY	SIGYZ	SIGZX
1	-20.0	-20.0	499.0	.1551E+01	.1272E-03	.1272E-03	.6440E-05	.2377E+04	.2377E+04	.1412E+04	.9485E+03	.4896E+02	.4896E+02
2	-17.9	-20.0	499.0	.1657E+01	.1209E-03	.1351E-03	.6847E-05	.2424E+04	.2646E+04	.1517E+04	.9920E+03	.5744E+02	.5137E+02
3	-15.8	-20.0	499.0	.1768E+01	.1131E-03	.1432E-03	.7270E-05	.2456E+04	.2944E+04	.1628E+04	.1020E+04	.6727E+02	.5303E+02
4	-13.7	-20.0	499.0	.1881E+01	.1037E-03	.1516E-03	.7702E-05	.2468E+04	.3268E+04	.1740E+04	.1026E+04	.7838E+02	.5350E+02
5	-11.6	-20.0	499.0	.1993E+01	.9244E-04	.1598E-03	.8132E-05	.2456E+04	.3610E+04	.1852E+04	.9974E+03	.9056E+02	.5221E+02
6	-9.5	-20.0	499.0	.2100E+01	.7931E-04	.1676E-03	.8542E-05	.2432E+04	.3956E+04	.1959E+04	.9254E+03	.1033E+03	.4861E+02
7	-7.4	-20.0	499.0	.2197E+01	.6425E-04	.1746E-03	.8912E-05	.2391E+04	.4285E+04	.2056E+04	.8017E+03	.1157E+03	.4224E+02
8	-5.3	-20.0	499.0	.2277E+01	.4740E-04	.1804E-03	.9218E-05	.2346E+04	.4568E+04	.2136E+04	.6236E+03	.1266E+03	.3293E+02
9	-3.2	-20.0	499.0	.2334E+01	.2908E-04	.1846E-03	.9438E-05	.2307E+04	.4778E+04	.2193E+04	.3969E+03	.1348E+03	.2100E+02
10	-1.1	-20.0	499.0	.2364E+01	.9807E-05	.1868E-03	.9553E-05	.2284E+04	.4890E+04	.2223E+04	.1363E+03	.1392E+03	.7218E+01
11	1.1	-20.0	499.0	.2364E+01	.9807E-05	.1868E-03	.9553E-05	.2284E+04	.4890E+04	.2223E+04	.1363E+03	.1392E+03	.7218E+01
12	3.2	-20.0	499.0	.2334E+01	.2908E-04	.1846E-03	.9438E-05	.2307E+04	.4778E+04	.2193E+04	.3969E+03	.1348E+03	.2100E+02
13	5.3	-20.0	499.0	.2277E+01	.4740E-04	.1804E-03	.9218E-05	.2346E+04	.4568E+04	.2136E+04	.6236E+03	.1266E+03	.3293E+02
14	7.4	-20.0	499.0	.2197E+01	.6425E-04	.1746E-03	.8912E-05	.2391E+04	.4285E+04	.2056E+04	.8017E+03	.1157E+03	.4224E+02
15	9.5	-20.0	499.0	.2100E+01	.7931E-04	.1676E-03	.8542E-05	.2432E+04	.3956E+04	.1959E+04	.9254E+03	.1033E+03	.4861E+02
16	11.6	-20.0	499.0	.1993E+01	.9244E-04	.1598E-03	.8132E-05	.2456E+04	.3610E+04	.1852E+04	.9974E+03	.9056E+02	.5221E+02
17	13.7	-20.0	499.0	.1881E+01	.1037E-03	.1516E-03	.7702E-05	.2468E+04	.3268E+04	.1740E+04	.1026E+04	.7838E+02	.5350E+02
18	15.8	-20.0	499.0	.1768E+01	.1131E-03	.1432E-03	.7270E-05	.2456E+04	.2944E+04	.1628E+04	.1020E+04	.6727E+02	.5303E+02
19	17.9	-20.0	499.0	.1657E+01	.1209E-03	.1351E-03	.6847E-05	.2424E+04	.2646E+04	.1517E+04	.9920E+03	.5744E+02	.5137E+02
20	20.0	-20.0	499.0	.1551E+01	.1272E-03	.1272E-03	.6440E-05	.2377E+04	.2377E+04	.1412E+04	.9485E+03	.4896E+02	.4896E+02
21	-20.0	-18.0	499.0	.1652E+01	.1347E-03	.1212E-03	.6826E-05	.2632E+04	.2422E+04	.1512E+04	.9901E+03	.5126E+02	.5699E+02
22	-17.9	-18.0	499.0	.1777E+01	.1287E-03	.1295E-03	.7303E-05	.2707E+04	.2719E+04	.1636E+04	.1053E+04	.6125E+02	.6089E+02
23	-15.8	-18.0	499.0	.1909E+01	.1212E-03	.1382E-03	.7810E-05	.2764E+04	.3056E+04	.1768E+04	.1105E+04	.7319E+02	.6414E+02
24	-13.7	-18.0	499.0	.2047E+01	.1120E-03	.1473E-03	.8339E-05	.2799E+04	.3432E+04	.1906E+04	.1133E+04	.8719E+02	.6613E+02
25	-11.6	-18.0	499.0	.2187E+01	.1006E-03	.1565E-03	.8876E-05	.2806E+04	.3841E+04	.2046E+04	.1126E+04	.1031E+03	.6603E+02
26	-9.5	-18.0	499.0	.2324E+01	.8696E-04	.1654E-03	.9400E-05	.2789E+04	.4267E+04	.2183E+04	.1067E+04	.1204E+03	.6287E+02
27	-7.4	-18.0	499.0	.2451E+01	.7094E-04	.1736E-03	.9884E-05	.2748E+04	.4684E+04	.2310E+04	.1067E+04	.1204E+03	.6287E+02
28	-5.3	-18.0	499.0	.2557E+01	.5264E-04	.1805E-03	.1029E-04	.2696E+04	.5053E+04	.2417E+04	.1067E+04	.1204E+03	.6287E+02
29	-3.2	-18.0	499.0	.2635E+01	.3244E-04	.1855E-03	.1059E-04	.2648E+04	.5331E+04	.2494E+04	.1067E+04	.1204E+03	.6287E+02
30	-1.1	-18.0	499.0	.2676E+01	.1096E-04	.1881E-03	.1075E-04	.2621E+04	.5480E+04	.2536E+04	.1067E+04	.1204E+03	.6287E+02
31	1.1	-18.0	499.0	.2676E+01	.1096E-04	.1881E-03	.1075E-04	.2621E+04	.5480E+04	.2536E+04	.1067E+04	.1204E+03	.6287E+02
32	3.2	-18.0	499.0	.2635E+01	.3244E-04	.1855E-03	.1059E-04	.2648E+04	.5331E+04	.2494E+04	.1067E+04	.1204E+03	.6287E+02
33	5.3	-18.0	499.0	.2557E+01	.5264E-04	.1805E-03	.1029E-04	.2696E+04	.5053E+04	.2417E+04	.1067E+04	.1204E+03	.6287E+02
34	7.4	-18.0	499.0	.2451E+01	.7094E-04	.1736E-03	.9884E-05	.2748E+04	.4684E+04	.2310E+04	.1067E+04	.1204E+03	.6287E+02
35	9.5	-18.0	499.0	.2324E+01	.8696E-04	.1654E-03	.9400E-05	.2789E+04	.4267E+04	.2183E+04	.1067E+04	.1204E+03	.6287E+02
36	11.6	-18.0	499.0	.2187E+01	.1006E-03	.1565E-03	.8876E-05	.2806E+04	.3841E+04	.2046E+04	.1126E+04	.1031E+03	.6603E+02
37	13.7	-18.0	499.0	.2047E+01	.1120E-03	.1473E-03	.8339E-05	.2799E+04	.3432E+04	.1906E+04	.1133E+04	.8719E+02	.6613E+02
38	15.8	-18.0	499.0	.1909E+01	.1212E-03	.1382E-03	.7810E-05	.2764E+04	.3056E+04	.1768E+04	.1105E+04	.7319E+02	.6414E+02
39	17.9	-18.0	499.0	.1777E+01	.1287E-03	.1295E-03	.7303E-05	.2707E+04	.2719E+04	.1636E+04	.1053E+04	.6125E+02	.6089E+02
40	20.0	-18.0	499.0	.1652E+01	.1347E-03	.1212E-03	.6826E-05	.2632E+04	.2422E+04	.1512E+04	.9901E+03	.5126E+02	.5699E+02
41	-20.0	-16.0	499.0	.1757E+01	.1424E-03	.1139E-03	.7227E-05	.2913E+04	.2453E+04	.1616E+04	.1019E+04	.5291E+02	.6102E+02
42	-17.9	-16.0	499.0	.1903E+01	.1370E-03	.1225E-03	.7788E-05	.3026E+04	.2777E+04	.1762E+04	.1105E+04	.6450E+02	.7220E+02
43	-15.8	-16.0	499.0	.2062E+01	.1301E-03	.1318E-03	.8396E-05	.3122E+04	.3153E+04	.1921E+04	.1184E+04	.7887E+02	.7782E+02
44	-13.7	-16.0	499.0	.2231E+01	.1211E-03	.1416E-03	.9046E-05	.3193E+04	.3587E+04	.2091E+04	.1244E+04	.9645E+02	.8234E+02
45	-11.6	-16.0	499.0	.2409E+01	.1098E-03	.1519E-03	.9723E-05	.3232E+04	.4075E+04	.2268E+04	.1274E+04	.1074E+03	.8454E+02
46	-9.5	-16.0	499.0	.2587E+01	.9580E-04	.1620E-03	.1040E-04	.3233E+04	.4603E+04	.2446E+04	.1235E+04	.1412E+03	.8283E+02
47	-7.4	-16.0	499.0	.2755E+01	.7884E-04	.1716E-03	.1105E-04	.3193E+04	.5139E+04	.2616E+04	.1274E+04	.1412E+03	.8283E+02
48	-5.3	-16.0	499.0	.2901E+01	.5895E-04	.1799E-03	.1161E-04	.3141E+04	.5629E+04	.2762E+04	.1274E+04	.1412E+03	.8283E+02
49	-3.2	-16.0	499.0	.3009E+01	.3653E-04	.1860E-03	.1202E-04	.3085E+04	.6006E+04	.2871E+04	.1274E+04	.1412E+03	.8283E+02
50	-1.1	-16.0	499.0	.3067E+01	.1238E-04	.1892E-03	.1224E-04	.3051E+04	.6211E+04	.2929E+04	.1274E+04	.1412E+03	.8283E+02
51	1.1	-16.0	499.0	.3067E+01	.1238E-04	.1892E-03	.1224E-04	.3051E+04	.6211E+04	.2929E+04	.1274E+04	.1412E+03	.8283E+02

52	3	2	-16	0	499	0	3000E+01	-3653E-04	1860E-03	1202E-04	3085E+04	6006E+04	2871E+04	5880E+03	2089E+03	3996E+02
53	-3	4	-16	0	499	0	2901E+01	-5895E-04	1790E-03	1161E-04	314E+04	5529E+04	2762E+04	9018E+02	1902E+03	6109E+02
54	-5	4	-16	0	499	0	2755E+01	-784E-04	1716E-03	1056E-04	3198E+04	5139E+04	2617E+04	118E+04	1664E+03	7543E+02
55	9	5	-16	0	499	0	2587E+01	-9580E-04	1620E-03	1040E-04	3233E+04	4603E+04	2446E+04	1235E+04	1412E+03	8283E+02
56	11	6	-16	0	499	0	2409E+01	-1098E-03	1519E-03	9723E-05	3232E+04	4075E+04	2268E+04	1269E+04	1174E+03	8454E+02
57	13	7	-16	0	499	0	2231E+01	-1211E-03	1416E-03	9046E-05	3193E+04	3587E+04	2091E+04	1244E+04	9645E+02	8234E+02
58	15	8	-16	0	499	0	2062E+01	-1301E-03	1318E-03	8396E-05	3122E+04	3153E+04	1921E+04	1184E+04	7887E+02	7782E+02
59	17	9	-16	0	499	0	1903E+01	-1370E-03	1225E-03	7789E-05	3026E+04	2777E+04	1762E+04	1105E+04	6450E+02	7220E+02
60	20	0	-16	0	499	0	1757E+01	-147E-03	1139E-03	727E-05	2913E+04	2433E+04	1616E+04	1019E+04	5291E+02	6622E+02
61	20	0	-14	0	499	0	1864E+01	-1503E-03	1052E-03	7637E-05	3218E+04	2467E+04	1723E+04	1027E+04	5132E+02	7644E+02
62	17	9	-14	0	499	0	2035E+01	-1457E-03	1119E-03	8293E-05	3381E+04	2814E+04	1894E+04	1137E+04	6668E+02	8541E+02
63	-15	8	-14	0	499	0	2225E+01	-1394E-03	1236E-03	9022E-05	3532E+04	3229E+04	2084E+04	1248E+04	8367E+02	9450E+02
64	-13	7	-14	0	499	0	2435E+01	-1311E-03	1341E-03	9823E-05	3661E+04	3723E+04	2294E+04	1349E+04	1055E+03	1031E+03
65	-11	6	-14	0	499	0	2660E+01	-1202E-03	1454E-03	1069E-04	375E+04	4302E+04	2520E+04	1420E+04	1330E+03	1095E+03
66	-9	5	-14	0	499	0	2895E+01	-1060E-03	1570E-03	1159E-04	3794E+04	4959E+04	2756E+04	1430E+04	1663E+03	1113E+03
67	-7	4	-14	0	499	0	3126E+01	-8826E-04	1683E-03	1247E-04	3780E+04	5658E+04	2989E+04	1337E+04	2038E+03	1050E+03
68	-5	3	-14	0	499	0	3332E+01	-6664E-04	1783E-03	1326E-04	3725E+04	6323E+04	3196E+04	1106E+04	2409E+03	8740E+02
69	-3	2	-14	0	499	0	3488E+01	-4158E-04	1858E-03	1385E-04	3663E+04	6848E+04	3354E+04	7322E+03	2709E+03	5809E+02
70	-1	1	-14	0	499	0	3572E+01	-1414E-04	1898E-03	1417E-04	3625E+04	7135E+04	3439E+04	2559E+03	2875E+03	2034E+02
71	-1	1	-14	0	499	0	3572E+01	-1414E-04	1898E-03	1417E-04	3625E+04	7135E+04	3439E+04	2559E+03	2875E+03	2034E+02
72	-1	1	-14	0	499	0	3488E+01	-4158E-04	1858E-03	1385E-04	3663E+04	6848E+04	3354E+04	7322E+03	2709E+03	5809E+02
73	-3	2	-14	0	499	0	3332E+01	-6664E-04	1783E-03	1326E-04	3725E+04	6323E+04	3196E+04	1106E+04	2409E+03	8740E+02
74	-7	4	-14	0	499	0	3126E+01	-8826E-04	1683E-03	1247E-04	3780E+04	5658E+04	2989E+04	1337E+04	2038E+03	1050E+03
75	-9	5	-14	0	499	0	2895E+01	-1060E-03	1570E-03	1159E-04	3794E+04	4959E+04	2756E+04	1430E+04	1663E+03	1113E+03
76	-11	6	-14	0	499	0	2660E+01	-1202E-03	1454E-03	1069E-04	375E+04	4302E+04	2520E+04	1420E+04	1330E+03	1095E+03
77	-13	7	-14	0	499	0	2435E+01	-1311E-03	1341E-03	9823E-05	3661E+04	3723E+04	2294E+04	1349E+04	1055E+03	1031E+03
78	-15	8	-14	0	499	0	2231E+01	-1211E-03	1416E-03	9022E-05	3532E+04	3229E+04	2084E+04	1248E+04	8367E+02	9450E+02
79	-17	9	-14	0	499	0	2062E+01	-1301E-03	1503E-03	8293E-05	341E+04	2814E+04	1894E+04	1137E+04	6668E+02	8541E+02
80	-20	0	-14	0	499	0	1864E+01	-1503E-03	1052E-03	7637E-05	3218E+04	2467E+04	1723E+04	1027E+04	5132E+02	7644E+02
81	-20	0	-12	0	499	0	1971E+01	-1582E-03	9483E-04	8047E-05	3541E+04	2463E+04	1830E+04	1006E+04	5264E+02	8806E+02
82	-17	9	-12	0	499	0	2170E+01	-1545E-03	1035E-03	8809E-05	3768E+04	2828E+04	2029E+04	1138E+04	6709E+02	1005E+03
83	-15	8	-12	0	499	0	2397E+01	-1492E-03	1133E-03	9679E-05	3996E+04	3276E+04	2256E+04	1283E+04	8658E+02	1144E+03
84	-13	7	-12	0	499	0	2655E+01	-1418E-03	1243E-03	1067E-04	4210E+04	3828E+04	2515E+04	1432E+04	1130E+03	1292E+03
85	-11	6	-12	0	499	0	2944E+01	-1317E-03	1365E-03	1177E-04	4391E+04	4505E+04	2805E+04	1566E+04	1487E+03	1433E+03
86	-9	5	-12	0	499	0	3298E+01	-1179E-03	1495E-03	1297E-04	465E+04	4839E+04	3079E+04	1677E+04	1615E+03	1582E+03
87	-7	4	-12	0	499	0	3583E+01	-9956E-04	1628E-03	1422E-04	4552E+04	6241E+04	3451E+04	1608E+04	2531E+03	1363E+03
88	-5	3	-12	0	499	0	3886E+01	-7614E-04	1751E-03	1537E-04	4517E+04	7172E+04	3758E+04	1376E+04	3144E+03	1306E+03
89	-3	2	-12	0	499	0	4121E+01	-4792E-04	1845E-03	1627E-04	4459E+04	7925E+04	3996E+04	9234E+03	3654E+03	8808E+02
90	-1	1	-12	0	499	0	4248E+01	-1636E-04	1896E-03	1676E-04	4429E+04	8334E+04	4126E+04	9232E+03	3929E+03	3078E+02
91	-1	1	-12	0	499	0	4248E+01	-1636E-04	1896E-03	1676E-04	4429E+04	8334E+04	4126E+04	9232E+03	3929E+03	3078E+02
92	-1	1	-12	0	499	0	4121E+01	-4792E-04	1845E-03	1627E-04	4459E+04	7925E+04	3996E+04	9234E+03	3654E+03	8808E+02
93	-3	2	-12	0	499	0	3886E+01	-7614E-04	1751E-03	1537E-04	4517E+04	7172E+04	3758E+04	1376E+04	3144E+03	1306E+03
94	-7	4	-12	0	499	0	3583E+01	-9956E-04	1628E-03	1422E-04	4552E+04	6241E+04	3451E+04	1608E+04	2531E+03	1363E+03
95	-9	5	-12	0	499	0	3298E+01	-1179E-03	1495E-03	1297E-04	465E+04	4839E+04	3079E+04	1677E+04	1615E+03	1582E+03
96	-11	6	-12	0	499	0	2944E+01	-1317E-03	1365E-03	1177E-04	4391E+04	4505E+04	2805E+04	1566E+04	1487E+03	1433E+03
97	-13	7	-12	0	499	0	2655E+01	-1418E-03	1243E-03	1067E-04	4210E+04	3828E+04	2515E+04	1432E+04	1130E+03	1292E+03
98	-15	8	-12	0	499	0	2397E+01	-1492E-03	1133E-03	9679E-05	3996E+04	3276E+04	2256E+04	1283E+04	8658E+02	1144E+03
99	-17	9	-12	0	499	0	2170E+01	-1545E-03	1035E-03	8809E-05	3768E+04	2828E+04	2029E+04	1138E+04	6709E+02	1005E+03
100	-20	0	-12	0	499	0	1971E+01	-1582E-03	9483E-04	8047E-05	3541E+04	2463E+04	1830E+04	1006E+04	5264E+02	8806E+02
101	-20	0	-10	0	499	0	2074E+01	-1657E-03	8277E-04	8442E-05	3871E+04	2441E+04	1933E+04	9480E+03	4976E+02	1001E+03
102	-17	9	-10	0	499	0	2303E+01	-1631E-03	9103E-04	9319E-05	4176E+04	2817E+04	2162E+04	1096E+04	6488E+02	1169E+03
103	-15	8	-10	0	499	0	2571E+01	-1590E-03	1006E-03	1035E-04	4502E+04	3288E+04	2431E+04	1269E+04	8621E+02	1373E+03
104	-13	7	-10	0	499	0	2840E+01	-1430E-03	1117E-03	1147E-04	4630E+04	3888E+04	2677E+04	1466E+04	1169E+03	1613E+03
105	-11	6	-10	0	499	0	3257E+01	-1442E-03	1244E-03	1297E-04	451E+04	5165E+04	3121E+04	1677E+04	1615E+03	1582E+03
106	-9	5	-10	0	499	0	3683E+01	-1314E-03	1388E-03	1460E-04	4440E+04	5649E+04	3553E+04	1863E+04	2267E+03	2140E+03
107	-7	4	-10	0	499	0	4155E+01	-1132E-03	1543E-03	1640E-04	4560E+04	6877E+04	4032E+04	1936E+04	3176E+03	2274E+03
108	-5	3	-10	0	499	0	4623E+01	-8805E-04	1694E-03	1819E-04	4634E+04	8231E+04	4512E+04	1738E+04	4271E+03	2073E+03
109	-3	2	-10	0	499	0	4999E+01	-594E-04	1814E-03	1963E-04	4612E+04	9361E+04	4898E+04	1169E+04	5212E+03	1399E+03
110	-1	1	-10	0	499	0	5188E+01	-1912E-04	1878E-03	2039E-04	4636E+04	9925E+04	5101E+04	3848E+03	5658E+03	4694E+02
111	-1	1	-10	0	499	0	4999E+01	-594E-04	1814E-03	1963E-04	4612E+04	9361E+04	4898E+04	1169E+04	5212E+03	1399E+03
112	-3	2	-10	0	499	0	4623E+01	-8805E-04	1694E-03	1819E-04	4634E+04	8231E+04	4512E+04	1738E+04	4271E+03	2073E+03
113	-5	3	-10	0	499	0	4155E+01	-1132E-03	1543E-03	1640E-04	4560E+04	6877E+04	4032E+04	1936E+04	3176E+03	2274E+03
114	-7	4	-10	0	499	0	3683E+01	-1314E-03	1388E-03	1460E-04	4440E+04	5649E+04	3553E+04	1863E+04	2267E+03	2140E+03
115	-9	5	-10	0	499	0	3257E+01	-1442E-03	1244E-03	1297E-04	451E+04	5165E+04	3121E+04	1677E+04	1615E+03	1582E+03
116	-11	6	-10	0	499	0	2887E+01	-1530E-03	117E-03	1155E-04	4839E+04	3888E+04	2677E+04	1466E+04	1169E+03	1613E+03
117	-13	7	-10	0	499	0	2571E+01	-1590E-03	1006E-03	1035E-04	4502E+04	3288E+04	2431E+04	1269E+04	8621E+02	1373E+03
118	-15	8	-10	0	499	0	2303E+01	-1631E-03	9103E-04	9319E-05	4176E+04	2817E+04	2162E+04	1096E+04	6488E+02	1169E+03
119	-17	9	-10	0	499	0	2074E+01	-1657E-03	8277E-04	8442E-05	3871E+04	2441E+04	1933E+04	9480E+03	4976E+02	1001E+03
120	-20	0	-8	0	499	0	2169E+01	-1726E-03	6							

168	-5.3	-4.0	499.0	9303E+01	1477E-03	1068E-03	3608E-04	1512E+05	1206E+05	9798E+04	3035E+04	1026E+04	1833E+04
169	-3.2	-4.0	499.0	1431E+02	9366E-04	1350E-03	5522E-04	1708E+05	2172E+05	1809E+05	2354E+04	4782E+04	1511E+04
170	-1.1	-4.0	499.0	1230E+02	1983E-04	1301E-03	4753E-04	1892E+05	1660E+05	1336E+05	1040E+04	1786E+04	1131E+04
171	-1.1	-4.0	499.0	1230E+02	1983E-04	1301E-03	4753E-04	1892E+05	1660E+05	1336E+05	1040E+04	1786E+04	1131E+04
172	-3.2	-4.0	499.0	1431E+02	9366E-04	1350E-03	5522E-04	1708E+05	2172E+05	1809E+05	2354E+04	4782E+04	1511E+04
173	-7.4	-4.0	499.0	9303E+01	1477E-03	1068E-03	3608E-04	1512E+05	1206E+05	9798E+04	3035E+04	1026E+04	1833E+04
174	-9.5	-4.0	499.0	6602E+01	1662E-03	8685E-04	2576E-04	1156E+05	8085E+04	6600E+04	2037E+04	7372E+03	8879E+03
175	-9.5	-4.0	499.0	5138E+01	1756E-03	7253E-04	2016E-04	9382E+04	5999E+04	5044E+04	1535E+04	1972E+03	5410E+03
176	11.6	-4.0	499.0	4190E+01	1805E-03	6159E-04	1654E-04	7903E+04	4686E+04	4067E+04	1186E+04	1180E+03	3712E+03
177	13.7	-4.0	499.0	3517E+01	1829E-03	5308E-04	1397E-04	6803E+04	3795E+04	3384E+04	9239E+03	7564E+02	2716E+03
178	15.8	-4.0	499.0	3015E+01	1838E-03	4635E-04	1204E-04	5948E+04	3160E+04	2876E+04	7399E+03	5100E+02	2074E+03
179	17.9	-4.0	499.0	2625E+01	1838E-03	4096E-04	1055E-04	5264E+04	2686E+04	2485E+04	5900E+03	3583E+02	1634E+03
180	20.0	-4.0	499.0	2314E+01	1832E-03	3656E-04	9362E-05	4705E+04	2321E+04	2173E+04	4927E+03	2605E+02	1319E+03
181	20.0	-4.0	499.0	2314E+01	1832E-03	3656E-04	9362E-05	4705E+04	2321E+04	2173E+04	4927E+03	2605E+02	1319E+03
182	17.9	-2.0	499.0	2680E+01	1873E-03	2086E-04	1076E-04	5465E+04	2650E+04	2540E+04	3143E+03	1883E+02	1723E+03
183	15.8	-2.0	499.0	3094E+01	1882E-03	2371E-04	1235E-04	6227E+04	3116E+04	2956E+04	3919E+03	2707E+02	2215E+03
184	13.7	-2.0	499.0	3636E+01	1885E-03	2729E-04	1442E-04	7203E+04	3746E+04	3503E+04	4967E+03	4052E+02	2952E+03
185	11.6	-2.0	499.0	4375E+01	1876E-03	3184E-04	1724E-04	8487E+04	4648E+04	4255E+04	6342E+03	6321E+02	4122E+03
186	-9.5	-2.0	499.0	5442E+01	1846E-03	3761E-04	2132E-04	1024E+05	6031E+04	5356E+04	7875E+03	1004E+03	6152E+03
187	-7.4	-2.0	499.0	7120E+01	1773E-03	4429E-04	2774E-04	1280E+05	8359E+04	7142E+04	8110E+03	1371E+03	1023E+03
188	-5.3	-2.0	499.0	1023E+02	1597E-03	4857E-04	3963E-04	1695E+05	1289E+05	1083E+05	3092E+02	1467E+03	2119E+04
189	-3.2	-2.0	499.0	1641E+02	1019E-03	4044E-04	6323E-04	1972E+05	2375E+05	2175E+05	6187E+03	1448E+04	2008E+04
190	-1.1	-2.0	499.0	1371E+02	2065E-04	5494E-04	5293E-04	2150E+05	1800E+05	1500E+05	1446E+04	4995E+03	1353E+04
191	-1.1	-2.0	499.0	1371E+02	2065E-04	5494E-04	5293E-04	2150E+05	1800E+05	1500E+05	1446E+04	4995E+03	1353E+04
192	-3.2	-2.0	499.0	1641E+02	1019E-03	4044E-04	6323E-04	1972E+05	2375E+05	2175E+05	6187E+03	1448E+04	2008E+04
193	-5.3	-2.0	499.0	1023E+02	1597E-03	4857E-04	3963E-04	1695E+05	1289E+05	1083E+05	3092E+02	1467E+03	2119E+04
194	-7.4	-2.0	499.0	5442E+01	1846E-03	3761E-04	2132E-04	1024E+05	6031E+04	5356E+04	7875E+03	1004E+03	6152E+03
195	-9.5	-2.0	499.0	4375E+01	1876E-03	3184E-04	1724E-04	8487E+04	4648E+04	4255E+04	6342E+03	6321E+02	4122E+03
196	11.6	-2.0	499.0	3636E+01	1885E-03	2729E-04	1442E-04	7203E+04	3746E+04	3503E+04	4967E+03	4052E+02	2952E+03
197	13.7	-2.0	499.0	3094E+01	1882E-03	2371E-04	1235E-04	6227E+04	3116E+04	2956E+04	3919E+03	2707E+02	2215E+03
198	15.8	-2.0	499.0	2680E+01	1873E-03	2086E-04	1076E-04	5465E+04	2650E+04	2540E+04	3143E+03	1883E+02	1723E+03
199	17.9	-2.0	499.0	2314E+01	1832E-03	3656E-04	9362E-05	4705E+04	2321E+04	2173E+04	4927E+03	2605E+02	1319E+03
200	20.0	-2.0	499.0	2314E+01	1832E-03	3656E-04	9362E-05	4705E+04	2321E+04	2173E+04	4927E+03	2605E+02	1319E+03
201	20.0	-2.0	499.0	2314E+01	1832E-03	3656E-04	9362E-05	4705E+04	2321E+04	2173E+04	4927E+03	2605E+02	1319E+03
202	17.9	-2.0	499.0	2680E+01	1873E-03	2086E-04	1076E-04	5465E+04	2650E+04	2540E+04	3143E+03	1883E+02	1723E+03
203	15.8	-2.0	499.0	3094E+01	1882E-03	2371E-04	1235E-04	6227E+04	3116E+04	2956E+04	3919E+03	2707E+02	2215E+03
204	13.7	-2.0	499.0	3677E+01	1904E-03	1819E-04	1457E-04	7343E+04	3729E+04	3545E+04	3204E+03	2575E-04	3035E+03
205	-11.6	-2.0	499.0	4439E+01	1901E-03	1655E-04	1749E-04	8686E+04	4639E+04	4320E+04	2380E+02	3214E-03	4260E+03
206	-9.5	-2.0	499.0	5541E+01	1876E-03	3184E-04	1724E-04	8487E+04	4648E+04	4255E+04	6342E+03	6321E+02	4122E+03
207	-7.4	-2.0	499.0	7120E+01	1773E-03	4429E-04	2774E-04	1280E+05	8359E+04	7142E+04	8110E+03	1371E+03	1023E+03
208	-5.3	-2.0	499.0	9859E+01	1576E-03	8549E-04	3821E-04	1508E+05	1194E+05	1018E+05	3076E+03	1294E+03	1458E+04
209	-3.2	-2.0	499.0	1262E+02	9987E-04	3638E-04	11487E-04	1569E+05	2103E+05	1345E+05	2747E+03	2441E+03	7884E+03
210	-1.1	-2.0	499.0	1283E+02	2788E-04	1382E-09	4956E-04	1807E+05	1949E+05	1344E+05	6104E+03	4883E-03	2387E+03
211	1.1	-2.0	499.0	1283E+02	2788E-04	1382E-09	4956E-04	1807E+05	1949E+05	1344E+05	6104E+03	4883E-03	2387E+03
212	3.2	-2.0	499.0	1262E+02	9987E-04	3638E-04	11487E-04	1569E+05	2103E+05	1345E+05	2747E+03	2441E+03	7884E+03
213	5.3	-2.0	499.0	9859E+01	1576E-03	8549E-04	3821E-04	1508E+05	1194E+05	1018E+05	3076E+03	1294E+03	1458E+04
214	7.4	-2.0	499.0	7234E+01	1800E-03	3368E-04	2818E-04	1282E+05	8668E+04	7249E+04	1053E+03	1588E+02	9962E+03
215	9.5	-2.0	499.0	5541E+01	1876E-03	3184E-04	1724E-04	8487E+04	4648E+04	4255E+04	6342E+03	6321E+02	4122E+03
216	11.6	-2.0	499.0	4439E+01	1901E-03	1655E-04	1749E-04	8686E+04	4639E+04	4320E+04	2380E+02	3214E-03	4260E+03
217	13.7	-2.0	499.0	3677E+01	1904E-03	1819E-04	1457E-04	7343E+04	3729E+04	3545E+04	3204E+03	2575E-04	3035E+03
218	15.8	-2.0	499.0	3122E+01	1897E-03	1182E-04	1245E-04	6325E+04	3099E+04	2984E+04	8621E-03	6262E-04	2265E+03
219	17.9	-2.0	499.0	2699E+01	1885E-03	7731E-11	1084E-04	5535E+04	2637E+04	2559E+04	1907E+03	7629E+05	1754E+03
220	20.0	-2.0	499.0	2368E+01	1870E-03	5912E-11	9568E-05	4805E+04	2282E+04	2227E+04	1450E+03	6199E+05	1398E+03
221	20.0	-2.0	499.0	2368E+01	1870E-03	5912E-11	9568E-05	4805E+04	2282E+04	2227E+04	1450E+03	6199E+05	1398E+03
222	17.9	-2.0	499.0	2680E+01	1873E-03	2086E-04	1076E-04	5465E+04	2650E+04	2540E+04	3143E+03	1883E+02	1723E+03
223	15.8	-2.0	499.0	3094E+01	1882E-03	2371E-04	1235E-04	6227E+04	3116E+04	2956E+04	3919E+03	2707E+02	2215E+03
224	13.7	-2.0	499.0	3636E+01	1885E-03	2729E-04	1442E-04	7203E+04	3746E+04	3503E+04	4967E+03	4052E+02	2952E+03
225	11.6	-2.0	499.0	4375E+01	1876E-03	3184E-04	1724E-04	8487E+04	4648E+04	4255E+04	6342E+03	6321E+02	4122E+03
226	9.5	-2.0	499.0	5442E+01	1846E-03	3761E-04	2132E-04	1024E+05	6031E+04	5356E+04	7875E+03	1004E+03	6152E+03
227	7.4	-2.0	499.0	7120E+01	1773E-03	4429E-04	2774E-04	1280E+05	8359E+04	7142E+04	8110E+03	1371E+03	1023E+03
228	5.3	-2.0	499.0	1023E+02	1597E-03	4857E-04	3963E-04	1695E+05	1289E+05	1083E+05	3092E+02	1467E+03	2119E+04
229	3.2	-2.0	499.0	1641E+02	1019E-03	4044E-04	6323E-04	1972E+05	2375E+05	2175E+05	6187E+03	1448E+04	2008E+04
230	-1.1	-2.0	499.0	1371E+02	2065E-04	5494E-04	5293E-04	2150E+05	1800E+05	1500E+05	1446E+04	4995E+03	1353E+04
231	-1.1	-2.0	499.0	1371E+02	2065E-04	5494E-04	5293E-04	2150E+05	1800E+05	1500E+05	1446E+04	4995E+03	1353E+04
232	-3.2	-2.0	499.0	1641E+02	1019E-03	4044E-04	6323E-04	1972E+05	2375E+05	2175E+05	6187E+03	1448E+04	2008E+04
233	-5.3	-2.0	499.0	1023E+02	1597E-03	4857E-04	3963E-04	1695E+05	1289E+05	1083E+05	3092E+02	1467E+03	2119E+04
234	-7.4	-2.0	499.0	5442E+01	1846E-03	3761E-04	2132E-04	1024E+05	6031E+04	5356E+04	7875E+03	1004E+03	6152E+03
235	-9.5	-2.0	499.0	4375E+01	1876E-03	3184E-04	1724E-04	8487E+04	4648E+04	4255E+04	6342E+03	6321E+02	4122E+03
236	11.6	-2.0	499.0	3636E+01	1885E-03	2729E-04	1442E-04	7203E+04	3746E+04	3503E+04	4967E+03	4052E+02	2952E+03
237	13.7	-2.0	499.0	3094E+01	1882E-03	2371E-04	1235E-04	6227E+04	3116E+04	2956E+04	3919E+03	2707E+02	2215E+03
238	15.8	-2.0	499.0	2680E+01	1873E-03	2086E-04	1076E-04	5465E+04	2650E+04	2540E+04	3143E+03	1883E+02	1723E+03
239	17.9	-2.0	499.0	2314E+01	1832E-03	3656E-04	9362E-05	4705E+04	2321E+04	2173E+04	4927E+03	2605E+02	1319E+03
240	20.0	-2.0	499.0	2314E+01	1832E-03	3656E-04	9362E-05	4705E+04	2321E+04	2173E+04	4927E+03	2605E+02	1319E+03
241	20.0	-2.0	499.0	2314E+01	1832								

284	-13.7	8.0	499.0	3120E+01	1642E-03	9570E-04	1245E-04	5525E+04	3896E+04	2983E+04	1416E+04	1139E+03	1944E+03
285	-11.6	8.0	499.0	3588E+01	1572E-03	1087E-04	140E-04	6068E+04	4739E+04	3456E+04	1697E+04	1659E+03	2452E+03
286	-9.5	8.0	499.0	4167E+01	146E-03	1233E-03	1645E-04	522E+04	5897E+04	4045E+04	2015E+04	2515E+03	3028E+03
287	-7.4	8.0	499.0	4871E+01	1294E-03	1408E-03	1914E-04	7089E+04	7504E+04	4770E+04	2292E+04	3955E+03	3594E+03
288	-5.3	8.0	499.0	5654E+01	1033E-03	1596E-03	2213E-04	7311E+04	9577E+04	5588E+04	2244E+04	6141E+03	3630E+03
289	-3.2	8.0	499.0	6311E+01	6603E-04	1751E-03	2465E-04	7384E+04	1142E+05	6278E+04	1456E+04	8195E+03	2338E+03
290	-1.1	8.0	499.0	6612E+01	2228E-04	1824E-03	2580E-04	7639E+04	1208E+05	6586E+04	4004E+03	8693E+03	6035E+02
291	-1.1	8.0	499.0	6612E+01	2228E-04	1824E-03	2580E-04	7639E+04	1206E+05	6586E+04	4004E+03	8693E+03	6035E+02
292	-3.2	8.0	499.0	6311E+01	6603E-04	1751E-03	2465E-04	7384E+04	1142E+05	6278E+04	1456E+04	8195E+03	2338E+03
293	-5.3	8.0	499.0	5654E+01	1033E-03	1596E-03	2213E-04	7311E+04	9577E+04	5588E+04	2244E+04	6141E+03	3630E+03
294	-7.4	8.0	499.0	4871E+01	1294E-03	1408E-03	1914E-04	7089E+04	7504E+04	4770E+04	2292E+04	3955E+03	3594E+03
295	-9.5	8.0	499.0	4167E+01	146E-03	1233E-03	1645E-04	522E+04	5897E+04	4045E+04	2015E+04	2515E+03	3028E+03
296	-11.6	8.0	499.0	3588E+01	1572E-03	1083E-03	1424E-04	6068E+04	4739E+04	3456E+04	1697E+04	1659E+03	2452E+03
297	-13.7	8.0	499.0	3120E+01	1642E-03	9570E-04	1245E-04	5525E+04	3896E+04	2983E+04	1416E+04	1139E+03	1944E+03
298	-15.8	8.0	499.0	2740E+01	1685E-03	8520E-04	1099E-04	5027E+04	3265E+04	2601E+04	1184E+04	8093E+02	1620E+03
299	-17.9	8.0	499.0	2428E+01	1712E-03	7639E-04	9799E-05	4583E+04	2783E+04	2288E+04	9962E+03	5923E+02	1339E+03
300	-20.0	8.0	499.0	2169E+01	1726E-03	6869E-04	8807E-05	4190E+04	2405E+04	2028E+04	2446E+03	4446E+02	1120E+03
301	-20.0	10.0	499.0	2074E+01	1657E-03	8277E-04	8442E-05	3871E+04	2441E+04	1933E+04	9480E+03	4976E+02	1001E+03
302	-17.9	10.0	499.0	2303E+01	1631E-03	9103E-04	9319E-05	4176E+04	2817E+04	2162E+04	1096E+04	6488E+02	1169E+03
303	-15.8	10.0	499.0	2571E+01	1590E-03	1006E-03	1035E-04	4502E+04	3288E+04	2431E+04	1269E+04	8621E+02	1373E+03
304	-13.7	10.0	499.0	2887E+01	1530E-03	1117E-03	1155E-04	4839E+04	3888E+04	2748E+04	1466E+04	1168E+02	1612E+03
305	-11.6	10.0	499.0	3257E+01	1442E-03	1244E-03	1297E-04	5165E+04	4660E+04	3121E+04	1677E+04	1215E+03	1882E+03
306	-9.5	10.0	499.0	3683E+01	1314E-03	1388E-03	1460E-04	5440E+04	5649E+04	3553E+04	1863E+04	2267E+03	2140E+03
307	-7.4	10.0	499.0	4155E+01	1132E-03	1543E-03	1640E-04	5606E+04	6877E+04	4032E+04	1936E+04	3176E+03	2274E+03
308	-5.3	10.0	499.0	4623E+01	8805E-04	1694E-03	1819E-04	5634E+04	8231E+04	4512E+04	1738E+04	4271E+03	2073E+03
309	-3.2	10.0	499.0	4999E+01	5594E-04	1814E-03	1963E-04	5612E+04	9361E+04	4898E+04	1169E+04	5212E+03	1399E+03
310	-1.1	10.0	499.0	5198E+01	1912E-04	1878E-03	2039E-04	5636E+04	9925E+04	5101E+04	3948E+03	5658E+03	4694E+02
311	-1.1	10.0	499.0	5198E+01	1912E-04	1878E-03	2039E-04	5636E+04	9925E+04	5101E+04	3948E+03	5658E+03	4694E+02
312	-3.2	10.0	499.0	4999E+01	5594E-04	1814E-03	1963E-04	5612E+04	9361E+04	4898E+04	1169E+04	5212E+03	1399E+03
313	-5.3	10.0	499.0	4623E+01	8805E-04	1694E-03	1819E-04	5634E+04	8231E+04	4512E+04	1738E+04	4271E+03	2073E+03
314	-7.4	10.0	499.0	4155E+01	1132E-03	1543E-03	1640E-04	5606E+04	6877E+04	4032E+04	1936E+04	3176E+03	2274E+03
315	-9.5	10.0	499.0	3683E+01	1314E-03	1388E-03	1460E-04	5440E+04	5649E+04	3553E+04	1863E+04	2267E+03	2140E+03
316	-11.6	10.0	499.0	3257E+01	1442E-03	1244E-03	1297E-04	5165E+04	4660E+04	3121E+04	1677E+04	1215E+03	1882E+03
317	-13.7	10.0	499.0	2887E+01	1530E-03	1117E-03	1155E-04	4839E+04	3888E+04	2748E+04	1466E+04	1168E+02	1612E+03
318	-15.8	10.0	499.0	2571E+01	1590E-03	1006E-03	1035E-04	4502E+04	3288E+04	2431E+04	1269E+04	8621E+02	1373E+03
319	-17.9	10.0	499.0	2303E+01	1631E-03	9103E-04	9319E-05	4176E+04	2817E+04	2162E+04	1096E+04	6488E+02	1169E+03
320	-20.0	10.0	499.0	2074E+01	1657E-03	8277E-04	8442E-05	3871E+04	2441E+04	1933E+04	9480E+03	4976E+02	1001E+03
321	-20.0	12.0	499.0	1971E+01	1582E-03	9483E-04	8047E-05	3541E+04	2463E+04	1830E+04	1006E+04	5264E+02	8806E+02
322	-17.9	12.0	499.0	2170E+01	1545E-03	1035E-03	8809E-05	3768E+04	2828E+04	2029E+04	1134E+04	6709E+02	1005E+03
323	-15.8	12.0	499.0	2397E+01	1492E-03	1133E-03	9679E-05	3996E+04	3276E+04	2256E+04	1234E+04	8658E+02	1144E+03
324	-13.7	12.0	499.0	2655E+01	1418E-03	1243E-03	1067E-04	4230E+04	3628E+04	2435E+04	1432E+04	1130E+03	1292E+03
325	-11.6	12.0	499.0	2917E+01	1317E-03	1365E-03	1177E-04	4391E+04	3828E+04	2515E+04	1432E+04	1130E+03	1292E+03
326	-9.5	12.0	499.0	3259E+01	1179E-03	1495E-03	1297E-04	4512E+04	5185E+04	3122E+04	1647E+04	1955E+03	1528E+03
327	-7.4	12.0	499.0	3583E+01	9956E-04	1628E-03	1422E-04	4552E+04	6241E+04	3451E+04	1608E+04	2531E+03	1513E+03
328	-5.3	12.0	499.0	3886E+01	7614E-04	1751E-03	1537E-04	4517E+04	7172E+04	3758E+04	1314E+04	3144E+03	1306E+03
329	-3.2	12.0	499.0	4121E+01	4792E-04	1845E-03	1627E-04	4459E+04	7925E+04	3996E+04	9234E+03	3654E+03	8808E+02
330	-1.1	12.0	499.0	4248E+01	1636E-04	1896E-03	1576E-04	4429E+04	8334E+04	4126E+04	3225E+03	3929E+03	3078E+02
331	-1.1	12.0	499.0	4248E+01	1636E-04	1896E-03	1576E-04	4429E+04	8334E+04	4126E+04	3225E+03	3929E+03	3078E+02
332	-3.2	12.0	499.0	4121E+01	4792E-04	1845E-03	1627E-04	4459E+04	7925E+04	3996E+04	9234E+03	3654E+03	8808E+02
333	-5.3	12.0	499.0	3886E+01	7614E-04	1751E-03	1537E-04	4517E+04	7172E+04	3758E+04	1314E+04	3144E+03	1306E+03
334	-7.4	12.0	499.0	3583E+01	9956E-04	1628E-03	1422E-04	4552E+04	6241E+04	3451E+04	1608E+04	2531E+03	1513E+03
335	-9.5	12.0	499.0	3259E+01	1179E-03	1495E-03	1297E-04	4512E+04	5185E+04	3122E+04	1647E+04	1955E+03	1528E+03
336	-11.6	12.0	499.0	2944E+01	1317E-03	1365E-03	1177E-04	4391E+04	3828E+04	2515E+04	1432E+04	1130E+03	1292E+03
337	-13.7	12.0	499.0	2655E+01	1418E-03	1243E-03	1067E-04	4230E+04	3628E+04	2435E+04	1432E+04	1130E+03	1292E+03
338	-15.8	12.0	499.0	2397E+01	1492E-03	1133E-03	9679E-05	3996E+04	3276E+04	2256E+04	1234E+04	8658E+02	1144E+03
339	-17.9	12.0	499.0	2170E+01	1545E-03	1035E-03	8809E-05	3768E+04	2828E+04	2029E+04	1134E+04	6709E+02	1005E+03
340	-20.0	14.0	499.0	1971E+01	1582E-03	9483E-04	8047E-05	3541E+04	2463E+04	1830E+04	1006E+04	5264E+02	8806E+02
341	-20.0	14.0	499.0	1864E+01	1503E-03	1052E-03	7637E-05	3218E+04	2467E+04	1723E+04	1027E+04	5352E+02	7664E+02
342	-17.9	14.0	499.0	2035E+01	1457E-03	1139E-03	8293E-05	3381E+04	2814E+04	1894E+04	1137E+04	6668E+02	8541E+02
343	-15.8	14.0	499.0	2225E+01	1394E-03	1236E-03	9022E-05	3532E+04	3229E+04	2084E+04	1248E+04	8367E+02	9450E+02
344	-13.7	14.0	499.0	2435E+01	1311E-03	1341E-03	9823E-05	3661E+04	3723E+04	2294E+04	1349E+04	1055E+03	1031E+03
345	-11.6	14.0	499.0	2650E+01	1202E-03	1454E-03	1069E-04	3753E+04	4302E+04	2502E+04	1420E+04	1305E+03	1095E+03
346	-9.5	14.0	499.0	2895E+01	1060E-03	1570E-03	1159E-04	3794E+04	4950E+04	2785E+04	1430E+04	1663E+03	1131E+03
347	-7.4	14.0	499.0	3126E+01	8826E-04	1683E-03	1247E-04	3780E+04	5658E+04	2989E+04	1337E+04	2038E+03	1050E+03
348	-5.3	14.0	499.0	3332E+01	6664E-04	1783E-03	1326E-04	3725E+04	6323E+04	3196E+04	1106E+04	2409E+03	8740E+02
349	-3.2	14.0	499.0	3488E+01	4158E-04	1858E-03	1385E-04	3663E+04	6848E+04	3354E+04	7322E+03	2709E+03	5809E+02
350	-1.1	14.0	499.0	3572E+01	1414E-04	1898E-03	1417E-04	3625E+04	7135E+04	3439E+04	2559E+03	2875E+03	2034E+02
351	-1.1	14.0	499.0	3572E+01	1414E-04	1898E-03	1417E-04	3625E+04	7135E+04	3439E+04	2559E+03	2875E+03	2034E+02
352	-3.2	14.0	499.0	3488E+01	4158E-04	1858E-03	1385E-04	3663E+04	6848E+04	3354E+04	7322E+03	2709E+03	5809E+02
353	-5.3	14.0	499.0	3332E+01	6664E-04	1783E-03	1326E-04	3725E+04	6323E+04	3196E+04	1106E+04	2409E+03	8740E+02
354	-7.4	14.0	499.0	3126E+01	8826E-04	1683E-03	1247E-04	3780E+04	5658E+04	2989E+04	1337E+04	2038E+03	1050E+03
355	-9.5	14.0	499.0	2895E+01	1060E-03	1570E-03	1159E-04	3794E+04	4959E+04	2785E+04	1430E+04	1663E+03	1131E+03
356	-11.6	14.0	499.0	2660E+01	1202E-03	1454E-03	1069E-04	3753E+04	4302E+04	2520E+04	1420E+04	1305E+03	1095E+03
357													

400	20.0	18.0	499.0	.1652E+01	-.1347E-03	-.1212E-03	.6826E-05	.2632E+04	.2422E+04	.1512E+04	.9901E+03	.5126E+02	.5699E+02
401	-20.0	20.0	499.0	.1551E+01	-.1272E-03	-.1272E-03	.6440E-05	.2377E+04	.2377E+04	.1412E+04	.9485E+03	.4896E+02	.4896E+02
402	-17.9	20.0	499.0	.1657E+01	-.1209E-03	-.1351E-03	.6847E-05	.2424E+04	.2646E+04	.1517E+04	.9920E+03	.5744E+02	.5137E+02
403	-15.8	20.0	499.0	.1768E+01	-.1131E-03	-.1432E-03	.7270E-05	.2456E+04	.2944E+04	.1628E+04	.1020E+04	.6727E+02	.5303E+02
404	-13.7	20.0	499.0	.1881E+01	-.1037E-03	-.1516E-03	.7702E-05	.2468E+04	.3268E+04	.1740E+04	.1026E+04	.7838E+02	.5350E+02
405	-11.6	20.0	499.0	.1993E+01	-.9244E-04	-.1598E-03	.8132E-05	.2459E+04	.3610E+04	.1852E+04	.9974E+03	.9056E+02	.5221E+02
406	-9.5	20.0	499.0	.2100E+01	-.7931E-04	-.1676E-03	.8542E-05	.2432E+04	.3956E+04	.1959E+04	.9254E+03	.1033E+03	.4861E+02
407	-7.4	20.0	499.0	.2197E+01	-.6425E-04	-.1746E-03	.8912E-05	.2391E+04	.4285E+04	.2056E+04	.8017E+03	.1157E+03	.4224E+02
408	-5.3	20.0	499.0	.2277E+01	-.4740E-04	-.1804E-03	.9218E-05	.2346E+04	.4568E+04	.2136E+04	.6236E+03	.1266E+03	.3293E+02
409	-3.2	20.0	499.0	.2334E+01	-.2908E-04	-.1846E-03	.9438E-05	.2307E+04	.4778E+04	.2193E+04	.3969E+03	.1348E+03	.2100E+02
410	-1.1	20.0	499.0	.2364E+01	-.9807E-05	-.1868E-03	.9553E-05	.2284E+04	.4890E+04	.2223E+04	.1363E+03	.1392E+03	.7218E+01
411	1.1	20.0	499.0	.2364E+01	-.9807E-05	-.1868E-03	.9553E-05	.2284E+04	.4890E+04	.2223E+04	.1363E+03	.1392E+03	.7218E+01
412	3.2	20.0	499.0	.2334E+01	-.2908E-04	-.1846E-03	.9438E-05	.2307E+04	.4778E+04	.2193E+04	.3969E+03	.1348E+03	.2100E+02
413	5.3	20.0	499.0	.2277E+01	-.4740E-04	-.1804E-03	.9218E-05	.2346E+04	.4568E+04	.2136E+04	.6236E+03	.1266E+03	.3293E+02
414	7.4	20.0	499.0	.2197E+01	-.6424E-04	-.1746E-03	.8912E-05	.2391E+04	.4285E+04	.2056E+04	.8017E+03	.1157E+03	.4224E+02
415	9.5	20.0	499.0	.2100E+01	-.7931E-04	-.1676E-03	.8542E-05	.2432E+04	.3956E+04	.1959E+04	.9254E+03	.1033E+03	.4861E+02
416	11.6	20.0	499.0	.1993E+01	-.9244E-04	-.1598E-03	.8132E-05	.2459E+04	.3610E+04	.1852E+04	.9974E+03	.9056E+02	.5221E+02
417	13.7	20.0	499.0	.1881E+01	-.1037E-03	-.1516E-03	.7702E-05	.2468E+04	.3268E+04	.1740E+04	.1026E+04	.7838E+02	.5350E+02
418	15.8	20.0	499.0	.1768E+01	-.1131E-03	-.1432E-03	.7270E-05	.2456E+04	.2944E+04	.1628E+04	.1020E+04	.6727E+02	.5303E+02
419	17.9	20.0	499.0	.1657E+01	-.1209E-03	-.1351E-03	.6847E-05	.2424E+04	.2646E+04	.1517E+04	.9920E+03	.5744E+02	.5137E+02
420	20.0	20.0	499.0	.1551E+01	-.1272E-03	-.1272E-03	.6440E-05	.2377E+04	.2377E+04	.1412E+04	.9485E+03	.4896E+02	.4896E+02

TOTAL RUN TIME = 24.00000 SECONDS.

STRESS3D VERSION 4.0 (MAY 1989)
J.F.T. AGAPITO AND ASSOCS. (303)242 4220

EXAMPLE, 10 BY 10 PLATE SOURCE IN AN INFINITE MEDIUM, ORDER-3

QA NUMBER: AGAPITO 4.0
INPUT FILE: EXAMP1-3.IN
DATE: 05/24/89

THERMO-ELASTIC ANALYSIS OF RADIO-ACTIVE WASTE REPOSITORY

DIFFUSIVITY 2893E+03
SURFACE TEMP 0000E+00
UNIFORM INITIAL TEMPERATURE
ELASTIC MOD 317E+09
POISSON RATIO 2200E+00
COEFF OF EXPAN 4888E-05
ROCK SP. WT 0000E+00
INITIAL MAX. HORIZ. STRESS 0000E+00
INITIAL MIN. HORIZ. STRESS 0000E+00
MAX. HORIZ. STRESS GRAD./VERT. STRESS GRAD. 0.000
MIN. HORIZ. STRESS GRAD./VERT. STRESS GRAD. 0.000
BEARING (DEG.) OF MAX. HORIZ. STRESS W.R.T. X-AXIS 0.00

NUMBER OF CANISTERS 0
NUMBER OF AREAL SOURCES 1
NUMBER OF LINE SOURCES 0
NUMBER OF CANISTER TYPES 1
NUMBER OF TIMES FOR OUTPUT 1
NUMBER OF LINES FOR OUTPUT 21
NUMBER OF SURFACE SHEAR ROWS 0
NUMBER OF SURFACE SHEAR COLUMNS 0
HALF WIDTH OF SURFACE ELEMENTS 0.00
CENTER OF SURFACE GRID (XCOORD) 0.00
CENTER OF SURFACE GRID (YCOORD) 0.00

NO FREE SURFACE

CANISTER TYPE 1

CANISTER LENGTH 1.00
NUMBER OF POINT SOURCES 1
NUMBER OF COMPONENTS 1
DEPTH BELOW SURFACE 0.00
CANISTER COMPONENTS
SOURCE DATA - TIME ON 0.00 STRENGTH 0.2000E+04 EXP(-0.0000E+00)

AREAL SOURCE NO. 1 SOURCE TYPE = 1 TIME ON = 0.00000E+00

SUB-AREAL SOURCE NO.	XCOORD	YCOORD	ZCOORD
1	4.31	-4.31	500.00
2	4.31	-1.70	500.00
3	4.31	1.70	500.00
4	4.31	4.31	500.00
5	1.70	-4.31	500.00
6	1.70	-1.70	500.00
7	1.70	1.70	500.00
8	1.70	4.31	500.00
9	-1.70	-4.31	500.00
10	-1.70	-1.70	500.00
11	-1.70	1.70	500.00
12	-1.70	4.31	500.00
13	-4.31	-4.31	500.00
14	-4.31	-1.70	500.00
15	-4.31	1.70	500.00
16	-4.31	4.31	500.00

TIMING FOR OUTPUT (YRS)

20.00
TEMPERATURES DISPLACEMENTS AND STRESSES AT TIME 0.20000E+02

PT	XCOORD	YCOORD	ZCOORD	TEMP	U	V	W	SIGXX	SIGYY	SIGZZ	SIGXY	SIGYZ	SIGZX
1	-20.0	-20.0	499.0	.1551E+01	.1272E-03	.1272E-03	.6439E-05	.2377E+04	.2377E+04	.1412E+04	.9480E+03	.4894E+02	.4894E+02
2	-17.9	-20.0	499.0	.1657E+01	.1209E-03	.1351E-03	.6846E-05	.2424E+04	.2646E+04	.1517E+04	.9914E+03	.5742E+02	.5136E+02
3	-15.8	-20.0	499.0	.1768E+01	.1131E-03	.1432E-03	.7269E-05	.2456E+04	.2943E+04	.1627E+04	.1020E+04	.6722E+02	.5303E+02
4	-13.7	-20.0	499.0	.1881E+01	.1037E-03	.1515E-03	.7702E-05	.2468E+04	.3267E+04	.1740E+04	.1025E+04	.7833E+02	.5351E+02
5	-11.6	-20.0	499.0	.1993E+01	.9245E-04	.1598E-03	.8132E-05	.2460E+04	.3609E+04	.1852E+04	.9973E+03	.9050E+02	.5226E+02
6	-9.5	-20.0	499.0	.2100E+01	.7933E-04	.1676E-03	.8542E-05	.2434E+04	.3955E+04	.1959E+04	.9260E+03	.1032E+03	.4871E+02
7	-7.4	-20.0	499.0	.2197E+01	.6428E-04	.1746E-03	.8913E-05	.2393E+04	.4284E+04	.2056E+04	.8031E+03	.1157E+03	.4239E+02
8	-5.3	-20.0	499.0	.2277E+01	.4743E-04	.1804E-03	.9221E-05	.2347E+04	.4569E+04	.2136E+04	.6255E+03	.1267E+03	.3311E+02
9	-3.2	-20.0	499.0	.2335E+01	.2911E-04	.1846E-03	.9442E-05	.2307E+04	.4781E+04	.2194E+04	.3986E+03	.1350E+03	.2114E+02
10	-1.1	-20.0	499.0	.2365E+01	.9818E-05	.1868E-03	.9558E-05	.2284E+04	.4894E+04	.2225E+04	.1370E+03	.1395E+03	.7277E+01
11	1.1	-20.0	499.0	.2365E+01	.9818E-05	.1868E-03	.9558E-05	.2284E+04	.4894E+04	.2225E+04	.1370E+03	.1395E+03	.7277E+01
12	3.2	-20.0	499.0	.2375E+01	.2911E-04	.1846E-03	.9442E-05	.2307E+04	.4781E+04	.2194E+04	.3986E+03	.1350E+03	.2114E+02
13	5.3	-20.0	499.0	.2375E+01	.4743E-04	.1804E-03	.9221E-05	.2347E+04	.4569E+04	.2136E+04	.6255E+03	.1267E+03	.3311E+02
14	7.4	-20.0	499.0	.2197E+01	.6428E-04	.1746E-03	.8913E-05	.2393E+04	.4284E+04	.2056E+04	.8031E+03	.1157E+03	.4239E+02
15	9.5	-20.0	499.0	.2100E+01	.7933E-04	.1676E-03	.8542E-05	.2434E+04	.3955E+04	.1959E+04	.9260E+03	.1032E+03	.4871E+02
16	11.6	-20.0	499.0	.1993E+01	.9245E-04	.1598E-03	.8132E-05	.2460E+04	.3609E+04	.1852E+04	.9973E+03	.9050E+02	.5226E+02
17	13.7	-20.0	499.0	.1881E+01	.1037E-03	.1515E-03	.7702E-05	.2468E+04	.3267E+04	.1740E+04	.1025E+04	.7833E+02	.5351E+02
18	15.8	-20.0	499.0	.1768E+01	.1131E-03	.1432E-03	.7269E-05	.2456E+04	.2943E+04	.1627E+04	.1020E+04	.6722E+02	.5303E+02
19	17.9	-20.0	499.0	.1657E+01	.1209E-03	.1351E-03	.6846E-05	.2424E+04	.2646E+04	.1517E+04	.9914E+03	.5742E+02	.5136E+02
20	20.0	-20.0	499.0	.1551E+01	.1272E-03	.1272E-03	.6439E-05	.2377E+04	.2377E+04	.1412E+04	.9480E+03	.4894E+02	.4894E+02
21	-20.0	-18.0	499.0	.1652E+01	.1347E-03	.1212E-03	.6825E-05	.2632E+04	.2422E+04	.1512E+04	.9895E+03	.5125E+02	.5696E+02
22	-17.9	-18.0	499.0	.1776E+01	.1287E-03	.1295E-03	.7303E-05	.2706E+04	.2719E+04	.1636E+04	.1053E+04	.6122E+02	.6086E+02
23	-15.8	-18.0	499.0	.1909E+01	.1212E-03	.1382E-03	.7809E-05	.2764E+04	.3055E+04	.1768E+04	.1104E+04	.7313E+02	.6411E+02
24	-13.7	-18.0	499.0	.2047E+01	.1120E-03	.1473E-03	.8338E-05	.2800E+04	.3430E+04	.1906E+04	.1132E+04	.8711E+02	.6612E+02
25	-11.6	-18.0	499.0	.2187E+01	.1006E-03	.1565E-03	.8875E-05	.2809E+04	.3839E+04	.2046E+04	.1126E+04	.1030E+03	.6608E+02
26	-9.5	-18.0	499.0	.2324E+01	.8698E-04	.1654E-03	.9400E-05	.2791E+04	.4265E+04	.2183E+04	.1068E+04	.1203E+03	.6302E+02
27	-7.4	-18.0	499.0	.2451E+01	.7098E-04	.1736E-03	.9885E-05	.2750E+04	.4682E+04	.2310E+04	.9447E+03	.1378E+03	.5602E+02
28	-5.3	-18.0	499.0	.2558E+01	.5270E-04	.1805E-03	.1030E-04	.2698E+04	.5053E+04	.2418E+04	.7482E+03	.1539E+03	.4455E+02
29	-3.2	-18.0	499.0	.2636E+01	.3249E-04	.1855E-03	.1060E-04	.2649E+04	.5335E+04	.2496E+04	.4826E+03	.1663E+03	.2881E+02
30	-1.1	-18.0	499.0	.2678E+01	.1098E-04	.1882E-03	.1075E-04	.2620E+04	.5487E+04	.2538E+04	.1669E+03	.1730E+03	.9982E+01
31	1.1	-18.0	499.0	.2678E+01	.1098E-04	.1882E-03	.1075E-04	.2620E+04	.5487E+04	.2538E+04	.1669E+03	.1730E+03	.9982E+01
32	3.2	-18.0	499.0	.2636E+01	.3249E-04	.1855E-03	.1060E-04	.2649E+04	.5335E+04	.2496E+04	.4826E+03	.1663E+03	.2881E+02
33	5.3	-18.0	499.0	.2558E+01	.5270E-04	.1805E-03	.1030E-04	.2698E+04	.5053E+04	.2418E+04	.7482E+03	.1539E+03	.4455E+02
34	7.4	-18.0	499.0	.2451E+01	.7098E-04	.1736E-03	.9885E-05	.2750E+04	.4682E+04	.2310E+04	.9447E+03	.1378E+03	.5602E+02
35	9.5	-18.0	499.0	.2324E+01	.8698E-04	.1654E-03	.9400E-05	.2791E+04	.4265E+04	.2183E+04	.1068E+04	.1203E+03	.6302E+02
36	11.6	-18.0	499.0	.2187E+01	.1006E-03	.1565E-03	.8875E-05	.2809E+04	.3839E+04	.2046E+04	.1126E+04	.1030E+03	.6608E+02
37	13.7	-18.0	499.0	.2047E+01	.1120E-03	.1473E-03	.8338E-05	.2800E+04	.3430E+04	.1906E+04	.1132E+04	.8711E+02	.6612E+02
38	15.8	-18.0	499.0	.1909E+01	.1212E-03	.1382E-03	.7809E-05	.2764E+04	.3055E+04	.1768E+04	.1104E+04	.7313E+02	.6411E+02
39	17.9	-18.0	499.0	.1776E+01	.1287E-03	.1295E-03	.7303E-05	.2706E+04	.2719E+04	.1636E+04	.1053E+04	.6122E+02	.6086E+02

40	-20.0	-18.0	499.0	1652E+01	1347E 03	1212E 03	6825E-05	2632E+04	2422E+04	1512E+04	5895E+04	5125E+02	5636E+02
41	-20.0	-16.0	499.0	1756E+01	1424E 03	1139E 03	7226E 05	2912E+04	2453E+04	1616E+04	1018E+04	5291E+02	6618E+02
42	-17.9	-16.0	499.0	1903E+01	1370E 03	1225E 03	7787E 05	3025E+04	2777E+04	1762E+04	1104E+04	6447E+02	7214E+02
43	-15.9	-16.0	499.0	2061E+01	1300E 03	1318E 03	8394E 05	3121E+04	3153E+04	1920E+04	1281E+04	7891E+02	7766E+02
44	-13.7	-16.0	499.0	2231E+01	1211E 03	1416E 03	9044E 05	3195E+04	3485E+04	2090E+04	1242E+04	9634E+02	9299E+02
45	-11.6	-16.0	499.0	2408E+01	1098E 03	1518E 03	9721E 05	3233E+04	4072E+04	2267E+04	1267E+04	1172E+03	8474E+02
46	-9.5	-16.0	499.0	2586E+01	9583E 04	1620E 03	1040E 04	3236E+04	4599E+04	2446E+04	1235E+04	1410E+03	8101E+02
47	-7.4	-16.0	499.0	2756E+01	7890E 04	1716E 03	1105E 04	3202E+04	5135E+04	2616E+04	1120E+04	1663E+03	7585E+02
48	-5.3	-16.0	499.0	2902E+01	5904E 04	1799E 03	1161E 04	3146E+04	5628E+04	2764E+04	9067E+03	1904E+03	6173E+02
49	-3.2	-16.0	499.0	3012E+01	3661E 04	1867E 03	1203E 04	3088E+04	6012E+04	2874E+04	5938E+03	2096E+03	6006E+02
50	-1.1	-16.0	499.0	3071E+01	1241E 04	1893E 03	1226E 04	3051E+04	6225E+04	2933E+04	2071E+03	2201E+03	1418E+02
51	-1.1	-16.0	499.0	3071E+01	1241E 04	1893E 03	1226E 04	3051E+04	6225E+04	2933E+04	2071E+03	2201E+03	1418E+02
52	-3.2	-16.0	499.0	3012E+01	3661E 04	1860E 03	1203E 04	3088E+04	6012E+04	2874E+04	5938E+03	2096E+03	6006E+02
53	-5.3	-16.0	499.0	2902E+01	5904E 04	1799E 03	1161E 04	3146E+04	5628E+04	2764E+04	9067E+03	1904E+03	6173E+02
54	-7.4	-16.0	499.0	2756E+01	7890E 04	1716E 03	1105E 04	3202E+04	5135E+04	2616E+04	1120E+04	1663E+03	7585E+02
55	-9.5	-16.0	499.0	2586E+01	9583E 04	1620E 03	1040E 04	3236E+04	4599E+04	2446E+04	1235E+04	1410E+03	8101E+02
56	-11.6	-16.0	499.0	2408E+01	1098E 03	1518E 03	9721E 05	3233E+04	4072E+04	2267E+04	1267E+04	1172E+03	8474E+02
57	-13.7	-16.0	499.0	2231E+01	1211E 03	1416E 03	9044E 05	3195E+04	3485E+04	2090E+04	1242E+04	9633E+02	8229E+02
58	-15.8	-16.0	499.0	2061E+01	1300E 03	1318E 03	8394E 05	3121E+04	3153E+04	1920E+04	1281E+04	7881E+02	7776E+02
59	-17.9	-16.0	499.0	1903E+01	1370E 03	1225E 03	7787E 05	3025E+04	2777E+04	1762E+04	1104E+04	6447E+02	7214E+02
60	-20.0	-16.0	499.0	1756E+01	1424E 03	1139E 03	7226E 05	2912E+04	2453E+04	1616E+04	1018E+04	5291E+02	6618E+02
61	-20.0	-14.0	499.0	1864E+01	1503E 03	1052E 03	7637E 05	3217E+04	2468E+04	1723E+04	1026E+04	5354E+02	7659E+02
62	-17.9	-14.0	499.0	1971E+01	1581E 03	9848E 04	8047E 05	3540E+04	2464E+04	1830E+04	1006E+04	5268E+02	8880E+02
63	-15.8	-14.0	499.0	2105E+01	1708E 03	1130E 03	8608E 05	3537E+04	2637E+04	2013E+04	1137E+04	6012E+03	1004E+03
64	-13.7	-14.0	499.0	2243E+01	1311E 03	1236E 03	9020E 05	3531E+04	3229E+04	2084E+04	1246E+04	8362E+02	9439E+02
65	-11.6	-14.0	499.0	2659E+01	1201E 03	1433E 03	1068E 04	3753E+04	4298E+04	2519E+04	1417E+04	1327E+03	1095E+03
66	-9.5	-14.0	499.0	2894E+01	1061E 03	1569E 03	1158E 04	3797E+04	4952E+04	2755E+04	1427E+04	1659E+03	1115E+03
67	-7.4	-14.0	499.0	3126E+01	8833E 04	1682E 03	1247E 04	3787E+04	5649E+04	2988E+04	1338E+04	2034E+03	1056E+03
68	-5.3	-14.0	499.0	3334E+01	6678E 04	1782E 03	1326E 04	3735E+04	6319E+04	3198E+04	1114E+04	2411E+03	8867E+02
69	-3.2	-14.0	499.0	3493E+01	4173E 04	1858E 03	1387E 04	3669E+04	6856E+04	3359E+04	7438E+03	2723E+03	5957E+02
70	-1.1	-14.0	499.0	3579E+01	1421E 04	1899E 03	1420E 04	3625E+04	7157E+04	3446E+04	2619E+03	2901E+03	2103E+02
71	-1.1	-14.0	499.0	3579E+01	1421E 04	1899E 03	1420E 04	3625E+04	7157E+04	3446E+04	2619E+03	2901E+03	2103E+02
72	-3.2	-14.0	499.0	3493E+01	4173E 04	1858E 03	1387E 04	3669E+04	6856E+04	3359E+04	7438E+03	2723E+03	5957E+02
73	-5.3	-14.0	499.0	3334E+01	6678E 04	1782E 03	1326E 04	3735E+04	6319E+04	3198E+04	1114E+04	2411E+03	8867E+02
74	-7.4	-14.0	499.0	3126E+01	8833E 04	1682E 03	1247E 04	3787E+04	5649E+04	2988E+04	1338E+04	2034E+03	1056E+03
75	-9.5	-14.0	499.0	2894E+01	1061E 03	1569E 03	1158E 04	3797E+04	4952E+04	2755E+04	1427E+04	1659E+03	1115E+03
76	-11.6	-14.0	499.0	2659E+01	1201E 03	1433E 03	1068E 04	3753E+04	4298E+04	2519E+04	1417E+04	1327E+03	1095E+03
77	-13.7	-14.0	499.0	2434E+01	1311E 03	1341E 03	9820E 05	3660E+04	3722E+04	2293E+04	1346E+04	1053E+03	1029E+03
78	-15.8	-14.0	499.0	2225E+01	1394E 03	1236E 03	9020E 05	3531E+04	3229E+04	2084E+04	1246E+04	8362E+02	9439E+02
79	-17.9	-14.0	499.0	2035E+01	1457E 03	1139E 03	8292E 05	3380E+04	2815E+04	1894E+04	1136E+04	5667E+02	7553E+02
80	-20.0	-12.0	499.0	1864E+01	1503E 03	1052E 03	7637E 05	3217E+04	2468E+04	1723E+04	1026E+04	5354E+02	7659E+02
81	-20.0	-12.0	499.0	1971E+01	1581E 03	9848E 04	8047E 05	3540E+04	2464E+04	1830E+04	1006E+04	5268E+02	8880E+02
82	-17.9	-12.0	499.0	2105E+01	1708E 03	1130E 03	8608E 05	3537E+04	2637E+04	2013E+04	1137E+04	6012E+03	1004E+03
83	-15.8	-12.0	499.0	2396E+01	1491E 03	1133E 03	9676E 05	3993E+04	3277E+04	2256E+04	1281E+04	8658E+02	1147E+03
84	-13.7	-12.0	499.0	2654E+01	1418E 03	1243E 03	1066E 04	4207E+04	3828E+04	2514E+04	1428E+04	1129E+03	1290E+03
85	-11.6	-12.0	499.0	2942E+01	1316E 03	1364E 03	1176E 04	4389E+04	4502E+04	2803E+04	1560E+04	1483E+03	1420E+03
86	-9.5	-12.0	499.0	3256E+01	1178E 03	1494E 03	1297E 04	4515E+04	5309E+04	3170E+04	1639E+04	1947E+03	1524E+03
87	-7.4	-12.0	499.0	3582E+01	9962E 04	1626E 03	1421E 04	4563E+04	6225E+04	3449E+04	1605E+04	2520E+03	1521E+03
88	-5.3	-12.0	499.0	3828E+01	7492E 04	1749E 03	1538E 04	4537E+04	6225E+04	3449E+04	1605E+04	2520E+03	1521E+03
89	-3.2	-12.0	499.0	4130E+01	4820E 04	1845E 03	1631E 04	4498E+04	7935E+04	4006E+04	1386E+04	3141E+03	1331E+03
90	-1.1	-12.0	499.0	4264E+01	1650E 04	1898E 03	1682E 04	4429E+04	8378E+04	4143E+04	3372E+03	3991E+03	3279E+02
91	-1.1	-12.0	499.0	4264E+01	1650E 04	1898E 03	1682E 04	4429E+04	8378E+04	4143E+04	3372E+03	3991E+03	3279E+02
92	-3.2	-12.0	499.0	4130E+01	4820E 04	1845E 03	1631E 04	4498E+04	7935E+04	4006E+04	1386E+04	3141E+03	1331E+03
93	-5.3	-12.0	499.0	3888E+01	7635E 04	1749E 03	1538E 04	4537E+04	7157E+04	3760E+04	1386E+04	3141E+03	1331E+03
94	-7.4	-12.0	499.0	3582E+01	9962E 04	1626E 03	1421E 04	4563E+04	6225E+04	3449E+04	1605E+04	2520E+03	1521E+03
95	-9.5	-12.0	499.0	3256E+01	1178E 03	1494E 03	1297E 04	4515E+04	5309E+04	3170E+04	1639E+04	1947E+03	1524E+03
96	-11.6	-12.0	499.0	2942E+01	1316E 03	1364E 03	1176E 04	4389E+04	4502E+04	2803E+04	1560E+04	1483E+03	1420E+03
97	-13.7	-12.0	499.0	2654E+01	1418E 03	1243E 03	1066E 04	4207E+04	3828E+04	2514E+04	1428E+04	1129E+03	1290E+03
98	-15.8	-12.0	499.0	2396E+01	1491E 03	1133E 03	9676E 05	3993E+04	3277E+04	2256E+04	1281E+04	8658E+02	1147E+03
99	-17.9	-12.0	499.0	2170E+01	1544E 03	1035E 03	8808E 05	3766E+04	2829E+04	2029E+04	1137E+04	6712E+02	1094E+03
100	-20.0	-10.0	499.0	1971E+01	1581E 03	9848E 04	8047E 05	3540E+04	2464E+04	1830E+04	1006E+04	5268E+02	8880E+02
101	-20.0	-10.0	499.0	2074E+01	1657E 03	8279E 04	8442E 05	3869E+04	2442E+04	1933E+04	9484E+03	4987E+02	1000E+03
102	-17.9	-10.0	499.0	2205E+01	1606E 03	1010E 03	9319E 05	3981E+04	2162E+04	1268E+04	1096E+04	6500E+02	1188E+03
103	-15.8	-10.0	499.0	2571E+01	1590E 03	1006E 03	1034E 04	4498E+04	3291E+04	2430E+04	1268E+04	8634E+02	1470E+03
104	-13.7	-10.0	499.0	2886E+01	1529E 03	1117E 03	1155E 04	4833E+04	3891E+04	2747E+04	1453E+04	1169E+03	1609E+03
105	-11.6	-10.0	499.0	3254E+01	1441E 03	1243E 03	1296E 04	5158E+04	4660E+04	3118E+04	1668E+04	1613E+03	1875E+03
106	-9.5	-10.0	499.0	3679E+01	1313E 03	1386E 03	1458E 04	5436E+04	5641E+04	3549E+04	1846E+04	2256E+03	2132E+03
107	-7.4	-10.0	499.0	4150E+01	1131E 03	1540E 03	1638E 04	5619E+04	6849E+04	4028E+04	1917E+04	3151E+03	2277E+03
108	-5.3	-10.0	499.0	4622E+01	8832E 04	1690E 03	1819E 04	5677E+04	8185E+04	4513E+04	1742E+04	2424E+03	2112E+03
109	-3.2	-10.0	499.0	5015E+01	6015E 04	1812E 03	1929E 04	5636E+04	9665E+04	4916E+04	2225E+04	3256E+03	1507E+03
110	-1.1	-10.0	499.0	5335E+01	3946E 04	1881E 03	2053E 04	5636E+04	1003E+05	4507E+04	2803E+04	1483E+03	1420E+03
111	-1.1	-10.0	499.0	5235E+01	1946E 04	1881E 03	2053E 04	5636E+04	1003E+05	4514E+04	4271E+04	5863E+03	5384E+02
112	-3.2	-10.0	499.0	5015E+01	5651E 04	1812E 03	1969E 04	5658E+04	9359E+04	4916E+04	1225E+04	5235E+03	1507E+03
113	-5.3	-10.0	499.0	4622E									

156	11.6	-6.0	499.0	3913E+01	1696E-03	8754E-04	1548E-04	7011E+04	4756E+04	3785E+04	1555E+04	1555E+03	3092E+03
157	11.7	-6.0	499.0	3339E+01	1744E-03	7624E-04	1328E-04	6203E+04	3866E+04	3204E+04	1249E+04	1018E+03	2707E+03
158	11.8	-6.0	499.0	2894E+01	1702E-03	6712E-04	1158E-04	5526E+04	3228E+04	2758E+04	1014E+04	6994E+02	1855E+02
159	11.9	-6.0	499.0	2539E+01	1782E-03	5968E-04	1022E-04	4957E+04	2738E+04	2399E+04	8332E+03	4987E+02	1501E+02
160	12.0	-6.0	499.0	2251E+01	1786E-03	5352E-04	9122E-05	4476E+04	2363E+04	2110E+04	6937E+03	3669E+02	1231E+02
161	12.1	-4.0	499.0	2315E+01	1832E-03	3659E-04	9365E-05	4707E+04	2322E+04	2174E+04	4946E+03	2622E+02	1321E+02
162	12.2	-4.0	499.0	2626E+01	1838E-03	4101E-04	1056E-04	5266E+04	2688E+04	2486E+04	6024E+03	3617E+02	1637E+02
163	12.3	-4.0	499.0	3017E+01	1838E-03	4644E-04	1205E-04	5951E+04	3163E+04	2879E+04	7462E+03	5173E+02	2079E+02
164	12.4	-4.0	499.0	3521E+01	1829E-03	5324E-04	1398E-04	6806E+04	3804E+04	3388E+04	9414E+03	7344E+02	2725E+02
165	12.5	-4.0	499.0	4196E+01	1804E-03	6189E-04	1566E-04	7896E+04	4709E+04	4074E+04	1209E+04	4189E+02	1637E+02
166	12.6	-4.0	499.0	5146E+01	1752E-03	7309E-04	2019E-04	9333E+04	6068E+04	5054E+04	1574E+04	2080E+03	5402E+02
167	12.7	-4.0	499.0	6593E+01	1648E-03	8767E-04	2572E-04	1130E+05	8296E+04	6606E+04	2036E+04	3924E+03	8660E+02
168	12.8	-4.0	499.0	9109E+01	1424E-03	1055E-03	3534E-04	1392E+05	1241E+05	9871E+04	2207E+04	7055E+03	1582E+04
169	12.9	-4.0	499.0	1151E+02	9547E-04	1220E-03	4453E-04	1650E+05	1646E+05	1282E+05	1688E+04	1118E+04	9695E+03
170	13.0	-4.0	499.0	1296E+02	2958E-04	1306E-03	5005E-04	1757E+05	1877E+05	1517E+05	3956E+03	1107E+04	7435E+03
171	13.1	-4.0	499.0	1296E+02	2958E-04	1306E-03	5005E-04	1757E+05	1877E+05	1517E+05	3956E+03	1107E+04	7435E+03
172	13.2	-4.0	499.0	1151E+02	9547E-04	1220E-03	4453E-04	1650E+05	1646E+05	1282E+05	1688E+04	1118E+04	9695E+03
173	13.3	-4.0	499.0	9109E+01	1424E-03	1055E-03	3534E-04	1392E+05	1241E+05	9871E+04	2207E+04	7055E+03	1582E+04
174	13.4	-4.0	499.0	6593E+01	1648E-03	8767E-04	2572E-04	1130E+05	8296E+04	6606E+04	2036E+04	3924E+03	8660E+02
175	13.5	-4.0	499.0	5146E+01	1752E-03	7309E-04	2019E-04	9333E+04	6068E+04	5054E+04	1574E+04	2080E+03	5402E+02
176	13.6	-4.0	499.0	4196E+01	1804E-03	6189E-04	1566E-04	7896E+04	4709E+04	4074E+04	1209E+04	4189E+02	1637E+02
177	13.7	-4.0	499.0	3521E+01	1829E-03	5324E-04	1398E-04	6806E+04	3804E+04	3388E+04	9414E+03	7344E+02	2725E+02
178	13.8	-4.0	499.0	3017E+01	1838E-03	4644E-04	1205E-04	5951E+04	3163E+04	2879E+04	7462E+03	5173E+02	2079E+02
179	13.9	-4.0	499.0	2626E+01	1838E-03	4101E-04	1056E-04	5266E+04	2688E+04	2486E+04	6024E+03	3617E+02	1637E+02
180	14.0	-4.0	499.0	2315E+01	1832E-03	3659E-04	9365E-05	4707E+04	2322E+04	2174E+04	4946E+03	2622E+02	1321E+02
181	14.1	-2.0	499.0	2355E+01	1861E-03	4858E-04	9520E-05	4476E+04	2363E+04	2110E+04	6937E+03	3669E+02	1231E+02
182	14.2	-2.0	499.0	2682E+01	1874E-03	2090E-04	1077E-04	5470E+04	2650E+04	2542E+04	3167E+03	1906E+02	1728E+02
183	14.3	-2.0	499.0	2894E+01	1897E-03	2378E-04	1273E-04	6203E+04	3866E+04	3204E+04	1249E+04	1018E+03	2707E+02
184	14.4	-2.0	499.0	3643E+01	1886E-03	2741E-04	1444E-04	7221E+04	3749E+04	3511E+04	5078E+03	1895E+02	2376E+02
185	14.5	-2.0	499.0	4390E+01	1877E-03	3212E-04	1730E-04	8522E+04	4656E+04	4272E+04	6625E+03	6735E+02	4180E+02
186	14.6	-2.0	499.0	5478E+01	1848E-03	3829E-04	2146E-04	1031E+05	8296E+04	6606E+04	2036E+04	3924E+03	8660E+02
187	14.7	-2.0	499.0	7218E+01	1772E-03	4630E-04	2811E-04	1291E+05	8502E+04	7280E+04	1106E+04	2098E+03	1073E+04
188	14.8	-2.0	499.0	1055E+02	1570E-03	5624E-04	4087E-04	1677E+05	1336E+05	1183E+05	1377E+04	5714E+03	2251E+04
189	14.9	-2.0	499.0	1373E+02	1050E-03	6510E-04	5300E-04	2066E+05	1810E+05	1582E+05	9110E+03	8015E+03	1289E+04
190	15.0	-2.0	499.0	1576E+02	3097E-04	7059E-04	6075E-04	2218E+05	2099E+05	1947E+05	1365E+03	1296E+04	1450E+04
191	15.1	-2.0	499.0	1576E+02	3097E-04	7059E-04	6074E-04	2218E+05	2099E+05	1947E+05	1365E+03	1296E+04	1450E+04
192	15.2	-2.0	499.0	1373E+02	1050E-03	6510E-04	5300E-04	2066E+05	1810E+05	1582E+05	9110E+03	8015E+03	1289E+04
193	15.3	-2.0	499.0	1055E+02	1570E-03	5624E-04	4087E-04	1677E+05	1336E+05	1183E+05	1377E+04	5714E+03	2251E+04
194	15.4	-2.0	499.0	7218E+01	1772E-03	4630E-04	2811E-04	1291E+05	8502E+04	7280E+04	1106E+04	2098E+03	1073E+04
195	15.5	-2.0	499.0	5478E+01	1848E-03	3829E-04	2146E-04	1031E+05	8296E+04	6606E+04	2036E+04	3924E+03	8660E+02
196	15.6	-2.0	499.0	4390E+01	1877E-03	3212E-04	1730E-04	8522E+04	4656E+04	4272E+04	6625E+03	6735E+02	4180E+02
197	15.7	-2.0	499.0	3643E+01	1886E-03	2741E-04	1444E-04	7221E+04	3749E+04	3511E+04	5078E+03	1895E+02	2376E+02
198	15.8	-2.0	499.0	3098E+01	1883E-03	2377E-04	1236E-04	6237E+04	3117E+04	2960E+04	3969E+03	2759E+02	2226E+02
199	15.9	-2.0	499.0	2682E+01	1874E-03	2090E-04	1077E-04	5470E+04	2650E+04	2542E+04	3167E+03	1906E+02	1728E+02
200	16.0	-2.0	499.0	2355E+01	1861E-03	4858E-04	9520E-05	4476E+04	2363E+04	2110E+04	6937E+03	3669E+02	1231E+02
201	16.1	-2.0	499.0	2315E+01	1832E-03	3659E-04	9365E-05	4707E+04	2322E+04	2174E+04	4946E+03	2622E+02	1321E+02
202	16.2	-2.0	499.0	2682E+01	1874E-03	2090E-04	1077E-04	5470E+04	2650E+04	2542E+04	3167E+03	1906E+02	1728E+02
203	16.3	-2.0	499.0	2894E+01	1897E-03	2378E-04	1273E-04	6203E+04	3866E+04	3204E+04	1249E+04	1018E+03	2707E+02
204	16.4	-2.0	499.0	3643E+01	1886E-03	2741E-04	1444E-04	7221E+04	3749E+04	3511E+04	5078E+03	1895E+02	2376E+02
205	16.5	-2.0	499.0	4390E+01	1877E-03	3212E-04	1730E-04	8522E+04	4656E+04	4272E+04	6625E+03	6735E+02	4180E+02
206	16.6	-2.0	499.0	5478E+01	1848E-03	3829E-04	2146E-04	1031E+05	8296E+04	6606E+04	2036E+04	3924E+03	8660E+02
207	16.7	-2.0	499.0	7218E+01	1772E-03	4630E-04	2811E-04	1291E+05	8502E+04	7280E+04	1106E+04	2098E+03	1073E+04
208	16.8	-2.0	499.0	1055E+02	1570E-03	5624E-04	4087E-04	1677E+05	1336E+05	1183E+05	1377E+04	5714E+03	2251E+04
209	16.9	-2.0	499.0	1373E+02	1050E-03	6510E-04	5300E-04	2066E+05	1810E+05	1582E+05	9110E+03	8015E+03	1289E+04
210	17.0	-2.0	499.0	1576E+02	3097E-04	7059E-04	6074E-04	2218E+05	2099E+05	1947E+05	1365E+03	1296E+04	1450E+04
211	17.1	-2.0	499.0	1576E+02	3097E-04	7059E-04	6074E-04	2218E+05	2099E+05	1947E+05	1365E+03	1296E+04	1450E+04
212	17.2	-2.0	499.0	1373E+02	1050E-03	6510E-04	5300E-04	2066E+05	1810E+05	1582E+05	9110E+03	8015E+03	1289E+04
213	17.3	-2.0	499.0	1055E+02	1570E-03	5624E-04	4087E-04	1677E+05	1336E+05	1183E+05	1377E+04	5714E+03	2251E+04
214	17.4	-2.0	499.0	7218E+01	1772E-03	4630E-04	2811E-04	1291E+05	8502E+04	7280E+04	1106E+04	2098E+03	1073E+04
215	17.5	-2.0	499.0	5478E+01	1848E-03	3829E-04	2146E-04	1031E+05	8296E+04	6606E+04	2036E+04	3924E+03	8660E+02
216	17.6	-2.0	499.0	4390E+01	1877E-03	3212E-04	1730E-04	8522E+04	4656E+04	4272E+04	6625E+03	6735E+02	4180E+02
217	17.7	-2.0	499.0	3643E+01	1886E-03	2741E-04	1444E-04	7221E+04	3749E+04	3511E+04	5078E+03	1895E+02	2376E+02
218	17.8	-2.0	499.0	3098E+01	1883E-03	2377E-04	1236E-04	6237E+04	3117E+04	2960E+04	3969E+03	2759E+02	2226E+02
219	17.9	-2.0	499.0	2682E+01	1874E-03	2090E-04	1077E-04	5470E+04	2650E+04	2542E+04	3167E+03	1906E+02	1728E+02
220	18.0	-2.0	499.0	2355E+01	1861E-03	4858E-04	9520E-05	4476E+04	2363E+04	2110E+04	6937E+03	3669E+02	1231E+02
221	18.1	-2.0	499.0	2315E+01	1832E-03	3659E-04	9365E-05	4707E+04	2322E+04	2174E+04	4946E+03	2622E+02	1321E+02
222	18.2	-2.0	499.0	2682E+01	1874E-03	2090E-04	1077E-04	5470E+04	2650E+04	2542E+04	3167E+03	1906E+02	1728E+02
223	18.3	-2.0	499.0	2894E+01	1897E-03	2378E-04	1273E-04	6203E+04	3866E+04	3204E+04	1249E+04	1018E+03	2707E+02
224	18.4	-2.0	499.0	3643E+01	1886E-03	2741E-04	1444E-04	7221E+04	3749E+04	3511E+04	5078E+03	1895E+02	2376E+02
225	18.5	-2.0	499.0	4390E+01	1877E-03	3212E-04	1730E-04	8522E+04	4656E+04	4272E+04	6625E+03	6735E+02	4180E+02
226	18.6	-2.0	499.0	5478E+01	1848E-03	3829E-04	2146E-04	1031E+05	8296E+04	6606E+04	2036E+04	3924E+03	8660E+02
227	18.7	-2.0	499.0	7218E+01	1772E-03	4630E-04	2811E-04	1291E+05	8502E+04	7280E+04	1106E+04	2098E+03	1073E+04
228	18.8	-2.0	499.0	1055E+02	1570E-03	5624E-04	4087E-04	1677E+05	1336E+05	1183E+05	1377E+04	5714E+03	2251E+04
229	18.9												

272	3	2	6	0	499	0	8528L+01	8091E	04	1493E	03	3312E	04	1105E+05	1398E+05	8869E+04	1944E+04	1425E+04	5440E+03
273	3	2	6	0	499	0	7159E+01	1222E	01	1403E	03	2789E	04	1013E+05	1102E+05	7301E+04	2678E+04	9352E+03	7453E+03
274	7	4	6	0	499	0	5718E+01	1472E	03	1193E	03	2238E	04	9083E+04	7980E+04	5666E+04	2407E+04	4512E+03	5811E+03
275	9	5	6	0	499	0	4633E+01	1614E	03	1017E	03	1839E	04	7973E+04	6039E+04	4566E+04	1946E+04	2526E+03	4164E+03
276	11	6	6	0	499	0	3339E+01	1696E	03	8524E	04	1548E	04	7011E+04	4756E+04	3785E+04	1555E+04	1555E+03	3092E+03
277	13	7	6	0	499	0	3339E+01	1744E	03	7624E	04	1328E	04	6203E+04	3866E+04	3204E+04	1249E+04	1018E+03	2370E+03
278	15	8	6	0	499	0	2894E+01	1770E	03	6712E	04	1158E	04	5262E+04	3222E+04	2755E+04	1014E+04	6994E+02	1895E+03
279	17	9	6	0	499	0	2539E+01	1822E	03	5968E	04	1022E	04	4357E+04	2738E+04	2398E+04	8332E+03	4987E+02	1501E+03
280	20	0	6	0	499	0	2251E+01	1786E	03	5352E	04	9122E	05	4476E+04	2363E+04	2110E+04	6937E+03	3669E+02	1731E+03
281	20	0	8	0	499	0	2169E+01	1726E	03	6899E	04	8807E	05	4189E+04	2406E+04	2028E+04	8457E+03	4460E+02	1170E+03
282	17	9	8	0	499	0	2429E+01	1711E	03	7643E	04	9800E	05	4581E+04	2785E+04	2288E+04	9975E+03	5946E+02	1339E+03
283	15	8	8	0	499	0	2740E+01	1685E	03	8525E	04	1094E	04	5023E+04	3270E+04	2601E+04	1185E+04	8128E+02	1618E+03
284	13	7	8	0	499	0	3120E+01	1641E	03	9575E	04	1244E	04	5516E+04	3902E+04	2982E+04	1415E+04	1143E+03	1376E+03
285	11	6	8	0	499	0	3566E+01	1570E	03	1083E	03	1423E	04	6052E+04	4748E+04	3453E+04	1689E+04	1663E+03	2440E+03
286	9	5	8	0	499	0	4161E+01	1461E	03	1732E	03	1642E	04	6600E+04	5900E+04	4039E+04	1990E+04	2509E+03	3004E+03
287	7	4	8	0	499	0	4860E+01	1292E	03	1404E	03	1910E	04	7083E+04	7474E+04	4760E+04	2238E+04	3918E+03	3573E+03
288	5	3	8	0	499	0	5642E+01	1034E	03	1587E	03	2209E	04	7388E+04	9460E+04	5582E+04	2192E+04	6052E+03	3668E+03
289	3	2	8	0	499	0	6334E+01	6726E	04	1743E	03	2473E	04	7546E+04	1132E+05	6314E+04	1582E+04	8192E+03	2683E+03
290	1	1	8	0	499	0	6719E+01	2324E	04	1831E	03	2621E	04	7658E+04	1233E+05	6719E+04	5392E+04	9309E+03	8873E+02
291	1	1	8	0	499	0	6719E+01	2324E	04	1831E	03	2621E	04	7658E+04	1233E+05	6719E+04	5392E+04	9309E+03	8873E+02
292	3	2	8	0	499	0	6334E+01	6726E	04	1743E	03	2473E	04	7546E+04	1132E+05	6314E+04	1582E+04	8192E+03	2683E+03
293	5	3	8	0	499	0	5642E+01	1034E	03	1587E	03	2209E	04	7388E+04	9460E+04	5582E+04	2192E+04	6052E+03	3668E+03
294	7	4	8	0	499	0	4860E+01	1292E	03	1404E	03	1910E	04	7083E+04	7474E+04	4760E+04	2238E+04	3918E+03	3573E+03
295	9	5	8	0	499	0	4161E+01	1461E	03	1732E	03	1642E	04	6600E+04	5900E+04	4039E+04	1990E+04	2509E+03	3004E+03
296	11	6	8	0	499	0	3586E+01	1570E	03	1083E	03	1423E	04	6052E+04	4748E+04	3453E+04	1689E+04	1663E+03	2440E+03
297	13	7	8	0	499	0	3120E+01	1641E	03	9575E	04	1244E	04	5516E+04	3902E+04	2982E+04	1415E+04	1143E+03	1376E+03
298	15	8	8	0	499	0	2740E+01	1685E	03	8525E	04	1094E	04	5023E+04	3270E+04	2601E+04	1185E+04	8128E+02	1618E+03
299	17	9	8	0	499	0	2429E+01	1711E	03	7643E	04	9800E	05	4581E+04	2785E+04	2288E+04	9975E+03	5946E+02	1339E+03
300	20	0	8	0	499	0	2169E+01	1726E	03	6899E	04	8807E	05	4189E+04	2406E+04	2028E+04	8457E+03	4460E+02	1170E+03
301	20	0	10	0	499	0	2074E+01	1657E	03	8279E	04	8442E	05	3869E+04	2442E+04	1933E+04	9484E+03	4985E+02	1000E+03
302	17	9	10	0	499	0	2303E+01	1630E	03	9105E	04	9319E	05	4173E+04	2819E+04	2162E+04	1096E+04	6500E+02	1168E+03
303	15	8	10	0	499	0	2571E+01	1590E	03	1006E	03	1034E	04	4498E+04	3291E+04	2430E+04	1268E+04	8634E+02	1370E+03
304	13	7	10	0	499	0	2886E+01	1529E	03	1117E	03	1155E	04	4833E+04	3891E+04	3118E+04	1668E+04	1613E+03	1875E+03
305	11	6	10	0	499	0	3254E+01	1441E	03	1243E	03	1296E	04	5158E+04	4466E+04	3549E+04	1846E+04	2256E+03	2132E+03
306	9	5	10	0	499	0	3679E+01	1313E	03	1386E	03	1458E	04	5436E+04	5641E+04	3549E+04	1846E+04	2256E+03	2132E+03
307	7	4	10	0	499	0	4150E+01	1131E	03	1540E	03	1638E	04	5619E+04	6849E+04	4028E+04	1917E+04	3151E+03	2272E+03
308	5	3	10	0	499	0	4622E+01	8832E	04	1690E	03	1819E	04	5677E+04	8185E+04	4513E+04	1742E+04	4245E+03	2118E+03
309	3	2	10	0	499	0	5015E+01	5651E	04	1812E	03	1969E	04	5658E+04	9359E+04	4916E+04	1225E+04	5256E+03	1507E+03
310	1	1	10	0	499	0	5235E+01	1946E	03	1881E	03	2053E	04	5639E+04	1003E+05	5144E+04	4371E+04	5835E+03	5384E+02
311	1	1	10	0	499	0	5015E+01	5651E	04	1812E	03	1969E	04	5658E+04	9359E+04	4916E+04	1225E+04	5256E+03	1507E+03
312	3	2	10	0	499	0	4622E+01	8832E	04	1690E	03	1819E	04	5677E+04	8185E+04	4513E+04	1742E+04	4245E+03	2118E+03
313	5	3	10	0	499	0	4150E+01	1131E	03	1540E	03	1638E	04	5619E+04	6849E+04	4028E+04	1917E+04	3151E+03	2272E+03
314	7	4	10	0	499	0	3679E+01	1313E	03	1386E	03	1458E	04	5436E+04	5641E+04	3549E+04	1846E+04	2256E+03	2132E+03
315	9	5	10	0	499	0	4150E+01	1131E	03	1540E	03	1638E	04	5619E+04	6849E+04	4028E+04	1917E+04	3151E+03	2272E+03
316	11	6	10	0	499	0	3679E+01	1313E	03	1386E	03	1458E	04	5436E+04	5641E+04	3549E+04	1846E+04	2256E+03	2132E+03
317	13	7	10	0	499	0	2886E+01	1529E	03	1117E	03	1155E	04	4833E+04	3891E+04	3118E+04	1668E+04	1613E+03	1875E+03
318	15	8	10	0	499	0	2571E+01	1590E	03	1006E	03	1034E	04	4498E+04	3291E+04	2430E+04	1268E+04	8634E+02	1370E+03
319	17	9	10	0	499	0	2303E+01	1630E	03	9105E	04	9319E	05	4173E+04	2819E+04	2162E+04	1096E+04	6500E+02	1168E+03
320	20	0	10	0	499	0	2074E+01	1657E	03	8279E	04	8442E	05	3869E+04	2442E+04	1933E+04	9484E+03	4985E+02	1000E+03
321	17	9	10	0	499	0	1971E+01	1581E	03	9484E	04	6047E	05	3540E+04	2464E+04	1830E+04	1006E+04	5268E+02	8800E+02
322	15	8	10	0	499	0	2154E+01	1544E	03	1035E	03	8808E	04	3766E+04	2829E+04	2029E+04	1137E+04	6712E+02	1004E+03
323	13	7	10	0	499	0	2396E+01	1471E	03	1237E	03	9676E	05	4207E+04	3277E+04	2519E+04	1281E+04	8658E+02	1142E+03
324	11	6	10	0	499	0	254E+01	1418E	03	1237E	03	9676E	05	4207E+04	3277E+04	2519E+04	1281E+04	8658E+02	1142E+03
325	9	5	10	0	499	0	2942E+01	1316E	03	1364E	03	1176E	04	4389E+04	4502E+04	2803E+04	1560E+04	1483E+03	1430E+03
326	7	4	10	0	499	0	3256E+01	1178E	03	1494E	03	1297E	04	4515E+04	5309E+04	3120E+04	1639E+04	1947E+03	1528E+03
327	5	3	10	0	499	0	3582E+01	9962E	04	1626E	03	1421E	04	4563E+04	6225E+04	3449E+04	1605E+04	2520E+03	1521E+03
328	3	2	10	0	499	0	3888E+01	7635E	04	1749E	03	1538E	04	4537E+04	7157E+04	3760E+04	1386E+04	3141E+03	1331E+03
329	1	1	10	0	499	0	4130E+01	4820E	04	1899E	03	1682E	04	4429E+04	8378E+04	4006E+04	9482E+03	3680E+03	9187E+02
330	1	1	10	0	499	0	4264E+01	1650E	04	1898E	03	1682E	04	4429E+04	8378E+04	4006E+04	9482E+03	3680E+03	9187E+02
331	3	2	10	0	499	0	4130E+01	4820E	04	1845E	03	1631E	04	4475E+04	7935E+04	4006E+04	9482E+03	3680E+03	9187E+02
332	5	3	10	0	499	0	3888E+01	7635E	04	1749E	03	1538E	04	4537E+04	7157E+04	3760E+04	1386E+04	3141E+03	1331E+03
333	7	4	10	0	499	0	3582E+01	9962E	04	1626E	03	1421E	04	4563E+04	6225E+04	3449E+04	1605E+04	2520E+03	1521E+03
334	9	5	10	0	499	0	3256E+01	1178E	03	1494E	03	1297E	04	4515E+04	5309E+04	3120E+04	1639E+04	1947E+03	1528E+03
335	11	6	10	0	499	0	2894E+01	1770E	03	6712E	04	1158E	04	5262E+04	3222E+04	2755E+04	1014E+04	6994E+02	1895E+03
33																			

388	-5.3	18.0	499.0	.2558E+01	.5270E-04	.1805E-03	1030E-04	.2698E+04	.5053E+04	.2418E+04	.7482E+03	.1539E+03	.4455E+02
389	-3.2	18.0	499.0	.2636E+01	.3249E-04	.1855E-03	1060E-04	.2649E+04	.5335E+04	.2496E+04	.4826E+03	.1663E+03	.2881E+02
390	-1.1	18.0	499.0	.2678E+01	.1098E-04	.1882E-03	1075E-04	.2620E+04	.5487E+04	.2538E+04	.1669E+03	.1730E+03	.9982E+01
391	1.1	18.0	499.0	.2678E+01	.1098E-04	.1882E-03	1075E-04	.2620E+04	.5487E+04	.2538E+04	.1669E+03	.1730E+03	.9982E+01
392	3.2	18.0	499.0	.2636E+01	.3249E-04	.1855E-03	1060E-04	.2649E+04	.5335E+04	.2496E+04	.4826E+03	.1663E+03	.2881E+02
393	5.3	18.0	499.0	.2558E+01	.5270E-04	.1805E-03	1030E-04	.2698E+04	.5053E+04	.2418E+04	.7482E+03	.1539E+03	.4455E+02
394	7.4	18.0	499.0	.2451E+01	.7098E-04	.1736E-03	9885E-05	.2750E+04	.4682E+04	.2310E+04	.9447E+03	.1378E+03	.5602E+02
395	9.5	18.0	499.0	.2324E+01	.8698E-04	.1654E-03	9400E-05	.2791E+04	.4265E+04	.2183E+04	.1068E+04	.1203E+03	.6302E+02
396	11.6	18.0	499.0	.2187E+01	.1006E-03	.1565E-03	8875E-05	.2809E+04	.3839E+04	.2046E+04	.1126E+04	.1030E+03	.6608E+02
397	13.7	18.0	499.0	.2047E+01	.1120E-03	.1473E-03	8338E-05	.2800E+04	.3430E+04	.1906E+04	.1132E+04	.8711E+02	.6617E+02
398	15.8	18.0	499.0	.1909E+01	.1212E-03	.1382E-03	7809E-05	.2764E+04	.3055E+04	.1768E+04	.1104E+04	.7313E+02	.6411E+02
399	17.9	18.0	499.0	.1776E+01	.1287E-03	.1295E-03	7303E-05	.2705E+04	.2719E+04	.1636E+04	.1053E+04	.6122E+02	.6086E+02
400	20.0	18.0	499.0	.1652E+01	.1347E-03	.1212E-03	6825E-05	.2632E+04	.2422E+04	.1512E+04	.9895E+03	.5125E+02	.5696E+02
401	-20.0	20.0	499.0	.1551E+01	.1272E-03	.1272E-03	6439E-05	.2377E+04	.2377E+04	.1412E+04	.9480E+03	.4894E+02	.4894E+02
402	-17.9	20.0	499.0	.1657E+01	.1209E-03	.1351E-03	6846E-05	.2424E+04	.2646E+04	.1517E+04	.9914E+03	.5742E+02	.5136E+02
403	-15.8	20.0	499.0	.1768E+01	.1131E-03	.1432E-03	7269E-05	.2456E+04	.2943E+04	.1627E+04	.1020E+04	.6722E+02	.5303E+02
404	-13.7	20.0	499.0	.1881E+01	.1037E-03	.1515E-03	7702E-05	.2468E+04	.3267E+04	.1740E+04	.1025E+04	.7833E+02	.5351E+02
405	-11.6	20.0	499.0	.1993E+01	.9245E-04	.1598E-03	8132E-05	.2460E+04	.3609E+04	.1852E+04	.9973E+03	.9050E+02	.5226E+02
406	-9.5	20.0	499.0	.2100E+01	.7933E-04	.1676E-03	8542E-05	.2434E+04	.3955E+04	.1955E+04	.9260E+03	.1032E+03	.4871E+02
407	-7.4	20.0	499.0	.2197E+01	.6428E-04	.1746E-03	8913E-05	.2393E+04	.4284E+04	.2056E+04	.8031E+03	.1157E+03	.4239E+02
408	-5.3	20.0	499.0	.2277E+01	.4743E-04	.1804E-03	9221E-05	.2347E+04	.4569E+04	.2136E+04	.7255E+03	.1267E+03	.3311E+02
409	-3.2	20.0	499.0	.2335E+01	.2911E-04	.1846E-03	9442E-05	.2307E+04	.4781E+04	.2194E+04	.3986E+03	.1350E+03	.2114E+02
410	-1.1	20.0	499.0	.2365E+01	.9818E-05	.1868E-03	9558E-05	.2284E+04	.4894E+04	.2225E+04	.1370E+03	.1395E+03	.7277E+01
411	1.1	20.0	499.0	.2365E+01	.9818E-05	.1868E-03	9558E-05	.2284E+04	.4894E+04	.2225E+04	.1370E+03	.1395E+03	.7277E+01
412	3.2	20.0	499.0	.2335E+01	.2911E-04	.1846E-03	9442E-05	.2307E+04	.4781E+04	.2194E+04	.3986E+03	.1350E+03	.2114E+02
413	5.3	20.0	499.0	.2277E+01	.4743E-04	.1804E-03	9221E-05	.2347E+04	.4569E+04	.2136E+04	.7255E+03	.1267E+03	.3311E+02
414	7.4	20.0	499.0	.2197E+01	.6428E-04	.1746E-03	8913E-05	.2393E+04	.4284E+04	.2056E+04	.8031E+03	.1157E+03	.4239E+02
415	9.5	20.0	499.0	.2100E+01	.7933E-04	.1676E-03	8542E-05	.2434E+04	.3955E+04	.1959E+04	.9260E+03	.1032E+03	.4871E+02
416	11.6	20.0	499.0	.1993E+01	.9245E-04	.1598E-03	8132E-05	.2460E+04	.3609E+04	.1852E+04	.9973E+03	.9050E+02	.5226E+02
417	13.7	20.0	499.0	.1881E+01	.1037E-03	.1515E-03	7702E-05	.2468E+04	.3267E+04	.1740E+04	.1025E+04	.7833E+02	.5351E+02
418	15.8	20.0	499.0	.1768E+01	.1131E-03	.1432E-03	7269E-05	.2456E+04	.2943E+04	.1627E+04	.1020E+04	.6722E+02	.5303E+02
419	17.9	20.0	499.0	.1657E+01	.1209E-03	.1351E-03	6846E-05	.2424E+04	.2646E+04	.1517E+04	.9914E+03	.5742E+02	.5136E+02
420	20.0	20.0	499.0	.1551E+01	.1272E-03	.1272E-03	6439E-05	.2377E+04	.2377E+04	.1412E+04	.9480E+03	.4894E+02	.4894E+02

TOTAL RUN TIME = 27.00000 SECONDS.

APPENDIX C

STRES3D Input and Output Files for Example Problem 2 in Section 2.3.2

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AGAPITO 4.0
EXPLORATORY SHAFT 2 - 100 YEARS AFTER EMPLACEMENT (2060 GAUSS POINTS)
289.3 54.9 5
.00546 250.
.0108 500.
.0090 1000.
.0112 1500.
.0162 2000.
3.171E9 .22 4.889E-6 0. 0. 0. 0. 0. 0.
0 32 0 1 1 1 2 80 120 100. 14000. 11000. 750000. 550000. 4150.
1 1.00 1 4 .00
.0 282.2 1.3539E-3
.0 1083.1 1.9142E-2
.0 275.8 5.1888E-2
.0 169.9 4.3768E-1
3
1 2. 16414. 14254. 3045. 304. 200. 500. 3045. 3045. 1 2 1A
1 1. 16261. 14481. 2995. 34. 400. 700. 2995. 2995. 1 2 1C
1 3. 16033. 14327. 3015. 124. 1200. 350. 3015. 3015. 3 1 2A
1 4. 15253. 13801. 3020. 34. 350. 1400. 3020. 3020. 1 3 2B
1 5. 15533. 12892. 3055. 124. 3080. 470. 3055. 3055. 6 1 3A
1 6. 15025. 12549. 3075. 124. 3080. 470. 3075. 3075. 6 1 3B
1 7.0 14407. 12132. 3105. 124. 3110. 470. 3105. 3105. 6 1 4A
1 8.0 13864. 11766. 3155. 124. 3110. 470. 3155. 3155. 6 1 4B
1 9. 13247. 11349. 3215. 124. 3010. 470. 3215. 3215. 6 1 5A
1 9. 12704. 10983. 3275. 124. 2720. 470. 3275. 3275. 4 1 5B
1 10.0 12086. 10567. 3340. 124. 2470. 470. 3340. 3340. 4 1 6A
1 11.0 11543. 10201. 3400. 124. 2150. 470. 3400. 3400. 3 1 6B
1 11.0 10926. 9784. 3470. 124. 1730. 470. 3470. 3470. 3 1 7A
1 12.0 10382. 9418. 3535. 124. 1490. 470. 3535. 3535. 2 1 7B
1 12.0 9765. 9001. 3595. 124. 1390. 470. 3595. 3595. 2 1 8A
1 13.0 9221. 8635. 3655. 124. 1510. 470. 3655. 3655. 2 1 8B
1 13.0 8665. 8259. 3710. 124. 1680. 470. 3710. 3710. 2 1 9
1 14.0 8989. 8670. 3660. 214. 470. 1510. 3660. 3660. 1 2 10A
1 13.0 9445. 8303. 3700. 214. 470. 950. 3700. 3700. 1 2 10B
1 15.0 11150. 9453. 3570. 214. 470. 2300. 3570. 3570. 1 3 11A
1 14.0 10606. 9086. 3615. 214. 470. 2000. 3615. 3615. 1 2 11B
1 16.0 12310. 10236. 3470. 214. 470. 2740. 3470. 3470. 1 4 12A
1 15.0 11767. 9869. 3520. 214. 470. 2470. 3520. 3520. 1 3 12B
1 18.0 13471. 11018. 3375. 214. 470. 3350. 3375. 3375. 1 6 13A
1 17.0 12928. 10651. 3420. 214. 470. 3010. 3420. 3420. 1 4 13B
1 19.0 14631. 11801. 3295. 214. 470. 3600. 3295. 3295. 1 6 14A
1 19.0 14088. 11434. 3330. 214. 470. 3600. 3330. 3330. 1 6 14B
1 21.0 15757. 12561. 3235. 214. 470. 3600. 3235. 3235. 1 6 15A
1 21.0 15249. 12217. 3275. 214. 470. 3600. 3275. 3275. 1 6 15B
1 23.0 16945. 13361. 3205. 214. 470. 3600. 3205. 3205. 1 6 16A
1 22.0 16365. 12970. 3225. 214. 470. 3600. 3225. 3225. 1 6 16B
1 24. 17348 13256. 3190. 304. 3300. 470. 3190. 3190. 6 1 17
100.0
64 16337. 13918. 4125. 16337. 13918. 2550.
STOP

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STRESS3D VERSION 4.0 (MAY 1989)
J.F.T. AGAPITO AND ASSOCS. (303)242 4220

EXPLORATORY SHAFT 2 - 100 YEARS AFTER EMPLACEMENT (2060 GAUSS POINTS)

QA NUMBER: AGAPITO 4.0
INPUT FILE: zss2100.in
DATE: 05/24/89

TEMPERATURES DISPLACEMENTS AND STRESSES AT TIME .10000E+03

PT	XCOORD	YCOORD	ELEV	TEMP	U	V	W	SIGXX	SIGYY	SIGZZ	SIGXY	SIGYZ	SIGZX
1	766337.0	563918.0	4125.0	.5504E+02	-1313E+00	-1706E+00	.1818E+00	-5977E+03	4535E+04	-2918E+03	-2205E+04	2835E+03	-2802E+03
2	766337.0	563918.0	4100.0	.5517E+02	-1300E+00	-1694E+00	.1817E+00	-8098E+03	4282E+04	-3783E+03	-2102E+04	7436E+03	-4959E+03
3	766337.0	563918.0	4075.0	.5531E+02	-1287E+00	-1681E+00	.1816E+00	-1093E+04	3901E+04	-4292E+03	-1849E+04	1174E+04	-6660E+03
4	766337.0	563918.0	4050.0	.5545E+02	-1274E+00	-1668E+00	.1815E+00	-1389E+04	3481E+04	-5121E+03	-1793E+04	1576E+04	-8328E+03
5	766337.0	563918.0	4025.0	.5558E+02	-1262E+00	-1654E+00	.1815E+00	-1664E+04	3094E+04	-6597E+03	-1648E+04	1930E+04	-9993E+03
6	766337.0	563918.0	4000.0	.5572E+02	-1250E+00	-1639E+00	.1814E+00	-1913E+04	2756E+04	-8666E+03	-1525E+04	2259E+04	-1170E+04
7	766337.0	563918.0	3975.0	.5586E+02	-1238E+00	-1624E+00	.1813E+00	-2132E+04	2471E+04	-1128E+04	-1426E+04	2562E+04	-1340E+04
8	766337.0	563918.0	3950.0	.5599E+02	-1227E+00	-1608E+00	.1811E+00	-2418E+04	2249E+04	-141E+04	-1330E+04	2716E+04	-1560E+04
9	766337.0	563918.0	3925.0	.5613E+02	-1216E+00	-1592E+00	.1810E+00	-2732E+04	2091E+04	-1633E+04	-1301E+04	3058E+04	-1791E+04
10	766337.0	563918.0	3900.0	.5627E+02	-1206E+00	-1576E+00	.1809E+00	-2625E+04	1968E+04	-2090E+04	-1281E+04	3377E+04	-1849E+04
11	766337.0	563918.0	3875.0	.5654E+02	-1195E+00	-1559E+00	.1807E+00	-2717E+04	1889E+04	-2549E+04	-1281E+04	3681E+04	-1995E+04
12	766337.0	563918.0	3850.0	.5681E+02	-1185E+00	-1542E+00	.1805E+00	-2795E+04	1855E+04	-3027E+04	-1297E+04	3985E+04	-2134E+04
13	766337.0	563918.0	3825.0	.5708E+02	-1175E+00	-1525E+00	.1803E+00	-2848E+04	1860E+04	-3532E+04	-1332E+04	4296E+04	-2273E+04
14	766337.0	563918.0	3800.0	.5735E+02	-1165E+00	-1507E+00	.1800E+00	-2876E+04	1910E+04	-4069E+04	-1384E+04	4614E+04	-2401E+04
15	766337.0	563918.0	3775.0	.5763E+02	-1156E+00	-1489E+00	.1797E+00	-2888E+04	2013E+04	-4641E+04	-1457E+04	4949E+04	-2511E+04
16	766337.0	563918.0	3750.0	.5790E+02	-1147E+00	-1471E+00	.1793E+00	-2867E+04	2152E+04	-5246E+04	-1532E+04	5304E+04	-2617E+04
17	766337.0	563918.0	3725.0	.5818E+02	-1138E+00	-1452E+00	.1788E+00	-2818E+04	2334E+04	-5888E+04	-1625E+04	5684E+04	-2707E+04
18	766337.0	563918.0	3700.0	.5846E+02	-1129E+00	-1433E+00	.1783E+00	-2747E+04	2570E+04	-6567E+04	-1733E+04	6083E+04	-2780E+04
19	766337.0	563918.0	3675.0	.5875E+02	-1121E+00	-1413E+00	.1778E+00	-2647E+04	2853E+04	-7282E+04	-1845E+04	6513E+04	-2838E+04
20	766337.0	563918.0	3650.0	.5904E+02	-1113E+00	-1393E+00	.1772E+00	-2514E+04	3185E+04	-8038E+04	-1963E+04	6966E+04	-2878E+04
21	766337.0	563918.0	3625.0	.5929E+02	-1104E+00	-1373E+00	.1765E+00	-2352E+04	3579E+04	-8835E+04	-2088E+04	7439E+04	-2893E+04
22	766337.0	563918.0	3600.0	.5955E+02	-1096E+00	-1352E+00	.1757E+00	-2146E+04	4018E+04	-9669E+04	-2207E+04	7940E+04	-2898E+04
23	766337.0	563918.0	3575.0	.5982E+02	-1089E+00	-1331E+00	.1749E+00	-1903E+04	4522E+04	-1055E+05	-2331E+04	8468E+04	-2877E+04
24	766337.0	563918.0	3550.0	.6010E+02	-1081E+00	-1309E+00	.1739E+00	-1619E+04	5096E+04	-1147E+05	-2445E+04	9009E+04	-2834E+04
25	766337.0	563918.0	3525.0	.6040E+02	-1073E+00	-1287E+00	.1729E+00	-1279E+04	5735E+04	-1244E+05	-2551E+04	9569E+04	-2769E+04
26	766337.0	563918.0	3500.0	.6071E+02	-1065E+00	-1267E+00	.1717E+00	-8940E+03	6465E+04	-1345E+05	-2647E+04	1011E+05	-2677E+04
27	766337.0	563918.0	3475.0	.6104E+02	-1058E+00	-1241E+00	.1705E+00	-4491E+03	7256E+04	-1450E+05	-2713E+04	1070E+05	-2562E+04
28	766337.0	563918.0	3450.0	.6140E+02	-1050E+00	-1217E+00	.1691E+00	-6756E+02	8134E+04	-1560E+05	-2764E+04	1126E+05	-2431E+04
29	766337.0	563918.0	3425.0	.6178E+02	-1043E+00	-1193E+00	.1676E+00	-6430E+03	9113E+04	-1675E+05	-2786E+04	1178E+05	-2274E+04
30	766337.0	563918.0	3400.0	.6218E+02	-1035E+00	-1169E+00	.1659E+00	-1291E+04	1018E+05	-1794E+05	-2784E+04	1229E+05	-2102E+04
31	766337.0	563918.0	3375.0	.6262E+02	-1027E+00	-1144E+00	.1641E+00	-2013E+04	1135E+05	-1918E+05	-2748E+04	1273E+05	-1923E+04
32	766337.0	563918.0	3350.0	.6308E+02	-1019E+00	-1119E+00	.1621E+00	-2809E+04	1260E+05	-2045E+05	-2674E+04	1309E+05	-1729E+04
33	766337.0	563918.0	3325.0	.6357E+02	-1012E+00	-1093E+00	.1600E+00	-3675E+04	1394E+05	-2175E+05	-2565E+04	1337E+05	-1540E+04
34	766337.0	563918.0	3300.0	.6409E+02	-1004E+00	-1068E+00	.1577E+00	-4604E+04	1535E+05	-2307E+05	-2415E+04	1352E+05	-1356E+04
35	766337.0	563918.0	3275.0	.6463E+02	-9958E-01	-1042E+00	.1552E+00	-5578E+04	1682E+05	-2440E+05	-2229E+04	1353E+05	-1189E+04
36	766337.0	563918.0	3250.0	.6518E+02	-9878E-01	-1017E+00	.1525E+00	-6592E+04	1831E+05	-2573E+05	-2010E+04	1338E+05	-1050E+04
37	766337.0	563918.0	3225.0	.6574E+02	-9798E-01	-9918E-01	.1496E+00	-7616E+04	1982E+05	-2704E+05	-1767E+04	1305E+05	-9469E+03
38	766337.0	563918.0	3200.0	.6630E+02	-9719E-01	-9672E-01	.1465E+00	-8627E+04	2128E+05	-2829E+05	-1511E+04	1252E+05	-8908E+03
39	766337.0	563918.0	3175.0	.6685E+02	-9641E-01	-9435E-01	.1433E+00	-9594E+04	2265E+05	-2946E+05	-1244E+04	1177E+05	-8883E+03
40	766337.0	563918.0	3150.0	.6737E+02	-9563E-01	-9207E-01	.1399E+00	-1048E+05	2390E+05	-3051E+05	-994E+03	1082E+05	-9416E+03
41	766337.0	563918.0	3125.0	.6790E+02	-9487E-01	-8989E-01	.1364E+00	-1124E+05	2496E+05	-3142E+05	-7796E+03	9662E+04	-1051E+04
42	766337.0	563918.0	3100.0	.6837E+02	-9414E-01	-8785E-01	.1327E+00	-1185E+05	2578E+05	-3213E+05	-6055E+03	8323E+04	-1205E+04
43	766337.0	563918.0	3075.0	.6889E+02	-9343E-01	-8596E-01	.1289E+00	-1227E+05	2631E+05	-3262E+05	-4971E+03	6840E+04	-1391E+04
44	766337.0	563918.0	3050.0	.6933E+02	-9276E-01	-8423E-01	.1251E+00	-1249E+05	2652E+05	-3287E+05	-4615E+03	5259E+04	-1588E+04
45	766337.0	563918.0	3025.0	.6989E+02	-9209E-01	-8265E-01	.1213E+00	-1248E+05	2641E+05	-3286E+05	-5121E+03	3635E+04	-1769E+04
46	766337.0	563918.0	3000.0	.6958E+02	-9147E-01	-8123E-01	.1175E+00	-1226E+05	2596E+05	-3260E+05	-6342E+03	2023E+04	-1912E+04
47	766337.0	563918.0	2975.0	.6971E+02	-9087E-01	-8000E-01	.1138E+00	-1184E+05	2521E+05	-3210E+05	-8216E+03	4794E+03	-1994E+04
48	766337.0	563918.0	2950.0	.6977E+02	-9028E-01	-7891E-01	.1101E+00	-1125E+05	2419E+05	-3139E+05	-1059E+04	9537E+03	-2001E+04
49	766337.0	563918.0	2925.0	.6978E+02	-8971E-01	-7796E-01	.1066E+00	-1051E+05	2295E+05	-3050E+05	-1327E+04	2243E+04	-1922E+04
50	766337.0	563918.0	2900.0	.6976E+02	-8912E-01	-7714E-01	.1032E+00	-9657E+04	2154E+05	-2947E+05	-1616E+04	3364E+04	-1762E+04
51	766337.0	563918.0	2875.0	.6971E+02	-8852E-01	-7643E-01	.1000E+00	-8741E+04	2000E+05	-2833E+05	-1900E+04	4311E+04	-1523E+04
52	766337.0	563918.0	2850.0	.6966E+02	-8791E-01	-7582E-01	.9699E-01	-7767E+04	1840E+05	-2711E+05	-2163E+04	5078E+04	-1216E+04
53	766337.0	563918.0	2825.0	.6961E+02	-8727E-01	-7528E-01	.9414E-01	-6804E+04	1678E+05	-2585E+05	-2403E+04	5673E+04	-8546E+03
54	766337.0	563918.0	2800.0	.6956E+02	-8660E-01	-7480E-01	.9149E-01	-5848E+04	1516E+05	-2456E+05	-2606E+04	6111E+04	-4547E+03
55	766337.0	563918.0	2775.0	.6954E+02	-8591E-01	-7437E-01	.8901E-01	-4928E+04	1357E+05	-2328E+05	-2770E+04	6403E+04	-2624E+02
56	766337.0	563918.0	2750.0	.6954E+02	-8517E-01	-7396E-01	.8671E-01	-4050E+04	1205E+05	-2200E+05	-2892E+04	6564E+04	-4138E+03
57	766337.0	563918.0	2725.0	.6956E+02	-8441E-01	-7359E-01	.8459E-01	-3235E+04	1061E+05	-2075E+05	-2976E+04	6613E+04	-8556E+03
58	766337.0	563918.0	2700.0	.6952E+02	-8362E-01	-7321E-01	.8263E-01	-2483E+04	9245E+04	-1954E+05	-3022E+04	6567E+04	-1289E+04
59	766337.0	563918.0	2675.0	.6970E+02	-8278E-01	-7286E-01	.8082E-01	-1797E+04	7977E+04	-1837E+05	-3034E+04	6237E+04	-1703E+04
60	766337.0	563918.0	2650.0	.6980E+02	-8193E-01	-7246E-01	.7918E-01	-1181E+04	6795E+04	-1724E+05	-3002E+04	6253E+04	-1204E+04
61	766337.0	563918.0	2625.0	.7006E+02	-8103E-01	-7209E-01	.7765E-01	-6250E+03	5717E+04	-1618E+05	-2957E+04	6007E+04	-2468E+04
62	766337.0	563918.0	2600.0	.7035E+02	-8011E-01	-7169E-01	.7625E-01	-1282E+03	4728E+04	-1516E+05	-2882E+04	5727E+04	-2805E+04
63	766337.0	563918.0	2575.0	.7065E+02	-7918E-01	-7127E-01	.7497E-01	-3067E+03	3822E+04	-1420E+05	-2792E+04	5418E+04	-3115E+04
64	766337.0	563918.0	2550.0	.7097E+02	-7821E-01	-7084E-01	.7380E-01	-6956E+03	2999E+04	-1330E+05	-2682E+04	5087E+04	-3537E+03

APPENDIX D

Output Files and FORTRAN Program Listing of Program CERR to Compare the Single Point and Distributed Shear Stress Effects on a Location Not on the Free Surface

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C PROGRAM CERR
COMMON /MATROP/ ALPHA, DIFF, E,
1 G, PR
DIMENSION CSIG(6,200),CSIG1(6,200),CU(200),CV(200),CW(200),
CU1(200),CV1(200),CW1(200),X(200),Y(200),Z(200),SIG(6)
C CHARACTER FILE1*64,CH*1
E=3 171E8
PR= 22
G=E/(2.+2.*PR)
C DO 5 I=1,200
CU(I)=0
CU1(I)=0
CV(I)=0
CV1(I)=0
CW(I)=0
CW1(I)=0
DO 5 J=1,6
CSIG(J,I)=0.0
5 CSIG1(J,I)=0.0
C WRITE(0,'(A)') 'Enter outfile for results '
READ(0,'(A)')FILE1
OPEN(10,FILE=FILE1,STATUS='UNKNOWN')
C WRITE(0,'(A)') 'Enter X, Y, Z coordinate for start point '
10 READ(0,*)X1,Y1,Z1
C WRITE(0,'(A)') 'Enter X, Y, Z coordinate for end point '
C READ(0,*)X2,Y2,Z2
C WRITE(0,'(A)') 'Enter the number of points '
C READ(0,*)NPOINT
C DX=(X2-X1)/FLOAT(NPOINT-1)
DY=(Y2-Y1)/FLOAT(NPOINT-1)
C DZ=(Z2-Z1)/FLOAT(NPOINT-1)
C WRITE(0,'(A)') 'Enter SW for the surface element in CERUT1 '
C READ(0,*)SW
C WRITE(0,'(A)') 'Enter tangential forces TX, TY '
C READ(0,*)TX,TY
C WRITE(0,30)CHAR(7)
29 FORMAT('Enter number of ROWS of surface elements '/
30 (MUST BE ODD ! ROWS=COLUMNS) ',A1,' \')
READ(0,*)NROW
NCOL=NROW
IF(MOD(NROW,2).EQ.0)GO TO 29
C X(1)=X1
Y(1)=Y1
Z(1)=Z1
DO 49 I=2,NPOINT
X(I)=X(I-1)+DX
49 Y(I)=Y(I-1)+DY
Z(I)=Z(I-1)+DZ
C SW1=SW/FLOAT(NROW)
DO 50 NR=1,NROW
DO 50 NC=1,NCOL
C DO 50 I=1,NPOINT
NCLOC=(NC-(NCOL/2+1))
NRLOC=(NR-(NROW/2+1))
XD=X(I)+2.*SW1*FLOAT(NCLOC)
YD=Y(I)+2.*SW1*FLOAT(NRLOC)
C IF(.EQ.1)THEN
C write(0,*) 'nr,nc,i=',nr,nc,i
C write(0,*) 'ncloc,nrloc,xd,yd=',ncloc,nrloc,xd,yd
C ENDIF
CALL CERUT1(TX,TY,XD,YD,Z(I),SW1,U,V,W,SIG)
CU(I)=CU(I)+U
CV(I)=CV(I)+V
CW(I)=CW(I)+W
DO 48 K=1,6
48 CSIG(K,I)=CSIG(K,I)+SIG(K)
50 CONTINUE
C WRITE(10,16)NROW,NCOL
16 FORMAT(' SURFACE DIVIDED INTO ',I3,' BY ',I3,' ELEMENTS')
WRITE(10,20)SW1,TX,TY
20 FORMAT(' SW1, TX, TY = ',F8.4,2F12.4)
C WRITE(10,18)
18 FORMAT(' RESULTS FOR CERUT1 (POINT SOLUTION)')
C WRITE(10,21)
21 FORMAT(
' X Y Z U V W',
' SX',
' SY',
' SZ SXY SYZ SZX')
C DO 60 I=1,NPOINT
WRITE(10,61)X(I),Y(I),Z(I),CU(I),CV(I),CW(I),(CSIG(J,I),J=1,6)
60 FORMAT(3F7.2,3E11.4,6E12.4)
C WRITE(10,17)
17 FORMAT(' SURFACE DIVIDED INTO 1 ELEMENT')
WRITE(10,15)SW,TX,TY
15 FORMAT(' SW, TX, TY = ',F8.4,2F12.4)
WRITE(10,19)
19 FORMAT(' RESULTS FOR CERUT1 (DISTRIBUTED SOLUTION)')
C WRITE(10,21)
C DO 62 I=1,NPOINT
52 CALL CERUT1(TX,TY,X(I),Y(I),Z(I),SW,CU1(I),CV1(I),CW1(I),
CSIG1(1,I))
C DO 62 I=1,NPOINT
62 WRITE(10,61)X(I),Y(I),Z(I),CU1(I),CV1(I),CW1(I),(CSIG1(J,I),J=1,6)
C

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```

C      STOP
C      END
C-----
C      SUBROUTINE CERUTI (TX,TY,XL,YL,ZL,SW,U,V,W,SIG)
C      SUBROUTINE TO EVALUATE DISPLACEMENTS AND STRESSES
C      RESULTING FROM SURFACE SHEARS
C
C      DIMENSION      SIG(6)
C      COMMON /MATROP/ ALPHA, DIFF, E,
C      1 G PR
C      AREA=4.0*SW*SW
C      X=XL
C      Y=YL
C      Z=ZL
C      CON=1.0-2.0*PR
C      PX=TX*0.159154943091895*AREA
C      PY=TY*0.159154943091895*AREA
C      X2=X*X
C      Y2=Y*Y
C      Z2=Z*Z
C      R2=X2+Y2+Z2
C      IF (R2.EQ.0.0) GO TO 1010
C      R=SQRT(R2)
C      R3=R*R2
C      R5=R2*R3
C      RZ=R2*PR
C      GR2=2.0*G*R
C      U=(-PX*(1.0+X2/R2+CON*(R/RZ-X2/RZ2))-PY*(X*Y/R2-CON*X*Y/RZ2))/GR2
C      V=(-PX*(X*Y/R2-CON*X*Y/RZ2)-PY*(1.0+Y2/R2+CON*(R/RZ-Y2/RZ2)))/GR2
C      W=(-PX*(X2/R2+CON*X/RZ)-PY*(Y2/R2+CON*Y/RZ))/GR2
C      SIG(1)=(PX*X*(3.0*X2/R2-CON/RZ2*(R2-Y2-2.0*R*Y2/RZ))+PY*Y*(3.0*X2/
C      1 R2-CON/RZ2*(3.0*R2-Y2-2.0*R*Y2/RZ)))/R3
C      SIG(2)=(PX*X*(3.0*Y2/R2-CON/RZ2*(3.0*R2-X2-2.0*R*X2/RZ))+PY*Y*(3.0
C      1 Y2/R2-CON/RZ2*(R2-X2-2.0*R*X2/RZ)))/R3
C      SIG(3)=3.0*Z2*(PX*X+PY*Y)/R5
C      SIG(4)=(PX*Y*(3.0*X2/R2-CON/RZ2*(-R2+X2+2.0*R*X2/RZ))+PY*X*(3.0*Y2
C      1 /R2-CON/RZ2*(-R2+Y2+2.0*R*Y2/RZ)))/R3
C      SIG(5)=3.0*(X*Y*Z*PX+Y2*Z*PY)/R5
C      SIG(6)=3.0*(X2*Z*PX+X*Y*Z*PY)/R5
C      RETURN
C      1010 WRITE (6,1020)
C      STOP
C
C      1020 FORMAT (38H ILLEGAL TO CALCULATE FOR FREE SURFACE)
C      END
C-----
C      SUBROUTINE CERUTI (TX,TY,XL,YL,ZL,SW,U,V,W,SIG)
C      SUBROUTINE TO EVALUATE DISPLACEMENTS AND STRESSES
C      RESULTING FROM SURFACE SHEAR STRESSES CONSIDERED AS ACTING
C      UNIFORMLY OVER EACH SURFACE SHEAR ELEMENT
C
C      DIMENSION      PX(2), PY(2), SIG(6)
C      COMMON /MATROP/ ALPHA, DIFF, E,
C      1 G PR
C      DATA PX(1),PX(2),PY(1),PY(2),ONE/-1.,1.,-1.,1.,1./
C      PR3=2.*PR
C      PR1=1.-PR3
C      PR2=1.+PR1
C      PI2=2.*ATAN(1.0)
C      G1=-1./(2.*G)
C      SX=TX/(4.0*PI2)
C      SY=TY/(4.0*PI2)
C      DX=SX*G1
C      DY=SY*G1
C      U=0.0
C      V=0.0
C      W=0.0
C      DO 1010 I=1,5
C      1010 SIG(I)=0.0
C      X0=XL
C      Y0=YL
C      Z=ZL
C      Z2=Z*Z
C
C      INTEGRATE OVER THE ELEMENT
C
C      DO 1050 I=1,2
C      X=X0+SW*PX(I)
C      X2=X*X
C      AX=SIGN(ONE,X)
C      DO 1040 J=1,2
C      Y=Y0+SW*PY(J)
C      AY=SIGN(ONE,Y)
C
C      FIRST EVALUATE THE EXPRESSIONS THAT ARE REPEATEDLY USED IN
C      COMPUTING DISPLACEMENTS AND STRESSES.
C
C      PXY=PX(I)*PY(J)
C      Y2=Y*Y
C      R2=X2+Y2+Z2
C      R=SQRT(R2)
C      R1=1./R
C      RMX=R*X
C      RMY=R*Y
C      RML=R*Z
C      ZRI=Z*RI
C      XR=X+R
C      YR=Y+R
C      ZR=Z+R
C      XY=X*Y
C      YZ=Y*Z
C      ZX=Z*X
C      XY2=X*Y*Z
C      Y2Z=Y2+Z2
C      X2Z=X2+Z2
C      XRLOG=ALOG(XR)
C      YRLOG=ALOG(YR)
C      ZRLOG=ALOG(ZR)

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      THETA=(X2Z2+RMZ)/(SQRT(X2Z2)*ZR)
      IF (ABS(THETA).GT.1.0) THETA=THETA/ABS(THETA)
      FI1=(PI2-ASIN(THETA))*AY
C      FI1=(PI2-ASIN(THETA))
      THETA=(Y2Z2+RMZ)/(SQRT(Y2Z2)*ZR)
      IF (ABS(THETA).GT.1.0) THETA=THETA/ABS(THETA)
C      FI3=(PI2-ASIN(THETA))*AX
      FI3=(PI2-ASIN(THETA))
      IF (Z.EQ.0) GO TO 1020
      THETA=(X2Z2+RMX)/(SQRT(X2Z2)*XR)
      IF (ABS(THETA).GT.1.0) THETA=THETA/ABS(THETA)
C      FI2=(PI2-ASIN(THETA))*AY
      FI2=(PI2-ASIN(THETA))
      THETA=(Y2Z2+RMY)/(SQRT(Y2Z2)*YR)
      IF (ABS(THETA).GT.1.0) THETA=THETA/ABS(THETA)
C      FI4=(PI2-ASIN(THETA))*AX
      FI4=(PI2-ASIN(THETA))
      FI5=ATAN(XY/RMZ)
      GO TO 1030
1020  FI2=-PI2
      FI4=-PI2
      FI5=SIGN(PI2,XY)
1030  XR=1./(XR*R)
      YR=1./(YR*R)
      ZR=1./(ZR*R)
      X2Z2=1./X2Z2
      Y2Z2=1./Y2Z2
      THETA=(PR3*R+Z)*ZR
CC
CC      THEN COMPUTE THE DISPLACEMENTS AND STRESSES.
      BB=ABS(Z)
      U=U+DX*(PR2*X*YRLOG+2.*Y*XRLOG+BB*(FI2+FI4)-FR1*Z*FI1*AX)-DY*
1      (PR3*R+PR1*Z*ZRLOG)*I*XY
      V=V-DX*(PR3*R+PR1*Z*ZRLOG)-DY*(PR2*Y*XRLOG+2.*X*YRLOG+BB*(FI2
1      +FI4)-PR1*Z*FI3*AY)*PXY
      W=W+DX*(PR1*(Y*ZRLOG+X*AX*FI1)-PR3*Z*YRLOG)+DY*(PR1*(X*ZRLOG+
1      Y*AY*FI3)-PR3*Z*XRLOG)*PXY
      SIG(1)=SIG(1)+(SX*(X2Z2*ZR*(PR1*R*Z2-Z*X2-PR3*R*X2)*Y-2.*YRLOG
1      )+SY*(THETA*X-PR3*XRLOG))*PXY
      SIG(2)=SIG(2)+(SX*(THETA*Y-PR3*YRLOG)+SY*(Y2Z2*ZR*(PR1*R*Z2-Z*
1      Y2-PR3*R*Y2)*X-2.*XRLOG))*PXY
      SIG(3)=SIG(3)-ZR1*(SX*Y2*X2Z2+SY*ZX*Y2Z2)*PXY
      SIG(4)=SIG(4)+(SX*(THETA*X-XRLOG)+SY*(THETA*Y-YRLOG))*PXY
      SIG(5)=SIG(5)+(SX*ZR1+SY*(FI5-XYZ*Y2Z2*R1))*PXY
      SIG(6)=SIG(6)+(SX*(FI5-XYZ*X2Z2*R1)+SY*ZR1)*PXY
1040  CONTINUE
1050  RETURN
      END

```


SURFACE DIVIDED INTO 5 BY 5 ELEMENTS
 SW TX TY = 10.0000 10000.0000 0.0000
 RESULTS FOR CERUT1 (POINT SOLUTION)

X	Y	Z	U	V	W	SX	SY	SZ	SXY	SYZ	SZX
10.00	10.00	0.01	-3672E-03	-3349E-04	-7592E-04	8969E+04	2618E+04	9384E-01	5277E+04	2083E+02	2296E+02
10.00	10.00	1.03	-3593E-03	-4013E-04	-8275E-04	7258E+04	2522E+04	7513E+03	4939E+04	1664E+04	1874E+04
10.00	10.00	2.05	-3421E-03	-3958E-04	-8474E-04	5362E+04	1645E+04	1563E+04	3612E+04	1898E+04	2267E+04
10.00	10.00	3.07	-3231E-03	-3731E-04	-8357E-04	4095E+04	1084E+04	1734E+04	2671E+04	1618E+04	2078E+04
10.00	10.00	4.09	-3050E-03	-3491E-04	-8131E-04	3260E+04	7881E+03	1669E+04	2100E+04	1368E+04	1853E+04
10.00	10.00	5.11	-2881E-03	-3257E-04	-7866E-04	2651E+04	6066E+03	1578E+04	1716E+04	1194E+04	1686E+04
10.00	10.00	6.13	-2723E-03	-3029E-04	-7581E-04	2178E+04	4776E+03	1497E+04	1430E+04	1065E+04	1533E+04
10.00	10.00	7.15	-2576E-03	-2807E-04	-7281E-04	1801E+04	3784E+03	1424E+04	1205E+04	9580E+03	1393E+04
10.00	10.00	8.17	-2439E-03	-2594E-04	-6974E-04	1495E+04	2995E+03	1356E+04	1023E+04	8650E+03	1263E+04
10.00	10.00	9.19	-2311E-03	-2392E-04	-6665E-04	1246E+04	2360E+03	1289E+04	8720E+03	7817E+03	1143E+04
10.00	10.00	10.21	-2193E-03	-2201E-04	-6356E-04	1042E+04	1844E+03	1223E+04	7463E+03	7065E+03	1032E+04
10.00	10.00	11.23	-2083E-03	-2023E-04	-6052E-04	8726E+03	1424E+03	1157E+04	6408E+03	6382E+03	9308E+03
10.00	10.00	12.25	-1982E-03	-1858E-04	-5756E-04	7326E+03	1082E+03	1093E+04	5519E+03	5762E+03	8383E+03
10.00	10.00	13.27	-1887E-03	-1705E-04	-5469E-04	6163E+03	8035E+02	1030E+04	4765E+03	5200E+03	7543E+03
10.00	10.00	14.29	-1799E-03	-1565E-04	-5193E-04	5194E+03	5778E+02	9684E+03	4125E+03	4691E+03	6782E+03
10.00	10.00	15.31	-1718E-03	-1436E-04	-4928E-04	4386E+03	3952E+02	9095E+03	3580E+03	4231E+03	6097E+03
10.00	10.00	16.33	-1642E-03	-1318E-04	-4675E-04	3710E+03	2481E+02	8531E+03	3115E+03	3616E+03	5480E+03
10.00	10.00	17.35	-1571E-03	-1211E-04	-4435E-04	3145E+03	1302E+02	7993E+03	2718E+03	3443E+03	4927E+03
10.00	10.00	18.37	-1506E-03	-1112E-04	-4207E-04	2670E+03	3627E+01	7483E+03	2375E+03	3107E+03	4431E+03
10.00	10.00	19.39	-1445E-03	-1023E-04	-3992E-04	2271E+03	3799E+01	7002E+03	2081E+03	2805E+03	3988E+03
10.00	10.00	20.41	-1387E-03	-9413E-05	-3788E-04	1935E+03	9614E+01	6548E+03	1829E+03	2534E+03	3591E+03
10.00	10.00	21.43	-1334E-03	-8671E-05	-3596E-04	1651E+03	1411E+02	6123E+03	1611E+03	2291E+03	3236E+03
10.00	10.00	22.45	-1284E-03	-7995E-05	-3415E-04	1412E+03	1754E+02	5725E+03	1422E+03	2073E+03	2920E+03
10.00	10.00	23.47	-1238E-03	-7399E-05	-3245E-04	1209E+03	2009E+02	5358E+03	1259E+03	1878E+03	2637E+03
10.00	10.00	24.49	-1194E-03	-6818E-05	-3085E-04	1037E+03	2194E+02	5006E+03	1117E+03	1702E+03	2384E+03
10.00	10.00	25.52	-1153E-03	-6307E-05	-2935E-04	8909E+02	2322E+02	4682E+03	9936E+02	1545E+03	2158E+03
10.00	10.00	26.54	-1114E-03	-5840E-05	-2793E-04	7665E+02	2403E+02	4381E+03	8860E+02	1404E+03	1956E+03
10.00	10.00	27.56	-1078E-03	-5415E-05	-2660E-04	6604E+02	2449E+02	4102E+03	7919E+02	1277E+03	1754E+03
10.00	10.00	28.58	-1044E-03	-5026E-05	-2535E-04	5698E+02	2465E+02	3842E+03	7094E+02	1163E+03	1612E+03
10.00	10.00	29.60	-1012E-03	-4670E-05	-2417E-04	4922E+02	2458E+02	3600E+03	6370E+02	1060E+03	1467E+03
10.00	10.00	30.62	-9813E-04	-4345E-05	-2306E-04	4256E+02	2433E+02	3376E+03	5733E+02	9679E+02	1327E+03
10.00	10.00	31.64	-9525E-04	-4047E-05	-2202E-04	3685E+02	2394E+02	3167E+03	5172E+02	8847E+02	1219E+03
10.00	10.00	32.66	-9253E-04	-3774E-05	-2104E-04	3193E+02	2345E+02	2974E+03	4675E+02	8096E+02	1114E+03
10.00	10.00	33.68	-8995E-04	-3523E-05	-2012E-04	2769E+02	2288E+02	2794E+03	4236E+02	7419E+02	1019E+03
10.00	10.00	34.70	-8750E-04	-3292E-05	-1925E-04	2402E+02	2225E+02	2627E+03	3846E+02	6806E+02	9332E+02
10.00	10.00	35.72	-8516E-04	-3080E-05	-1843E-04	2086E+02	2157E+02	2472E+03	3499E+02	6252E+02	8559E+02
10.00	10.00	36.74	-8296E-04	-2885E-05	-1766E-04	1812E+02	2088E+02	2248E+03	3188E+02	5750E+02	7860E+02
10.00	10.00	37.76	-8086E-04	-2705E-05	-1693E-04	1574E+02	2019E+02	2193E+03	2913E+02	5295E+02	7248E+02
10.00	10.00	38.78	-7885E-04	-2539E-05	-1624E-04	1367E+02	1948E+02	2068E+03	2666E+02	4882E+02	6655E+02
10.00	10.00	39.80	-7694E-04	-2385E-05	-1559E-04	1187E+02	1878E+02	1952E+03	2444E+02	4506E+02	6135E+02
10.00	10.00	40.82	-7512E-04	-2243E-05	-1497E-04	1030E+02	1808E+02	1843E+03	2245E+02	4164E+02	5663E+02
10.00	10.00	41.84	-7338E-04	-2112E-05	-1439E-04	8939E+01	1739E+02	1742E+03	2065E+02	3852E+02	5233E+02
10.00	10.00	42.86	-7171E-04	-1996E-05	-1384E-04	7747E+01	1673E+02	1624E+03	1873E+02	3568E+02	4842E+02
10.00	10.00	43.88	-7011E-04	-1877E-05	-1332E-04	6705E+01	1607E+02	1560E+03	1757E+02	3309E+02	4485E+02
10.00	10.00	44.90	-6859E-04	-1772E-05	-1282E-04	5793E+01	1544E+02	1477E+03	1625E+02	3072E+02	4160E+02
10.00	10.00	45.92	-6712E-04	-1674E-05	-1235E-04	4995E+01	1483E+02	1400E+03	1505E+02	2854E+02	3862E+02
10.00	10.00	46.94	-6572E-04	-1583E-05	-1191E-04	4295E+01	1424E+02	1328E+03	1396E+02	2655E+02	3590E+02
10.00	10.00	47.96	-6437E-04	-1499E-05	-1148E-04	3681E+01	1368E+02	1261E+03	1297E+02	2473E+02	3340E+02
10.00	10.00	48.98	-6307E-04	-1420E-05	-1108E-04	3142E+01	1313E+02	1198E+03	1207E+02	2305E+02	3111E+02
10.00	10.00	49.00	-6183E-04	-1346E-05	-1070E-04	2669E+01	1261E+02	1139E+03	1124E+02	2151E+02	2901E+02

SURFACE DIVIDED INTO 1 ELEMENT
 SW TX TY = 10.0000 10000.0000 0.0000
 RESULTS FOR CERUT1 (DISTRIBUTED SOLUTION)

X	Y	Z	U	V	W	SX	SY	SZ	SXY	SYZ	SZX
10.00	10.00	0.01	-3840E-03	-3176E-04	-7780E-04	2221E+05	4986E+04	1592E+04	1159E+05	1591E+04	2498E+04
10.00	10.00	1.03	-3623E-03	-3160E-04	-8282E-04	5346E+04	1720E+04	1586E+04	1498E+04	1486E+04	2326E+04
10.00	10.00	2.05	-3418E-03	-3604E-04	-8222E-04	5346E+04	1720E+04	1586E+04	1498E+04	1486E+04	2326E+04
10.00	10.00	3.07	-3226E-03	-3497E-04	-8124E-04	4118E+04	9353E+03	1547E+04	2450E+04	1280E+04	1990E+04
10.00	10.00	4.09	-3045E-03	-3347E-04	-7952E-04	3280E+04	7332E+03	1515E+04	2002E+04	1182E+04	1829E+04
10.00	10.00	5.11	-2876E-03	-3143E-04	-7727E-04	2660E+04	5814E+03	1474E+04	1664E+04	1086E+04	1674E+04
10.00	10.00	6.13	-2719E-03	-2940E-04	-7467E-04	2180E+04	4630E+03	1427E+04	1397E+04	9958E+03	1527E+04
10.00	10.00	7.15	-2535E-03	-2735E-04	-7186E-04	1800E+04	3687E+03	1373E+04	1182E+04	9100E+03	1389E+04
10.00	10.00	8.17	-2353E-03	-2535E-04	-6892E-04	1400E+04	2926E+03	1259E+04	9294E+03	8254E+03	1260E+04
10.00	10.00	9.19	-2190E-03	-2341E-04	-6593E-04	1124E+04	2308E+03	1259E+04	8866E+03	7542E+03	1140E+04
10.00	10.00	10.21	-2190E-03	-2158E-04	-6292E-04	1040E+04	1805E+03	1199E+04	7558E+03	6845E+03	1029E+04
10.00	10.00	11.23	-2080E-03	-1986E-04	-5995E-04	8717E+03	1394E+03	1137E+04	6324E+03	6203E+03	9280E+03
10.00	10.00	12.25	-1979E-03	-1826E-04	-5705E-04	7320E+03	1060E+03	1075E+04	5451E+03	5614E+03	8357E+03
10.00	10.00	13.27	-1884E-03	-1678E-04	-5423E-04	6160E+03	7871E+02	1015E+04	4710E+03	5076E+03	7519E+03
10.00	10.00	14.29	-1797E-03	-1541E-04	-5148E-04	5194E+03	5658E+02	9553E+03	4080E+03	4586E+03	6762E+03
10.00	10.00	15.31	-1716E-03	-1415E-04	-4890E-04	4388E+03	3866E+02	8428E+03	3543E+03	4142E+03	6079E+03
10.00	10.00	16.33	-1640E-03	-1300E-04	-4641E-04	3714E+03	3241E+02	8428E+03	3084E+03	3740E+03	5465E+03
10.00	10.00	17.35	-1570E-03	-1195E-04	-4404E-04	3150E+03	1263E+02	7901E+03	2692E+03	3378E+03	4914E+03
10.00	10.00	18.37	-1504E-03	-1098E-04	-4176E-04	2676E+03	3396E+01	7401E+03	2354E+03	3051E+03	4421E+03
10.00	10.00	19.39	-1443E-03	-1010E-04	-3966E-04	2277E+03	3906E+01	6928E+03	2065E+03	2757E+03	3979E+03
10.00	10.00	20.41	-1386E-03	-9304E-05	-3764E-04	1942E+03	9627E+01	6482E+03	1815E+03	2493E+03	3584E+03
10.00	10.00	21.43	-1333E-03	-8574E-05	-3575E-04	1658E+03	1406E+02	6063E+03	1599E+03	2255E+03	3231E+03
10.00	10.00	22.45	-1283E-03	-7910E-05	-3396E-04	1419E+03	1743E+02	5671E+03	1413E+03	2042E+03	2916E+03
10.00	10.00	23.47	-1237E-03	-7303E-05	-3227E-04	1216E+03	1995E+02	5304E+03	1251E+03	1850E+03	2634E+03
10.00	10.00	24.49	-1192E-03	-6751E-05	-3069E-04	1044E+03	2177E+02	4962E+03	1111E+03	1678E+03	2382E+03
10.00	10.00	25.52	-1152E-03	-6247E-05	-2919E-04	8977E+02	2303E+02	4642E+03	9884E+02	1524E+03	2157E+03
10.00	10.00	26.54	-1114E-03	-5787E-05	-2779E-04	7730E+02	2384E+02	4345E+03	8816E+02	1365E+03	1955E+03
10.00	10.00	27.56	-1077E-03	-5368E-05	-2647E-04	6666E+02	2428E+02	4069E+03	7883E+02	1261E+03	1755E+03
10.00	10.00	28.58	-1043E-03	-4984E-05	-2523E-04	5756E+02	2444E+02	3812E+03	7065E+02	1149E+03	1613E+03
10.00	10.00	29.60	-1011E-03	-463							

SURFACE DIVIDED INTO 5 BY 5 ELEMENTS		SW TX TY = 2.0000 10000.0000 .0000		RESULTS FOR CERUTTI (POINT SOLUTION)		X		Y		Z		U		V		W		SX		SY		SZ		SXY		SYZ		SZX	
10.00	20.00	0.01	-1887E-03	-1710E-04	-2694E-04	9445E+03	5423E+03	5339E-03	1055E+04	7819E+00	4993E+00																		
10.00	20.00	1.03	-1867E-03	-1902E-04	-2798E-04	8809E+03	5934E+03	5611E+01	1028E+04	7983E+02	5102E+02																		
10.00	20.00	2.05	-1842E-03	-2047E-04	-2897E-04	8171E+03	6213E+03	6115E+02	9915E+03	1547E+03	9916E+03																		
10.00	20.00	3.07	-1813E-03	-2147E-04	-2986E-04	7535E+03	6282E+03	6420E+02	9410E+03	2220E+03	1423E+03																		
10.00	20.00	4.09	-1780E-03	-2206E-04	-3062E-04	6908E+03	6179E+03	6797E+02	8960E+03	2791E+03	1806E+03																		
10.00	20.00	5.11	-1744E-03	-2230E-04	-3121E-04	6207E+03	5941E+03	6112E+03	8405E+03	3248E+03	2116E+03																		
10.00	20.00	6.13	-1706E-03	-2223E-04	-3163E-04	5709E+03	5609E+03	1463E+03	7825E+03	3589E+03	2353E+03																		
10.00	20.00	7.15	-1666E-03	-2193E-04	-3187E-04	5149E+03	5217E+03	1801E+03	7237E+03	3821E+03	2522E+03																		
10.00	20.00	8.17	-1624E-03	-2143E-04	-3194E-04	4624E+03	4795E+03	2112E+03	6657E+03	3955E+03	2628E+03																		
10.00	20.00	9.19	-1582E-03	-2079E-04	-3185E-04	4136E+03	4365E+03	2385E+03	6096E+03	4007E+03	2678E+03																		
10.00	20.00	10.21	-1539E-03	-2005E-04	-3162E-04	3687E+03	3945E+03	2614E+03	5561E+03	3922E+03	2683E+03																		
10.00	20.00	11.23	-1496E-03	-1923E-04	-3126E-04	3277E+03	3539E+03	2799E+03	5059E+03	3927E+03	2649E+03																		
10.00	20.00	12.25	-1454E-03	-1837E-04	-3079E-04	2905E+03	3160E+03	2940E+03	4592E+03	3814E+03	2586E+03																		
10.00	20.00	13.27	-1412E-03	-1749E-04	-3023E-04	2570E+03	2809E+03	3041E+03	4161E+03	3677E+03	2501E+03																		
10.00	20.00	14.29	-1372E-03	-1660E-04	-2960E-04	2271E+03	2489E+03	3106E+03	3766E+03	3519E+03	2400E+03																		
10.00	20.00	15.31	-1332E-03	-1573E-04	-2891E-04	2003E+03	2198E+03	3138E+03	3407E+03	3349E+03	2289E+03																		
10.00	20.00	16.33	-1293E-03	-1487E-04	-2818E-04	1766E+03	1937E+03	3143E+03	3080E+03	3172E+03	2172E+03																		
10.00	20.00	17.35	-1256E-03	-1404E-04	-2742E-04	1555E+03	1702E+03	3124E+03	2785E+03	2993E+03	2052E+03																		
10.00	20.00	18.37	-1220E-03	-1324E-04	-2663E-04	1369E+03	1493E+03	3086E+03	2518E+03	2815E+03	1932E+03																		
10.00	20.00	19.39	-1185E-03	-1248E-04	-2584E-04	1205E+03	1307E+03	3033E+03	2278E+03	2641E+03	1813E+03																		
10.00	20.00	20.41	-1151E-03	-1175E-04	-2504E-04	1060E+03	1143E+03	2967E+03	2062E+03	2473E+03	1698E+03																		
10.00	20.00	21.43	-1119E-03	-1106E-04	-2424E-04	9324E+02	9971E+02	2891E+03	1868E+03	2311E+03	1587E+03																		
10.00	20.00	22.45	-1088E-03	-1041E-04	-2345E-04	8203E+02	8685E+02	2808E+03	1694E+03	2158E+03	1481E+03																		
10.00	20.00	23.47	-1058E-03	-9793E-04	-2265E-04	7219E+02	7551E+02	2721E+03	1537E+03	2012E+03	1381E+03																		
10.00	20.00	24.49	-1030E-03	-9215E-05	-2191E-04	6354E+02	6554E+02	2629E+03	1397E+03	1856E+03	1286E+03																		
10.00	20.00	25.52	-1002E-03	-8671E-05	-2117E-04	5593E+02	5676E+02	2536E+03	1270E+03	1746E+03	1197E+03																		
10.00	20.00	26.54	-9759E-04	-8161E-05	-2044E-04	4926E+02	4905E+02	2441E+03	1157E+03	1626E+03	1113E+03																		
10.00	20.00	27.56	-9507E-04	-7683E-05	-1974E-04	4339E+02	4228E+02	2347E+03	1055E+03	1513E+03	1035E+03																		
10.00	20.00	28.58	-9265E-04	-7235E-05	-1905E-04	3823E+02	3634E+02	2254E+03	9630E+02	1408E+03	9628E+02																		
10.00	20.00	29.60	-9033E-04	-6816E-05	-1839E-04	3370E+02	3114E+02	2163E+03	8804E+02	1310E+03	8953E+02																		
10.00	20.00	30.62	-8810E-04	-6421E-05	-1775E-04	2971E+02	2657E+02	2073E+03	8058E+02	1220E+03	8262E+02																		
10.00	20.00	31.64	-8597E-04	-6057E-05	-1714E-04	2620E+02	2258E+02	1986E+03	7386E+02	1135E+03	7745E+02																		
10.00	20.00	32.66	-8392E-04	-5714E-05	-1654E-04	2310E+02	1908E+02	1901E+03	6779E+02	1058E+03	7206E+02																		
10.00	20.00	33.68	-8195E-04	-5393E-05	-1597E-04	2038E+02	1602E+02	1819E+03	6230E+02	9852E+02	6706E+02																		
10.00	20.00	34.70	-8007E-04	-5093E-05	-1542E-04	1797E+02	1334E+02	1741E+03	5734E+02	9181E+02	6244E+02																		
10.00	20.00	35.72	-7825E-04	-4812E-05	-1490E-04	1585E+02	1100E+02	1665E+03	5284E+02	8560E+02	5817E+02																		
10.00	20.00	36.74	-7651E-04	-4550E-05	-1439E-04	1398E+02	8962E+01	1592E+03	4876E+02	7938E+02	5424E+02																		
10.00	20.00	37.76	-7484E-04	-4304E-05	-1390E-04	1233E+02	7180E+01	1522E+03	4505E+02	7453E+02	5055E+02																		
10.00	20.00	38.78	-7322E-04	-4074E-05	-1344E-04	1086E+02	5628E+01	1456E+03	4168E+02	6958E+02	4717E+02																		
10.00	20.00	39.80	-7167E-04	-3859E-05	-1299E-04	9568E+01	4276E+01	1392E+03	3861E+02	6501E+02	4403E+02																		
10.00	20.00	40.82	-7018E-04	-3657E-05	-1256E-04	8422E+01	3100E+01	1331E+03	3581E+02	6078E+02	4113E+02																		
10.00	20.00	41.84	-6874E-04	-3468E-05	-1215E-04	7408E+01	2079E+01	1273E+03	3326E+02	5686E+02	3845E+02																		
10.00	20.00	42.86	-6736E-04	-3291E-05	-1176E-04	6506E+01	1218E+01	1216E+03	3090E+02	5352E+02	3596E+02																		
10.00	20.00	43.88	-6603E-04	-3124E-05	-1138E-04	5708E+01	4278E+00	1165E+03	2880E+02	4985E+02	3366E+02																		
10.00	20.00	44.90	-6474E-04	-2968E-05	-1101E-04	5000E+01	-2335E+00	1115E+03	2684E+02	4672E+02	3152E+02																		
10.00	20.00	45.92	-6350E-04	-2822E-05	-1067E-04	4371E+01	-8029E+00	1067E+03	2505E+02	4381E+02	2954E+02																		
10.00	20.00	46.94	-6230E-04	-2684E-05	-1033E-04	3812E+01	-1292E+01	1021E+03	2340E+02	4111E+02	2771E+02																		
10.00	20.00	47.96	-6114E-04	-2554E-05	-1001E-04	3316E+01	-1710E+01	9781E+02	2189E+02	3860E+02	2600E+02																		
10.00	20.00	48.98	-6002E-04	-2432E-05	-9706E-05	2875E+01	-2065E+01	9369E+02	2050E+02	3627E+02	2442E+02																		
10.00	20.00	50.00	-5894E-04	-2318E-05	-9411E-05	2483E+01	-2367E+01	8977E+02	1922E+02	3411E+02	2294E+02																		

SURFACE DIVIDED INTO 1 ELEMENT		SW TX TY = 10.0000 10000.0000 .0000		RESULTS FOR CERUTTI (TRIBUTED SOLUTION)		X		Y		Z		U		V		W		SX		SY		SZ		SXY		SYZ		SZX	
10.00	20.00	1.03	-1892E-03	-1701E-04	-2693E-04	9556E+03	5398E+03	4572E-03	1065E+04	7907E+00	5168E+00																		
10.00	20.00	2.05	-1846E-03	-2037E-04	-2898E-04	8975E+03	6066E+03	5820E+01	1037E+04	8069E+02	5278E+02																		
10.00	20.00	3.07	-1817E-03	-2136E-04	-2987E-04	8271E+03	6177E+03	6235E+02	9997E+03	1562E+03	1025E+03																		
10.00	20.00	4.09	-1784E-03	-2194E-04	-3062E-04	7631E+03	6237E+03	6469E+02	9539E+03	2237E+03	1473E+03																		
10.00	20.00	5.11	-1748E-03	-2216E-04	-3121E-04	6994E+03	6123E+03	7917E+02	9015E+03	2806E+03	1858E+03																		
10.00	20.00	6.13	-1709E-03	-2209E-04	-3162E-04	6372E+03	5877E+03	8447E+03	8447E+03	3258E+03	2170E+03																		
10.00	20.00	7.15	-1668E-03	-2178E-04	-3185E-04	5773E+03	5539E+03	1493E+03	7855E+03	3592E+03	2408E+03																		
10.00	20.00	8.17	-1626E-03	-2118E-04	-3191E-04	5205E+03	5146E+03	1832E+03	7256E+03	3816E+03	2574E+03																		
10.00	20.00	9.19	-1583E-03	-2063E-04	-3181E-04	4671E+03	4725E+03	2145E+03	6668E+03	3983E+03	2675E+03																		
10.00	20.00	10.21	-1540E-03	-1989E-04	-3157E-04	4175E+03	4298E+03	2410E+03	6100E+03	3989E+03	2720E+03																		
10.00	20.00	11.23	-1497E-03	-1908E-04	-3120E-04	3720E+03	3880E+03	2635E+03	5561E+03	3968E+03	2719E+03																		
10.00	20.00	12.25	-1455E-03	-1822E-04	-3072E-04	3305E+03	3481E+03	2816E+03	5055E+03	3896E+03	2680E+03																		
10.00	20.00	13.27	-1413E-03	-1735E-04	-3016E-04	2929E+03	3107E+03	2952E+03	4586E+03	3785E+03	2613E+03																		
10.00	20.00	14.29	-1372E-03	-1647E-04	-2952E-04	2591E+03	2762E+03	3049E+03	4154E+03	3647E+03	2524E+03																		
10.00	20.00	15.31	-1332E-03	-1560E-04	-2883E-04	2288E+03	2447E+03	3110E+03	3759E+03	3489E+03	2420E+03																		
10.00	20.00	16.33	-1293E-03	-1475E-04	-2810E-04	2019E+03	2162E+03	3138E+03	3400E+03	3319E+03	2306E+03																		
10.00	20.00	17.35	-1256E-03	-1393E-04	-2734E-04	1779E+03	1904E+03	3141E+03	3074E+03	3173E+03	2186E+03																		
10.00	20.00	18.37	-1219E-03	-1314E-04	-2655E-04	1567E+03	1674E+03	3120E+03	2779E+03	2965E+03	2064E+03																		
10.00	20.00	19.39	-1184E-03	-1238E-04	-2576E-04	1380E+03	1469E+03	3081E+03	2513E+03	2789E+03	1942E+03																		
10.00	20.00	20.41	-1151E-03	-1166E-04	-2496E-04	1215E+03	1286E+03	3026E+03	2273E+03	2617E+03	1822E+03																		
10.00	20.00	21.43	-1119E-03	-1098E-04	-2417E-04	1069E+03	1124E+03	2959E+03	2058E+03	2450E+03	1706E+03																		
10.00	20.00	22.45	-1088E-03	-1034E-04	-2338E-04	9407E+02	9813E+02	2883E+03	1884E+03	2290E+03	1594E+03																		
10.00	20.00	23.47	-1058E-03	-9727E-05	-2261E-04	8280E+02	8549E+02	2799E+03	1690E+03	2136E+03	1488E+03																		
10.00	20.00	24.49	-1029E-03	-9153E-05	-2185E-04	7289E+02	7434E+02	2711E+03	1534E+03	1994E+03	1387E+03																		
10.00	20.00	25.52	-1002E-03	-8615E-05	-2110E-04	6418E+02	6453E+02	2620E+03	1394E+03	1858E+03	1291E+03																		
10.00	20.00	26.54	-9758E-04	-8109E-05	-2038E-04	5653E+02	5590E+02	2526E+03	1268E+03	1731E+03	1202E+03																		
10.00	20.00	27.56	-9514E-04	-7635E-05	-1967E-04	4981E+02	4831E+02	2432E+03	1155E+03	1612E+03	1118E+03																		
10.00	20.00	28.58	-9263E-04	-7191E-05	-1894E-04	4390E+02	4164E+02	2338E+03	1053E+03	1500E+03	1040E+03																		
10.00	20.00	29.60	-9032E-04	-6776E-05	-1830E-04																								

APPENDIX E

Input and Output Files for Verification Problem in Section 3.2

STRESS3D VERSION 4.0 (MAY 1989)
J.F.T. AGAPITO AND ASSOCS. (303)242 4220

Verification Problem 1 - Pulse point heat source

QA NUMBER: AGAPITO 4.0
INPUT FILE: VERIF1.DAT
DATE: 05/18/89

THERMO-ELASTIC ANALYSIS OF RADIO-ACTIVE WASTE REPOSITORY

DIFFUSIVITY .1000E-01
SURFACE TEMP .0000E+00
UNIFORM INITIAL TEMPERATURE
ELASTIC MOD .1010E+10
POISSON RATIO .2000E+00
COEFF OF EXPAN .5400E-05
ROCK SP. WT. .0000E+00
INITIAL MAX. HORZ. STRESS .0000E+00
INITIAL MIN. HORZ. STRESS .0000E+00
MAX. HORZ. STRESS GRAD./VERT. STRESS GRAD. .000
MIN. HORZ. STRESS GRAD./VERT. STRESS GRAD. .000
BEARING (DEG.) OF MAX. HORZ. STRESS W.R.T. X-AXIS .00

NUMBER OF CANISTERS 1
NUMBER OF AREAL SOURCES 0
NUMBER OF LINE SOURCES 0
NUMBER OF CANISTER TYPES 1
NUMBER OF TIMES FOR OUTPUT 1
NUMBER OF LINES FOR OUTPUT 1
NUMBER OF SURFACE SHEAR ROWS 0
NUMBER OF SURFACE SHEAR COLUMNS 0
HALF WIDTH OF SURFACE ELEMENTS .00
CENTER OF SURFACE GRID (XCOORD) .00
CENTER OF SURFACE GRID (YCOORD) .00

NO FREE SURFACE

CANISTER TYPE 1
CANISTER LENGTH 1.00
NUMBER OF POINT SOURCES 1
NUMBER OF COMPONENTS 2
DEPTH BELOW SURFACE 1000.00
CANISTER COMPONENTS
SOURCE DATA - TIME ON .00 STRENGTH .5856E+03 EXP(-.0000E+00)
SOURCE DATA - TIME ON .10 STRENGTH .5856E+03 EXP(-.0000E+00)

CANISTER PLACEMENT
CANISTER TYPE XCOORD YCOORD TIME ON
1 1 .00 .00 .00

TIMING FOR OUTPUT (YRS)

10.00
TEMPERATURES DISPLACEMENTS AND STRESSES AT TIME .10000E+02

PT	XCOORD	YCOORD	ZCOORD	TEMP	U	V	W	SIGXX	SIGYY	SIGZZ	SIGXY	SIGYZ	SIGZX
1	.1	.0	1000.0	.4163E+02	.5669E-05	.0000E+00	.0000E+00	.1909E+06	.1884E+06	.1884E+06	.0000E+00	.0000E+00	.0000E+00
2	.2	.0	1000.0	.4084E+02	.1115E-04	.0000E+00	.0000E+00	.1876E+06	.1846E+06	.1846E+06	.0000E+00	.0000E+00	.0000E+00
3	.3	.0	1000.0	.3958E+02	.1641E-04	.0000E+00	.0000E+00	.1841E+06	.1778E+06	.1778E+06	.0000E+00	.0000E+00	.0000E+00
4	.4	.0	1000.0	.3788E+02	.2131E-04	.0000E+00	.0000E+00	.1793E+06	.1686E+06	.1686E+06	.0000E+00	.0000E+00	.0000E+00
5	.5	.0	1000.0	.3580E+02	.2575E-04	.0000E+00	.0000E+00	.1734E+06	.1574E+06	.1574E+06	.0000E+00	.0000E+00	.0000E+00
6	.6	.0	1000.0	.3341E+02	.2967E-04	.0000E+00	.0000E+00	.1665E+06	.1445E+06	.1445E+06	.0000E+00	.0000E+00	.0000E+00
7	.7	.0	1000.0	.3079E+02	.3302E-04	.0000E+00	.0000E+00	.1588E+06	.1305E+06	.1305E+06	.0000E+00	.0000E+00	.0000E+00
8	.8	.0	1000.0	.2802E+02	.3574E-04	.0000E+00	.0000E+00	.1504E+06	.1158E+06	.1158E+06	.0000E+00	.0000E+00	.0000E+00
9	.9	.0	1000.0	.2518E+02	.3784E-04	.0000E+00	.0000E+00	.1415E+06	.1009E+06	.1009E+06	.0000E+00	.0000E+00	.0000E+00
10	1.0	.0	1000.0	.2235E+02	.3932E-04	.0000E+00	.0000E+00	.1324E+06	.8617E+05	.8617E+05	.0000E+00	.0000E+00	.0000E+00
11	1.1	.0	1000.0	.1959E+02	.4022E-04	.0000E+00	.0000E+00	.1231E+06	.7198E+05	.7198E+05	.0000E+00	.0000E+00	.0000E+00
12	1.2	.0	1000.0	.1695E+02	.4058E-04	.0000E+00	.0000E+00	.1139E+06	.5865E+05	.5865E+05	.0000E+00	.0000E+00	.0000E+00
13	1.3	.0	1000.0	.1449E+02	.4045E-04	.0000E+00	.0000E+00	.1048E+06	.4640E+05	.4640E+05	.0000E+00	.0000E+00	.0000E+00
14	1.4	.0	1000.0	.1223E+02	.3989E-04	.0000E+00	.0000E+00	.9593E+05	.3540E+05	.3540E+05	.0000E+00	.0000E+00	.0000E+00
15	1.5	.0	1000.0	.1019E+02	.3898E-04	.0000E+00	.0000E+00	.8749E+05	.2574E+05	.2574E+05	.0000E+00	.0000E+00	.0000E+00
16	1.6	.0	1000.0	.8388E+01	.3778E-04	.0000E+00	.0000E+00	.7949E+05	.1744E+05	.1744E+05	.0000E+00	.0000E+00	.0000E+00
17	1.7	.0	1000.0	.6818E+01	.3635E-04	.0000E+00	.0000E+00	.7199E+05	.1049E+05	.1049E+05	.0000E+00	.0000E+00	.0000E+00
18	1.8	.0	1000.0	.5472E+01	.3477E-04	.0000E+00	.0000E+00	.6502E+05	.4797E+04	.4797E+04	.0000E+00	.0000E+00	.0000E+00
19	1.9	.0	1000.0	.4337E+01	.3308E-04	.0000E+00	.0000E+00	.5861E+05	.2666E+03	.2666E+03	.0000E+00	.0000E+00	.0000E+00
20	2.0	.0	1000.0	.3396E+01	.3133E-04	.0000E+00	.0000E+00	.5274E+05	.3222E+04	.3222E+04	.0000E+00	.0000E+00	.0000E+00
21	2.1	.0	1000.0	.2624E+01	.2957E-04	.0000E+00	.0000E+00	.4741E+05	.5816E+04	.5816E+04	.0000E+00	.0000E+00	.0000E+00
22	2.2	.0	1000.0	.2003E+01	.2783E-04	.0000E+00	.0000E+00	.4259E+05	.7641E+04	.7641E+04	.0000E+00	.0000E+00	.0000E+00
23	2.3	.0	1000.0	.1510E+01	.2614E-04	.0000E+00	.0000E+00	.3826E+05	.8839E+04	.8839E+04	.0000E+00	.0000E+00	.0000E+00
24	2.4	.0	1000.0	.1126E+01	.2452E-04	.0000E+00	.0000E+00	.3440E+05	.9526E+04	.9526E+04	.0000E+00	.0000E+00	.0000E+00
25	2.5	.0	1000.0	.8248E+00	.2296E-04	.0000E+00	.0000E+00	.3092E+05	.9839E+04	.9839E+04	.0000E+00	.0000E+00	.0000E+00
26	2.6	.0	1000.0	.5995E+00	.2151E-04	.0000E+00	.0000E+00	.2785E+05	.9840E+04	.9840E+04	.0000E+00	.0000E+00	.0000E+00
27	2.7	.0	1000.0	.4306E+00	.2015E-04	.0000E+00	.0000E+00	.2513E+05	.9627E+04	.9627E+04	.0000E+00	.0000E+00	.0000E+00
28	2.8	.0	1000.0	.3043E+00	.1888E-04	.0000E+00	.0000E+00	.2270E+05	.9273E+04	.9273E+04	.0000E+00	.0000E+00	.0000E+00
29	2.9	.0	1000.0	.2109E+00	.1769E-04	.0000E+00	.0000E+00	.2053E+05	.8828E+04	.8828E+04	.0000E+00	.0000E+00	.0000E+00
30	3.0	.0	1000.0	.1496E+00	.1662E-04	.0000E+00	.0000E+00	.1865E+05	.8306E+04	.8306E+04	.0000E+00	.0000E+00	.0000E+00
31	3.1	.0	1000.0	.9713E-01	.1558E-04	.0000E+00	.0000E+00	.1692E+05	.7799E+04	.7799E+04	.0000E+00	.0000E+00	.0000E+00
32	3.2	.0	1000.0	.6396E-01	.1469E-04	.0000E+00	.0000E+00	.1545E+05	.7249E+04	.7249E+04	.0000E+00	.0000E+00	.0000E+00
33	3.3	.0	1000.0	.4242E-01	.1380E-04	.0000E+00	.0000E+00	.1408E+05	.6752E+04	.6752E+04	.0000E+00	.0000E+00	.0000E+00
34	3.4	.0	1000.0	.3480E-01	.1307E-04	.0000E+00	.0000E+00	.1294E+05	.6232E+04	.6232E+04	.0000E+00	.0000E+00	.0000E+00
35	3.5	.0	1000.0	.1270E-01	.1226E-04	.0000E+00	.0000E+00	.1180E+05	.5812E+04	.5812E+04	.0000E+00	.0000E+00	.0000E+00
36	3.6	.0	1000.0	.5247E-02	.1152E-04	.0000E+00	.0000E+00	.1077E+05	.5422E+04	.5422E+04	.0000E+00	.0000E+00	.0000E+00
37	3.7	.0	1000.0	.2417E-01	.1080E-04	.0000E+00	.0000E+00	.9824E+04	.5077E+04	.5077E+04	.0000E+00	.0000E+00	.0000E+00
38	3.8	.0	1000.0	.1403E-01	.1031E-04	.0000E+00	.0000E+00	.9138E+04	.4665E+04	.4665E+04	.0000E+00	.0000E+00	.0000E+00
39	3.9	.0	1000.0	.5171E-01	.1029E-04	.0000E+00	.0000E+00	.8882E+04	.4088E+04	.4088E+04	.0000E+00	.0000E+00	.0000E+00
40	4.0	.0	1000.0	.8333E-02	.9357E-05	.0000E+00	.0000E+00	.7875E+04	.3994E+04	.3994E+04	.0000E+00	.0000E+00	.0000E+00

TOTAL RUN TIME = 12.00000 SECONDS.

```

AGAPITO 4.0
Verification Problem 1 - Pulse point heat source
01 00 0
1 01E9 20 5.4E-6 .00 0 0 0 0 0 0 0 0 0 0
1 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 0 1 2 1000. 0 0 0 0 0 0 0 0 0 0
00 585.6 .00
10 -585.6 .00
1 .00 .00 .00
10. 40 .05 .0 -1000. 2. .00 -1000.
STOP

```


STRESS3D VERSION 4.0 (MAY 1989)
J.F.T. AGAPITO AND ASSOCS. (303)242 4220

Verification Problem 1 - Pulse point heat source

QA NUMBER: AGAPITO 4.0
INPUT FILE: VERIF1.DAT
DATE: 05/18/89

TEMPERATURES DISPLACEMENTS AND STRESSES AT TIME .10000E+02

PT	XCOORD	YCOORD	ELEV	TEMP	U	V	W	SIGXX	SIGYY	SIGZZ	SIGXY	SIGYZ	SIGZX
1	.1	.0	-1000.0	4.163E+02	.5669E-05	.0000E+00	.0000E+00	.1909E+06	.1884E+06	.1884E+06	.0000E+00	.0000E+00	.0000E+00
2	.1	.0	-1000.0	4.084E+02	.1113E-04	.0000E+00	.0000E+00	.1876E+06	.1846E+06	.1846E+06	.0000E+00	.0000E+00	.0000E+00
3	.1	.0	-1000.0	3.998E+02	.1641E-04	.0000E+00	.0000E+00	.1841E+06	.1778E+06	.1778E+06	.0000E+00	.0000E+00	.0000E+00
4	.1	.0	-1000.0	3.788E+02	.2131E-04	.0000E+00	.0000E+00	.1793E+06	.1686E+06	.1686E+06	.0000E+00	.0000E+00	.0000E+00
5	.1	.0	-1000.0	3.580E+02	.2573E-04	.0000E+00	.0000E+00	.1734E+06	.1574E+06	.1574E+06	.0000E+00	.0000E+00	.0000E+00
6	.1	.0	-1000.0	3.341E+02	.2967E-04	.0000E+00	.0000E+00	.1665E+06	.1445E+06	.1445E+06	.0000E+00	.0000E+00	.0000E+00
7	.1	.0	-1000.0	3.079E+02	.3302E-04	.0000E+00	.0000E+00	.1588E+06	.1305E+06	.1305E+06	.0000E+00	.0000E+00	.0000E+00
8	.1	.0	-1000.0	2.802E+02	.3574E-04	.0000E+00	.0000E+00	.1504E+06	.1158E+06	.1158E+06	.0000E+00	.0000E+00	.0000E+00
9	.1	.0	-1000.0	2.518E+02	.3784E-04	.0000E+00	.0000E+00	.1415E+06	.1009E+06	.1009E+06	.0000E+00	.0000E+00	.0000E+00
10	.1	.0	-1000.0	2.225E+02	.3932E-04	.0000E+00	.0000E+00	.1324E+06	.8617E+05	.8617E+05	.0000E+00	.0000E+00	.0000E+00
11	.1	.0	-1000.0	1.959E+02	.4022E-04	.0000E+00	.0000E+00	.1231E+06	.7198E+05	.7198E+05	.0000E+00	.0000E+00	.0000E+00
12	.1	.0	-1000.0	1.695E+02	.4058E-04	.0000E+00	.0000E+00	.1139E+06	.5865E+05	.5865E+05	.0000E+00	.0000E+00	.0000E+00
13	.1	.0	-1000.0	1.449E+02	.4045E-04	.0000E+00	.0000E+00	.1048E+06	.4640E+05	.4640E+05	.0000E+00	.0000E+00	.0000E+00
14	.1	.0	-1000.0	1.223E+02	.3989E-04	.0000E+00	.0000E+00	.9593E+05	.3540E+05	.3540E+05	.0000E+00	.0000E+00	.0000E+00
15	.1	.0	-1000.0	1.019E+02	.3898E-04	.0000E+00	.0000E+00	.8749E+05	.2574E+05	.2574E+05	.0000E+00	.0000E+00	.0000E+00
16	.1	.0	-1000.0	8388E+01	.3778E-04	.0000E+00	.0000E+00	.7949E+05	.1744E+05	.1744E+05	.0000E+00	.0000E+00	.0000E+00
17	.1	.0	-1000.0	6818E+01	.3635E-04	.0000E+00	.0000E+00	.7199E+05	.1049E+05	.1049E+05	.0000E+00	.0000E+00	.0000E+00
18	.1	.0	-1000.0	5472E+01	.3477E-04	.0000E+00	.0000E+00	.6502E+05	.4797E+04	.4797E+04	.0000E+00	.0000E+00	.0000E+00
19	.1	.0	-1000.0	4337E+01	.3308E-04	.0000E+00	.0000E+00	.5861E+05	.2666E+03	.2666E+03	.0000E+00	.0000E+00	.0000E+00
20	.1	.0	-1000.0	3396E+01	.3133E-04	.0000E+00	.0000E+00	.5274E+05	.3222E+04	.3222E+04	.0000E+00	.0000E+00	.0000E+00
21	.1	.0	-1000.0	2624E+01	.2957E-04	.0000E+00	.0000E+00	.4741E+05	.5816E+04	.5816E+04	.0000E+00	.0000E+00	.0000E+00
22	.1	.0	-1000.0	2003E+01	.2783E-04	.0000E+00	.0000E+00	.4259E+05	.7641E+04	.7641E+04	.0000E+00	.0000E+00	.0000E+00
23	.1	.0	-1000.0	1510E+01	.2614E-04	.0000E+00	.0000E+00	.3825E+05	.8839E+04	.8839E+04	.0000E+00	.0000E+00	.0000E+00
24	.1	.0	-1000.0	1126E+01	.2452E-04	.0000E+00	.0000E+00	.3440E+05	.9526E+04	.9526E+04	.0000E+00	.0000E+00	.0000E+00
25	.1	.0	-1000.0	8248E+00	.2296E-04	.0000E+00	.0000E+00	.3092E+05	.9839E+04	.9839E+04	.0000E+00	.0000E+00	.0000E+00
26	.1	.0	-1000.0	5995E+00	.2151E-04	.0000E+00	.0000E+00	.2785E+05	.9840E+04	.9840E+04	.0000E+00	.0000E+00	.0000E+00
27	.1	.0	-1000.0	4306E+00	.2015E-04	.0000E+00	.0000E+00	.2513E+05	.9627E+04	.9627E+04	.0000E+00	.0000E+00	.0000E+00
28	.1	.0	-1000.0	3043E+00	.1886E-04	.0000E+00	.0000E+00	.2270E+05	.9273E+04	.9273E+04	.0000E+00	.0000E+00	.0000E+00
29	.1	.0	-1000.0	2109E+00	.1769E-04	.0000E+00	.0000E+00	.2053E+05	.8828E+04	.8828E+04	.0000E+00	.0000E+00	.0000E+00
30	.1	.0	-1000.0	1496E+00	.1662E-04	.0000E+00	.0000E+00	.1865E+05	.8306E+04	.8306E+04	.0000E+00	.0000E+00	.0000E+00
31	.1	.0	-1000.0	9713E+01	.1558E-04	.0000E+00	.0000E+00	.1692E+05	.7799E+04	.7799E+04	.0000E+00	.0000E+00	.0000E+00
32	.1	.0	-1000.0	6996E+01	.1469E-04	.0000E+00	.0000E+00	.1545E+05	.7249E+04	.7249E+04	.0000E+00	.0000E+00	.0000E+00
33	.1	.0	-1000.0	4242E+01	.1380E-04	.0000E+00	.0000E+00	.1408E+05	.6752E+04	.6752E+04	.0000E+00	.0000E+00	.0000E+00
34	.1	.0	-1000.0	3480E+01	.1307E-04	.0000E+00	.0000E+00	.1294E+05	.6232E+04	.6232E+04	.0000E+00	.0000E+00	.0000E+00
35	.1	.0	-1000.0	1270E+01	.1226E-04	.0000E+00	.0000E+00	.1190E+05	.5812E+04	.5812E+04	.0000E+00	.0000E+00	.0000E+00
36	.1	.0	-1000.0	5247E+02	.1152E-04	.0000E+00	.0000E+00	.1077E+05	.5422E+04	.5422E+04	.0000E+00	.0000E+00	.0000E+00
37	.1	.0	-1000.0	2417E+01	.1080E-04	.0000E+00	.0000E+00	.9824E+04	.5077E+04	.5077E+04	.0000E+00	.0000E+00	.0000E+00
38	.1	.0	-1000.0	1403E+01	.1031E-04	.0000E+00	.0000E+00	.9138E+04	.4665E+04	.4665E+04	.0000E+00	.0000E+00	.0000E+00
39	.1	.0	-1000.0	5171E+01	.1029E-04	.0000E+00	.0000E+00	.8882E+04	.4088E+04	.4088E+04	.0000E+00	.0000E+00	.0000E+00
40	.2	.0	-1000.0	8333E+02	.9357E-05	.0000E+00	.0000E+00	.7875E+04	.3994E+04	.3994E+04	.0000E+00	.0000E+00	.0000E+00

APPENDIX F

Input and Output Files for Verification Problem for Section 3.3

F-2

STRESS3D VERSION 4.0 (MAY 1989)
J.F.T. AGAPITO AND ASSOCS. (303)242 4220

INFINITE PLATE SOURCE IN A SEMI-INFINITE MEDIUM - 50 YEARS

QA NUMBER: AGAPITO 4.0
INPUT FILE: verif2a.dat
DATE: 05/18/89

TEMPERATURES DISPLACEMENTS AND STRESSES AT TIME .50000E+02

FT	XCOORD	YCOORD	ELEV	TEMP	U	V	W	SIGXX	SIGYY	SIGZZ	SIGXY	SIGYZ	SIGZX
1	.0	.0	50.0	.7509E+00	-.2367E-03	-.2615E-04	-.2247E+00	-.2121E+05	-.2119E+05	-.2359E+04	-.5705E+00	-.1210E+01	-.4386E+02
2	.0	.0	100.0	.2179E+01	.1049E-03	-.2553E-04	-.2238E+00	-.1855E+05	-.1853E+05	-.2312E+04	-.2748E+00	-.1360E+01	-.4047E+01
3	.0	.0	150.0	.5086E+01	.8279E-04	-.2459E-04	-.2239E+00	-.1296E+05	-.1297E+05	-.2224E+04	-.5822E+00	-.1505E+01	-.1133E+01
4	.0	.0	200.0	.1113E+02	.8221E-04	-.2422E-04	-.2255E+00	-.1568E+04	-.1552E+04	-.1305E+04	-.5903E+00	-.1669E+01	-.1270E+01
5	.0	.0	250.0	.2261E+02	.1018E-03	-.2318E-04	-.2301E+00	-.1967E+05	-.1968E+05	-.1549E+04	-.5896E+00	-.1828E+01	-.3090E+01
6	.0	.0	300.0	.4350E+02	.1178E-03	-.2239E-04	-.2397E+00	-.5742E+05	-.5743E+05	-.8804E+04	-.5826E+00	-.1999E+01	-.4285E+01
7	.0	.0	350.0	.7929E+02	.9152E-04	-.2184E-04	-.2580E+00	-.1217E+06	-.1217E+06	-.2220E+05	-.5631E+00	-.2150E+01	-.2280E+01
8	.0	.0	400.0	.1364E+03	.9786E-04	-.2074E-04	-.2911E+00	-.2290E+06	-.2290E+06	-.3451E+05	-.5237E+00	-.2312E+01	-.2417E+01
9	.0	.0	450.0	.2115E+03	.1016E-03	-.2040E-04	-.3503E+00	-.3889E+06	-.3889E+06	-.1273E+05	-.4990E+00	-.2443E+01	-.1851E+01

INFINITE PLATE SOURCE IN A SEMI-INFINITE MEDIUM - 50 YEARS

QA NUMBER: AGAPITO 4.0
INPUT FILE: veri12a.dat
DATE: 05/18/89

THERMO-ELASTIC ANALYSIS OF RADIO-ACTIVE WASTE REPOSITORY

DIFFUSIVITY .2893E+03
SURFACE TEMP .0000E+00
UNIFORM INITIAL TEMPERATURE
ELASTIC MOD .3171E+09
POISSON RATIO .2200E+00
COEFF OF EXPAN .4889E-05
ROCK SP. WT. .0000E+00
INITIAL MAX. HORZ. STRESS .0000E+00
INITIAL MIN. HORZ. STRESS .0000E+00
MAX. HORZ. STRESS GRAD./VERT. STRESS GRAD. 1.000
MIN. HORZ. STRESS GRAD./VERT. STRESS GRAD. 1.000
BEARING (DEG.) OF MAX. HORZ. STRESS W.R.T. X-AXIS .00

NUMBER OF CANISTERS 0
NUMBER OF AREAL SOURCES 1
NUMBER OF LINE SOURCES 0
NUMBER OF CANISTER TYPES 1
NUMBER OF TIMES FOR OUTPUT 1
NUMBER OF LINES FOR OUTPUT 1
NUMBER OF SURFACE SHEAR ROWS 100
NUMBER OF SURFACE SHEAR COLUMNS 100
HALF WIDTH OF SURFACE ELEMENTS 100.00
CENTER OF SURFACE GRID (XCOORD) .00
CENTER OF SURFACE GRID (YCOORD) .00

ISOTHERMAL FREE SURFACE

CANISTER TYPE 1
CANISTER LENGTH 1.00
NUMBER OF POINT SOURCES 1
NUMBER OF COMPONENTS 1
DEPTH BELOW SURFACE .00
CANISTER COMPONENTS
SOURCE DATA - TIME ON .00 STRENGTH .1214E+04 EXP(- .0000E+00)

AREAL SOURCE NO. 1 SOURCE TYPE = 1 TIME ON = .00000E+00

SUB-AREAL SOURCE NO. GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	4930.57	-4930.57	500.00
2	4930.57	-4669.99	500.00
3	4930.57	-4330.01	500.00
4	4930.57	-4069.43	500.00
5	4669.99	-4930.57	500.00
6	4669.99	-4669.99	500.00
7	4669.99	-4330.01	500.00
8	4669.99	-4069.43	500.00
9	4330.01	-4930.57	500.00
10	4330.01	-4669.99	500.00
11	4330.01	-4330.01	500.00
12	4330.01	-4069.43	500.00
13	4069.43	-4930.57	500.00
14	4069.43	-4669.99	500.00
15	4069.43	-4330.01	500.00
16	4069.43	-4069.43	500.00

SUB-AREAL SOURCE NO. GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	4930.57	-3930.57	500.00
2	4930.57	-3669.99	500.00
3	4930.57	-3330.01	500.00
4	4930.57	-3069.43	500.00
5	4669.99	-3930.57	500.00
6	4669.99	-3669.99	500.00
7	4669.99	-3330.01	500.00
8	4669.99	-3069.43	500.00
9	4330.01	-3930.57	500.00
10	4330.01	-3669.99	500.00
11	4330.01	-3330.01	500.00
12	4330.01	-3069.43	500.00
13	4069.43	-3930.57	500.00
14	4069.43	-3669.99	500.00
15	4069.43	-3330.01	500.00
16	4069.43	-3069.43	500.00

SUB-AREAL SOURCE NO. GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	4930.57	-2930.57	500.00
2	4930.57	-2669.99	500.00
3	4930.57	-2330.01	500.00
4	4930.57	-2069.43	500.00
5	4669.99	-2930.57	500.00
6	4669.99	-2669.99	500.00
7	4669.99	-2330.01	500.00
8	4669.99	-2069.43	500.00
9	4330.01	-2930.57	500.00
10	4330.01	-2669.99	500.00
11	4330.01	-2330.01	500.00
12	4330.01	-2069.43	500.00
13	4069.43	-2930.57	500.00
14	4069.43	-2669.99	500.00
15	4069.43	-2330.01	500.00
16	4069.43	-2069.43	500.00

SUB-AREAL SOURCE NO. GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	4930.57	-1930.57	500.00
2	4930.57	-1669.99	500.00
3	4930.57	-1330.01	500.00
4	4930.57	-1069.43	500.00
5	4669.99	-1930.57	500.00
6	4669.99	-1669.99	500.00
7	4669.99	-1330.01	500.00

8	4669.99	-1069.43	500.00
9	4330.01	-1930.57	500.00
10	4330.01	-1669.99	500.00
11	4330.01	-1330.01	500.00
12	4330.01	-1069.43	500.00
13	4069.43	-1930.57	500.00
14	4069.43	-1669.99	500.00
15	4069.43	-1330.01	500.00
16	4069.43	-1069.43	500.00
SUB-AREAL SOURCE NO. 5			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	4930.57	-930.57	500.00
2	4930.57	-669.99	500.00
3	4930.57	-330.01	500.00
4	4930.57	-69.43	500.00
5	4669.99	-930.57	500.00
6	4669.99	-669.99	500.00
7	4669.99	-330.01	500.00
8	4669.99	-69.43	500.00
9	4330.01	-930.57	500.00
10	4330.01	-669.99	500.00
11	4330.01	-330.01	500.00
12	4330.01	-69.43	500.00
13	4069.43	-930.57	500.00
14	4069.43	-669.99	500.00
15	4069.43	-330.01	500.00
16	4069.43	-69.43	500.00
SUB-AREAL SOURCE NO. 6			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	4930.57	69.43	500.00
2	4930.57	330.01	500.00
3	4930.57	669.99	500.00
4	4930.57	930.57	500.00
5	4669.99	69.43	500.00
6	4669.99	330.01	500.00
7	4669.99	669.99	500.00
8	4669.99	930.57	500.00
9	4330.01	69.43	500.00
10	4330.01	330.01	500.00
11	4330.01	669.99	500.00
12	4330.01	930.57	500.00
13	4069.43	69.43	500.00
14	4069.43	330.01	500.00
15	4069.43	669.99	500.00
16	4069.43	930.57	500.00
SUB-AREAL SOURCE NO. 7			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	4930.57	1069.43	500.00
2	4930.57	1330.01	500.00
3	4930.57	1669.99	500.00
4	4930.57	1930.57	500.00
5	4669.99	1069.43	500.00
6	4669.99	1330.01	500.00
7	4669.99	1669.99	500.00
8	4669.99	1930.57	500.00
9	4330.01	1069.43	500.00
10	4330.01	1330.01	500.00
11	4330.01	1669.99	500.00
12	4330.01	1930.57	500.00
13	4069.43	1069.43	500.00
14	4069.43	1330.01	500.00
15	4069.43	1669.99	500.00
16	4069.43	1930.57	500.00
SUB-AREAL SOURCE NO. 8			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	4930.57	2069.43	500.00
2	4930.57	2330.01	500.00
3	4930.57	2669.99	500.00
4	4930.57	2930.57	500.00
5	4669.99	2069.43	500.00
6	4669.99	2330.01	500.00
7	4669.99	2669.99	500.00
8	4669.99	2930.57	500.00
9	4330.01	2069.43	500.00
10	4330.01	2330.01	500.00
11	4330.01	2669.99	500.00
12	4330.01	2930.57	500.00
13	4069.43	2069.43	500.00
14	4069.43	2330.01	500.00
15	4069.43	2669.99	500.00
16	4069.43	2930.57	500.00
SUB-AREAL SOURCE NO. 9			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	4930.57	3069.43	500.00
2	4930.57	3330.01	500.00
3	4930.57	3669.99	500.00
4	4930.57	3930.57	500.00
5	4669.99	3069.43	500.00
6	4669.99	3330.01	500.00
7	4669.99	3669.99	500.00
8	4669.99	3930.57	500.00
9	4330.01	3069.43	500.00
10	4330.01	3330.01	500.00
11	4330.01	3669.99	500.00
12	4330.01	3930.57	500.00
13	4069.43	3069.43	500.00
14	4069.43	3330.01	500.00
15	4069.43	3669.99	500.00
16	4069.43	3930.57	500.00
SUB-AREAL SOURCE NO. 10			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	4930.57	4069.43	500.00
2	4930.57	4330.01	500.00
3	4930.57	4669.99	500.00
4	4930.57	4930.57	500.00
5	4669.99	4069.43	500.00
6	4669.99	4330.01	500.00
7	4669.99	4669.99	500.00
8	4669.99	4930.57	500.00
9	4330.01	4069.43	500.00

10	4330.01	4330.01	500.00
11	4330.01	4669.99	500.00
12	4330.01	4930.57	500.00
13	4069.43	4069.43	500.00
14	4069.43	4330.01	500.00
15	4069.43	4669.99	500.00
16	4069.43	4930.57	500.00

SUB-AREAL	SOURCE NO.	11	
GAUSS PT.	XCOORD	YCOORD	ZCOORD

1	3930.57	-4930.57	500.00
2	3930.57	-4669.99	500.00
3	3930.57	-4330.01	500.00
4	3930.57	-4069.43	500.00
5	3669.99	-4930.57	500.00
6	3669.99	-4669.99	500.00
7	3669.99	-4330.01	500.00
8	3669.99	-4069.43	500.00
9	3330.01	-4930.57	500.00
10	3330.01	-4669.99	500.00
11	3330.01	-4330.01	500.00
12	3330.01	-4069.43	500.00
13	3069.43	-4930.57	500.00
14	3069.43	-4669.99	500.00
15	3069.43	-4330.01	500.00
16	3069.43	-4069.43	500.00

SUB-AREAL	SOURCE NO.	12	
GAUSS PT.	XCOORD	YCOORD	ZCOORD

1	3930.57	-3930.57	500.00
2	3930.57	-3669.99	500.00
3	3930.57	-3330.01	500.00
4	3930.57	-3069.43	500.00
5	3669.99	-3930.57	500.00
6	3669.99	-3669.99	500.00
7	3669.99	-3330.01	500.00
8	3669.99	-3069.43	500.00
9	3330.01	-3930.57	500.00
10	3330.01	-3669.99	500.00
11	3330.01	-3330.01	500.00
12	3330.01	-3069.43	500.00
13	3069.43	-3930.57	500.00
14	3069.43	-3669.99	500.00
15	3069.43	-3330.01	500.00
16	3069.43	-3069.43	500.00

SUB-AREAL	SOURCE NO.	13	
GAUSS PT.	XCOORD	YCOORD	ZCOORD

1	3930.57	-2930.57	500.00
2	3930.57	-2669.99	500.00
3	3930.57	-2330.01	500.00
4	3930.57	-2069.43	500.00
5	3669.99	-2930.57	500.00
6	3669.99	-2669.99	500.00
7	3669.99	-2330.01	500.00
8	3669.99	-2069.43	500.00
9	3330.01	-2930.57	500.00
10	3330.01	-2669.99	500.00
11	3330.01	-2330.01	500.00
12	3330.01	-2069.43	500.00
13	3069.43	-2930.57	500.00
14	3069.43	-2669.99	500.00
15	3069.43	-2330.01	500.00
16	3069.43	-2069.43	500.00

SUB-AREAL	SOURCE NO.	14	
GAUSS PT.	XCOORD	YCOORD	ZCOORD

1	3930.57	-1930.57	500.00
2	3930.57	-1669.99	500.00
3	3930.57	-1330.01	500.00
4	3930.57	-1069.43	500.00
5	3669.99	-1930.57	500.00
6	3669.99	-1669.99	500.00
7	3669.99	-1330.01	500.00
8	3669.99	-1069.43	500.00
9	3330.01	-1930.57	500.00
10	3330.01	-1669.99	500.00
11	3330.01	-1330.01	500.00
12	3330.01	-1069.43	500.00
13	3069.43	-1930.57	500.00
14	3069.43	-1669.99	500.00
15	3069.43	-1330.01	500.00
16	3069.43	-1069.43	500.00

SUB-AREAL	SOURCE NO.	15	
GAUSS PT.	XCOORD	YCOORD	ZCOORD

1	3930.57	-930.57	500.00
2	3930.57	-669.99	500.00
3	3930.57	-330.01	500.00
4	3930.57	-69.43	500.00
5	3669.99	-930.57	500.00
6	3669.99	-669.99	500.00
7	3669.99	-330.01	500.00
8	3669.99	-69.43	500.00
9	3330.01	-930.57	500.00
10	3330.01	-669.99	500.00
11	3330.01	-330.01	500.00
12	3330.01	-69.43	500.00
13	3069.43	-930.57	500.00
14	3069.43	-669.99	500.00
15	3069.43	-330.01	500.00
16	3069.43	-69.43	500.00

SUB-AREAL	SOURCE NO.	16	
GAUSS PT.	XCOORD	YCOORD	ZCOORD

1	3930.57	69.43	500.00
2	3930.57	330.01	500.00
3	3930.57	669.99	500.00
4	3930.57	930.57	500.00
5	3669.99	69.43	500.00
6	3669.99	330.01	500.00
7	3669.99	669.99	500.00
8	3669.99	930.57	500.00
9	3330.01	69.43	500.00
10	3330.01	330.01	500.00
11	3330.01	669.99	500.00

12	3330.01	930.57	500.00
13	3069.43	69.43	500.00
14	3069.43	330.01	500.00
15	3069.43	669.99	500.00
16	3069.43	930.57	500.00
SUB-AREAL SOURCE NO. 17			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	3930.57	1069.43	500.00
2	3930.57	1330.01	500.00
3	3930.57	1669.99	500.00
4	3930.57	1930.57	500.00
5	3669.99	1069.43	500.00
6	3669.99	1330.01	500.00
7	3669.99	1669.99	500.00
8	3669.99	1930.57	500.00
9	3330.01	1069.43	500.00
10	3330.01	1330.01	500.00
11	3330.01	1669.99	500.00
12	3330.01	1930.57	500.00
13	3069.43	1069.43	500.00
14	3069.43	1330.01	500.00
15	3069.43	1669.99	500.00
16	3069.43	1930.57	500.00
SUB-AREAL SOURCE NO. 18			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	3930.57	2069.43	500.00
2	3930.57	2330.01	500.00
3	3930.57	2669.99	500.00
4	3930.57	2930.57	500.00
5	3669.99	2069.43	500.00
6	3669.99	2330.01	500.00
7	3669.99	2669.99	500.00
8	3669.99	2930.57	500.00
9	3330.01	2069.43	500.00
10	3330.01	2330.01	500.00
11	3330.01	2669.99	500.00
12	3330.01	2930.57	500.00
13	3069.43	2069.43	500.00
14	3069.43	2330.01	500.00
15	3069.43	2669.99	500.00
16	3069.43	2930.57	500.00
SUB-AREAL SOURCE NO. 19			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	3930.57	3069.43	500.00
2	3930.57	3330.01	500.00
3	3930.57	3669.99	500.00
4	3930.57	3930.57	500.00
5	3669.99	3069.43	500.00
6	3669.99	3330.01	500.00
7	3669.99	3669.99	500.00
8	3669.99	3930.57	500.00
9	3330.01	3069.43	500.00
10	3330.01	3330.01	500.00
11	3330.01	3669.99	500.00
12	3330.01	3930.57	500.00
13	3069.43	3069.43	500.00
14	3069.43	3330.01	500.00
15	3069.43	3669.99	500.00
16	3069.43	3930.57	500.00
SUB-AREAL SOURCE NO. 20			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	3930.57	4069.43	500.00
2	3930.57	4330.01	500.00
3	3930.57	4669.99	500.00
4	3930.57	4930.57	500.00
5	3669.99	4069.43	500.00
6	3669.99	4330.01	500.00
7	3669.99	4669.99	500.00
8	3669.99	4930.57	500.00
9	3330.01	4069.43	500.00
10	3330.01	4330.01	500.00
11	3330.01	4669.99	500.00
12	3330.01	4930.57	500.00
13	3069.43	4069.43	500.00
14	3069.43	4330.01	500.00
15	3069.43	4669.99	500.00
16	3069.43	4930.57	500.00
SUB-AREAL SOURCE NO. 21			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	4930.57	500.00
2	2930.57	-4069.99	500.00
3	2930.57	-4330.01	500.00
4	2930.57	-4669.43	500.00
5	2669.99	-4930.57	500.00
6	2669.99	-4669.99	500.00
7	2669.99	-4330.01	500.00
8	2669.99	-4069.43	500.00
9	2330.01	-4930.57	500.00
10	2330.01	-4669.99	500.00
11	2330.01	-4330.01	500.00
12	2330.01	-4069.43	500.00
13	2069.43	-4930.57	500.00
14	2069.43	-4669.99	500.00
15	2069.43	-4330.01	500.00
16	2069.43	-4069.43	500.00
SUB-AREAL SOURCE NO. 22			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	-3930.57	500.00
2	2930.57	-3669.99	500.00
3	2930.57	-3330.01	500.00
4	2930.57	-3069.43	500.00
5	2669.99	-3930.57	500.00
6	2669.99	-3669.99	500.00
7	2669.99	-3330.01	500.00
8	2669.99	-3069.43	500.00
9	2330.01	-3930.57	500.00
10	2330.01	-3669.99	500.00
11	2330.01	-3330.01	500.00
12	2330.01	-3069.43	500.00
13	2069.43	-3930.57	500.00

14	2069.43	-3669.99	500.00
15	2069.43	-3330.01	500.00
16	2069.43	-3069.43	500.00
SUR-AREAL SOURCE NO. 23			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	-2930.57	500.00
2	2930.57	-2669.99	500.00
3	2930.57	-2330.01	500.00
4	2930.57	-2069.43	500.00
5	2669.99	-2930.57	500.00
6	2669.99	-2669.99	500.00
7	2669.99	-2330.01	500.00
8	2669.99	-2069.43	500.00
9	2330.01	-2930.57	500.00
10	2330.01	-2669.99	500.00
11	2330.01	-2330.01	500.00
12	2330.01	-2069.43	500.00
13	2069.43	-2930.57	500.00
14	2069.43	-2669.99	500.00
15	2069.43	-2330.01	500.00
16	2069.43	-2069.43	500.00
SUR-AREAL SOURCE NO. 24			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	-1930.57	500.00
2	2930.57	-1669.99	500.00
3	2930.57	-1330.01	500.00
4	2930.57	-1069.43	500.00
5	2669.99	-1930.57	500.00
6	2669.99	-1669.99	500.00
7	2669.99	-1330.01	500.00
8	2669.99	-1069.43	500.00
9	2330.01	-1930.57	500.00
10	2330.01	-1669.99	500.00
11	2330.01	-1330.01	500.00
12	2330.01	-1069.43	500.00
13	2069.43	-1930.57	500.00
14	2069.43	-1669.99	500.00
15	2069.43	-1330.01	500.00
16	2069.43	-1069.43	500.00
SUR-AREAL SOURCE NO. 25			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	-930.57	500.00
2	2930.57	-669.99	500.00
3	2930.57	-330.01	500.00
4	2930.57	-69.43	500.00
5	2669.99	-930.57	500.00
6	2669.99	-669.99	500.00
7	2669.99	-330.01	500.00
8	2669.99	-69.43	500.00
9	2330.01	-930.57	500.00
10	2330.01	-669.99	500.00
11	2330.01	-330.01	500.00
12	2330.01	-69.43	500.00
13	2069.43	-930.57	500.00
14	2069.43	-669.99	500.00
15	2069.43	-330.01	500.00
16	2069.43	-69.43	500.00
SUR-AREAL SOURCE NO. 26			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	69.43	500.00
2	2930.57	330.01	500.00
3	2930.57	669.99	500.00
4	2930.57	930.57	500.00
5	2669.99	69.43	500.00
6	2669.99	330.01	500.00
7	2669.99	669.99	500.00
8	2669.99	930.57	500.00
9	2330.01	69.43	500.00
10	2330.01	330.01	500.00
11	2330.01	669.99	500.00
12	2330.01	930.57	500.00
13	2069.43	69.43	500.00
14	2069.43	330.01	500.00
15	2069.43	669.99	500.00
16	2069.43	930.57	500.00
SUR-AREAL SOURCE NO. 27			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	1069.43	500.00
2	2930.57	1330.01	500.00
3	2930.57	1669.99	500.00
4	2930.57	1930.57	500.00
5	2669.99	1069.43	500.00
6	2669.99	1330.01	500.00
7	2669.99	1669.99	500.00
8	2669.99	1930.57	500.00
9	2330.01	1069.43	500.00
10	2330.01	1330.01	500.00
11	2330.01	1669.99	500.00
12	2330.01	1930.57	500.00
13	2069.43	1069.43	500.00
14	2069.43	1330.01	500.00
15	2069.43	1669.99	500.00
16	2069.43	1930.57	500.00
SUR-AREAL SOURCE NO. 28			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	2069.43	500.00
2	2930.57	2330.01	500.00
3	2930.57	2669.99	500.00
4	2930.57	2930.57	500.00
5	2669.99	2069.43	500.00
6	2669.99	2330.01	500.00
7	2669.99	2669.99	500.00
8	2669.99	2930.57	500.00
9	2330.01	2069.43	500.00
10	2330.01	2330.01	500.00
11	2330.01	2669.99	500.00
12	2330.01	2930.57	500.00
13	2069.43	2069.43	500.00
14	2069.43	2330.01	500.00
15	2069.43	2669.99	500.00

16	2069.43	2930.57	500.00
SUB-AREAL SOURCE NO.	29		
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	3069.43	500.00
2	2930.57	3330.01	500.00
3	2930.57	3669.99	500.00
4	2930.57	3930.57	500.00
5	2669.99	3069.43	500.00
6	2669.99	3330.01	500.00
7	2669.99	3669.99	500.00
8	2669.99	3930.57	500.00
9	2330.01	3069.43	500.00
10	2330.01	3330.01	500.00
11	2330.01	3669.99	500.00
12	2330.01	3930.57	500.00
13	2069.43	3069.43	500.00
14	2069.43	3330.01	500.00
15	2069.43	3669.99	500.00
16	2069.43	3930.57	500.00
SUB-AREAL SOURCE NO.	30		
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	4069.43	500.00
2	2930.57	4330.01	500.00
3	2930.57	4669.99	500.00
4	2930.57	4930.57	500.00
5	2669.99	4069.43	500.00
6	2669.99	4330.01	500.00
7	2669.99	4669.99	500.00
8	2669.99	4930.57	500.00
9	2330.01	4069.43	500.00
10	2330.01	4330.01	500.00
11	2330.01	4669.99	500.00
12	2330.01	4930.57	500.00
13	2069.43	4069.43	500.00
14	2069.43	4330.01	500.00
15	2069.43	4669.99	500.00
16	2069.43	4930.57	500.00
SUB-AREAL SOURCE NO.	31		
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	1930.57	-4930.57	500.00
2	1930.57	-4669.99	500.00
3	1930.57	-4330.01	500.00
4	1930.57	-4069.43	500.00
5	1669.99	-4930.57	500.00
6	1669.99	-4669.99	500.00
7	1669.99	-4330.01	500.00
8	1669.99	-4069.43	500.00
9	1330.01	-4930.57	500.00
10	1330.01	-4669.99	500.00
11	1330.01	-4330.01	500.00
12	1330.01	-4069.43	500.00
13	1069.43	-4930.57	500.00
14	1069.43	-4669.99	500.00
15	1069.43	-4330.01	500.00
16	1069.43	-4069.43	500.00
SUB-AREAL SOURCE NO.	32		
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	1930.57	-3930.57	500.00
2	1930.57	-3669.99	500.00
3	1930.57	-3330.01	500.00
4	1930.57	-3069.43	500.00
5	1669.99	-3930.57	500.00
6	1669.99	-3669.99	500.00
7	1669.99	-3330.01	500.00
8	1669.99	-3069.43	500.00
9	1330.01	-3930.57	500.00
10	1330.01	-3669.99	500.00
11	1330.01	-3330.01	500.00
12	1330.01	-3069.43	500.00
13	1069.43	-3930.57	500.00
14	1069.43	-3669.99	500.00
15	1069.43	-3330.01	500.00
16	1069.43	-3069.43	500.00
SUB-AREAL SOURCE NO.	33		
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	1930.57	-2930.57	500.00
2	1930.57	-2669.99	500.00
3	1930.57	-2330.01	500.00
4	1930.57	-2069.43	500.00
5	1669.99	-2930.57	500.00
6	1669.99	-2669.99	500.00
7	1669.99	-2330.01	500.00
8	1669.99	-2069.43	500.00
9	1330.01	-2930.57	500.00
10	1330.01	-2669.99	500.00
11	1330.01	-2330.01	500.00
12	1330.01	-2069.43	500.00
13	1069.43	-2930.57	500.00
14	1069.43	-2669.99	500.00
15	1069.43	-2330.01	500.00
16	1069.43	-2069.43	500.00
SUB-AREAL SOURCE NO.	34		
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	1930.57	-1930.57	500.00
2	1930.57	-1669.99	500.00
3	1930.57	-1330.01	500.00
4	1930.57	-1069.43	500.00
5	1669.99	-1930.57	500.00
6	1669.99	-1669.99	500.00
7	1669.99	-1330.01	500.00
8	1669.99	-1069.43	500.00
9	1330.01	-1930.57	500.00
10	1330.01	-1669.99	500.00
11	1330.01	-1330.01	500.00
12	1330.01	-1069.43	500.00
13	1069.43	-1930.57	500.00
14	1069.43	-1669.99	500.00
15	1069.43	-1330.01	500.00
16	1069.43	-1069.43	500.00
SUB-AREAL SOURCE NO.	35		

GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	1930.57	-930.57	500.00
2	1930.57	-669.99	500.00
3	1930.57	-330.01	500.00
4	1930.57	-69.43	500.00
5	1669.99	-930.57	500.00
6	1669.99	-669.99	500.00
7	1669.99	-330.01	500.00
8	1669.99	-69.43	500.00
9	1330.01	-930.57	500.00
10	1330.01	-669.99	500.00
11	1330.01	-330.01	500.00
12	1330.01	-69.43	500.00
13	1069.43	-930.57	500.00
14	1069.43	-669.99	500.00
15	1069.43	-330.01	500.00
16	1069.43	-69.43	500.00
SUB-AREAL SOURCE NO. 36			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	1930.57	69.43	500.00
2	1930.57	330.01	500.00
3	1930.57	669.99	500.00
4	1930.57	930.57	500.00
5	1669.99	69.43	500.00
6	1669.99	330.01	500.00
7	1669.99	669.99	500.00
8	1669.99	930.57	500.00
9	1330.01	69.43	500.00
10	1330.01	330.01	500.00
11	1330.01	669.99	500.00
12	1330.01	930.57	500.00
13	1069.43	69.43	500.00
14	1069.43	330.01	500.00
15	1069.43	669.99	500.00
16	1069.43	930.57	500.00
SUB-AREAL SOURCE NO. 37			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	1930.57	1069.43	500.00
2	1930.57	1330.01	500.00
3	1930.57	1669.99	500.00
4	1930.57	1930.57	500.00
5	1669.99	1069.43	500.00
6	1669.99	1330.01	500.00
7	1669.99	1669.99	500.00
8	1669.99	1930.57	500.00
9	1330.01	1069.43	500.00
10	1330.01	1330.01	500.00
11	1330.01	1669.99	500.00
12	1330.01	1930.57	500.00
13	1069.43	1069.43	500.00
14	1069.43	1330.01	500.00
15	1069.43	1669.99	500.00
16	1069.43	1930.57	500.00
SUB-AREAL SOURCE NO. 38			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	1930.57	2069.43	500.00
2	1930.57	2330.01	500.00
3	1930.57	2669.99	500.00
4	1930.57	2930.57	500.00
5	1669.99	2069.43	500.00
6	1669.99	2330.01	500.00
7	1669.99	2669.99	500.00
8	1669.99	2930.57	500.00
9	1330.01	2069.43	500.00
10	1330.01	2330.01	500.00
11	1330.01	2669.99	500.00
12	1330.01	2930.57	500.00
13	1069.43	2069.43	500.00
14	1069.43	2330.01	500.00
15	1069.43	2669.99	500.00
16	1069.43	2930.57	500.00
SUB-AREAL SOURCE NO. 39			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	1930.57	3069.43	500.00
2	1930.57	3330.01	500.00
3	1930.57	3669.99	500.00
4	1930.57	3930.57	500.00
5	1669.99	3069.43	500.00
6	1669.99	3330.01	500.00
7	1669.99	3669.99	500.00
8	1669.99	3930.57	500.00
9	1330.01	3069.43	500.00
10	1330.01	3330.01	500.00
11	1330.01	3669.99	500.00
12	1330.01	3930.57	500.00
13	1069.43	3069.43	500.00
14	1069.43	3330.01	500.00
15	1069.43	3669.99	500.00
16	1069.43	3930.57	500.00
SUB-AREAL SOURCE NO. 40			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	1930.57	4069.43	500.00
2	1930.57	4330.01	500.00
3	1930.57	4669.99	500.00
4	1930.57	4930.57	500.00
5	1669.99	4069.43	500.00
6	1669.99	4330.01	500.00
7	1669.99	4669.99	500.00
8	1669.99	4930.57	500.00
9	1330.01	4069.43	500.00
10	1330.01	4330.01	500.00
11	1330.01	4669.99	500.00
12	1330.01	4930.57	500.00
13	1069.43	4069.43	500.00
14	1069.43	4330.01	500.00
15	1069.43	4669.99	500.00
16	1069.43	4930.57	500.00
SUB-AREAL SOURCE NO. 41			
GAUSS PT.	XCOORD	YCOORD	ZCOORD

1	930.57	-4930.57	500.00
2	930.57	-4669.99	500.00
3	930.57	-4330.01	500.00
4	930.57	-4069.43	500.00
5	669.99	-4930.57	500.00
6	669.99	-4669.99	500.00
7	669.99	-4330.01	500.00
8	669.99	-4069.43	500.00
9	330.01	-4930.57	500.00
10	330.01	-4669.99	500.00
11	330.01	-4330.01	500.00
12	330.01	-4069.43	500.00
13	69.43	-4930.57	500.00
14	69.43	-4669.99	500.00
15	69.43	-4330.01	500.00
16	69.43	-4069.43	500.00
SUB-AREAL SOURCE NO. 42			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	-3930.57	500.00
2	930.57	-3669.99	500.00
3	930.57	-3330.01	500.00
4	930.57	-3069.43	500.00
5	669.99	-3930.57	500.00
6	669.99	-3669.99	500.00
7	669.99	-3330.01	500.00
8	669.99	-3069.43	500.00
9	330.01	-3930.57	500.00
10	330.01	-3669.99	500.00
11	330.01	-3330.01	500.00
12	330.01	-3069.43	500.00
13	69.43	-3930.57	500.00
14	69.43	-3669.99	500.00
15	69.43	-3330.01	500.00
16	69.43	-3069.43	500.00
SUB-AREAL SOURCE NO. 43			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	-2930.57	500.00
2	930.57	-2669.99	500.00
3	930.57	-2330.01	500.00
4	930.57	-2069.43	500.00
5	669.99	-2930.57	500.00
6	669.99	-2669.99	500.00
7	669.99	-2330.01	500.00
8	669.99	-2069.43	500.00
9	330.01	-2930.57	500.00
10	330.01	-2669.99	500.00
11	330.01	-2330.01	500.00
12	330.01	-2069.43	500.00
13	69.43	-2930.57	500.00
14	69.43	-2669.99	500.00
15	69.43	-2330.01	500.00
16	69.43	-2069.43	500.00
SUB-AREAL SOURCE NO. 44			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	-1930.57	500.00
2	930.57	-1669.99	500.00
3	930.57	-1330.01	500.00
4	930.57	-1069.43	500.00
5	669.99	-1930.57	500.00
6	669.99	-1669.99	500.00
7	669.99	-1330.01	500.00
8	669.99	-1069.43	500.00
9	330.01	-1930.57	500.00
10	330.01	-1669.99	500.00
11	330.01	-1330.01	500.00
12	330.01	-1069.43	500.00
13	69.43	-1930.57	500.00
14	69.43	-1669.99	500.00
15	69.43	-1330.01	500.00
16	69.43	-1069.43	500.00
SUB-AREAL SOURCE NO. 45			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	-930.57	500.00
2	930.57	-669.99	500.00
3	930.57	-330.01	500.00
4	930.57	-69.43	500.00
5	669.99	-930.57	500.00
6	669.99	-669.99	500.00
7	669.99	-330.01	500.00
8	669.99	-69.43	500.00
9	330.01	-930.57	500.00
10	330.01	-669.99	500.00
11	330.01	-330.01	500.00
12	330.01	-69.43	500.00
13	69.43	-930.57	500.00
14	69.43	-669.99	500.00
15	69.43	-330.01	500.00
16	69.43	-69.43	500.00
SUB-AREAL SOURCE NO. 46			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	69.43	500.00
2	930.57	330.01	500.00
3	930.57	669.99	500.00
4	930.57	930.57	500.00
5	669.99	69.43	500.00
6	669.99	330.01	500.00
7	669.99	669.99	500.00
8	669.99	930.57	500.00
9	330.01	69.43	500.00
10	330.01	330.01	500.00
11	330.01	669.99	500.00
12	330.01	930.57	500.00
13	69.43	69.43	500.00
14	69.43	330.01	500.00
15	69.43	669.99	500.00
16	69.43	930.57	500.00
SUB-AREAL SOURCE NO. 47			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	1069.43	500.00
2	930.57	1330.01	500.00

3	930.57	1669.99	500.00
4	930.57	1930.57	500.00
5	669.99	1069.43	500.00
6	669.99	1330.01	500.00
7	669.99	1669.99	500.00
8	669.99	1930.57	500.00
9	330.01	1069.43	500.00
10	330.01	1330.01	500.00
11	330.01	1669.99	500.00
12	330.01	1930.57	500.00
13	69.43	1069.43	500.00
14	69.43	1330.01	500.00
15	69.43	1669.99	500.00
16	69.43	1930.57	500.00
SUB-AREAL SOURCE NO. 48			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	2069.43	500.00
2	930.57	2330.01	500.00
3	930.57	2669.99	500.00
4	930.57	2930.57	500.00
5	669.99	2069.43	500.00
6	669.99	2330.01	500.00
7	669.99	2669.99	500.00
8	669.99	2930.57	500.00
9	330.01	2069.43	500.00
10	330.01	2330.01	500.00
11	330.01	2669.99	500.00
12	330.01	2930.57	500.00
13	69.43	2069.43	500.00
14	69.43	2330.01	500.00
15	69.43	2669.99	500.00
16	69.43	2930.57	500.00
SUB-AREAL SOURCE NO. 49			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	3069.43	500.00
2	930.57	3330.01	500.00
3	930.57	3669.99	500.00
4	930.57	3930.57	500.00
5	669.99	3069.43	500.00
6	669.99	3330.01	500.00
7	669.99	3669.99	500.00
8	669.99	3930.57	500.00
9	330.01	3069.43	500.00
10	330.01	3330.01	500.00
11	330.01	3669.99	500.00
12	330.01	3930.57	500.00
13	69.43	3069.43	500.00
14	69.43	3330.01	500.00
15	69.43	3669.99	500.00
16	69.43	3930.57	500.00
SUB-AREAL SOURCE NO. 50			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	4069.43	500.00
2	930.57	4330.01	500.00
3	930.57	4669.99	500.00
4	930.57	4930.57	500.00
5	669.99	4069.43	500.00
6	669.99	4330.01	500.00
7	669.99	4669.99	500.00
8	669.99	4930.57	500.00
9	330.01	4069.43	500.00
10	330.01	4330.01	500.00
11	330.01	4669.99	500.00
12	330.01	4930.57	500.00
13	69.43	4069.43	500.00
14	69.43	4330.01	500.00
15	69.43	4669.99	500.00
16	69.43	4930.57	500.00
SUB-AREAL SOURCE NO. 51			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	-4930.57	500.00
2	-69.43	-4669.99	500.00
3	-69.43	-4330.01	500.00
4	-69.43	-4069.43	500.00
5	-330.01	-4930.57	500.00
6	-330.01	-4669.99	500.00
7	-330.01	-4330.01	500.00
8	-330.01	-4069.43	500.00
9	-669.99	-4930.57	500.00
10	-669.99	-4669.99	500.00
11	-669.99	-4330.01	500.00
12	-669.99	-4069.43	500.00
13	-930.57	-4930.57	500.00
14	-930.57	-4669.99	500.00
15	-930.57	-4330.01	500.00
16	-930.57	-4069.43	500.00
SUB-AREAL SOURCE NO. 52			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	-3930.57	500.00
2	-69.43	-3669.99	500.00
3	-69.43	-3330.01	500.00
4	-69.43	-3069.43	500.00
5	-330.01	-3930.57	500.00
6	-330.01	-3669.99	500.00
7	-330.01	-3330.01	500.00
8	-330.01	-3069.43	500.00
9	-669.99	-3930.57	500.00
10	-669.99	-3669.99	500.00
11	-669.99	-3330.01	500.00
12	-669.99	-3069.43	500.00
13	-930.57	-3930.57	500.00
14	-930.57	-3669.99	500.00
15	-930.57	-3330.01	500.00
16	-930.57	-3069.43	500.00
SUB-AREAL SOURCE NO. 53			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	-2930.57	500.00
2	-69.43	-2669.99	500.00
3	-69.43	-2330.01	500.00
4	-69.43	-2069.43	500.00

5	-330.01	-2330.57	500.00
6	-330.01	-2669.99	500.00
7	-330.01	-2330.01	500.00
8	-330.01	-2069.43	500.00
9	-669.99	-2930.57	500.00
10	-669.99	-2669.99	500.00
11	-669.99	-2330.01	500.00
12	-669.99	-2069.43	500.00
13	-930.57	-2930.57	500.00
14	-930.57	-2669.99	500.00
15	-930.57	-2330.01	500.00
16	-930.57	-2069.43	500.00
SUB-AREAL SOURCE NO. 54			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	1930.57	500.00
2	-69.43	-1669.99	500.00
3	-69.43	-1330.01	500.00
4	-69.43	-1069.43	500.00
5	-330.01	-1930.57	500.00
6	-330.01	-1669.99	500.00
7	-330.01	-1330.01	500.00
8	-330.01	-1069.43	500.00
9	-669.99	-1930.57	500.00
10	-669.99	-1669.99	500.00
11	-669.99	-1330.01	500.00
12	-669.99	-1069.43	500.00
13	-930.57	-1930.57	500.00
14	-930.57	-1669.99	500.00
15	-930.57	-1330.01	500.00
16	-930.57	-1069.43	500.00
SUB-AREAL SOURCE NO. 55			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	-930.57	500.00
2	-69.43	-669.99	500.00
3	-69.43	-330.01	500.00
4	-69.43	-69.43	500.00
5	-330.01	-930.57	500.00
6	-330.01	-669.99	500.00
7	-330.01	-330.01	500.00
8	-330.01	-69.43	500.00
9	-669.99	-930.57	500.00
10	-669.99	-669.99	500.00
11	-669.99	-330.01	500.00
12	-669.99	-69.43	500.00
13	-930.57	-930.57	500.00
14	-930.57	-669.99	500.00
15	-930.57	-330.01	500.00
16	-930.57	-69.43	500.00
SUB-AREAL SOURCE NO. 56			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	69.43	500.00
2	-69.43	330.01	500.00
3	-69.43	669.99	500.00
4	-69.43	930.57	500.00
5	-330.01	69.43	500.00
6	-330.01	330.01	500.00
7	-330.01	669.99	500.00
8	-330.01	930.57	500.00
9	-669.99	69.43	500.00
10	-669.99	330.01	500.00
11	-669.99	669.99	500.00
12	-669.99	930.57	500.00
13	-930.57	69.43	500.00
14	-930.57	330.01	500.00
15	-930.57	669.99	500.00
16	-930.57	930.57	500.00
SUB-AREAL SOURCE NO. 57			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	1069.43	500.00
2	-69.43	1330.01	500.00
3	-69.43	1669.99	500.00
4	-69.43	1930.57	500.00
5	-330.01	1069.43	500.00
6	-330.01	1330.01	500.00
7	-330.01	1669.99	500.00
8	-330.01	1930.57	500.00
9	-669.99	1069.43	500.00
10	-669.99	1330.01	500.00
11	-669.99	1669.99	500.00
12	-669.99	1930.57	500.00
13	-930.57	1069.43	500.00
14	-930.57	1330.01	500.00
15	-930.57	1669.99	500.00
16	-930.57	1930.57	500.00
SUB-AREAL SOURCE NO. 58			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	2069.43	500.00
2	-69.43	2330.01	500.00
3	-69.43	2669.99	500.00
4	-69.43	2930.57	500.00
5	-330.01	2069.43	500.00
6	-330.01	2330.01	500.00
7	-330.01	2669.99	500.00
8	-330.01	2930.57	500.00
9	-669.99	2069.43	500.00
10	-669.99	2330.01	500.00
11	-669.99	2669.99	500.00
12	-669.99	2930.57	500.00
13	-930.57	2069.43	500.00
14	-930.57	2330.01	500.00
15	-930.57	2669.99	500.00
16	-930.57	2930.57	500.00
SUB-AREAL SOURCE NO. 59			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	3069.43	500.00
2	-69.43	3330.01	500.00
3	-69.43	3669.99	500.00
4	-69.43	3930.57	500.00
5	-330.01	3069.43	500.00
6	-330.01	3330.01	500.00

7	-330 01	3669 99	500 00
8	-330 01	3930 57	500 00
9	-669 99	3069 43	500 00
10	-669 99	3330 01	500 00
11	-669 99	3669 99	500 00
12	-669 99	3930 57	500 00
13	-930 57	3069 43	500 00
14	-930 57	3330 01	500 00
15	-930 57	3669 99	500 00
16	-930 57	3930 57	500 00

SUB-AREAL	SOURCE NO	60	
GAUSS PT.	XCOORD	YCOORD	ZCOORD

1	-69 43	4069 43	500 00
2	-69 43	4330 01	500 00
3	-69 43	4669 99	500 00
4	-69 43	4930 57	500 00
5	-330 01	4069 43	500 00
6	-330 01	4330 01	500 00
7	-330 01	4669 99	500 00
8	-330 01	4930 57	500 00
9	-669 99	4069 43	500 00
10	-669 99	4330 01	500 00
11	-669 99	4669 99	500 00
12	-669 99	4930 57	500 00
13	-930 57	4069 43	500 00
14	-930 57	4330 01	500 00
15	-930 57	4669 99	500 00
16	-930 57	4930 57	500 00

SUB-AREAL	SOURCE NO	61	
GAUSS PT.	XCOORD	YCOORD	ZCOORD

1	-1069 43	4930 57	500 00
2	-1069 43	4669 99	500 00
3	-1069 43	4330 01	500 00
4	-1069 43	4069 43	500 00
5	-1330 01	4930 57	500 00
6	-1330 01	4669 99	500 00
7	-1330 01	4330 01	500 00
8	-1330 01	4069 43	500 00
9	-1669 99	4930 57	500 00
10	-1669 99	4669 99	500 00
11	-1669 99	4330 01	500 00
12	-1669 99	4069 43	500 00
13	-1930 57	4930 57	500 00
14	-1930 57	4669 99	500 00
15	-1930 57	4330 01	500 00
16	-1930 57	4069 43	500 00

SUB-AREAL	SOURCE NO	62	
GAUSS PT.	XCOORD	YCOORD	ZCOORD

1	-1069 43	3930 57	500 00
2	-1069 43	3669 99	500 00
3	-1069 43	3330 01	500 00
4	-1069 43	3069 43	500 00
5	-1330 01	3930 57	500 00
6	-1330 01	3669 99	500 00
7	-1330 01	3330 01	500 00
8	-1330 01	3069 43	500 00
9	-1669 99	3930 57	500 00
10	-1669 99	3669 99	500 00
11	-1669 99	3330 01	500 00
12	-1669 99	3069 43	500 00
13	-1930 57	3930 57	500 00
14	-1930 57	3669 99	500 00
15	-1930 57	3330 01	500 00
16	-1930 57	3069 43	500 00

SUB-AREAL	SOURCE NO	63	
GAUSS PT.	XCOORD	YCOORD	ZCOORD

1	-1069 43	2930 57	500 00
2	-1069 43	2669 99	500 00
3	-1069 43	2330 01	500 00
4	-1069 43	2069 43	500 00
5	-1330 01	2930 57	500 00
6	-1330 01	2669 99	500 00
7	-1330 01	2330 01	500 00
8	-1330 01	2069 43	500 00
9	-1669 99	2930 57	500 00
10	-1669 99	2669 99	500 00
11	-1669 99	2330 01	500 00
12	-1669 99	2069 43	500 00
13	-1930 57	2930 57	500 00
14	-1930 57	2669 99	500 00
15	-1930 57	2330 01	500 00
16	-1930 57	2069 43	500 00

SUB-AREAL	SOURCE NO	64	
GAUSS PT.	XCOORD	YCOORD	ZCOORD

1	-1069 43	1930 57	500 00
2	-1069 43	1669 99	500 00
3	-1069 43	1330 01	500 00
4	-1069 43	1069 43	500 00
5	-1330 01	1930 57	500 00
6	-1330 01	1669 99	500 00
7	-1330 01	1330 01	500 00
8	-1330 01	1069 43	500 00
9	-1669 99	1930 57	500 00
10	-1669 99	1669 99	500 00
11	-1669 99	1330 01	500 00
12	-1669 99	1069 43	500 00
13	-1930 57	1930 57	500 00
14	-1930 57	1669 99	500 00
15	-1930 57	1330 01	500 00
16	-1930 57	1069 43	500 00

SUB-AREAL	SOURCE NO	65	
GAUSS PT.	XCOORD	YCOORD	ZCOORD

1	-1069 43	930 57	500 00
2	-1069 43	669 99	500 00
3	-1069 43	330 01	500 00
4	-1069 43	69 43	500 00
5	-1330 01	930 57	500 00
6	-1330 01	669 99	500 00
7	-1330 01	330 01	500 00
8	-1330 01	69 43	500 00

9	-1669.99	-930.57	500.00
10	-1669.99	-669.99	500.00
11	-1669.99	-330.01	500.00
12	-1669.99	-69.43	500.00
13	-1930.57	-930.57	500.00
14	-1930.57	-669.99	500.00
15	-1930.57	-330.01	500.00
16	-1930.57	-69.43	500.00
SUB-AREAL SOURCE NO. 66			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-1069.43	69.43	500.00
2	-1069.43	330.01	500.00
3	-1069.43	669.99	500.00
4	-1069.43	930.57	500.00
5	-1330.01	69.43	500.00
6	-1330.01	330.01	500.00
7	-1330.01	669.99	500.00
8	-1330.01	930.57	500.00
9	-1669.99	69.43	500.00
10	-1669.99	330.01	500.00
11	-1669.99	669.99	500.00
12	-1669.99	930.57	500.00
13	-1930.57	69.43	500.00
14	-1930.57	330.01	500.00
15	-1930.57	669.99	500.00
16	-1930.57	930.57	500.00
SUB-AREAL SOURCE NO. 67			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-1069.43	1069.43	500.00
2	-1069.43	1330.01	500.00
3	-1069.43	1669.99	500.00
4	-1069.43	1930.57	500.00
5	-1330.01	1069.43	500.00
6	-1330.01	1330.01	500.00
7	-1330.01	1669.99	500.00
8	-1330.01	1930.57	500.00
9	-1669.99	1069.43	500.00
10	-1669.99	1330.01	500.00
11	-1669.99	1669.99	500.00
12	-1669.99	1930.57	500.00
13	-1930.57	1069.43	500.00
14	-1930.57	1330.01	500.00
15	-1930.57	1669.99	500.00
16	-1930.57	1930.57	500.00
SUB-AREAL SOURCE NO. 68			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-1069.43	2069.43	500.00
2	-1069.43	2330.01	500.00
3	-1069.43	2669.99	500.00
4	-1069.43	2930.57	500.00
5	-1330.01	2069.43	500.00
6	-1330.01	2330.01	500.00
7	-1330.01	2669.99	500.00
8	-1330.01	2930.57	500.00
9	-1669.99	2069.43	500.00
10	-1669.99	2330.01	500.00
11	-1669.99	2669.99	500.00
12	-1669.99	2930.57	500.00
13	-1930.57	2069.43	500.00
14	-1930.57	2330.01	500.00
15	-1930.57	2669.99	500.00
16	-1930.57	2930.57	500.00
SUB-AREAL SOURCE NO. 69			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-1069.43	3069.43	500.00
2	-1069.43	3330.01	500.00
3	-1069.43	3669.99	500.00
4	-1069.43	3930.57	500.00
5	-1330.01	3069.43	500.00
6	-1330.01	3330.01	500.00
7	-1330.01	3669.99	500.00
8	-1330.01	3930.57	500.00
9	-1669.99	3069.43	500.00
10	-1669.99	3330.01	500.00
11	-1669.99	3669.99	500.00
12	-1669.99	3930.57	500.00
13	-1930.57	3069.43	500.00
14	-1930.57	3330.01	500.00
15	-1930.57	3669.99	500.00
16	-1930.57	3930.57	500.00
SUB-AREAL SOURCE NO. 70			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-1069.43	4069.43	500.00
2	-1069.43	4330.01	500.00
3	-1069.43	4669.99	500.00
4	-1069.43	4930.57	500.00
5	-1330.01	4069.43	500.00
6	-1330.01	4330.01	500.00
7	-1330.01	4669.99	500.00
8	-1330.01	4930.57	500.00
9	-1669.99	4069.43	500.00
10	-1669.99	4330.01	500.00
11	-1669.99	4669.99	500.00
12	-1669.99	4930.57	500.00
13	-1930.57	4069.43	500.00
14	-1930.57	4330.01	500.00
15	-1930.57	4669.99	500.00
16	-1930.57	4930.57	500.00
SUB-AREAL SOURCE NO. 71			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-2069.43	-4930.57	500.00
2	-2069.43	-4669.99	500.00
3	-2069.43	-4330.01	500.00
4	-2069.43	-4069.43	500.00
5	-2330.01	-4930.57	500.00
6	-2330.01	-4669.99	500.00
7	-2330.01	-4330.01	500.00
8	-2330.01	-4069.43	500.00
9	-2669.99	-4930.57	500.00
10	-2669.99	-4669.99	500.00

11	-2669.99	-4330.01	500.00
12	-2669.99	-4069.43	500.00
13	-2930.57	-4330.57	500.00
14	-2930.57	-4669.99	500.00
15	-2930.57	-4330.01	500.00
16	-2930.57	-4069.43	500.00
SUB-AREAL SOURCE NO. 72			
GAUSS PT. XCOOR YCOOR ZCOOR			
1	-2069.43	-3930.57	500.00
2	-2069.43	-3669.99	500.00
3	-2069.43	-3330.01	500.00
4	-2069.43	-3069.43	500.00
5	-2330.01	-3930.57	500.00
6	-2330.01	-3669.99	500.00
7	-2330.01	-3330.01	500.00
8	-2330.01	-3069.43	500.00
9	-2669.99	-3930.57	500.00
10	-2669.99	-3669.99	500.00
11	-2669.99	-3330.01	500.00
12	-2669.99	-3069.43	500.00
13	-2930.57	-3930.57	500.00
14	-2930.57	-3669.99	500.00
15	-2930.57	-3330.01	500.00
16	-2930.57	-3069.43	500.00
SUB-AREAL SOURCE NO. 73			
GAUSS PT. XCOOR YCOOR ZCOOR			
1	-2069.43	-2930.57	500.00
2	-2069.43	-2669.99	500.00
3	-2069.43	-2330.01	500.00
4	-2069.43	-2069.43	500.00
5	-2330.01	-2930.57	500.00
6	-2330.01	-2669.99	500.00
7	-2330.01	-2330.01	500.00
8	-2330.01	-2069.43	500.00
9	-2669.99	-2930.57	500.00
10	-2669.99	-2669.99	500.00
11	-2669.99	-2330.01	500.00
12	-2669.99	-2069.43	500.00
13	-2930.57	-2930.57	500.00
14	-2930.57	-2669.99	500.00
15	-2930.57	-2330.01	500.00
16	-2930.57	-2069.43	500.00
SUB-AREAL SOURCE NO. 74			
GAUSS PT. XCOOR YCOOR ZCOOR			
1	-2069.43	-1930.57	500.00
2	-2069.43	-1669.99	500.00
3	-2069.43	-1330.01	500.00
4	-2069.43	-1069.43	500.00
5	-2330.01	-1930.57	500.00
6	-2330.01	-1669.99	500.00
7	-2330.01	-1330.01	500.00
8	-2330.01	-1069.43	500.00
9	-2669.99	-1930.57	500.00
10	-2669.99	-1669.99	500.00
11	-2669.99	-1330.01	500.00
12	-2669.99	-1069.43	500.00
13	-2930.57	-1930.57	500.00
14	-2930.57	-1669.99	500.00
15	-2930.57	-1330.01	500.00
16	-2930.57	-1069.43	500.00
SUB-AREAL SOURCE NO. 75			
GAUSS PT. XCOOR YCOOR ZCOOR			
1	-2069.43	-930.57	500.00
2	-2069.43	-669.99	500.00
3	-2069.43	-330.01	500.00
4	-2069.43	-69.43	500.00
5	-2330.01	-930.57	500.00
6	-2330.01	-669.99	500.00
7	-2330.01	-330.01	500.00
8	-2330.01	-69.43	500.00
9	-2669.99	-930.57	500.00
10	-2669.99	-669.99	500.00
11	-2669.99	-330.01	500.00
12	-2669.99	-69.43	500.00
13	-2930.57	-930.57	500.00
14	-2930.57	-669.99	500.00
15	-2930.57	-330.01	500.00
16	-2930.57	-69.43	500.00
SUB-AREAL SOURCE NO. 76			
GAUSS PT. XCOOR YCOOR ZCOOR			
1	-2069.43	59.43	500.00
2	-2069.43	330.01	500.00
3	-2069.43	669.99	500.00
4	-2069.43	930.57	500.00
5	-2330.01	59.43	500.00
6	-2330.01	330.01	500.00
7	-2330.01	669.99	500.00
8	-2330.01	930.57	500.00
9	-2669.99	59.43	500.00
10	-2669.99	330.01	500.00
11	-2669.99	669.99	500.00
12	-2669.99	930.57	500.00
13	-2930.57	59.43	500.00
14	-2930.57	330.01	500.00
15	-2930.57	669.99	500.00
16	-2930.57	930.57	500.00
SUB-AREAL SOURCE NO. 77			
GAUSS PT. XCOOR YCOOR ZCOOR			
1	-2069.43	1069.43	500.00
2	-2069.43	1330.01	500.00
3	-2069.43	1669.99	500.00
4	-2069.43	1930.57	500.00
5	-2330.01	1069.43	500.00
6	-2330.01	1330.01	500.00
7	-2330.01	1669.99	500.00
8	-2330.01	1930.57	500.00
9	-2669.99	1069.43	500.00
10	-2669.99	1330.01	500.00
11	-2669.99	1669.99	500.00
12	-2669.99	1930.57	500.00

13	-2930.57	1069.43	500.00
14	-2930.57	1330.01	500.00
15	-2930.57	1669.99	500.00
16	-2930.57	1930.57	500.00
SUR-AREAL SOURCE NO. 78			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-2069.43	2069.43	500.00
2	-2069.43	2330.01	500.00
3	-2069.43	2669.99	500.00
4	-2069.43	2930.57	500.00
5	-2330.01	2069.43	500.00
6	-2330.01	2330.01	500.00
7	-2330.01	2669.99	500.00
8	-2330.01	2930.57	500.00
9	-2669.99	2069.43	500.00
10	-2669.99	2330.01	500.00
11	-2669.99	2669.99	500.00
12	-2669.99	2930.57	500.00
13	-2930.57	2069.43	500.00
14	-2930.57	2330.01	500.00
15	-2930.57	2669.99	500.00
16	-2930.57	2930.57	500.00
SUR-AREAL SOURCE NO. 79			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-2069.43	3069.43	500.00
2	-2069.43	3330.01	500.00
3	-2069.43	3669.99	500.00
4	-2069.43	3930.57	500.00
5	-2330.01	3069.43	500.00
6	-2330.01	3330.01	500.00
7	-2330.01	3669.99	500.00
8	-2330.01	3930.57	500.00
9	-2669.99	3069.43	500.00
10	-2669.99	3330.01	500.00
11	-2669.99	3669.99	500.00
12	-2669.99	3930.57	500.00
13	-2930.57	3069.43	500.00
14	-2930.57	3330.01	500.00
15	-2930.57	3669.99	500.00
16	-2930.57	3930.57	500.00
SUR-AREAL SOURCE NO. 80			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-2069.43	4069.43	500.00
2	-2069.43	4330.01	500.00
3	-2069.43	4669.99	500.00
4	-2069.43	4930.57	500.00
5	-2330.01	4069.43	500.00
6	-2330.01	4330.01	500.00
7	-2330.01	4669.99	500.00
8	-2330.01	4930.57	500.00
9	-2669.99	4069.43	500.00
10	-2669.99	4330.01	500.00
11	-2669.99	4669.99	500.00
12	-2669.99	4930.57	500.00
13	-2930.57	4069.43	500.00
14	-2930.57	4330.01	500.00
15	-2930.57	4669.99	500.00
16	-2930.57	4930.57	500.00
SUR-AREAL SOURCE NO. 81			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	-4930.57	500.00
2	-3069.43	-4669.99	500.00
3	-3069.43	-4330.01	500.00
4	-3069.43	-4069.43	500.00
5	-3330.01	-4930.57	500.00
6	-3330.01	-4669.99	500.00
7	-3330.01	-4330.01	500.00
8	-3330.01	-4069.43	500.00
9	-3669.99	-4930.57	500.00
10	-3669.99	-4669.99	500.00
11	-3669.99	-4330.01	500.00
12	-3669.99	-4069.43	500.00
13	-3930.57	-4930.57	500.00
14	-3930.57	-4669.99	500.00
15	-3930.57	-4330.01	500.00
16	-3930.57	-4069.43	500.00
SUR-AREAL SOURCE NO. 82			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	-3930.57	500.00
2	-3069.43	-3669.99	500.00
3	-3069.43	-3330.01	500.00
4	-3069.43	-3069.43	500.00
5	-3330.01	-3930.57	500.00
6	-3330.01	-3669.99	500.00
7	-3330.01	-3330.01	500.00
8	-3330.01	-3069.43	500.00
9	-3669.99	-3930.57	500.00
10	-3669.99	-3669.99	500.00
11	-3669.99	-3330.01	500.00
12	-3669.99	-3069.43	500.00
13	-3930.57	-3930.57	500.00
14	-3930.57	-3669.99	500.00
15	-3930.57	-3330.01	500.00
16	-3930.57	-3069.43	500.00
SUR-AREAL SOURCE NO. 83			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	-2930.57	500.00
2	-3069.43	-2669.99	500.00
3	-3069.43	-2330.01	500.00
4	-3069.43	-2069.43	500.00
5	-3330.01	-2930.57	500.00
6	-3330.01	-2669.99	500.00
7	-3330.01	-2330.01	500.00
8	-3330.01	-2069.43	500.00
9	-3669.99	-2930.57	500.00
10	-3669.99	-2669.99	500.00
11	-3669.99	-2330.01	500.00
12	-3669.99	-2069.43	500.00
13	-3930.57	-2930.57	500.00
14	-3930.57	-2669.99	500.00

15	-3930.57	-2330.01	500.00
16	-3930.57	-2069.43	500.00
SUB-AREAL SOURCE NO. 84			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	-1930.57	500.00
2	-3069.43	-1669.99	500.00
3	-3069.43	-1330.01	500.00
4	-3069.43	-1069.43	500.00
5	-3330.01	-1930.57	500.00
6	-3330.01	-1669.99	500.00
7	-3330.01	-1330.01	500.00
8	-3330.01	-1069.43	500.00
9	-3669.99	-1930.57	500.00
10	-3669.99	-1669.99	500.00
11	-3669.99	-1330.01	500.00
12	-3669.99	-1069.43	500.00
13	-3930.57	-1930.57	500.00
14	-3930.57	-1669.99	500.00
15	-3930.57	-1330.01	500.00
16	-3930.57	-1069.43	500.00
SUB-AREAL SOURCE NO. 85			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	-930.57	500.00
2	-3069.43	-669.99	500.00
3	-3069.43	-330.01	500.00
4	-3069.43	-69.43	500.00
5	-3330.01	-930.57	500.00
6	-3330.01	-669.99	500.00
7	-3330.01	-330.01	500.00
8	-3330.01	-69.43	500.00
9	-3669.99	-930.57	500.00
10	-3669.99	-669.99	500.00
11	-3669.99	-330.01	500.00
12	-3669.99	-69.43	500.00
13	-3930.57	-930.57	500.00
14	-3930.57	-669.99	500.00
15	-3930.57	-330.01	500.00
16	-3930.57	-69.43	500.00
SUB-AREAL SOURCE NO. 86			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	69.43	500.00
2	-3069.43	330.01	500.00
3	-3069.43	669.99	500.00
4	-3069.43	930.57	500.00
5	-3330.01	69.43	500.00
6	-3330.01	330.01	500.00
7	-3330.01	669.99	500.00
8	-3330.01	930.57	500.00
9	-3669.99	69.43	500.00
10	-3669.99	330.01	500.00
11	-3669.99	669.99	500.00
12	-3669.99	930.57	500.00
13	-3930.57	69.43	500.00
14	-3930.57	330.01	500.00
15	-3930.57	669.99	500.00
16	-3930.57	930.57	500.00
SUB-AREAL SOURCE NO. 87			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	1069.43	500.00
2	-3069.43	1330.01	500.00
3	-3069.43	1669.99	500.00
4	-3069.43	1930.57	500.00
5	-3330.01	1069.43	500.00
6	-3330.01	1330.01	500.00
7	-3330.01	1669.99	500.00
8	-3330.01	1930.57	500.00
9	-3669.99	1069.43	500.00
10	-3669.99	1330.01	500.00
11	-3669.99	1669.99	500.00
12	-3669.99	1930.57	500.00
13	-3930.57	1069.43	500.00
14	-3930.57	1330.01	500.00
15	-3930.57	1669.99	500.00
16	-3930.57	1930.57	500.00
SUB-AREAL SOURCE NO. 88			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	2069.43	500.00
2	-3069.43	2330.01	500.00
3	-3069.43	2669.99	500.00
4	-3069.43	2930.57	500.00
5	-3330.01	2069.43	500.00
6	-3330.01	2330.01	500.00
7	-3330.01	2669.99	500.00
8	-3330.01	2930.57	500.00
9	-3669.99	2069.43	500.00
10	-3669.99	2330.01	500.00
11	-3669.99	2669.99	500.00
12	-3669.99	2930.57	500.00
13	-3930.57	2069.43	500.00
14	-3930.57	2330.01	500.00
15	-3930.57	2669.99	500.00
16	-3930.57	2930.57	500.00
SUB-AREAL SOURCE NO. 89			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	3069.43	500.00
2	-3069.43	3330.01	500.00
3	-3069.43	3669.99	500.00
4	-3069.43	3930.57	500.00
5	-3330.01	3069.43	500.00
6	-3330.01	3330.01	500.00
7	-3330.01	3669.99	500.00
8	-3330.01	3930.57	500.00
9	-3669.99	3069.43	500.00
10	-3669.99	3330.01	500.00
11	-3669.99	3669.99	500.00
12	-3669.99	3930.57	500.00
13	-3930.57	3069.43	500.00
14	-3930.57	3330.01	500.00
15	-3930.57	3669.99	500.00
16	-3930.57	3930.57	500.00

SUB-AREAL GAUSS PT.	SOURCE NO. XCOORD	90 YCOORD	ZCOORD
1	-3069.43	4069.43	500.00
2	-3069.43	4330.01	500.00
3	-3069.43	4669.99	500.00
4	-3069.43	4930.57	500.00
5	-3330.01	4069.43	500.00
6	-3330.01	4330.01	500.00
7	-3330.01	4669.99	500.00
8	-3330.01	4930.57	500.00
9	-3669.99	4069.43	500.00
10	-3669.99	4330.01	500.00
11	-3669.99	4669.99	500.00
12	-3669.99	4930.57	500.00
13	-3930.57	4069.43	500.00
14	-3930.57	4330.01	500.00
15	-3930.57	4669.99	500.00
16	-3930.57	4930.57	500.00
SUB-AREAL GAUSS PT.	SOURCE NO. XCOORD	91 YCOORD	ZCOORD
1	-4069.43	-4930.57	500.00
2	-4069.43	-4669.99	500.00
3	-4069.43	-4330.01	500.00
4	-4069.43	-4069.43	500.00
5	-4330.01	-4930.57	500.00
6	-4330.01	-4669.99	500.00
7	-4330.01	-4330.01	500.00
8	-4330.01	-4069.43	500.00
9	-4669.99	-4930.57	500.00
10	-4669.99	-4669.99	500.00
11	-4669.99	-4330.01	500.00
12	-4669.99	-4069.43	500.00
13	-4930.57	-4930.57	500.00
14	-4930.57	-4669.99	500.00
15	-4930.57	-4330.01	500.00
16	-4930.57	-4069.43	500.00
SUB-AREAL GAUSS PT.	SOURCE NO. XCOORD	92 YCOORD	ZCOORD
1	-4069.43	-3930.57	500.00
2	-4069.43	-3669.99	500.00
3	-4069.43	-3330.01	500.00
4	-4069.43	-3069.43	500.00
5	-4330.01	-3930.57	500.00
6	-4330.01	-3669.99	500.00
7	-4330.01	-3330.01	500.00
8	-4330.01	-3069.43	500.00
9	-4669.99	-3930.57	500.00
10	-4669.99	-3669.99	500.00
11	-4669.99	-3330.01	500.00
12	-4669.99	-3069.43	500.00
13	-4930.57	-3930.57	500.00
14	-4930.57	-3669.99	500.00
15	-4930.57	-3330.01	500.00
16	-4930.57	-3069.43	500.00
SUB-AREAL GAUSS PT.	SOURCE NO. XCOORD	93 YCOORD	ZCOORD
1	-4069.43	-2930.57	500.00
2	-4069.43	-2669.99	500.00
3	-4069.43	-2330.01	500.00
4	-4069.43	-2069.43	500.00
5	-4330.01	-2930.57	500.00
6	-4330.01	-2669.99	500.00
7	-4330.01	-2330.01	500.00
8	-4330.01	-2069.43	500.00
9	-4669.99	-2930.57	500.00
10	-4669.99	-2669.99	500.00
11	-4669.99	-2330.01	500.00
12	-4669.99	-2069.43	500.00
13	-4930.57	-2930.57	500.00
14	-4930.57	-2669.99	500.00
15	-4930.57	-2330.01	500.00
16	-4930.57	-2069.43	500.00
SUB-AREAL GAUSS PT.	SOURCE NO. XCOORD	94 YCOORD	ZCOORD
1	-4069.43	-1930.57	500.00
2	-4069.43	-1669.99	500.00
3	-4069.43	-1330.01	500.00
4	-4069.43	-1069.43	500.00
5	-4330.01	-1930.57	500.00
6	-4330.01	-1669.99	500.00
7	-4330.01	-1330.01	500.00
8	-4330.01	-1069.43	500.00
9	-4669.99	-1930.57	500.00
10	-4669.99	-1669.99	500.00
11	-4669.99	-1330.01	500.00
12	-4669.99	-1069.43	500.00
13	-4930.57	-1930.57	500.00
14	-4930.57	-1669.99	500.00
15	-4930.57	-1330.01	500.00
16	-4930.57	-1069.43	500.00
SUB-AREAL GAUSS PT.	SOURCE NO. XCOORD	95 YCOORD	ZCOORD
1	-4069.43	-930.57	500.00
2	-4069.43	-669.99	500.00
3	-4069.43	-330.01	500.00
4	-4069.43	-69.43	500.00
5	-4330.01	-930.57	500.00
6	-4330.01	-669.99	500.00
7	-4330.01	-330.01	500.00
8	-4330.01	-69.43	500.00
9	-4669.99	-930.57	500.00
10	-4669.99	-669.99	500.00
11	-4669.99	-330.01	500.00
12	-4669.99	-69.43	500.00
13	-4930.57	-930.57	500.00
14	-4930.57	-669.99	500.00
15	-4930.57	-330.01	500.00
16	-4930.57	-69.43	500.00
SUB-AREAL GAUSS PT.	SOURCE NO. XCOORD	96 YCOORD	ZCOORD

1	-4069.43	69.43	500.00
2	-4069.43	330.01	500.00
3	-4069.43	669.99	500.00
4	-4069.43	930.57	500.00
5	-4330.01	69.43	500.00
6	-4330.01	330.01	500.00
7	-4330.01	669.99	500.00
8	-4330.01	930.57	500.00
9	-4669.99	69.43	500.00
10	-4669.99	330.01	500.00
11	-4669.99	669.99	500.00
12	-4669.99	930.57	500.00
13	-4930.57	69.43	500.00
14	-4930.57	330.01	500.00
15	-4930.57	669.99	500.00
16	-4930.57	930.57	500.00
SUB-AREAL SOURCE NO. 97			
GAUSS PT. XCOORD YCOORD ZCOORD			
1	-4069.43	1069.43	500.00
2	-4069.43	1330.01	500.00
3	-4069.43	1669.99	500.00
4	-4069.43	1930.57	500.00
5	-4330.01	1069.43	500.00
6	-4330.01	1330.01	500.00
7	-4330.01	1669.99	500.00
8	-4330.01	1930.57	500.00
9	-4669.99	1069.43	500.00
10	-4669.99	1330.01	500.00
11	-4669.99	1669.99	500.00
12	-4669.99	1930.57	500.00
13	-4930.57	1069.43	500.00
14	-4930.57	1330.01	500.00
15	-4930.57	1669.99	500.00
16	-4930.57	1930.57	500.00
SUB-AREAL SOURCE NO. 98			
GAUSS PT. XCOORD YCOORD ZCOORD			
1	-4069.43	2069.43	500.00
2	-4069.43	2330.01	500.00
3	-4069.43	2669.99	500.00
4	-4069.43	2930.57	500.00
5	-4330.01	2069.43	500.00
6	-4330.01	2330.01	500.00
7	-4330.01	2669.99	500.00
8	-4330.01	2930.57	500.00
9	-4669.99	2069.43	500.00
10	-4669.99	2330.01	500.00
11	-4669.99	2669.99	500.00
12	-4669.99	2930.57	500.00
13	-4930.57	2069.43	500.00
14	-4930.57	2330.01	500.00
15	-4930.57	2669.99	500.00
16	-4930.57	2930.57	500.00
SUB-AREAL SOURCE NO. 99			
GAUSS PT. XCOORD YCOORD ZCOORD			
1	-4069.43	3069.43	500.00
2	-4069.43	3330.01	500.00
3	-4069.43	3669.99	500.00
4	-4069.43	3930.57	500.00
5	-4330.01	3069.43	500.00
6	-4330.01	3330.01	500.00
7	-4330.01	3669.99	500.00
8	-4330.01	3930.57	500.00
9	-4669.99	3069.43	500.00
10	-4669.99	3330.01	500.00
11	-4669.99	3669.99	500.00
12	-4669.99	3930.57	500.00
13	-4930.57	3069.43	500.00
14	-4930.57	3330.01	500.00
15	-4930.57	3669.99	500.00
16	-4930.57	3930.57	500.00
SUB-AREAL SOURCE NO. 100			
GAUSS PT. XCOORD YCOORD ZCOORD			
1	-4069.43	4069.43	500.00
2	-4069.43	4330.01	500.00
3	-4069.43	4669.99	500.00
4	-4069.43	4930.57	500.00
5	-4330.01	4069.43	500.00
6	-4330.01	4330.01	500.00
7	-4330.01	4669.99	500.00
8	-4330.01	4930.57	500.00
9	-4669.99	4069.43	500.00
10	-4669.99	4330.01	500.00
11	-4669.99	4669.99	500.00
12	-4669.99	4930.57	500.00
13	-4930.57	4069.43	500.00
14	-4930.57	4330.01	500.00
15	-4930.57	4669.99	500.00
16	-4930.57	4930.57	500.00

TIMING FOR OUTPUT (YRS)

50.00

TEMPERATURES DISPLACEMENTS AND STRESSES AT TIME .50000E+02

PT	XCOORD	YCOORD	ZCOORD	TEMP	U	V	W	SIGXX	SIGYY	SIGZZ	SIGXY	SIGYZ	SIGZX
1	.0	.0	950.0	.7509E+00	-.2367E-03	-.2615E-04	.2247E+00	-.2121E+05	-.2119E+05	-.2359E+04	-.5705E+00	-.1210E+01	-.4386E+02
2	.0	.0	900.0	.2179E+01	.1049E-03	-.2553E-04	.2238E+00	-.1855E+05	-.1853E+05	-.2312E+04	-.5748E+00	-.1360E+01	-.4047E+01
3	.0	.0	850.0	.5086E+01	.8279E-04	-.2459E-04	.2239E+00	-.1296E+05	-.1297E+05	-.2224E+04	-.5822E+00	-.1505E+01	-.1133E+01
4	.0	.0	800.0	.1131E+02	.8221E-04	-.2422E-04	.2255E+00	-.1568E+04	-.1552E+04	-.1305E+04	-.5903E+00	-.1869E+01	-.1270E+01
5	.0	.0	750.0	.2261E+02	.1018E-03	-.2318E-04	.2301E+00	-.1967E+05	-.1968E+05	-.1549E+04	-.5896E+00	-.1828E+01	-.3090E+01
6	.0	.0	700.0	.4350E+02	.1178E-03	-.2239E-04	.2397E+00	-.5742E+05	-.5743E+05	-.8804E+04	-.5826E+00	-.1999E+01	-.4285E+01
7	.0	.0	650.0	.7929E+02	.9152E-04	-.2184E-04	.2580E+00	-.1217E+06	-.1217E+06	-.2220E+05	-.5631E+00	-.2150E+01	-.2280E+01
8	.0	.0	600.0	.1364E+03	.9786E-04	-.2074E-04	.2911E+00	-.2290E+06	-.2290E+06	-.3451E+05	-.5237E+00	-.2312E+01	-.2417E+01
9	.0	.0	550.0	.2115E+03	.1016E-03	-.2040E-04	.3503E+00	-.3889E+06	-.3889E+06	-.1273E+05	-.4990E+00	-.2443E+01	-.1851E+01

TOTAL RUN TIME = 6902.00000 SECONDS.

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AGAPITO 4.0
INFINITE PLATE SOURCE IN A SEMI-INFINITE MEDIUM - 100 YEARS
289.3 0. 0
3.171E8 .22 0 4.889E-6 0 0 0 0 1. 1. 0.
0 1 0 1 1 1 1 100 100 100. 0. 0. 0. 1000.
1 1.00 1 1 .0
0. 1214.4 0.
3
1 0. 5000. -5000. 500. 90. 10000. 10000. 500. 500. 10 10
100.
9 0. 0. 50. 0. 0. 450.
STOP

```

STRESS3D VERSION 4.0 (MAY 1989)
J.F.T. AGAPITO AND ASSOCS. (303)242 4220

INFINITE PLATE SOURCE IN A SEMI-INFINITE MEDIUM - 100 YEARS

QA NUMBER: AGAPITO 4.0
INPUT FILE: verif2
DATE: 05/18/89

TEMPERATURES DISPLACEMENTS AND STRESSES AT TIME .10000E+03

PT	XCOORD	YCOORD	ELEV	TEMP	U	V	W	SIGXX	SIGYY	SIGZZ	SIGXY	SIGYZ	SIGZX
1	.0	.0	50.0	.1194E+02-.3202E-03-.1325E-04	.4506E+00-	.2151E+05-	.2150E+05-	.4083E+04-	.3249E+01	.2653E+01	.1379E+02		
2	.0	.0	100.0	.1991E+02-.1578E-03-.2534E-04	.4542E+00-	.5854E+04-	.5847E+04-	.4335E+04-	.5936E+01	.4964E+00	.2492E+01		
3	.0	.0	150.0	.3237E+02-.4640E-03-.3606E-03	.4615E+00-	.1858E+05-	.1860E+05-	.4320E+04-	.5131E+02	.1798E+02	.1847E+02		
4	.0	.0	200.0	.5061E+02-.3331E-03-.1283E-03	.4748E+00-	.5436E+05-	.5430E+05-	.3902E+04-	.1189E+02	.3059E+01	.1637E+02		
5	.0	.0	250.0	.7745E+02-.1077E-03-.5935E-04	.4962E+00-	.1060E+06-	.1060E+06-	.1152E+04-	.2213E+01	.2017E+01	.1172E+02		
6	.0	.0	300.0	.1152E+03-.6009E-03-.1134E-03	.5285E+00-	.1772E+06-	.1772E+06-	.5846E+04-	.6914E+01	.4225E+01	.2921E+02		
7	.0	.0	350.0	.1678E+03-.3496E-03-.1536E-03	.5765E+00-	.2749E+06-	.2749E+06-	.1895E+05-	.1971E+02	.2019E+01	.1821E+02		
8	.0	.0	400.0	.2394E+03-.6212E-03-.9851E-04	.6449E+00-	.4108E+06-	.4109E+06-	.3109E+05-	.1728E+02	.5602E+00	.6209E+02		
9	.0	.0	450.0	.3240E+03-.5579E-03-.2529E-03	.7449E+00-	.5900E+06-	.5900E+06-	.8902E+04-	.1545E+02	.4677E+01	.1025E+03		

STRESJD VERSION 4.0 (MAY 1989)
J.F.T. AGAPITO AND ASSOCS. (303)242 4220

INFINITE PLATE SOURCE IN A SEMI-INFINITE MEDIUM - 100 YEARS

QA NUMBER: AGAPITO 4.0
INPUT FILE: ver1f2
DATE: 05/18/89

THERMO-ELASTIC ANALYSIS OF RADIO ACTIVE WASTE REPOSITORY

DIFFUSIVITY .2893E+03
SURFACE TEMP .0000E+00
UNIFORM INITIAL TEMPERATURE
ELASTIC MOD. .3171E+09
POISSON RATIO .2200E+00
COEFF OF EXPAN .4889E-05
ROCK SP. WT. .0000E+00
INITIAL MAX. HORZ. STRESS .0000E+00
INITIAL MIN. HORZ. STRESS .0000E+00
MAX. HORZ. STRESS GRAD./VERT. STRESS GRAD. 1.000
MIN. HORZ. STRESS GRAD./VERT. STRESS GRAD. 1.000
BEARING (DEG.) OF MAX. HORZ. STRESS W.R.T. X-AXIS .00

NUMBER OF CANISTERS 0
NUMBER OF AREAL SOURCES 1
NUMBER OF LINE SOURCES 0
NUMBER OF CANISTER TYPES 1
NUMBER OF TIMES FOR OUTPUT 1
NUMBER OF LINES FOR OUTPUT 1
NUMBER OF SURFACE SHEAR ROWS 100
NUMBER OF SURFACE COLUMNS 100
HALF WIDTH OF SURFACE ELEMENTS 100.00
CENTER OF SURFACE GRID (XCOORD) .00
CENTER OF SURFACE GRID (YCOORD) .00

ISOTHERMAL FREE SURFACE

CANISTER TYPE 1

CANISTER LENGTH 1.00
NUMBER OF POINT SOURCES 1
NUMBER OF COMPONENTS 1
DEPTH BELOW SURFACE .00
CANISTER COMPONENTS
SOURCE DATA - TIME ON .00 STRENGTH .1214E+04 EXP(-.0000E+00)

AREAL SOURCE NO. 1 SOURCE TYPE = 1 TIME ON = .00000E+00

SUB-AREAL SOURCE NO. GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	4930.57	-4930.57	500.00
2	4930.57	-4669.99	500.00
3	4930.57	-4330.01	500.00
4	4930.57	-4069.43	500.00
5	4669.99	-4930.57	500.00
6	4669.99	-4669.99	500.00
7	4669.99	-4330.01	500.00
8	4669.99	-4069.43	500.00
9	4330.01	-4930.57	500.00
10	4330.01	-4669.99	500.00
11	4330.01	-4330.01	500.00
12	4330.01	-4069.43	500.00
13	4069.43	-4930.57	500.00
14	4069.43	-4669.99	500.00
15	4069.43	-4330.01	500.00
16	4069.43	-4069.43	500.00

SUB-AREAL SOURCE NO. GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	4930.57	-3930.57	500.00
2	4930.57	-3669.99	500.00
3	4930.57	-3330.01	500.00
4	4930.57	-3069.43	500.00
5	4669.99	-3930.57	500.00
6	4669.99	-3669.99	500.00
7	4669.99	-3330.01	500.00
8	4669.99	-3069.43	500.00
9	4330.01	-3930.57	500.00
10	4330.01	-3669.99	500.00
11	4330.01	-3330.01	500.00
12	4330.01	-3069.43	500.00
13	4069.43	-3930.57	500.00
14	4069.43	-3669.99	500.00
15	4069.43	-3330.01	500.00
16	4069.43	-3069.43	500.00

SUB-AREAL SOURCE NO. GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	4930.57	-2930.57	500.00
2	4930.57	-2669.99	500.00
3	4930.57	-2330.01	500.00
4	4930.57	-2069.43	500.00
5	4669.99	-2930.57	500.00
6	4669.99	-2669.99	500.00
7	4669.99	-2330.01	500.00
8	4669.99	-2069.43	500.00
9	4330.01	-2930.57	500.00
10	4330.01	-2669.99	500.00
11	4330.01	-2330.01	500.00
12	4330.01	-2069.43	500.00
13	4069.43	-2930.57	500.00
14	4069.43	-2669.99	500.00
15	4069.43	-2330.01	500.00
16	4069.43	-2069.43	500.00

SUB-AREAL SOURCE NO. GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	4930.57	-1930.57	500.00
2	4930.57	-1669.99	500.00
3	4930.57	-1330.01	500.00
4	4930.57	-1069.43	500.00
5	4669.99	-1930.57	500.00
6	4669.99	-1669.99	500.00

7	4669.99	-1330.01	500.00
8	4669.99	-1069.43	500.00
9	4330.01	-1930.57	500.00
10	4330.01	-1669.99	500.00
11	4330.01	-1330.01	500.00
12	4330.01	-1069.43	500.00
13	4069.43	-1930.57	500.00
14	4069.43	-1669.99	500.00
15	4069.43	-1330.01	500.00
16	4069.43	-1069.43	500.00
SUB-AREAL SOURCE NO. 5			
GAUSS PT. XCOOR YCOOR ZCOOR			
1	4930.57	-930.57	500.00
2	4930.57	-669.99	500.00
3	4930.57	-330.01	500.00
4	4930.57	-69.43	500.00
5	4669.99	-930.57	500.00
6	4669.99	-669.99	500.00
7	4669.99	-330.01	500.00
8	4669.99	-69.43	500.00
9	4330.01	-930.57	500.00
10	4330.01	-669.99	500.00
11	4330.01	-330.01	500.00
12	4330.01	-69.43	500.00
13	4069.43	-930.57	500.00
14	4069.43	-669.99	500.00
15	4069.43	-330.01	500.00
16	4069.43	-69.43	500.00
SUB-AREAL SOURCE NO. 6			
GAUSS PT. XCOOR YCOOR ZCOOR			
1	4930.57	69.43	500.00
2	4930.57	330.01	500.00
3	4930.57	669.99	500.00
4	4930.57	930.57	500.00
5	4669.99	69.43	500.00
6	4669.99	330.01	500.00
7	4669.99	669.99	500.00
8	4669.99	930.57	500.00
9	4330.01	69.43	500.00
10	4330.01	330.01	500.00
11	4330.01	669.99	500.00
12	4330.01	930.57	500.00
13	4069.43	69.43	500.00
14	4069.43	330.01	500.00
15	4069.43	669.99	500.00
16	4069.43	930.57	500.00
SUB-AREAL SOURCE NO. 7			
GAUSS PT. XCOOR YCOOR ZCOOR			
1	4930.57	1069.43	500.00
2	4930.57	1330.01	500.00
3	4930.57	1669.99	500.00
4	4930.57	1930.57	500.00
5	4669.99	1069.43	500.00
6	4669.99	1330.01	500.00
7	4669.99	1669.99	500.00
8	4669.99	1930.57	500.00
9	4330.01	1069.43	500.00
10	4330.01	1330.01	500.00
11	4330.01	1669.99	500.00
12	4330.01	1930.57	500.00
13	4069.43	1069.43	500.00
14	4069.43	1330.01	500.00
15	4069.43	1669.99	500.00
16	4069.43	1930.57	500.00
SUB-AREAL SOURCE NO. 8			
GAUSS PT. XCOOR YCOOR ZCOOR			
1	4930.57	2069.43	500.00
2	4930.57	2330.01	500.00
3	4930.57	2669.99	500.00
4	4930.57	2930.57	500.00
5	4669.99	2069.43	500.00
6	4669.99	2330.01	500.00
7	4669.99	2669.99	500.00
8	4669.99	2930.57	500.00
9	4330.01	2069.43	500.00
10	4330.01	2330.01	500.00
11	4330.01	2669.99	500.00
12	4330.01	2930.57	500.00
13	4069.43	2069.43	500.00
14	4069.43	2330.01	500.00
15	4069.43	2669.99	500.00
16	4069.43	2930.57	500.00
SUB-AREAL SOURCE NO. 9			
GAUSS PT. XCOOR YCOOR ZCOOR			
1	4930.57	3069.43	500.00
2	4930.57	3330.01	500.00
3	4930.57	3669.99	500.00
4	4930.57	3930.57	500.00
5	4669.99	3069.43	500.00
6	4669.99	3330.01	500.00
7	4669.99	3669.99	500.00
8	4669.99	3930.57	500.00
9	4330.01	3069.43	500.00
10	4330.01	3330.01	500.00
11	4330.01	3669.99	500.00
12	4330.01	3930.57	500.00
13	4069.43	3069.43	500.00
14	4069.43	3330.01	500.00
15	4069.43	3669.99	500.00
16	4069.43	3930.57	500.00
SUB-AREAL SOURCE NO. 10			
GAUSS PT. XCOOR YCOOR ZCOOR			
1	4930.57	4069.43	500.00
2	4930.57	4330.01	500.00
3	4930.57	4669.99	500.00
4	4930.57	4930.57	500.00
5	4669.99	4069.43	500.00
6	4669.99	4330.01	500.00
7	4669.99	4669.99	500.00
8	4669.99	4930.57	500.00

9	4330.01	4069.43	500.00
10	4330.01	4330.01	500.00
11	4330.01	4669.99	500.00
12	4330.01	4930.57	500.00
13	4069.43	4069.43	500.00
14	4069.43	4330.01	500.00
15	4069.43	4669.99	500.00
16	4069.43	4930.57	500.00
SUB-AREAL SOURCE NO. 11			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	3930.57	-4930.57	500.00
2	3930.57	-4669.99	500.00
3	3930.57	-4330.01	500.00
4	3930.57	-4069.43	500.00
5	3669.99	-4930.57	500.00
6	3669.99	-4669.99	500.00
7	3669.99	-4330.01	500.00
8	3669.99	-4069.43	500.00
9	3330.01	-4930.57	500.00
10	3330.01	-4669.99	500.00
11	3330.01	-4330.01	500.00
12	3330.01	-4069.43	500.00
13	3069.43	-4930.57	500.00
14	3069.43	-4669.99	500.00
15	3069.43	-4330.01	500.00
16	3069.43	-4069.43	500.00
SUB-AREAL SOURCE NO. 12			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	3930.57	-3930.57	500.00
2	3930.57	-3669.99	500.00
3	3930.57	-3330.01	500.00
4	3930.57	-3069.43	500.00
5	3669.99	-3930.57	500.00
6	3669.99	-3669.99	500.00
7	3669.99	-3330.01	500.00
8	3669.99	-3069.43	500.00
9	3330.01	-3930.57	500.00
10	3330.01	-3669.99	500.00
11	3330.01	-3330.01	500.00
12	3330.01	-3069.43	500.00
13	3069.43	-3930.57	500.00
14	3069.43	-3669.99	500.00
15	3069.43	-3330.01	500.00
16	3069.43	-3069.43	500.00
SUB-AREAL SOURCE NO. 13			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	3930.57	-2930.57	500.00
2	3930.57	-2669.99	500.00
3	3930.57	-2330.01	500.00
4	3930.57	-2069.43	500.00
5	3669.99	-2930.57	500.00
6	3669.99	-2669.99	500.00
7	3669.99	-2330.01	500.00
8	3669.99	-2069.43	500.00
9	3330.01	-2930.57	500.00
10	3330.01	-2669.99	500.00
11	3330.01	-2330.01	500.00
12	3330.01	-2069.43	500.00
13	3069.43	-2930.57	500.00
14	3069.43	-2669.99	500.00
15	3069.43	-2330.01	500.00
16	3069.43	-2069.43	500.00
SUB-AREAL SOURCE NO. 14			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	3930.57	-1930.57	500.00
2	3930.57	-1669.99	500.00
3	3930.57	-1330.01	500.00
4	3930.57	-1069.43	500.00
5	3669.99	-1930.57	500.00
6	3669.99	-1669.99	500.00
7	3669.99	-1330.01	500.00
8	3669.99	-1069.43	500.00
9	3330.01	-1930.57	500.00
10	3330.01	-1669.99	500.00
11	3330.01	-1330.01	500.00
12	3330.01	-1069.43	500.00
13	3069.43	-1930.57	500.00
14	3069.43	-1669.99	500.00
15	3069.43	-1330.01	500.00
16	3069.43	-1069.43	500.00
SUB-AREAL SOURCE NO. 15			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	3930.57	-930.57	500.00
2	3930.57	-669.99	500.00
3	3930.57	-330.01	500.00
4	3930.57	-69.43	500.00
5	3669.99	-930.57	500.00
6	3669.99	-669.99	500.00
7	3669.99	-330.01	500.00
8	3669.99	-69.43	500.00
9	3330.01	-930.57	500.00
10	3330.01	-669.99	500.00
11	3330.01	-330.01	500.00
12	3330.01	-69.43	500.00
13	3069.43	-930.57	500.00
14	3069.43	-669.99	500.00
15	3069.43	-330.01	500.00
16	3069.43	-69.43	500.00
SUB-AREAL SOURCE NO. 16			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	3930.57	69.43	500.00
2	3930.57	330.01	500.00
3	3930.57	669.99	500.00
4	3930.57	930.57	500.00
5	3669.99	69.43	500.00
6	3669.99	330.01	500.00
7	3669.99	669.99	500.00
8	3669.99	930.57	500.00
9	3330.01	69.43	500.00
10	3330.01	330.01	500.00

11	3330.01	669.99	500.00
12	3330.01	930.57	500.00
13	3069.43	69.43	500.00
14	3069.43	330.01	500.00
15	3069.43	669.99	500.00
16	3069.43	930.57	500.00
SUB-AREAL SOURCE NO. 17			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	3930.57	1069.43	500.00
2	3930.57	1330.01	500.00
3	3930.57	1669.99	500.00
4	3930.57	1930.57	500.00
5	3669.99	1069.43	500.00
6	3669.99	1330.01	500.00
7	3669.99	1669.99	500.00
8	3669.99	1930.57	500.00
9	3330.01	1069.43	500.00
10	3330.01	1330.01	500.00
11	3330.01	1669.99	500.00
12	3330.01	1930.57	500.00
13	3069.43	1069.43	500.00
14	3069.43	1330.01	500.00
15	3069.43	1669.99	500.00
16	3069.43	1930.57	500.00
SUB-AREAL SOURCE NO. 18			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	3930.57	2069.43	500.00
2	3930.57	2330.01	500.00
3	3930.57	2669.99	500.00
4	3930.57	2930.57	500.00
5	3669.99	2069.43	500.00
6	3669.99	2330.01	500.00
7	3669.99	2669.99	500.00
8	3669.99	2930.57	500.00
9	3330.01	2069.43	500.00
10	3330.01	2330.01	500.00
11	3330.01	2669.99	500.00
12	3330.01	2930.57	500.00
13	3069.43	2069.43	500.00
14	3069.43	2330.01	500.00
15	3069.43	2669.99	500.00
16	3069.43	2930.57	500.00
SUB-AREAL SOURCE NO. 19			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	3930.57	3069.43	500.00
2	3930.57	3330.01	500.00
3	3930.57	3669.99	500.00
4	3930.57	3930.57	500.00
5	3669.99	3069.43	500.00
6	3669.99	3330.01	500.00
7	3669.99	3669.99	500.00
8	3669.99	3930.57	500.00
9	3330.01	3069.43	500.00
10	3330.01	3330.01	500.00
11	3330.01	3669.99	500.00
12	3330.01	3930.57	500.00
13	3069.43	3069.43	500.00
14	3069.43	3330.01	500.00
15	3069.43	3669.99	500.00
16	3069.43	3930.57	500.00
SUB-AREAL SOURCE NO. 20			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	3930.57	4069.43	500.00
2	3930.57	4330.01	500.00
3	3930.57	4669.99	500.00
4	3930.57	4930.57	500.00
5	3669.99	4069.43	500.00
6	3669.99	4330.01	500.00
7	3669.99	4669.99	500.00
8	3669.99	4930.57	500.00
9	3330.01	4069.43	500.00
10	3330.01	4330.01	500.00
11	3330.01	4669.99	500.00
12	3330.01	4930.57	500.00
13	3069.43	4069.43	500.00
14	3069.43	4330.01	500.00
15	3069.43	4669.99	500.00
16	3069.43	4930.57	500.00
SUB-AREAL SOURCE NO. 21			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	-4930.57	500.00
2	2930.57	-4669.99	500.00
3	2930.57	-4330.01	500.00
4	2930.57	-4069.43	500.00
5	2669.99	-4930.57	500.00
6	2669.99	-4669.99	500.00
7	2669.99	-4330.01	500.00
8	2669.99	-4069.43	500.00
9	2330.01	-4930.57	500.00
10	2330.01	-4669.99	500.00
11	2330.01	-4330.01	500.00
12	2330.01	-4069.43	500.00
13	2069.43	-4930.57	500.00
14	2069.43	-4669.99	500.00
15	2069.43	-4330.01	500.00
16	2069.43	-4069.43	500.00
SUB-AREAL SOURCE NO. 22			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	-3930.57	500.00
2	2930.57	-3669.99	500.00
3	2930.57	-3330.01	500.00
4	2930.57	-3069.43	500.00
5	2669.99	-3930.57	500.00
6	2669.99	-3669.99	500.00
7	2669.99	-3330.01	500.00
8	2669.99	-3069.43	500.00
9	2330.01	-3930.57	500.00
10	2330.01	-3669.99	500.00
11	2330.01	-3330.01	500.00
12	2330.01	-3069.43	500.00

13	2069.43	-3930.57	500.00
14	2069.43	-3669.99	500.00
15	2069.43	-3330.01	500.00
16	2069.43	-3069.43	500.00
SUB-AREAL SOURCE NO. 23			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	-2930.57	500.00
2	2930.57	-2669.99	500.00
3	2930.57	-2330.01	500.00
4	2930.57	-2069.43	500.00
5	2669.99	-2930.57	500.00
6	2669.99	-2669.99	500.00
7	2669.99	-2330.01	500.00
8	2669.99	-2069.43	500.00
9	2330.01	-2930.57	500.00
10	2330.01	-2669.99	500.00
11	2330.01	-2330.01	500.00
12	2330.01	-2069.43	500.00
13	2069.43	-2930.57	500.00
14	2069.43	-2669.99	500.00
15	2069.43	-2330.01	500.00
16	2069.43	-2069.43	500.00
SUB-AREAL SOURCE NO. 24			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	-1930.57	500.00
2	2930.57	-1669.99	500.00
3	2930.57	-1330.01	500.00
4	2930.57	-1069.43	500.00
5	2669.99	-1930.57	500.00
6	2669.99	-1669.99	500.00
7	2669.99	-1330.01	500.00
8	2669.99	-1069.43	500.00
9	2330.01	-1930.57	500.00
10	2330.01	-1669.99	500.00
11	2330.01	-1330.01	500.00
12	2330.01	-1069.43	500.00
13	2069.43	-1930.57	500.00
14	2069.43	-1669.99	500.00
15	2069.43	-1330.01	500.00
16	2069.43	-1069.43	500.00
SUB-AREAL SOURCE NO. 25			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	-930.57	500.00
2	2930.57	-669.99	500.00
3	2930.57	-330.01	500.00
4	2930.57	-69.43	500.00
5	2669.99	-930.57	500.00
6	2669.99	-669.99	500.00
7	2669.99	-330.01	500.00
8	2669.99	-69.43	500.00
9	2330.01	-930.57	500.00
10	2330.01	-669.99	500.00
11	2330.01	-330.01	500.00
12	2330.01	-69.43	500.00
13	2069.43	-930.57	500.00
14	2069.43	-669.99	500.00
15	2069.43	-330.01	500.00
16	2069.43	-69.43	500.00
SUB-AREAL SOURCE NO. 26			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	69.43	500.00
2	2930.57	330.01	500.00
3	2930.57	669.99	500.00
4	2930.57	930.57	500.00
5	2669.99	69.43	500.00
6	2669.99	330.01	500.00
7	2669.99	669.99	500.00
8	2669.99	930.57	500.00
9	2330.01	69.43	500.00
10	2330.01	330.01	500.00
11	2330.01	669.99	500.00
12	2330.01	930.57	500.00
13	2069.43	69.43	500.00
14	2069.43	330.01	500.00
15	2069.43	669.99	500.00
16	2069.43	930.57	500.00
SUB-AREAL SOURCE NO. 27			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	1069.43	500.00
2	2930.57	1330.01	500.00
3	2930.57	1669.99	500.00
4	2930.57	1930.57	500.00
5	2669.99	1069.43	500.00
6	2669.99	1330.01	500.00
7	2669.99	1669.99	500.00
8	2669.99	1930.57	500.00
9	2330.01	1069.43	500.00
10	2330.01	1330.01	500.00
11	2330.01	1669.99	500.00
12	2330.01	1930.57	500.00
13	2069.43	1069.43	500.00
14	2069.43	1330.01	500.00
15	2069.43	1669.99	500.00
16	2069.43	1930.57	500.00
SUB-AREAL SOURCE NO. 28			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930.57	2069.43	500.00
2	2930.57	2330.01	500.00
3	2930.57	2669.99	500.00
4	2930.57	2930.57	500.00
5	2669.99	2069.43	500.00
6	2669.99	2330.01	500.00
7	2669.99	2669.99	500.00
8	2669.99	2930.57	500.00
9	2330.01	2069.43	500.00
10	2330.01	2330.01	500.00
11	2330.01	2669.99	500.00
12	2330.01	2930.57	500.00
13	2069.43	2069.43	500.00
14	2069.43	2330.01	500.00

15	2069 43	2669 99	500 00
16	2069 43	2930 57	500 00
SUB-AREAL SOURCE NO. 29			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930 57	3069 43	500 00
2	2930 57	3330 01	500 00
3	2930 57	3669 99	500 00
4	2930 57	3930 57	500 00
5	2669 99	3069 43	500 00
6	2669 99	3330 01	500 00
7	2669 99	3669 99	500 00
8	2669 99	3930 57	500 00
9	2330 01	3069 43	500 00
10	2330 01	3330 01	500 00
11	2330 01	3669 99	500 00
12	2330 01	3930 57	500 00
13	2069 43	3069 43	500 00
14	2069 43	3330 01	500 00
15	2069 43	3669 99	500 00
16	2069 43	3930 57	500 00
SUB-AREAL SOURCE NO. 30			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	2930 57	4069 43	500 00
2	2930 57	4330 01	500 00
3	2930 57	4669 99	500 00
4	2930 57	4930 57	500 00
5	2669 99	4069 43	500 00
6	2669 99	4330 01	500 00
7	2669 99	4669 99	500 00
8	2669 99	4930 57	500 00
9	2330 01	4069 43	500 00
10	2330 01	4330 01	500 00
11	2330 01	4669 99	500 00
12	2330 01	4930 57	500 00
13	2069 43	4069 43	500 00
14	2069 43	4330 01	500 00
15	2069 43	4669 99	500 00
16	2069 43	4930 57	500 00
SUB-AREAL SOURCE NO. 31			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	1930 57	-4930 57	500 00
2	1930 57	-4669 99	500 00
3	1930 57	-4330 01	500 00
4	1930 57	-4069 43	500 00
5	1669 99	-4930 57	500 00
6	1669 99	-4669 99	500 00
7	1669 99	-4330 01	500 00
8	1669 99	-4069 43	500 00
9	1330 01	-4930 57	500 00
10	1330 01	-4669 99	500 00
11	1330 01	-4330 01	500 00
12	1330 01	-4069 43	500 00
13	1069 43	-4930 57	500 00
14	1069 43	-4669 99	500 00
15	1069 43	-4330 01	500 00
16	1069 43	-4069 43	500 00
SUB-AREAL SOURCE NO. 32			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	1930 57	-3930 57	500 00
2	1930 57	-3669 99	500 00
3	1930 57	-3330 01	500 00
4	1930 57	-3069 43	500 00
5	1669 99	-3930 57	500 00
6	1669 99	-3669 99	500 00
7	1669 99	-3330 01	500 00
8	1669 99	-3069 43	500 00
9	1330 01	-3930 57	500 00
10	1330 01	-3669 99	500 00
11	1330 01	-3330 01	500 00
12	1330 01	-3069 43	500 00
13	1069 43	-3930 57	500 00
14	1069 43	-3669 99	500 00
15	1069 43	-3330 01	500 00
16	1069 43	-3069 43	500 00
SUB-AREAL SOURCE NO. 33			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	1930 57	-2930 57	500 00
2	1930 57	-2669 99	500 00
3	1930 57	-2330 01	500 00
4	1930 57	-2069 43	500 00
5	1669 99	-2930 57	500 00
6	1669 99	-2669 99	500 00
7	1669 99	-2330 01	500 00
8	1669 99	-2069 43	500 00
9	1330 01	-2930 57	500 00
10	1330 01	-2669 99	500 00
11	1330 01	-2330 01	500 00
12	1330 01	-2069 43	500 00
13	1069 43	-2930 57	500 00
14	1069 43	-2669 99	500 00
15	1069 43	-2330 01	500 00
16	1069 43	-2069 43	500 00
SUB-AREAL SOURCE NO. 34			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	1930 57	-1930 57	500 00
2	1930 57	-1669 99	500 00
3	1930 57	-1330 01	500 00
4	1930 57	-1069 43	500 00
5	1669 99	-1930 57	500 00
6	1669 99	-1669 99	500 00
7	1669 99	-1330 01	500 00
8	1669 99	-1069 43	500 00
9	1330 01	-1930 57	500 00
10	1330 01	-1669 99	500 00
11	1330 01	-1330 01	500 00
12	1330 01	-1069 43	500 00
13	1069 43	-1930 57	500 00
14	1069 43	-1669 99	500 00
15	1069 43	-1330 01	500 00
16	1069 43	-1069 43	500 00

SUB-AREAL GAUSS PT.	SOURCE NO. XCOORD	35 YCOORD	ZCOORD
1	1930.57	-930.57	500.00
2	1930.57	-669.99	500.00
3	1930.57	-330.01	500.00
4	1930.57	-69.43	500.00
5	1669.99	-930.57	500.00
6	1669.99	-669.99	500.00
7	1669.99	-330.01	500.00
8	1669.99	-69.43	500.00
9	1330.01	-930.57	500.00
10	1330.01	-669.99	500.00
11	1330.01	-330.01	500.00
12	1330.01	-69.43	500.00
13	1069.43	-930.57	500.00
14	1069.43	-669.99	500.00
15	1069.43	-330.01	500.00
16	1069.43	-69.43	500.00
SUB-AREAL GAUSS PT.	SOURCE NO. XCOORD	36 YCOORD	ZCOORD
1	1930.57	69.43	500.00
2	1930.57	330.01	500.00
3	1930.57	669.99	500.00
4	1930.57	930.57	500.00
5	1669.99	69.43	500.00
6	1669.99	330.01	500.00
7	1669.99	669.99	500.00
8	1669.99	930.57	500.00
9	1330.01	69.43	500.00
10	1330.01	330.01	500.00
11	1330.01	669.99	500.00
12	1330.01	930.57	500.00
13	1069.43	69.43	500.00
14	1069.43	330.01	500.00
15	1069.43	669.99	500.00
16	1069.43	930.57	500.00
SUB-AREAL GAUSS PT.	SOURCE NO. XCOORD	37 YCOORD	ZCOORD
1	1930.57	1069.43	500.00
2	1930.57	1330.01	500.00
3	1930.57	1669.99	500.00
4	1930.57	1930.57	500.00
5	1669.99	1069.43	500.00
6	1669.99	1330.01	500.00
7	1669.99	1669.99	500.00
8	1669.99	1930.57	500.00
9	1330.01	1069.43	500.00
10	1330.01	1330.01	500.00
11	1330.01	1669.99	500.00
12	1330.01	1930.57	500.00
13	1069.43	1069.43	500.00
14	1069.43	1330.01	500.00
15	1069.43	1669.99	500.00
16	1069.43	1930.57	500.00
SUB-AREAL GAUSS PT.	SOURCE NO. XCOORD	38 YCOORD	ZCOORD
1	1930.57	2069.43	500.00
2	1930.57	2330.01	500.00
3	1930.57	2669.99	500.00
4	1930.57	2930.57	500.00
5	1669.99	2069.43	500.00
6	1669.99	2330.01	500.00
7	1669.99	2669.99	500.00
8	1669.99	2930.57	500.00
9	1330.01	2069.43	500.00
10	1330.01	2330.01	500.00
11	1330.01	2669.99	500.00
12	1330.01	2930.57	500.00
13	1069.43	2069.43	500.00
14	1069.43	2330.01	500.00
15	1069.43	2669.99	500.00
16	1069.43	2930.57	500.00
SUB-AREAL GAUSS PT.	SOURCE NO. XCOORD	39 YCOORD	ZCOORD
1	1930.57	3069.43	500.00
2	1930.57	3330.01	500.00
3	1930.57	3669.99	500.00
4	1930.57	3930.57	500.00
5	1669.99	3069.43	500.00
6	1669.99	3330.01	500.00
7	1669.99	3669.99	500.00
8	1669.99	3930.57	500.00
9	1330.01	3069.43	500.00
10	1330.01	3330.01	500.00
11	1330.01	3669.99	500.00
12	1330.01	3930.57	500.00
13	1069.43	3069.43	500.00
14	1069.43	3330.01	500.00
15	1069.43	3669.99	500.00
16	1069.43	3930.57	500.00
SUB-AREAL GAUSS PT.	SOURCE NO. XCOORD	40 YCOORD	ZCOORD
1	1930.57	4069.43	500.00
2	1930.57	4330.01	500.00
3	1930.57	4669.99	500.00
4	1930.57	4930.57	500.00
5	1669.99	4069.43	500.00
6	1669.99	4330.01	500.00
7	1669.99	4669.99	500.00
8	1669.99	4930.57	500.00
9	1330.01	4069.43	500.00
10	1330.01	4330.01	500.00
11	1330.01	4669.99	500.00
12	1330.01	4930.57	500.00
13	1069.43	4069.43	500.00
14	1069.43	4330.01	500.00
15	1069.43	4669.99	500.00
16	1069.43	4930.57	500.00
SUB-AREAL GAUSS PT.	SOURCE NO. XCOORD	41 YCOORD	ZCOORD

1	930.57	-4930.57	500.00
2	930.57	-4669.99	500.00
3	930.57	-4330.01	500.00
4	930.57	-4069.43	500.00
5	669.99	-4930.57	500.00
6	669.99	-4669.99	500.00
7	669.99	-4330.01	500.00
8	669.99	-4069.43	500.00
9	330.01	-4930.57	500.00
10	330.01	-4669.99	500.00
11	330.01	-4330.01	500.00
12	330.01	-4069.43	500.00
13	69.43	-4930.57	500.00
14	69.43	-4669.99	500.00
15	69.43	-4330.01	500.00
16	69.43	-4069.43	500.00
SUB-AREAL SOURCE NO. 42			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	-3930.57	500.00
2	930.57	-3669.99	500.00
3	930.57	-3330.01	500.00
4	930.57	-3069.43	500.00
5	669.99	-3930.57	500.00
6	669.99	-3669.99	500.00
7	669.99	-3330.01	500.00
8	669.99	-3069.43	500.00
9	330.01	-3930.57	500.00
10	330.01	-3669.99	500.00
11	330.01	-3330.01	500.00
12	330.01	-3069.43	500.00
13	69.43	-3930.57	500.00
14	69.43	-3669.99	500.00
15	69.43	-3330.01	500.00
16	69.43	-3069.43	500.00
SUB-AREAL SOURCE NO. 43			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	-2930.57	500.00
2	930.57	-2669.99	500.00
3	930.57	-2330.01	500.00
4	930.57	-2069.43	500.00
5	669.99	-2930.57	500.00
6	669.99	-2669.99	500.00
7	669.99	-2330.01	500.00
8	669.99	-2069.43	500.00
9	330.01	-2930.57	500.00
10	330.01	-2669.99	500.00
11	330.01	-2330.01	500.00
12	330.01	-2069.43	500.00
13	69.43	-2930.57	500.00
14	69.43	-2669.99	500.00
15	69.43	-2330.01	500.00
16	69.43	-2069.43	500.00
SUB-AREAL SOURCE NO. 44			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	-1930.57	500.00
2	930.57	-1669.99	500.00
3	930.57	-1330.01	500.00
4	930.57	-1069.43	500.00
5	669.99	-1930.57	500.00
6	669.99	-1669.99	500.00
7	669.99	-1330.01	500.00
8	669.99	-1069.43	500.00
9	330.01	-1930.57	500.00
10	330.01	-1669.99	500.00
11	330.01	-1330.01	500.00
12	330.01	-1069.43	500.00
13	69.43	-1930.57	500.00
14	69.43	-1669.99	500.00
15	69.43	-1330.01	500.00
16	69.43	-1069.43	500.00
SUB-AREAL SOURCE NO. 45			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	-930.57	500.00
2	930.57	-669.99	500.00
3	930.57	-330.01	500.00
4	930.57	-69.43	500.00
5	669.99	-930.57	500.00
6	669.99	-669.99	500.00
7	669.99	-330.01	500.00
8	669.99	-69.43	500.00
9	330.01	-930.57	500.00
10	330.01	-669.99	500.00
11	330.01	-330.01	500.00
12	330.01	-69.43	500.00
13	69.43	-930.57	500.00
14	69.43	-669.99	500.00
15	69.43	-330.01	500.00
16	69.43	-69.43	500.00
SUB-AREAL SOURCE NO. 46			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	69.43	500.00
2	930.57	330.01	500.00
3	930.57	669.99	500.00
4	930.57	930.57	500.00
5	669.99	69.43	500.00
6	669.99	330.01	500.00
7	669.99	669.99	500.00
8	669.99	930.57	500.00
9	330.01	69.43	500.00
10	330.01	330.01	500.00
11	330.01	669.99	500.00
12	330.01	930.57	500.00
13	69.43	69.43	500.00
14	69.43	330.01	500.00
15	69.43	669.99	500.00
16	69.43	930.57	500.00
SUB-AREAL SOURCE NO. 47			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	1069.43	500.00

2	930.57	1330.01	500.00
3	930.57	1669.99	500.00
4	930.57	1930.57	500.00
5	669.99	1069.43	500.00
6	669.99	1330.01	500.00
7	669.99	1669.99	500.00
8	669.99	1930.57	500.00
9	330.01	1069.43	500.00
10	330.01	1330.01	500.00
11	330.01	1669.99	500.00
12	330.01	1930.57	500.00
13	69.43	1069.43	500.00
14	69.43	1330.01	500.00
15	69.43	1669.99	500.00
16	69.43	1930.57	500.00
SUB-AREAL SOURCE NO. 48			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	2069.43	500.00
2	930.57	2330.01	500.00
3	930.57	2669.99	500.00
4	930.57	2930.57	500.00
5	669.99	2069.43	500.00
6	669.99	2330.01	500.00
7	669.99	2669.99	500.00
8	669.99	2930.57	500.00
9	330.01	2069.43	500.00
10	330.01	2330.01	500.00
11	330.01	2669.99	500.00
12	330.01	2930.57	500.00
13	69.43	2069.43	500.00
14	69.43	2330.01	500.00
15	69.43	2669.99	500.00
16	69.43	2930.57	500.00
SUB-AREAL SOURCE NO. 49			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	3069.43	500.00
2	930.57	3330.01	500.00
3	930.57	3669.99	500.00
4	930.57	3930.57	500.00
5	669.99	3069.43	500.00
6	669.99	3330.01	500.00
7	669.99	3669.99	500.00
8	669.99	3930.57	500.00
9	330.01	3069.43	500.00
10	330.01	3330.01	500.00
11	330.01	3669.99	500.00
12	330.01	3930.57	500.00
13	69.43	3069.43	500.00
14	69.43	3330.01	500.00
15	69.43	3669.99	500.00
16	69.43	3930.57	500.00
SUB-AREAL SOURCE NO. 50			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	930.57	4069.43	500.00
2	930.57	4330.01	500.00
3	930.57	4669.99	500.00
4	930.57	4930.57	500.00
5	669.99	4069.43	500.00
6	669.99	4330.01	500.00
7	669.99	4669.99	500.00
8	669.99	4930.57	500.00
9	330.01	4069.43	500.00
10	330.01	4330.01	500.00
11	330.01	4669.99	500.00
12	330.01	4930.57	500.00
13	69.43	4069.43	500.00
14	69.43	4330.01	500.00
15	69.43	4669.99	500.00
16	69.43	4930.57	500.00
SUB-AREAL SOURCE NO. 51			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	-4930.57	500.00
2	-69.43	-4669.99	500.00
3	-69.43	-4330.01	500.00
4	-69.43	-4069.43	500.00
5	-330.01	-4930.57	500.00
6	-330.01	-4669.99	500.00
7	-330.01	-4330.01	500.00
8	-330.01	-4069.43	500.00
9	-669.99	-4930.57	500.00
10	-669.99	-4669.99	500.00
11	-669.99	-4330.01	500.00
12	-669.99	-4069.43	500.00
13	-930.57	-4930.57	500.00
14	-930.57	-4669.99	500.00
15	-930.57	-4330.01	500.00
16	-930.57	-4069.43	500.00
SUB-AREAL SOURCE NO. 52			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	-3930.57	500.00
2	-69.43	-3669.99	500.00
3	-69.43	-3330.01	500.00
4	-69.43	-3069.43	500.00
5	-330.01	-3930.57	500.00
6	-330.01	-3669.99	500.00
7	-330.01	-3330.01	500.00
8	-330.01	-3069.43	500.00
9	-669.99	-3930.57	500.00
10	-669.99	-3669.99	500.00
11	-669.99	-3330.01	500.00
12	-669.99	-3069.43	500.00
13	-930.57	-3930.57	500.00
14	-930.57	-3669.99	500.00
15	-930.57	-3330.01	500.00
16	-930.57	-3069.43	500.00
SUB-AREAL SOURCE NO. 53			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	-2930.57	500.00
2	-69.43	-2669.99	500.00
3	-69.43	-2330.01	500.00

4	-69.43	-2069.43	500.00
5	-330.01	-2930.57	500.00
6	-330.01	-2669.99	500.00
7	-330.01	-2330.01	500.00
8	-330.01	-2069.43	500.00
9	-669.99	-2930.57	500.00
10	-669.99	-2669.99	500.00
11	-669.99	-2330.01	500.00
12	-669.99	-2069.43	500.00
13	-930.57	-2930.57	500.00
14	-930.57	-2669.99	500.00
15	-930.57	-2330.01	500.00
16	-930.57	-2069.43	500.00
SUB-AREAL SOURCE NO. 54			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	-1930.57	500.00
2	-69.43	-1669.99	500.00
3	-69.43	-1330.01	500.00
4	-69.43	-1069.43	500.00
5	-330.01	-1930.57	500.00
6	-330.01	-1669.99	500.00
7	-330.01	-1330.01	500.00
8	-330.01	-1069.43	500.00
9	-669.99	-1930.57	500.00
10	-669.99	-1669.99	500.00
11	-669.99	-1330.01	500.00
12	-669.99	-1069.43	500.00
13	-930.57	-1930.57	500.00
14	-930.57	-1669.99	500.00
15	-930.57	-1330.01	500.00
16	-930.57	-1069.43	500.00
SUB-AREAL SOURCE NO. 55			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	-930.57	500.00
2	-69.43	-669.99	500.00
3	-69.43	-330.01	500.00
4	-69.43	-69.43	500.00
5	-330.01	-930.57	500.00
6	-330.01	-669.99	500.00
7	-330.01	-330.01	500.00
8	-330.01	-69.43	500.00
9	-669.99	-930.57	500.00
10	-669.99	-669.99	500.00
11	-669.99	-330.01	500.00
12	-669.99	-69.43	500.00
13	-930.57	-930.57	500.00
14	-930.57	-669.99	500.00
15	-930.57	-330.01	500.00
16	-930.57	-69.43	500.00
SUB-AREAL SOURCE NO. 56			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	69.43	500.00
2	-69.43	330.01	500.00
3	-69.43	669.99	500.00
4	-69.43	930.57	500.00
5	-330.01	69.43	500.00
6	-330.01	330.01	500.00
7	-330.01	669.99	500.00
8	-330.01	930.57	500.00
9	-669.99	69.43	500.00
10	-669.99	330.01	500.00
11	-669.99	669.99	500.00
12	-669.99	930.57	500.00
13	-930.57	69.43	500.00
14	-930.57	330.01	500.00
15	-930.57	669.99	500.00
16	-930.57	930.57	500.00
SUB-AREAL SOURCE NO. 57			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	1069.43	500.00
2	-69.43	1330.01	500.00
3	-69.43	1669.99	500.00
4	-69.43	1930.57	500.00
5	-330.01	1069.43	500.00
6	-330.01	1330.01	500.00
7	-330.01	1669.99	500.00
8	-330.01	1930.57	500.00
9	-669.99	1069.43	500.00
10	-669.99	1330.01	500.00
11	-669.99	1669.99	500.00
12	-669.99	1930.57	500.00
13	-930.57	1069.43	500.00
14	-930.57	1330.01	500.00
15	-930.57	1669.99	500.00
16	-930.57	1930.57	500.00
SUB-AREAL SOURCE NO. 58			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	2069.43	500.00
2	-69.43	2330.01	500.00
3	-69.43	2669.99	500.00
4	-69.43	2930.57	500.00
5	-330.01	2069.43	500.00
6	-330.01	2330.01	500.00
7	-330.01	2669.99	500.00
8	-330.01	2930.57	500.00
9	-669.99	2069.43	500.00
10	-669.99	2330.01	500.00
11	-669.99	2669.99	500.00
12	-669.99	2930.57	500.00
13	-930.57	2069.43	500.00
14	-930.57	2330.01	500.00
15	-930.57	2669.99	500.00
16	-930.57	2930.57	500.00
SUB-AREAL SOURCE NO. 59			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	3069.43	500.00
2	-69.43	3330.01	500.00
3	-69.43	3669.99	500.00
4	-69.43	3930.57	500.00
5	-330.01	3069.43	500.00

6	-330.01	3330.01	500.00
7	-330.01	3669.99	500.00
8	-330.01	3930.57	500.00
9	-669.99	3069.43	500.00
10	-669.99	3330.01	500.00
11	-669.99	3669.99	500.00
12	-669.99	3930.57	500.00
13	-930.57	3069.43	500.00
14	-930.57	3330.01	500.00
15	-930.57	3669.99	500.00
16	-930.57	3930.57	500.00
SUB-AREAL SOURCE NO. 60			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-69.43	4069.43	500.00
2	-69.43	4330.01	500.00
3	-69.43	4669.99	500.00
4	-69.43	4930.57	500.00
5	-330.01	4069.43	500.00
6	-330.01	4330.01	500.00
7	-330.01	4669.99	500.00
8	-330.01	4930.57	500.00
9	-669.99	4069.43	500.00
10	-669.99	4330.01	500.00
11	-669.99	4669.99	500.00
12	-669.99	4930.57	500.00
13	-930.57	4069.43	500.00
14	-930.57	4330.01	500.00
15	-930.57	4669.99	500.00
16	-930.57	4930.57	500.00
SUB-AREAL SOURCE NO. 61			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-1069.43	-4930.57	500.00
2	-1069.43	-4669.99	500.00
3	-1069.43	-4330.01	500.00
4	-1069.43	-4069.43	500.00
5	-1330.01	-4930.57	500.00
6	-1330.01	-4669.99	500.00
7	-1330.01	-4330.01	500.00
8	-1330.01	-4069.43	500.00
9	-1669.99	-4930.57	500.00
10	-1669.99	-4669.99	500.00
11	-1669.99	-4330.01	500.00
12	-1669.99	-4069.43	500.00
13	-1930.57	-4930.57	500.00
14	-1930.57	-4669.99	500.00
15	-1930.57	-4330.01	500.00
16	-1930.57	-4069.43	500.00
SUB-AREAL SOURCE NO. 62			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-1069.43	-3930.57	500.00
2	-1069.43	-3669.99	500.00
3	-1069.43	-3330.01	500.00
4	-1069.43	-3069.43	500.00
5	-1330.01	-3930.57	500.00
6	-1330.01	-3669.99	500.00
7	-1330.01	-3330.01	500.00
8	-1330.01	-3069.43	500.00
9	-1669.99	-3930.57	500.00
10	-1669.99	-3669.99	500.00
11	-1669.99	-3330.01	500.00
12	-1669.99	-3069.43	500.00
13	-1930.57	-3930.57	500.00
14	-1930.57	-3669.99	500.00
15	-1930.57	-3330.01	500.00
16	-1930.57	-3069.43	500.00
SUB-AREAL SOURCE NO. 63			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-1069.43	-2930.57	500.00
2	-1069.43	-2669.99	500.00
3	-1069.43	-2330.01	500.00
4	-1069.43	-2069.43	500.00
5	-1330.01	-2930.57	500.00
6	-1330.01	-2669.99	500.00
7	-1330.01	-2330.01	500.00
8	-1330.01	-2069.43	500.00
9	-1669.99	-2930.57	500.00
10	-1669.99	-2669.99	500.00
11	-1669.99	-2330.01	500.00
12	-1669.99	-2069.43	500.00
13	-1930.57	-2930.57	500.00
14	-1930.57	-2669.99	500.00
15	-1930.57	-2330.01	500.00
16	-1930.57	-2069.43	500.00
SUB-AREAL SOURCE NO. 64			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-1069.43	-1930.57	500.00
2	-1069.43	-1669.99	500.00
3	-1069.43	-1330.01	500.00
4	-1069.43	-1069.43	500.00
5	-1330.01	-1930.57	500.00
6	-1330.01	-1669.99	500.00
7	-1330.01	-1330.01	500.00
8	-1330.01	-1069.43	500.00
9	-1669.99	-1930.57	500.00
10	-1669.99	-1669.99	500.00
11	-1669.99	-1330.01	500.00
12	-1669.99	-1069.43	500.00
13	-1930.57	-1930.57	500.00
14	-1930.57	-1669.99	500.00
15	-1930.57	-1330.01	500.00
16	-1930.57	-1069.43	500.00
SUB-AREAL SOURCE NO. 65			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-1069.43	-930.57	500.00
2	-1069.43	-669.99	500.00
3	-1069.43	-330.01	500.00
4	-1069.43	-69.43	500.00
5	-1330.01	-930.57	500.00
6	-1330.01	-669.99	500.00
7	-1330.01	-330.01	500.00

8	-1330.01	-69.43	500.00
9	-1669.99	-930.57	500.00
10	-1669.99	-669.99	500.00
11	-1669.99	-330.01	500.00
12	-1669.99	-69.43	500.00
13	-1930.57	-930.57	500.00
14	-1930.57	-669.99	500.00
15	-1930.57	-330.01	500.00
16	-1930.57	-69.43	500.00
SUB-AREAL SOURCE NO. 66			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-1069.43	69.43	500.00
2	-1069.43	330.01	500.00
3	-1069.43	669.99	500.00
4	-1069.43	930.57	500.00
5	-1330.01	69.43	500.00
6	-1330.01	330.01	500.00
7	-1330.01	669.99	500.00
8	-1330.01	930.57	500.00
9	-1669.99	69.43	500.00
10	-1669.99	330.01	500.00
11	-1669.99	669.99	500.00
12	-1669.99	930.57	500.00
13	-1930.57	69.43	500.00
14	-1930.57	330.01	500.00
15	-1930.57	669.99	500.00
16	-1930.57	930.57	500.00
SUB-AREAL SOURCE NO. 67			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-1069.43	1069.43	500.00
2	-1069.43	1330.01	500.00
3	-1069.43	1669.99	500.00
4	-1069.43	1930.57	500.00
5	-1330.01	1069.43	500.00
6	-1330.01	1330.01	500.00
7	-1330.01	1669.99	500.00
8	-1330.01	1930.57	500.00
9	-1669.99	1069.43	500.00
10	-1669.99	1330.01	500.00
11	-1669.99	1669.99	500.00
12	-1669.99	1930.57	500.00
13	-1930.57	1069.43	500.00
14	-1930.57	1330.01	500.00
15	-1930.57	1669.99	500.00
16	-1930.57	1930.57	500.00
SUB-AREAL SOURCE NO. 68			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-1069.43	2069.43	500.00
2	-1069.43	2330.01	500.00
3	-1069.43	2669.99	500.00
4	-1069.43	2930.57	500.00
5	-1330.01	2069.43	500.00
6	-1330.01	2330.01	500.00
7	-1330.01	2669.99	500.00
8	-1330.01	2930.57	500.00
9	-1669.99	2069.43	500.00
10	-1669.99	2330.01	500.00
11	-1669.99	2669.99	500.00
12	-1669.99	2930.57	500.00
13	-1930.57	2069.43	500.00
14	-1930.57	2330.01	500.00
15	-1930.57	2669.99	500.00
16	-1930.57	2930.57	500.00
SUB-AREAL SOURCE NO. 69			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-1069.43	3069.43	500.00
2	-1069.43	3330.01	500.00
3	-1069.43	3669.99	500.00
4	-1069.43	3930.57	500.00
5	-1330.01	3069.43	500.00
6	-1330.01	3330.01	500.00
7	-1330.01	3669.99	500.00
8	-1330.01	3930.57	500.00
9	-1669.99	3069.43	500.00
10	-1669.99	3330.01	500.00
11	-1669.99	3669.99	500.00
12	-1669.99	3930.57	500.00
13	-1930.57	3069.43	500.00
14	-1930.57	3330.01	500.00
15	-1930.57	3669.99	500.00
16	-1930.57	3930.57	500.00
SUB-AREAL SOURCE NO. 70			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-1069.43	4069.43	500.00
2	-1069.43	4330.01	500.00
3	-1069.43	4669.99	500.00
4	-1069.43	4930.57	500.00
5	-1330.01	4069.43	500.00
6	-1330.01	4330.01	500.00
7	-1330.01	4669.99	500.00
8	-1330.01	4930.57	500.00
9	-1669.99	4069.43	500.00
10	-1669.99	4330.01	500.00
11	-1669.99	4669.99	500.00
12	-1669.99	4930.57	500.00
13	-1930.57	4069.43	500.00
14	-1930.57	4330.01	500.00
15	-1930.57	4669.99	500.00
16	-1930.57	4930.57	500.00
SUB-AREAL SOURCE NO. 71			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-2069.43	-4930.57	500.00
2	-2069.43	-4669.99	500.00
3	-2069.43	-4330.01	500.00
4	-2069.43	-4069.43	500.00
5	-2330.01	-4930.57	500.00
6	-2330.01	-4669.99	500.00
7	-2330.01	-4330.01	500.00
8	-2330.01	-4069.43	500.00
9	-2669.99	-4930.57	500.00

10	-2669.99	-4669.99	500.00
11	-2669.99	-4330.01	500.00
12	-2669.99	-4069.43	500.00
13	-2930.57	-4930.57	500.00
14	-2930.57	-4669.99	500.00
15	-2930.57	-4330.01	500.00
16	-2930.57	-4069.43	500.00
SUB-AREAL SOURCE NO. 72			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-2069.43	-3930.57	500.00
2	-2069.43	-3669.99	500.00
3	-2069.43	-3330.01	500.00
4	-2069.43	-3069.43	500.00
5	-2330.01	-3930.57	500.00
6	-2330.01	-3669.99	500.00
7	-2330.01	-3330.01	500.00
8	-2330.01	-3069.43	500.00
9	-2669.99	-3930.57	500.00
10	-2669.99	-3669.99	500.00
11	-2669.99	-3330.01	500.00
12	-2669.99	-3069.43	500.00
13	-2930.57	-3930.57	500.00
14	-2930.57	-3669.99	500.00
15	-2930.57	-3330.01	500.00
16	-2930.57	-3069.43	500.00
SUB-AREAL SOURCE NO. 73			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-2069.43	-2930.57	500.00
2	-2069.43	-2669.99	500.00
3	-2069.43	-2330.01	500.00
4	-2069.43	-2069.43	500.00
5	-2330.01	-2930.57	500.00
6	-2330.01	-2669.99	500.00
7	-2330.01	-2330.01	500.00
8	-2330.01	-2069.43	500.00
9	-2669.99	-2930.57	500.00
10	-2669.99	-2669.99	500.00
11	-2669.99	-2330.01	500.00
12	-2669.99	-2069.43	500.00
13	-2930.57	-2930.57	500.00
14	-2930.57	-2669.99	500.00
15	-2930.57	-2330.01	500.00
16	-2930.57	-2069.43	500.00
SUB-AREAL SOURCE NO. 74			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-2069.43	-1930.57	500.00
2	-2069.43	-1669.99	500.00
3	-2069.43	-1330.01	500.00
4	-2069.43	-1069.43	500.00
5	-2330.01	-1930.57	500.00
6	-2330.01	-1669.99	500.00
7	-2330.01	-1330.01	500.00
8	-2330.01	-1069.43	500.00
9	-2669.99	-1930.57	500.00
10	-2669.99	-1669.99	500.00
11	-2669.99	-1330.01	500.00
12	-2669.99	-1069.43	500.00
13	-2930.57	-1930.57	500.00
14	-2930.57	-1669.99	500.00
15	-2930.57	-1330.01	500.00
16	-2930.57	-1069.43	500.00
SUB-AREAL SOURCE NO. 75			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-2069.43	-930.57	500.00
2	-2069.43	-669.99	500.00
3	-2069.43	-330.01	500.00
4	-2069.43	-69.43	500.00
5	-2330.01	-930.57	500.00
6	-2330.01	-669.99	500.00
7	-2330.01	-330.01	500.00
8	-2330.01	-69.43	500.00
9	-2669.99	-930.57	500.00
10	-2669.99	-669.99	500.00
11	-2669.99	-330.01	500.00
12	-2669.99	-69.43	500.00
13	-2930.57	-930.57	500.00
14	-2930.57	-669.99	500.00
15	-2930.57	-330.01	500.00
16	-2930.57	-69.43	500.00
SUB-AREAL SOURCE NO. 76			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-2069.43	69.43	500.00
2	-2069.43	330.01	500.00
3	-2069.43	669.99	500.00
4	-2069.43	930.57	500.00
5	-2330.01	69.43	500.00
6	-2330.01	330.01	500.00
7	-2330.01	669.99	500.00
8	-2330.01	930.57	500.00
9	-2669.99	69.43	500.00
10	-2669.99	330.01	500.00
11	-2669.99	669.99	500.00
12	-2669.99	930.57	500.00
13	-2930.57	69.43	500.00
14	-2930.57	330.01	500.00
15	-2930.57	669.99	500.00
16	-2930.57	930.57	500.00
SUB-AREAL SOURCE NO. 77			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-2069.43	1069.43	500.00
2	-2069.43	1330.01	500.00
3	-2069.43	1669.99	500.00
4	-2069.43	1930.57	500.00
5	-2330.01	1069.43	500.00
6	-2330.01	1330.01	500.00
7	-2330.01	1669.99	500.00
8	-2330.01	1930.57	500.00
9	-2669.99	1069.43	500.00
10	-2669.99	1330.01	500.00
11	-2669.99	1669.99	500.00

12	-2669.99	1930.57	500.00
13	-2930.57	1069.43	500.00
14	-2930.57	1330.01	500.00
15	-2930.57	1669.99	500.00
16	-2930.57	1930.57	500.00
SUB-AREAL SOURCE NO. 78			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-2069.43	2069.43	500.00
2	-2069.43	2330.01	500.00
3	-2069.43	2669.99	500.00
4	-2069.43	2930.57	500.00
5	-2330.01	2069.43	500.00
6	-2330.01	2330.01	500.00
7	-2330.01	2669.99	500.00
8	-2330.01	2930.57	500.00
9	-2669.99	2069.43	500.00
10	-2669.99	2330.01	500.00
11	-2669.99	2669.99	500.00
12	-2669.99	2930.57	500.00
13	-2930.57	2069.43	500.00
14	-2930.57	2330.01	500.00
15	-2930.57	2669.99	500.00
16	-2930.57	2930.57	500.00
SUB-AREAL SOURCE NO. 79			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-2069.43	3069.43	500.00
2	-2069.43	3330.01	500.00
3	-2069.43	3669.99	500.00
4	-2069.43	3930.57	500.00
5	-2330.01	3069.43	500.00
6	-2330.01	3330.01	500.00
7	-2330.01	3669.99	500.00
8	-2330.01	3930.57	500.00
9	-2669.99	3069.43	500.00
10	-2669.99	3330.01	500.00
11	-2669.99	3669.99	500.00
12	-2669.99	3930.57	500.00
13	-2930.57	3069.43	500.00
14	-2930.57	3330.01	500.00
15	-2930.57	3669.99	500.00
16	-2930.57	3930.57	500.00
SUB-AREAL SOURCE NO. 80			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-2069.43	4069.43	500.00
2	-2069.43	4330.01	500.00
3	-2069.43	4669.99	500.00
4	-2069.43	4930.57	500.00
5	-2330.01	4069.43	500.00
6	-2330.01	4330.01	500.00
7	-2330.01	4669.99	500.00
8	-2330.01	4930.57	500.00
9	-2669.99	4069.43	500.00
10	-2669.99	4330.01	500.00
11	-2669.99	4669.99	500.00
12	-2669.99	4930.57	500.00
13	-2930.57	4069.43	500.00
14	-2930.57	4330.01	500.00
15	-2930.57	4669.99	500.00
16	-2930.57	4930.57	500.00
SUB-AREAL SOURCE NO. 81			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	-4930.57	500.00
2	-3069.43	-4669.99	500.00
3	-3069.43	-4330.01	500.00
4	-3069.43	-4069.43	500.00
5	-3330.01	-4930.57	500.00
6	-3330.01	-4669.99	500.00
7	-3330.01	-4330.01	500.00
8	-3330.01	-4069.43	500.00
9	-3669.99	-4930.57	500.00
10	-3669.99	-4669.99	500.00
11	-3669.99	-4330.01	500.00
12	-3669.99	-4069.43	500.00
13	-3930.57	-4930.57	500.00
14	-3930.57	-4669.99	500.00
15	-3930.57	-4330.01	500.00
16	-3930.57	-4069.43	500.00
SUB-AREAL SOURCE NO. 82			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	-3930.57	500.00
2	-3069.43	-3669.99	500.00
3	-3069.43	-3330.01	500.00
4	-3069.43	-3069.43	500.00
5	-3330.01	-3930.57	500.00
6	-3330.01	-3669.99	500.00
7	-3330.01	-3330.01	500.00
8	-3330.01	-3069.43	500.00
9	-3669.99	-3930.57	500.00
10	-3669.99	-3669.99	500.00
11	-3669.99	-3330.01	500.00
12	-3669.99	-3069.43	500.00
13	-3930.57	-3930.57	500.00
14	-3930.57	-3669.99	500.00
15	-3930.57	-3330.01	500.00
16	-3930.57	-3069.43	500.00
SUB-AREAL SOURCE NO. 83			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	-2930.57	500.00
2	-3069.43	-2669.99	500.00
3	-3069.43	-2330.01	500.00
4	-3069.43	-2069.43	500.00
5	-3330.01	-2930.57	500.00
6	-3330.01	-2669.99	500.00
7	-3330.01	-2330.01	500.00
8	-3330.01	-2069.43	500.00
9	-3669.99	-2930.57	500.00
10	-3669.99	-2669.99	500.00
11	-3669.99	-2330.01	500.00
12	-3669.99	-2069.43	500.00
13	-3930.57	-2930.57	500.00

14	-3930.57	-2669.99	500.00
15	-3930.57	-2330.01	500.00
16	-3930.57	-2069.43	500.00
SUB-AREAL SOURCE NO. 84			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	-1930.57	500.00
2	-3069.43	-1669.99	500.00
3	-3069.43	-1330.01	500.00
4	-3069.43	-1069.43	500.00
5	-3330.01	-1930.57	500.00
6	-3330.01	-1669.99	500.00
7	-3330.01	-1330.01	500.00
8	-3330.01	-1069.43	500.00
9	-3669.99	-1930.57	500.00
10	-3669.99	-1669.99	500.00
11	-3669.99	-1330.01	500.00
12	-3669.99	-1069.43	500.00
13	-3930.57	-1930.57	500.00
14	-3930.57	-1669.99	500.00
15	-3930.57	-1330.01	500.00
16	-3930.57	-1069.43	500.00
SUB-AREAL SOURCE NO. 85			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	-930.57	500.00
2	-3069.43	-669.99	500.00
3	-3069.43	-330.01	500.00
4	-3069.43	69.43	500.00
5	-3330.01	-930.57	500.00
6	-3330.01	-669.99	500.00
7	-3330.01	-330.01	500.00
8	-3330.01	69.43	500.00
9	-3669.99	-930.57	500.00
10	-3669.99	-669.99	500.00
11	-3669.99	-330.01	500.00
12	-3669.99	69.43	500.00
13	-3930.57	-930.57	500.00
14	-3930.57	-669.99	500.00
15	-3930.57	-330.01	500.00
16	-3930.57	69.43	500.00
SUB-AREAL SOURCE NO. 86			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	69.43	500.00
2	-3069.43	330.01	500.00
3	-3069.43	669.99	500.00
4	-3069.43	930.57	500.00
5	-3330.01	69.43	500.00
6	-3330.01	330.01	500.00
7	-3330.01	669.99	500.00
8	-3330.01	930.57	500.00
9	-3669.99	69.43	500.00
10	-3669.99	330.01	500.00
11	-3669.99	669.99	500.00
12	-3669.99	930.57	500.00
13	-3930.57	69.43	500.00
14	-3930.57	330.01	500.00
15	-3930.57	669.99	500.00
16	-3930.57	930.57	500.00
SUB-AREAL SOURCE NO. 87			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	1069.43	500.00
2	-3069.43	1330.01	500.00
3	-3069.43	1669.99	500.00
4	-3069.43	1930.57	500.00
5	-3330.01	1069.43	500.00
6	-3330.01	1330.01	500.00
7	-3330.01	1669.99	500.00
8	-3330.01	1930.57	500.00
9	-3669.99	1069.43	500.00
10	-3669.99	1330.01	500.00
11	-3669.99	1669.99	500.00
12	-3669.99	1930.57	500.00
13	-3930.57	1069.43	500.00
14	-3930.57	1330.01	500.00
15	-3930.57	1669.99	500.00
16	-3930.57	1930.57	500.00
SUB-AREAL SOURCE NO. 88			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	2069.43	500.00
2	-3069.43	2330.01	500.00
3	-3069.43	2669.99	500.00
4	-3069.43	2930.57	500.00
5	-3330.01	2069.43	500.00
6	-3330.01	2330.01	500.00
7	-3330.01	2669.99	500.00
8	-3330.01	2930.57	500.00
9	-3669.99	2069.43	500.00
10	-3669.99	2330.01	500.00
11	-3669.99	2669.99	500.00
12	-3669.99	2930.57	500.00
13	-3930.57	2069.43	500.00
14	-3930.57	2330.01	500.00
15	-3930.57	2669.99	500.00
16	-3930.57	2930.57	500.00
SUB-AREAL SOURCE NO. 89			
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	3069.43	500.00
2	-3069.43	3330.01	500.00
3	-3069.43	3669.99	500.00
4	-3069.43	3930.57	500.00
5	-3330.01	3069.43	500.00
6	-3330.01	3330.01	500.00
7	-3330.01	3669.99	500.00
8	-3330.01	3930.57	500.00
9	-3669.99	3069.43	500.00
10	-3669.99	3330.01	500.00
11	-3669.99	3669.99	500.00
12	-3669.99	3930.57	500.00
13	-3930.57	3069.43	500.00
14	-3930.57	3330.01	500.00
15	-3930.57	3669.99	500.00

16	-3930.57	3930.57	500.00
SUB-AREAL	SOURCE NO.	90	
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-3069.43	4069.43	500.00
2	-3069.43	4330.01	500.00
3	-3069.43	4669.99	500.00
4	-3069.43	4930.57	500.00
5	-3330.01	4069.43	500.00
6	-3330.01	4330.01	500.00
7	-3330.01	4669.99	500.00
8	-3330.01	4930.57	500.00
9	-3669.99	4069.43	500.00
10	-3669.99	4330.01	500.00
11	-3669.99	4669.99	500.00
12	-3669.99	4930.57	500.00
13	-3930.57	4069.43	500.00
14	-3930.57	4330.01	500.00
15	-3930.57	4669.99	500.00
16	-3930.57	4930.57	500.00
SUB-AREAL	SOURCE NO.	91	
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-4069.43	-4930.57	500.00
2	-4069.43	-4669.99	500.00
3	-4069.43	-4330.01	500.00
4	-4069.43	-4069.43	500.00
5	-4330.01	-4930.57	500.00
6	-4330.01	-4669.99	500.00
7	-4330.01	-4330.01	500.00
8	-4330.01	-4069.43	500.00
9	-4669.99	-4930.57	500.00
10	-4669.99	-4669.99	500.00
11	-4669.99	-4330.01	500.00
12	-4669.99	-4069.43	500.00
13	-4930.57	-4930.57	500.00
14	-4930.57	-4669.99	500.00
15	-4930.57	-4330.01	500.00
16	-4930.57	-4069.43	500.00
SUB-AREAL	SOURCE NO.	92	
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-4069.43	-3930.57	500.00
2	-4069.43	-3669.99	500.00
3	-4069.43	-3330.01	500.00
4	-4069.43	-3069.43	500.00
5	-4330.01	-3930.57	500.00
6	-4330.01	-3669.99	500.00
7	-4330.01	-3330.01	500.00
8	-4330.01	-3069.43	500.00
9	-4669.99	-3930.57	500.00
10	-4669.99	-3669.99	500.00
11	-4669.99	-3330.01	500.00
12	-4669.99	-3069.43	500.00
13	-4930.57	-3930.57	500.00
14	-4930.57	-3669.99	500.00
15	-4930.57	-3330.01	500.00
16	-4930.57	-3069.43	500.00
SUB-AREAL	SOURCE NO.	93	
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-4069.43	-2930.57	500.00
2	-4069.43	-2669.99	500.00
3	-4069.43	-2330.01	500.00
4	-4069.43	-2069.43	500.00
5	-4330.01	-2930.57	500.00
6	-4330.01	-2669.99	500.00
7	-4330.01	-2330.01	500.00
8	-4330.01	-2069.43	500.00
9	-4669.99	-2930.57	500.00
10	-4669.99	-2669.99	500.00
11	-4669.99	-2330.01	500.00
12	-4669.99	-2069.43	500.00
13	-4930.57	-2930.57	500.00
14	-4930.57	-2669.99	500.00
15	-4930.57	-2330.01	500.00
16	-4930.57	-2069.43	500.00
SUB-AREAL	SOURCE NO.	94	
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-4069.43	-1930.57	500.00
2	-4069.43	-1669.99	500.00
3	-4069.43	-1330.01	500.00
4	-4069.43	-1069.43	500.00
5	-4330.01	-1930.57	500.00
6	-4330.01	-1669.99	500.00
7	-4330.01	-1330.01	500.00
8	-4330.01	-1069.43	500.00
9	-4669.99	-1930.57	500.00
10	-4669.99	-1669.99	500.00
11	-4669.99	-1330.01	500.00
12	-4669.99	-1069.43	500.00
13	-4930.57	-1930.57	500.00
14	-4930.57	-1669.99	500.00
15	-4930.57	-1330.01	500.00
16	-4930.57	-1069.43	500.00
SUB-AREAL	SOURCE NO.	95	
GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-4069.43	-930.57	500.00
2	-4069.43	-669.99	500.00
3	-4069.43	-330.01	500.00
4	-4069.43	-69.43	500.00
5	-4330.01	-930.57	500.00
6	-4330.01	-669.99	500.00
7	-4330.01	-330.01	500.00
8	-4330.01	-69.43	500.00
9	-4669.99	-930.57	500.00
10	-4669.99	-669.99	500.00
11	-4669.99	-330.01	500.00
12	-4669.99	-69.43	500.00
13	-4930.57	-930.57	500.00
14	-4930.57	-669.99	500.00
15	-4930.57	-330.01	500.00
16	-4930.57	-69.43	500.00
SUB-AREAL	SOURCE NO.	96	

GAUSS PT.	XCOORD	YCOORD	ZCOORD
1	-4069.43	69.43	500.00
2	-4069.43	330.01	500.00
3	-4069.43	669.99	500.00
4	-4069.43	930.57	500.00
5	-4330.01	69.43	500.00
6	-4330.01	330.01	500.00
7	-4330.01	669.99	500.00
8	-4330.01	930.57	500.00
9	-4669.99	69.43	500.00
10	-4669.99	330.01	500.00
11	-4669.99	669.99	500.00
12	-4669.99	930.57	500.00
13	-4930.57	69.43	500.00
14	-4930.57	330.01	500.00
15	-4930.57	669.99	500.00
16	-4930.57	930.57	500.00

SUB-AREAL SOURCE NO.	XCOORD	YCOORD	ZCOORD
1	-4069.43	1069.43	500.00
2	-4069.43	1330.01	500.00
3	-4069.43	1669.99	500.00
4	-4069.43	1930.57	500.00
5	-4330.01	1069.43	500.00
6	-4330.01	1330.01	500.00
7	-4330.01	1669.99	500.00
8	-4330.01	1930.57	500.00
9	-4669.99	1069.43	500.00
10	-4669.99	1330.01	500.00
11	-4669.99	1669.99	500.00
12	-4669.99	1930.57	500.00
13	-4930.57	1069.43	500.00
14	-4930.57	1330.01	500.00
15	-4930.57	1669.99	500.00
16	-4930.57	1930.57	500.00

SUB-AREAL SOURCE NO.	XCOORD	YCOORD	ZCOORD
1	-4069.43	2069.43	500.00
2	-4069.43	2330.01	500.00
3	-4069.43	2669.99	500.00
4	-4069.43	2930.57	500.00
5	-4330.01	2069.43	500.00
6	-4330.01	2330.01	500.00
7	-4330.01	2669.99	500.00
8	-4330.01	2930.57	500.00
9	-4669.99	2069.43	500.00
10	-4669.99	2330.01	500.00
11	-4669.99	2669.99	500.00
12	-4669.99	2930.57	500.00
13	-4930.57	2069.43	500.00
14	-4930.57	2330.01	500.00
15	-4930.57	2669.99	500.00
16	-4930.57	2930.57	500.00

SUB-AREAL SOURCE NO.	XCOORD	YCOORD	ZCOORD
1	-4069.43	3069.43	500.00
2	-4069.43	3330.01	500.00
3	-4069.43	3669.99	500.00
4	-4069.43	3930.57	500.00
5	-4330.01	3069.43	500.00
6	-4330.01	3330.01	500.00
7	-4330.01	3669.99	500.00
8	-4330.01	3930.57	500.00
9	-4669.99	3069.43	500.00
10	-4669.99	3330.01	500.00
11	-4669.99	3669.99	500.00
12	-4669.99	3930.57	500.00
13	-4930.57	3069.43	500.00
14	-4930.57	3330.01	500.00
15	-4930.57	3669.99	500.00
16	-4930.57	3930.57	500.00

SUB-AREAL SOURCE NO.	XCOORD	YCOORD	ZCOORD
1	-4069.43	4069.43	500.00
2	-4069.43	4330.01	500.00
3	-4069.43	4669.99	500.00
4	-4069.43	4930.57	500.00
5	-4330.01	4069.43	500.00
6	-4330.01	4330.01	500.00
7	-4330.01	4669.99	500.00
8	-4330.01	4930.57	500.00
9	-4669.99	4069.43	500.00
10	-4669.99	4330.01	500.00
11	-4669.99	4669.99	500.00
12	-4669.99	4930.57	500.00
13	-4930.57	4069.43	500.00
14	-4930.57	4330.01	500.00
15	-4930.57	4669.99	500.00
16	-4930.57	4930.57	500.00

TIMING FOR OUTPUT (YRS)

100.00
TEMPERATURES DISPLACEMENTS AND STRESSES AT TIME .10000E+03

PT	XCOORD	YCOORD	ZCOORD	TEMP	U	V	W	SIGXX	SIGYY	SIGZZ	SIGXY	SIGYZ	SIGZX
1	.0	.0	950.0	.1194E+02	-.3202E-03	-.1325E-04	.4506E+00	-.2151E+05	-.2150E+05	-.4083E+04	-.3249E+01	.2653E+01	.1379E+02
2	.0	.0	900.0	.1991E+02	-.1578E-03	-.2534E-04	.4542E+00	-.5854E+04	-.5847E+04	-.4335E+04	-.5936E+01	-.4964E+00	.2492E+01
3	.0	.0	850.0	.3237E+02	-.4840E-03	-.3606E-03	.4615E+00	-.1858E+05	-.1860E+05	-.4320E+04	-.5131E+02	.1798E+02	-.1847E+02
4	.0	.0	800.0	.5061E+02	-.3331E-03	-.1283E-03	.4748E+00	-.5436E+05	-.5430E+05	-.3902E+04	-.1181E+02	.5059E+01	-.1637E+02
5	.0	.0	750.0	.7745E+02	-.1077E-03	-.5935E-04	.4962E+00	-.1060E+06	-.1060E+06	-.1152E+04	-.2215E+01	.2017E+01	-.1172E+02
6	.0	.0	700.0	.1152E+03	-.6009E-03	-.1134E-03	.5285E+00	-.1772E+06	-.1772E+06	-.5846E+04	-.8914E+01	.4225E+01	.2921E+02
7	.0	.0	650.0	.1678E+03	-.3496E-03	-.1536E-03	.5765E+00	-.2749E+06	-.2749E+06	-.1895E+05	-.1971E+02	.2019E+01	.1821E+02
8	.0	.0	600.0	.2394E+03	-.6212E-03	-.9851E-04	.6449E+00	-.4108E+06	-.4109E+06	-.3109E+05	-.1728E+02	.5602E+00	.6209E+02
9	.0	.0	550.0	.3240E+03	-.5579E-03	-.2529E-03	.7449E+00	-.5900E+06	-.5900E+06	-.8902E+04	-.1545E+02	-.4677E+01	.1025E+03

TOTAL RUN TIME = 7084.00000 SECONDS.

APPENDIX G

DOT and VISCOT Input Files for Verification and Benchmark Problem in Section 3.4

```

420--05C-02
START DOT/VISCOT MODEL 1
615 1 7850 1 1
1 50.0000 -200.0000 0 0
2 33.3330 -200.0000 0 0
3 16.6670 -200.0000 0 0
4 50.0000 -200.0000 0 0
5 33.3330 -225.0000 0 0
6 16.6670 -225.0000 0 0
7 50.0000 -225.0000 0 0
8 33.3330 -250.0000 0 0
9 16.6670 -250.0000 0 0
10 50.0000 -250.0000 0 0
11 33.3330 -275.0000 0 0
12 16.6670 -275.0000 0 0
13 50.0000 -275.0000 0 0
14 33.3330 -300.0000 0 0
15 16.6670 -300.0000 0 0
16 50.0000 -300.0000 0 0
17 33.3330 -325.0000 0 0
18 16.6670 -325.0000 0 0
19 50.0000 -325.0000 0 0
20 33.3330 -350.0000 0 0
21 16.6670 -350.0000 0 0
22 50.0000 -350.0000 0 0
23 33.3330 -375.0000 0 0
24 16.6670 -375.0000 0 0
25 50.0000 -375.0000 0 0
26 33.3330 -400.0000 0 0
27 16.6670 -400.0000 0 0
28 50.0000 -400.0000 0 0
29 33.3330 -425.0000 0 0
30 16.6670 -425.0000 0 0
31 50.0000 -425.0000 0 0
32 33.3330 -450.0000 0 0
33 16.6670 -450.0000 0 0
34 50.0000 -450.0000 0 0
35 33.3330 -475.0000 0 0
36 16.6670 -475.0000 0 0
37 50.0000 -475.0000 0 0
38 33.3330 -500.0000 0 0
39 16.6670 -500.0000 0 0
40 50.0000 -500.0000 0 0
41 33.3330 -525.0000 0 0
42 16.6670 -525.0000 0 0
43 50.0000 -525.0000 0 0
44 33.3330 -550.0000 0 0
45 16.6670 -550.0000 0 0
46 50.0000 -550.0000 0 0
47 33.3330 -575.0000 0 0
48 16.6670 -575.0000 0 0
49 50.0000 -575.0000 0 0
50 33.3330 -600.0000 0 0
51 16.6670 -600.0000 0 0
52 50.0000 -600.0000 0 0
53 33.3330 -625.0000 0 0
54 16.6670 -625.0000 0 0
55 50.0000 -625.0000 0 0
56 33.3330 -650.0000 0 0
57 16.6670 -650.0000 0 0
58 50.0000 -650.0000 0 0
59 33.3330 -675.0000 0 0
60 16.6670 -675.0000 0 0
61 50.0000 -675.0000 0 0
62 33.3330 -700.0000 0 0
63 16.6670 -700.0000 0 0
64 50.0000 -700.0000 0 0
65 33.3330 -725.0000 0 0
66 16.6670 -725.0000 0 0
67 50.0000 -725.0000 0 0
68 33.3330 -750.0000 0 0
69 16.6670 -750.0000 0 0
70 50.0000 -750.0000 0 0
71 33.3330 -775.0000 0 0
72 16.6670 -775.0000 0 0
73 50.0000 -775.0000 0 0
74 33.3330 -800.0000 0 0
75 16.6670 -800.0000 0 0
76 50.0000 -800.0000 0 0
77 33.3330 -825.0000 0 0
78 16.6670 -825.0000 0 0
79 50.0000 -825.0000 0 0
80 33.3330 -850.0000 0 0
81 16.6670 -850.0000 0 0
82 50.0000 -850.0000 0 0
83 33.3330 -875.0000 0 0
84 16.6670 -875.0000 0 0
85 50.0000 -875.0000 0 0
86 33.3330 -900.0000 0 0
87 16.6670 -900.0000 0 0
88 50.0000 -900.0000 0 0
89 33.3330 -900.0000 0 0
90 16.6670 -900.0000 0 0
91 50.0000 -900.0000 0 0
92 33.3330 -900.0000 0 0
93 16.6670 -900.0000 0 0
94 50.0000 -900.0000 0 0
95 33.3330 -900.0000 0 0
96 16.6670 -900.0000 0 0
97 50.0000 -900.0000 0 0
98 33.3330 -900.0000 0 0
99 16.6670 -900.0000 0 0
100 50.0000 -900.0000 0 0
101 33.3330 -900.0000 0 0
102 16.6670 -900.0000 0 0
103 50.0000 -900.0000 0 0
104 33.3330 -900.0000 0 0
105 16.6670 -900.0000 0 0
106 50.0000 -900.0000 0 0
107 33.3330 -900.0000 0 0
108 16.6670 -900.0000 0 0
109 50.0000 -900.0000 0 0
110 33.3330 -900.0000 0 0
111 16.6670 -900.0000 0 0
112 50.0000 -900.0000 0 0
113 33.3330 -900.0000 0 0

```

114	33.3330	-800.0000	0	0
115	16.6670	-900.0000	0	0
116	.0000	-900.0000	0	0
117	50.0000	-925.0000	0	0
118	33.3330	-925.0000	0	0
119	16.6670	-925.0000	0	0
120	.0000	-925.0000	0	0
121	50.0000	-850.0000	0	0
122	33.3330	-850.0000	0	0
123	16.6670	-850.0000	0	0
124	.0000	-850.0000	0	0
125	50.0000	-875.0000	0	0
126	33.3330	-875.0000	0	0
127	16.6670	-875.0000	0	0
128	.0000	-875.0000	0	0
129	50.0000	-1000.0000	0	0
130	33.3330	-1000.0000	0	0
131	16.6670	-1000.0000	0	0
132	.0000	-1000.0000	0	0
133	.0000	-175.0000	0	0
134	16.6670	-175.0000	0	0
135	33.3330	-175.0000	0	0
136	50.0000	-175.0000	0	0
137	.0000	-150.0000	0	0
138	16.6670	-150.0000	0	0
139	33.3330	-150.0000	0	0
140	50.0000	-150.0000	0	0
141	.0000	-125.0000	0	0
142	16.6670	-125.0000	0	0
143	33.3330	-125.0000	0	0
144	50.0000	-125.0000	0	0
145	.0000	-100.0000	0	0
146	16.6670	-100.0000	0	0
147	33.3330	-100.0000	0	0
148	50.0000	-100.0000	0	0
149	.0000	-75.0000	0	0
150	16.6670	-75.0000	0	0
151	33.3330	-75.0000	0	0
152	50.0000	-75.0000	0	0
153	.0000	-50.0000	0	0
154	16.6670	-50.0000	0	0
155	33.3330	-50.0000	0	0
156	50.0000	-50.0000	0	0
157	.0000	-25.0000	0	0
158	16.6670	-25.0000	0	0
159	33.3330	-25.0000	0	0
160	50.0000	-25.0000	0	0
161	.0000	.0000	0	0
162	16.6670	.0000	0	0
163	33.3330	.0000	0	0
164	50.0000	.0000	0	0
165	83.3330	-200.0000	0	0
166	83.3330	-225.0000	0	0
167	83.3330	-250.0000	0	0
168	83.3330	-275.0000	0	0
169	83.3330	-300.0000	0	0
170	83.3330	-325.0000	0	0
171	83.3330	-350.0000	0	0
172	83.3330	-375.0000	0	0
173	83.3330	-400.0000	0	0
174	83.3330	-425.0000	0	0
175	83.3330	-450.0000	0	0
176	83.3330	-475.0000	0	0
177	83.3330	-500.0000	0	0
178	83.3330	-525.0000	0	0
179	83.3330	-550.0000	0	0
180	83.3330	-575.0000	0	0
181	83.3330	-600.0000	0	0
182	83.3330	-625.0000	0	0
183	83.3330	-650.0000	0	0
184	83.3330	-675.0000	0	0
185	83.3330	-700.0000	0	0
186	83.3330	-725.0000	0	0
187	83.3330	-750.0000	0	0
188	83.3330	-775.0000	0	0
189	83.3330	-800.0000	0	0
190	83.3330	-825.0000	0	0
191	83.3330	-850.0000	0	0
192	83.3330	-875.0000	0	0
193	83.3330	-900.0000	0	0
194	83.3330	-925.0000	0	0
195	83.3330	-950.0000	0	0
196	83.3330	-975.0000	0	0
197	83.3330	-1000.0000	0	0
198	116.6700	-200.0000	0	0
199	116.6700	-225.0000	0	0
200	116.6700	-250.0000	0	0
201	116.6700	-275.0000	0	0
202	116.6700	-300.0000	0	0
203	116.6700	-325.0000	0	0
204	116.6700	-350.0000	0	0
205	116.6700	-375.0000	0	0
206	116.6700	-400.0000	0	0
207	116.6700	-425.0000	0	0
208	116.6700	-450.0000	0	0
209	116.6700	-475.0000	0	0
210	116.6700	-500.0000	0	0
211	116.6700	-525.0000	0	0
212	116.6700	-550.0000	0	0
213	116.6700	-575.0000	0	0
214	116.6700	-600.0000	0	0
215	116.6700	-625.0000	0	0
216	116.6700	-650.0000	0	0
217	116.6700	-675.0000	0	0
218	116.6700	-700.0000	0	0
219	116.6700	-725.0000	0	0
220	116.6700	-750.0000	0	0
221	116.6700	-775.0000	0	0
222	116.6700	-800.0000	0	0
223	116.6700	-825.0000	0	0
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226	116.6700	-900.0000	0	0
227	116.6700	-925.0000	0	0
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264	183.3300	-200.0000	0	0
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86	103	104	108	107	0	0	0	0	1	4	0
87	104	105	109	108	0	0	0	0	1	4	0
88	105	106	110	109	0	0	0	0	1	4	0
89	106	107	111	110	0	0	0	0	1	4	0
90	107	108	112	111	0	0	0	0	1	4	0
91	108	109	113	112	0	0	0	0	1	4	0
92	109	110	114	113	0	0	0	0	1	4	0
93	110	111	115	114	0	0	0	0	1	4	0
94	111	112	116	115	0	0	0	0	1	4	0
95	112	113	117	116	0	0	0	0	1	4	0
96	113	114	118	117	0	0	0	0	1	4	0
97	114	115	119	118	0	0	0	0	1	4	0
98	115	116	120	119	0	0	0	0	1	4	0
99	116	117	121	120	0	0	0	0	1	4	0
100	117	118	122	121	0	0	0	0	1	4	0
101	118	119	123	122	0	0	0	0	1	4	0
102	119	120	124	123	0	0	0	0	1	4	0
103	120	121	125	124	0	0	0	0	1	4	0
104	121	122	126	125	0	0	0	0	1	4	0
105	122	123	127	126	0	0	0	0	1	4	0
106	123	124	128	127	0	0	0	0	1	4	0
107	124	125	129	128	0	0	0	0	1	4	0
108	125	126	130	129	0	0	0	0	1	4	0
109	126	127	131	130	0	0	0	0	1	4	0
110	127	128	132	131	0	0	0	0	1	4	0
111	128	129	133	132	0	0	0	0	1	4	0
112	129	130	134	133	0	0	0	0	1	4	0
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114	131	132	136	135	0	0	0	0	1	4	0
115	132	133	137	136	0	0	0	0	1	4	0
116	133	134	138	137	0	0	0	0	1	4	0
117	134	135	139	138	0	0	0	0	1	4	0
118	135	136	140	139	0	0	0	0	1	4	0
119	136	137	141	140	0	0	0	0	1	4	0
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121	138	139	143	142	0	0	0	0	1	4	0
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123	140	141	145	144	0	0	0	0	1	4	0
124	141	142	146	145	0	0	0	0	1	4	0
125	142	143	147	146	0	0	0	0	1	4	0
126	143	144	148	147	0	0	0	0	1	4	0
127	144	145	149	148	0	0	0	0	1	4	0
128	145	146	150	149	0	0	0	0	1	4	0
129	146	147	151	150	0	0	0	0	1	4	0
130	147	148	152	151	0	0	0	0	1	4	0
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133	150	151	155	154	0	0	0	0	1	4	0
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136	153	154	158	157	0	0	0	0	1	4	0
137	154	155	159	158	0	0	0	0	1	4	0
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139	156	157	161	160	0	0	0	0	1	4	0
140	157	158	162	161	0	0	0	0	1	4	0
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143	160	161	165	164	0	0	0	0	1	4	0
144	161	162	166	165	0	0	0	0	1	4	0
145	162	163	167	166	0	0	0	0	1	4	0
146	163	164	168	167	0	0	0	0	1	4	0
147	164	165	169	168	0	0	0	0	1	4	0
148	165	166	170	169	0	0	0	0	1	4	0
149	166	167	171	170	0	0	0	0	1	4	0
150	167	168	172	171	0	0	0	0	1	4	0
151	168	169	173	172	0	0	0	0	1	4	0
152	169	170	174	173	0	0	0	0	1	4	0
153	170	171	175	174	0	0	0	0	1	4	0
154	171	172	176	175	0	0	0	0	1	4	0
155	172	173	177	176	0	0	0	0	1	4	0
156	173	174	178	177	0	0	0	0	1	4	0
157	174	175	179	178	0	0	0	0	1	4	0
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159	176	177	181	180	0	0	0	0	1	4	0
160	177	178	182	181	0	0	0	0	1	4	0
161	178	179	183	182	0	0	0	0	1	4	0
162	179	180	184	183	0	0	0	0	1	4	0
163	180	181	185	184	0	0	0	0	1	4	0
164	181	182	186	185	0	0	0	0	1	4	0
165	182	183	187	186	0	0	0	0	1	4	0
166	183	184	188	187	0	0	0	0	1	4	0
167	184	185	189	188	0	0	0	0	1	4	0
168	185	186	190	189	0	0	0	0	1	4	0
169	186	187	191	190	0	0	0	0	1	4	0
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171	188	189	193	192	0	0	0	0	1	4	0
172	189	190	194	193	0	0	0	0	1	4	0
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176	193	194	198	197	0	0	0	0	1	4	0
177	194	195	199	198	0	0	0	0	1	4	0
178	195	196	200	199	0	0	0	0	1	4	0
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180	197	198	202	201	0	0	0	0	1	4	0
181	198	199	203	202	0	0	0	0	1	4	0
182	199	200	204	203	0	0	0	0	1	4	0
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185	202	203	207	206	0	0	0	0	1	4	0
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187	204	205	209	208	0	0	0	0	1	4	0
188	205	206	210	209	0	0	0	0	1	4	0
189	206	207	211	210	0	0	0	0	1	4	0
190	207	208	212	211	0	0	0	0	1	4	0
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168	180	181	214	213	0	0	0	0	1	4	0
169	181	182	214	214	0	0	0	0	1	4	0
170	182	183	215	215	0	0	0	0	1	4	0
171	183	184	216	216	0	0	0	0	1	4	0
172	184	185	217	217	0	0	0	0	1	4	0
173	185	186	218	218	0	0	0	0	1	4	0
174	186	187	219	219	0	0	0	0	1	4	0
175	187	188	220	220	0	0	0	0	1	4	0
176	188	189	221	221	0	0	0	0	1	4	0
177	189	190	222	222	0	0	0	0	1	4	0
178	190	191	223	223	0	0	0	0	1	4	0
179	191	192	224	224	0	0	0	0	1	4	0
180	192	193	225	225	0	0	0	0	1	4	0
181	193	194	226	226	0	0	0	0	1	4	0
182	194	195	227	227	0	0	0	0	1	4	0
183	195	196	228	228	0	0	0	0	1	4	0
184	196	197	229	229	0	0	0	0	1	4	0
185	197	198	230	230	0	0	0	0	1	4	0
186	198	199	231	231	0	0	0	0	1	4	0
187	199	200	232	232	0	0	0	0	1	4	0
188	200	201	233	233	0	0	0	0	1	4	0
189	201	202	234	234	0	0	0	0	1	4	0
190	202	203	235	235	0	0	0	0	1	4	0
191	203	204	236	236	0	0	0	0	1	4	0
192	204	205	237	237	0	0	0	0	1	4	0
193	205	206	238	238	0	0	0	0	1	4	0
194	206	207	239	239	0	0	0	0	1	4	0
195	207	208	240	240	0	0	0	0	1	4	0
196	208	209	241	241	0	0	0	0	1	4	0
197	209	210	242	242	0	0	0	0	1	4	0
198	210	211	243	243	0	0	0	0	1	4	0
199	211	212	244	244	0	0	0	0	1	4	0
200	212	213	245	245	0	0	0	0	1	4	0
201	213	214	246	246	0	0	0	0	1	4	0
202	214	215	247	247	0	0	0	0	1	4	0
203	215	216	248	248	0	0	0	0	1	4	0
204	216	217	249	249	0	0	0	0	1	4	0
205	217	218	250	250	0	0	0	0	1	4	0
206	218	219	251	251	0	0	0	0	1	4	0
207	219	220	252	252	0	0	0	0	1	4	0
208	220	221	253	253	0	0	0	0	1	4	0
209	221	222	254	254	0	0	0	0	1	4	0
210	222	223	255	255	0	0	0	0	1	4	0
211	223	224	256	256	0	0	0	0	1	4	0
212	224	225	257	257	0	0	0	0	1	4	0
213	225	226	258	258	0	0	0	0	1	4	0
214	226	227	259	259	0	0	0	0	1	4	0
215	227	228	260	260	0	0	0	0	1	4	0
216	228	229	261	261	0	0	0	0	1	4	0
217	229	230	262	262	0	0	0	0	1	4	0
218	230	231	263	263	0	0	0	0	1	4	0
219	231	232	264	264	0	0	0	0	1	4	0
220	232	233	265	265	0	0	0	0	1	4	0
221	233	234	266	266	0	0	0	0	1	4	0
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223	235	236	268	268	0	0	0	0	1	4	0
224	236	237	269	269	0	0	0	0	1	4	0
225	237	238	270	270	0	0	0	0	1	4	0
226	238	239	271	271	0	0	0	0	1	4	0
227	239	240	272	272	0	0	0	0	1	4	0
228	240	241	273	273	0	0	0	0	1	4	0
229	241	242	274	274	0	0	0	0	1	4	0
230	242	243	275	275	0	0	0	0	1	4	0
231	243	244	276	276	0	0	0	0	1	4	0
232	244	245	277	277	0	0	0	0	1	4	0
233	245	246	278	278	0	0	0	0	1	4	0
234	246	247	279	279	0	0	0	0	1	4	0
235	247	248	280	280	0	0	0	0	1	4	0
236	248	249	281	281	0	0	0	0	1	4	0
237	249	250	282	282	0	0	0	0	1	4	0
238	250	251	283	283	0	0	0	0	1	4	0
239	251	252	284	284	0	0	0	0	1	4	0
240	252	253	285	285	0	0	0	0	1	4	0
241	253	254	286	286	0	0	0	0	1	4	0
242	254	255	287	287	0	0	0	0	1	4	0
243	255	256	288	288	0	0	0	0	1	4	0
244	256	257	289	289	0	0	0	0	1	4	0
245	257	258	290	290	0	0	0	0	1	4	0
246	258	259	291	291	0	0	0	0	1	4	0
247	259	260	292	292	0	0	0	0	1	4	0
248	260	261	293	293	0	0	0	0	1	4	0
249	261	262	294	294	0	0	0	0	1	4	0
250	262	263	295	295	0	0	0	0	1	4	0
251	263	264	296	296	0	0	0	0	1	4	0
252	264	265	297	297	0	0	0	0	1	4	0
253	265	266	298	298	0	0	0	0	1	4	0
254	266	267	299	299	0	0	0	0	1	4	0
255	267	268	300	300	0	0	0	0	1	4	0
256	268	269	301	301	0	0	0	0	1	4	0
257	269	270	302	302	0	0	0	0	1	4	0
258	270	271	303	303	0	0	0	0	1	4	0
259	271	272	304	304	0	0	0	0	1	4	0
260	272	273	305	305	0	0	0	0	1	4	0
261	273	274	306	306	0	0	0	0	1	4	0
262	274	275	307	307	0	0	0	0	1	4	0
263	275	276	308	308	0	0	0	0	1	4	0
264	276	277	309	309	0	0	0	0	1	4	0
265	277	278	310	310	0	0	0	0	1	4	0
266	278	279	311	311	0	0	0	0	1	4	0
267	279	280	312	312	0	0	0	0	1	4	0
268	280	281	313	313	0	0	0	0	1	4	0
269	281	282	314	314	0	0	0	0	1	4	0
270	282	283	315	315	0	0	0	0	1	4	0
271	283	284	316	316	0	0	0	0	1	4	0
272	284	285	317	317	0	0	0	0	1	4	0
273	285	286	318	318	0	0	0	0	1	4	0
274	286	287	319	319	0	0	0	0	1	4	0
275	287	288	320	320	0	0	0	0	1	4	0
276	288	289	321	321	0	0	0	0	1	4	0
277	289	290	322	322	0	0	0	0	1	4	0
278	290	291	323	323	0	0	0	0	1	4	0
279	291	292	324	324	0	0	0	0	1	4	0
280	292	293	325	325	0	0	0	0	1	4	0
281	293	294	326	326	0	0	0	0	1	4	0
282	294	295	327	327	0	0	0	0	1	4	0
283	295	296	328	328	0	0	0	0	1	4	0
	296	297	329	329	0	0	0	0	1	4	0
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	298	299	331	331	0	0	0	0	1	4	0
	299	300	332	332	0	0	0	0	1	4	0
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284	300	301	334	333	0	0	0	0	1	4	0
285	301	302	335	334	0	0	0	0	1	4	0
286	302	303	336	335	0	0	0	0	1	4	0
287	303	304	337	336	0	0	0	0	1	4	0
288	304	305	338	337	0	0	0	0	1	4	0
289	305	306	339	338	0	0	0	0	1	4	0
290	306	307	340	339	0	0	0	0	1	4	0
291	307	308	341	340	0	0	0	0	1	4	0
292	308	309	342	341	0	0	0	0	1	4	0
293	309	310	343	342	0	0	0	0	1	4	0
294	310	311	344	343	0	0	0	0	1	4	0
295	311	312	345	344	0	0	0	0	1	4	0
296	312	313	346	345	0	0	0	0	1	4	0
297	313	314	347	346	0	0	0	0	1	4	0
298	314	315	348	347	0	0	0	0	1	4	0
299	315	316	349	348	0	0	0	0	1	4	0
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302	318	319	352	351	0	0	0	0	1	4	0
303	319	320	353	352	0	0	0	0	1	4	0
304	320	321	354	353	0	0	0	0	1	4	0
305	321	322	355	354	0	0	0	0	1	4	0
306	322	323	356	355	0	0	0	0	1	4	0
307	323	324	357	356	0	0	0	0	1	4	0
308	324	325	358	357	0	0	0	0	1	4	0
309	325	326	359	358	0	0	0	0	1	4	0
310	326	327	360	359	0	0	0	0	1	4	0
311	327	328	361	360	0	0	0	0	1	4	0
312	328	329	362	361	0	0	0	0	1	4	0
313	1	165	363	136	0	0	0	0	1	4	0
314	165	198	364	363	0	0	0	0	1	4	0
315	198	231	365	364	0	0	0	0	1	4	0
316	231	264	366	365	0	0	0	0	1	4	0
317	264	297	367	366	0	0	0	0	1	4	0
318	297	330	368	367	0	0	0	0	1	4	0
319	330	363	369	140	0	0	0	0	1	4	0
320	363	364	370	368	0	0	0	0	1	4	0
321	364	365	371	369	0	0	0	0	1	4	0
322	365	366	372	371	0	0	0	0	1	4	0
323	366	367	373	372	0	0	0	0	1	4	0
324	367	368	374	373	0	0	0	0	1	4	0
325	140	369	375	144	0	0	0	0	1	4	0
326	369	370	376	375	0	0	0	0	1	4	0
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328	371	372	378	377	0	0	0	0	1	4	0
329	372	373	379	378	0	0	0	0	1	4	0
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331	144	375	381	148	0	0	0	0	1	4	0
332	375	376	382	381	0	0	0	0	1	4	0
333	376	377	383	382	0	0	0	0	1	4	0
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336	379	380	386	385	0	0	0	0	1	4	0
337	148	381	387	152	0	0	0	0	1	4	0
338	381	382	388	387	0	0	0	0	1	4	0
339	382	383	389	388	0	0	0	0	1	4	0
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343	152	387	393	156	0	0	0	0	1	4	0
344	387	388	394	393	0	0	0	0	1	4	0
345	388	389	395	394	0	0	0	0	1	4	0
346	389	390	396	395	0	0	0	0	1	4	0
347	390	391	397	396	0	0	0	0	1	4	0
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349	156	393	399	160	0	0	0	0	1	4	0
350	393	394	400	399	0	0	0	0	1	4	0
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352	395	396	402	401	0	0	0	0	1	4	0
353	396	397	403	402	0	0	0	0	1	4	0
354	397	398	404	403	0	0	0	0	1	4	0
355	160	399	405	164	0	0	0	0	1	4	0
356	399	400	406	405	0	0	0	0	1	4	0
357	400	401	407	406	0	0	0	0	1	4	0
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361	330	331	412	411	0	0	0	0	1	4	0
362	331	332	413	412	0	0	0	0	1	4	0
363	332	333	414	413	0	0	0	0	1	4	0
364	333	334	415	414	0	0	0	0	1	4	0
365	334	335	416	415	0	0	0	0	1	4	0
366	335	336	417	416	0	0	0	0	1	4	0
367	336	337	418	417	0	0	0	0	1	4	0
368	337	338	419	418	0	0	0	0	1	4	0
369	338	339	420	419	0	0	0	0	1	4	0
370	339	340	421	420	0	0	0	0	1	4	0
371	340	341	422	421	0	0	0	0	1	4	0
372	341	342	423	422	0	0	0	0	1	4	0
373	342	343	424	423	0	0	0	0	1	4	0
374	343	344	425	424	0	0	0	0	1	4	0
375	344	345	426	425	0	0	0	0	1	4	0
376	345	346	427	426	0	0	0	0	1	4	0
377	346	347	428	427	0	0	0	0	1	4	0
378	347	348	429	428	0	0	0	0	1	4	0
379	348	349	430	429	0	0	0	0	1	4	0
380	349	350	431	430	0	0	0	0	1	4	0
381	350	351	432	431	0	0	0	0	1	4	0
382	351	352	433	432	0	0	0	0	1	4	0
383	352	353	434	433	0	0	0	0	1	4	0
384	353	354	435	434	0	0	0	0	1	4	0
385	354	355	436	435	0	0	0	0	1	4	0
386	355	356	437	436	0	0	0	0	1	4	0
387	356	357	438	437	0	0	0	0	1	4	0
388	357	358	439	438	0	0	0	0	1	4	0
389	358	359	440	439	0	0	0	0	1	4	0
390	359	360	441	440	0	0	0	0	1	4	0
391	360	361	442	441	0	0	0	0	1	4	0
392	361	362	443	442	0	0	0	0	1	4	0
393	411	412	445	444	0	0	0	0	1	4	0
394	412	413	446	445	0	0	0	0	1	4	0
395	413	414	447	446	0	0	0	0	1	4	0
396	414	415	448	447	0	0	0	0	1	4	0
397	415	416	449	448	0	0	0	0	1	4	0
398	416	417	450	449	0	0	0	0	1	4	0
399	417	418	451	450	0	0	0	0	1	4	0

400	418	419	452	451	0	0	0	0	1	4	0
401	419	420	453	452	0	0	0	0	1	4	0
402	420	421	454	453	0	0	0	0	1	4	0
403	421	422	455	454	0	0	0	0	1	4	0
404	422	423	456	455	0	0	0	0	1	4	0
405	423	424	457	456	0	0	0	0	1	4	0
406	424	425	458	457	0	0	0	0	1	4	0
407	425	426	459	458	0	0	0	0	1	4	0
408	426	427	460	459	0	0	0	0	1	4	0
409	427	428	461	460	0	0	0	0	1	4	0
410	428	429	462	461	0	0	0	0	1	4	0
411	429	430	463	462	0	0	0	0	1	4	0
412	430	431	464	463	0	0	0	0	1	4	0
413	431	432	465	464	0	0	0	0	1	4	0
414	432	433	466	465	0	0	0	0	1	4	0
415	433	434	467	466	0	0	0	0	1	4	0
416	434	435	468	467	0	0	0	0	1	4	0
417	435	436	469	468	0	0	0	0	1	4	0
418	436	437	470	469	0	0	0	0	1	4	0
419	437	438	471	470	0	0	0	0	1	4	0
420	438	439	472	471	0	0	0	0	1	4	0
421	439	440	473	472	0	0	0	0	1	4	0
422	440	441	474	473	0	0	0	0	1	4	0
423	441	442	475	474	0	0	0	0	1	4	0
424	442	443	476	475	0	0	0	0	1	4	0
425	443	444	477	476	0	0	0	0	1	4	0
426	444	445	478	477	0	0	0	0	1	4	0
427	445	446	479	478	0	0	0	0	1	4	0
428	446	447	480	479	0	0	0	0	1	4	0
429	447	448	481	480	0	0	0	0	1	4	0
430	448	449	482	481	0	0	0	0	1	4	0
431	449	450	483	482	0	0	0	0	1	4	0
432	450	451	484	483	0	0	0	0	1	4	0
433	451	452	485	484	0	0	0	0	1	4	0
434	452	453	486	485	0	0	0	0	1	4	0
435	453	454	487	486	0	0	0	0	1	4	0
436	454	455	488	487	0	0	0	0	1	4	0
437	455	456	489	488	0	0	0	0	1	4	0
438	456	457	490	489	0	0	0	0	1	4	0
439	457	458	491	490	0	0	0	0	1	4	0
440	458	459	492	491	0	0	0	0	1	4	0
441	459	460	493	492	0	0	0	0	1	4	0
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443	461	462	495	494	0	0	0	0	1	4	0
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447	465	466	499	498	0	0	0	0	1	4	0
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452	470	471	504	503	0	0	0	0	1	4	0
453	471	472	505	504	0	0	0	0	1	4	0
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456	474	475	508	507	0	0	0	0	1	4	0
457	475	476	509	508	0	0	0	0	1	4	0
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459	477	478	511	510	0	0	0	0	1	4	0
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464	482	483	516	515	0	0	0	0	1	4	0
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466	484	485	518	517	0	0	0	0	1	4	0
467	485	486	519	518	0	0	0	0	1	4	0
468	486	487	520	519	0	0	0	0	1	4	0
469	487	488	521	520	0	0	0	0	1	4	0
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472	490	491	524	523	0	0	0	0	1	4	0
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474	492	493	526	525	0	0	0	0	1	4	0
475	493	494	527	526	0	0	0	0	1	4	0
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479	497	498	531	530	0	0	0	0	1	4	0
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483	501	502	535	534	0	0	0	0	1	4	0
484	502	503	536	535	0	0	0	0	1	4	0
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487	505	506	539	538	0	0	0	0	1	4	0
488	506	507	540	539	0	0	0	0	1	4	0
489	507	508	541	540	0	0	0	0	1	4	0
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497	515	516	549	548	0	0	0	0	1	4	0
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516	534	535	568	567	0	0	0	0	1	4	0
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525	546	547	580	579	0	0	0	0	1	4	0
526	547	548	581	580	0	0	0	0	1	4	0
527	548	549	582	581	0	0	0	0	1	4	0
528	549	550	583	582	0	0	0	0	1	4	0
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542	563	564	597	596	0	0	0	0	1	4	0
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545	566	567	600	599	0	0	0	0	1	4	0
546	567	568	601	600	0	0	0	0	1	4	0
547	568	569	602	601	0	0	0	0	1	4	0
548	569	570	603	602	0	0	0	0	1	4	0
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555	576	577	610	609	0	0	0	0	1	4	0
556	577	578	611	610	0	0	0	0	1	4	0
557	578	579	612	611	0	0	0	0	1	4	0
558	579	580	613	612	0	0	0	0	1	4	0
559	580	581	614	613	0	0	0	0	1	4	0
560	581	582	615	614	0	0	0	0	1	4	0

STOP

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420--05C-02
START DOT/VISCOT MODEL 2
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2 25.0000 -200.0000 0 1
3 0.0000 -200.0000 0 1
4 -25.0000 -200.0000 0 1
5 -50.0000 -200.0000 0 1
6 50.0000 -258.8500 0 1
7 25.0000 -258.8500 0 1
8 0.0000 -258.8500 0 1
9 -25.0000 -258.8500 0 1
10 -50.0000 -258.8500 0 1
11 50.0000 -326.5200 0 1
12 25.0000 -326.5200 0 1
13 0.0000 -326.5200 0 1
14 -25.0000 -326.5200 0 1
15 -50.0000 -326.5200 0 1
16 50.0000 -404.3500 0 1
17 25.0000 -404.3500 0 1
18 0.0000 -404.3500 0 1
19 -25.0000 -404.3500 0 1
20 -50.0000 -404.3500 0 1
21 50.0000 -483.8500 0 1
22 25.0000 -483.8500 0 1
23 0.0000 -483.8500 0 1
24 -25.0000 -483.8500 0 1
25 -50.0000 -483.8500 0 1
26 50.0000 -586.7700 0 1
27 25.0000 -586.7700 0 1
28 0.0000 -586.7700 0 1
29 -25.0000 -586.7700 0 1
30 -50.0000 -586.7700 0 1
31 50.0000 -715.1400 0 1
32 25.0000 -715.1400 0 1
33 0.0000 -715.1400 0 1
34 -25.0000 -715.1400 0 1
35 -50.0000 -715.1400 0 1
36 50.0000 -851.2600 0 1
37 25.0000 -851.2600 0 1
38 0.0000 -851.2600 0 1
39 -25.0000 -851.2600 0 1
40 -50.0000 -851.2600 0 1
41 50.0000 -1007.8000 0 1
42 25.0000 -1007.8000 0 1
43 0.0000 -1007.8000 0 1
44 -25.0000 -1007.8000 0 1
45 -50.0000 -1007.8000 0 1
46 50.0000 -1187.8000 0 1
47 25.0000 -1187.8000 0 1
48 0.0000 -1187.8000 0 1
49 -25.0000 -1187.8000 0 1
50 -50.0000 -1187.8000 0 1
51 50.0000 -1394.8000 0 1
52 25.0000 -1394.8000 0 1
53 0.0000 -1394.8000 0 1
54 -25.0000 -1394.8000 0 1
55 -50.0000 -1394.8000 0 1
56 50.0000 -1632.9000 0 1
57 25.0000 -1632.9000 0 1
58 0.0000 -1632.9000 0 1
59 -25.0000 -1632.9000 0 1
60 -50.0000 -1632.9000 0 1
61 50.0000 -1906.7000 0 1
62 25.0000 -1906.7000 0 1
63 0.0000 -1906.7000 0 1
64 -25.0000 -1906.7000 0 1
65 -50.0000 -1906.7000 0 1
66 50.0000 -2221.5000 0 1
67 25.0000 -2221.5000 0 1
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69 -25.0000 -2221.5000 0 1
70 -50.0000 -2221.5000 0 1
71 50.0000 -2583.6000 0 1
72 25.0000 -2583.6000 0 1
73 0.0000 -2583.6000 0 1
74 -25.0000 -2583.6000 0 1
75 -50.0000 -2583.6000 0 1
76 50.0000 -3000.0000 0 1
77 25.0000 -3000.0000 0 1
78 0.0000 -3000.0000 0 1
79 -25.0000 -3000.0000 0 1
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81 50.0000 -150.0000 0 1
82 25.0000 -150.0000 0 1
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92 25.0000 -50.0000 0 1
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97 25.0000 0.0000 0 1
98 0.0000 0.0000 0 1
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100 -50.0000 0.0000 0 1
101 101.8700 -200.0000 0 1
102 101.8700 -258.8500 0 1
103 101.8700 -326.5200 0 1
104 101.8700 -404.3500 0 1
105 101.8700 -483.8500 0 1
106 101.8700 -586.7700 0 1
107 101.8700 -715.1400 0 1
108 101.8700 -851.2600 0 1
109 101.8700 -1007.8000 0 1
110 101.8700 -1187.8000 0 1
111 101.8700 -1394.8000 0 1
112 101.8700 -1632.9000 0 1
113 101.8700 -1906.7000 0 1

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115	101.8700-2583.6000	0	1
116	101.8700-3000.0000	0	1
117	182.2600-200.0000	0	1
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119	182.2600-326.5200	0	1
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122	182.2600-596.7700	0	1
123	182.2600-715.1400	0	1
124	182.2600-851.2600	0	1
125	182.2600-1007.8000	0	1
126	182.2600-1187.8000	0	1
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131	182.2600-2583.6000	0	1
132	182.2600-3000.0000	0	1
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134	306.8600-258.8500	0	1
135	306.8600-326.5200	0	1
136	306.8600-404.3500	0	1
137	306.8600-493.8500	0	1
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153	500.0000-493.8500	0	1
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156	500.0000-851.2600	0	1
157	500.0000-1007.8000	0	1
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161	500.0000-1906.7000	0	1
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163	500.0000-2583.6000	0	1
164	500.0000-3000.0000	0	1
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166	182.2600-150.0000	0	1
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172	500.0000-100.0000	0	1
173	101.8700-50.0000	0	1
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199	816.3400-326.5200	0	1
200	816.3400-404.3500	0	1
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204	816.3400-851.2600	0	1
205	816.3400-1007.8000	0	1
206	816.3400-1187.8000	0	1
207	816.3400-1394.8000	0	1
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236	950.0000	-851.2600	0	1
237	950.0000	-1007.8000	0	1
238	950.0000	-1187.8000	0	1
239	950.0000	-1394.8000	0	1
240	950.0000	-1632.9000	0	1
241	950.0000	-1906.7000	0	1
242	950.0000	-2221.5000	0	1
243	950.0000	-2583.6000	0	1
244	950.0000	-3000.0000	0	1
245	691.7200	-150.0000	0	1
246	816.3400	-150.0000	0	1
247	897.3500	-150.0000	0	1
248	950.0000	-150.0000	0	1
249	691.7200	-100.0000	0	1
250	816.3400	-100.0000	0	1
251	897.3500	-100.0000	0	1
252	950.0000	-100.0000	0	1
253	691.7200	-50.0000	0	1
254	816.3400	-50.0000	0	1
255	897.3500	-50.0000	0	1
256	950.0000	-50.0000	0	1
257	691.7200	.0000	0	1
258	816.3400	.0000	0	1
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260	950.0000	.0000	0	1
261	975.0000	-200.0000	0	1
262	975.0000	-258.8500	0	1
263	975.0000	-326.5200	0	1
264	975.0000	-404.3500	0	1
265	975.0000	-493.8500	0	1
266	975.0000	-596.7700	0	1
267	975.0000	-715.1400	0	1
268	975.0000	-851.2600	0	1
269	975.0000	-1007.8000	0	1
270	975.0000	-1187.8000	0	1
271	975.0000	-1394.8000	0	1
272	975.0000	-1632.9000	0	1
273	975.0000	-1906.7000	0	1
274	975.0000	-2221.5000	0	1
275	975.0000	-2583.6000	0	1
276	975.0000	-3000.0000	0	1
277	1000.0000	-200.0000	0	1
278	1000.0000	-258.8500	0	1
279	1000.0000	-326.5200	0	1
280	1000.0000	-404.3500	0	1
281	1000.0000	-493.8500	0	1
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283	1000.0000	-715.1400	0	1
284	1000.0000	-851.2600	0	1
285	1000.0000	-1007.8000	0	1
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290	1000.0000	-2221.5000	0	1
291	1000.0000	-2583.6000	0	1
292	1000.0000	-3000.0000	0	1
293	1025.0000	-200.0000	0	1
294	1025.0000	-258.8500	0	1
295	1025.0000	-326.5200	0	1
296	1025.0000	-404.3500	0	1
297	1025.0000	-493.8500	0	1
298	1025.0000	-596.7700	0	1
299	1025.0000	-715.1400	0	1
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305	1025.0000	-1906.7000	0	1
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307	1025.0000	-2583.6000	0	1
308	1025.0000	-3000.0000	0	1
309	1050.0000	-200.0000	0	1
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323	1050.0000	-2583.6000	0	1
324	1050.0000	-3000.0000	0	1
325	975.0000	-150.0000	0	1
326	1000.0000	-150.0000	0	1
327	1025.0000	-150.0000	0	1
328	1050.0000	-150.0000	0	1
329	975.0000	-100.0000	0	1
330	1000.0000	-100.0000	0	1
331	1025.0000	-100.0000	0	1
332	1050.0000	-100.0000	0	1
333	975.0000	-50.0000	0	1
334	1000.0000	-50.0000	0	1
335	1025.0000	-50.0000	0	1
336	1050.0000	-50.0000	0	1
337	975.0000	.0000	0	1
338	1000.0000	.0000	0	1
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344	1110.1000	-404.3500	0	1
345	1110.1000	-493.8500	0	1

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354	1110.1000	-2221.5000	0	1
355	1110.1000	-2583.6000	0	1
356	1110.1000	-3000.0000	0	1
357	1206.2000	-200.0000	0	1
358	1206.2000	-258.8500	0	1
359	1206.2000	-326.5200	0	1
360	1206.2000	-404.3500	0	1
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363	1206.2000	-715.1400	0	1
364	1206.2000	-851.2600	0	1
365	1206.2000	-1007.8000	0	1
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368	1206.2000	-1632.9000	0	1
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371	1206.2000	-2583.6000	0	1
372	1206.2000	-3000.0000	0	1
373	1360.1000	-200.0000	0	1
374	1360.1000	-258.8500	0	1
375	1360.1000	-326.5200	0	1
376	1360.1000	-404.3500	0	1
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386	1360.1000	-2221.5000	0	1
387	1360.1000	-2583.6000	0	1
388	1360.1000	-3000.0000	0	1
389	1606.2000	-200.0000	0	1
390	1606.2000	-258.8500	0	1
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392	1606.2000	-404.3500	0	1
393	1606.2000	-493.8500	0	1
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395	1606.2000	-715.1400	0	1
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399	1606.2000	-1394.8000	0	1
400	1606.2000	-1632.9000	0	1
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402	1606.2000	-2221.5000	0	1
403	1606.2000	-2583.6000	0	1
404	1606.2000	-3000.0000	0	1
405	2000.0000	-200.0000	0	1
406	2000.0000	-258.8500	0	1
407	2000.0000	-326.5200	0	1
408	2000.0000	-404.3500	0	1
409	2000.0000	-493.8500	0	1
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412	2000.0000	-851.2600	0	1
413	2000.0000	-1007.8000	0	1
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417	2000.0000	-1906.7000	0	1
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421	1110.1000	-150.0000	0	1
422	1206.2000	-150.0000	0	1
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427	1206.2000	-100.0000	0	1
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431	1110.1000	-50.0000	0	1
432	1206.2000	-50.0000	0	1
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436	1110.1000	.0000	0	1
437	1206.2000	.0000	0	1
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448	-105.3800	-1007.8000	0	1
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450	-105.3800	-715.1400	0	1
451	-105.3800	-596.7700	0	1
452	-105.3800	-493.8500	0	1
453	-105.3800	-404.3500	0	1
454	-105.3800	-326.5200	0	1
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456	-105.3800	-200.0000	0	1
457	-188.4600	-3000.0000	0	1
458	-188.4600	-2583.6000	0	1
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460	-188.4600	-1906.7000	0	1
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466	-188.4600-715.1400	0	1
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471	-188.4600-258.8500	0	1
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588	-691.7200	.0000	0	1
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690	-1115.8000	-715.1400	0	1
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692	-1115.8000	-493.8500	0	1
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279	296	297	313	312	0	0	0	0	1	4	0
280	297	298	314	313	0	0	0	0	1	4	0
281	298	299	315	314	0	0	0	0	1	4	0
282	299	300	316	315	0	0	0	0	1	4	0
283	300	301	317	316	0	0	0	0	1	4	0
284	301	302	318	317	0	0	0	0	1	4	0
285	302	303	319	318	0	0	0	0	1	4	0
286	303	304	320	319	0	0	0	0	1	4	0
287	304	305	321	320	0	0	0	0	1	4	0
288	305	306	322	321	0	0	0	0	1	4	0
289	306	307	323	322	0	0	0	0	1	4	0
290	307	308	324	323	0	0	0	0	1	4	0
291	308	309	325	324	0	0	0	0	1	4	0
292	309	310	326	325	0	0	0	0	1	4	0
293	310	311	327	326	0	0	0	0	1	4	0
294	311	312	328	327	0	0	0	0	1	4	0
295	312	313	329	328	0	0	0	0	1	4	0
296	313	314	330	329	0	0	0	0	1	4	0
297	314	315	331	330	0	0	0	0	1	4	0
298	315	316	332	331	0	0	0	0	1	4	0
299	316	317	333	332	0	0	0	0	1	4	0
300	317	318	334	333	0	0	0	0	1	4	0
301	318	319	335	334	0	0	0	0	1	4	0
302	319	320	336	335	0	0	0	0	1	4	0
303	320	321	337	336	0	0	0	0	1	4	0
304	321	322	338	337	0	0	0	0	1	4	0
305	322	323	339	338	0	0	0	0	1	4	0
306	323	324	340	339	0	0	0	0	1	4	0
307	324	325	341	340	0	0	0	0	1	4	0
308	325	326	342	341	0	0	0	0	1	4	0
309	326	327	343	342	0	0	0	0	1	4	0
310	327	328	344	343	0	0	0	0	1	4	0
311	328	329	345	344	0	0	0	0	1	4	0
312	329	330	346	345	0	0	0	0	1	4	0
313	330	331	347	346	0	0	0	0	1	4	0
314	331	332	348	347	0	0	0	0	1	4	0
315	332	333	349	348	0	0	0	0	1	4	0
	333	334	350	349	0	0	0	0	1	4	0
	334	335	351	350	0	0	0	0	1	4	0
	335	336	352	351	0	0	0	0	1	4	0

APPENDIX H

STRES3D Input and Output Files for Verification and Benchmark Problem in Section 3.4

```

AGAPITO 4.0
STRES3D MODEL 1
5000. 0.0 0
10000. 0.0 20 1.0E-6 0.00 0.0 0.0 0.0 0.0 0.0 0.0
0 3 0 1 1 14 1 10 10 100. 100. 100. 100. 100. 100. 100. 100. 100. 100.
1 1.0 1.0 1.0 1.0 0.
00 1500. 100.
3
1 0.0 50. -500. -200. 90. 1000. 100. -200. -200. 20 2
1 0.0 1050. -500. -200. 90. 1000. 100. -200. -200. 20 2
1 0.0 -950. -500. -200. 90. 1000. 100. -200. -200. 20 2
20
40 0.0 0.00 -0.5 0.00 0. -1000.
40 16.7 0.00 -0.5 16.7 0. -1000.
40 33.3 0.00 -0.5 33.3 0. -1000.
40 50. 0.00 -0.5 50. 0. -1000.
40 75. 0.00 -0.5 75. 0. -1000.
40 100. 0.00 -0.5 100. 0. -1000.
30 150. 0.00 -0.5 150. 0. -1000.
30 200. 0.00 -0.5 200. 0. -1000.
30 250. 0.00 -0.5 250. 0. -1000.
30 300. 0.00 -0.5 300. 0. -1000.
30 350. 0.00 -0.5 350. 0. -1000.
30 400. 0.00 -0.5 400. 0. -1000.
30 500. 0.00 -0.5 500. 0. -1000.
20 0.0 0.00 -200. 500. 0.0 -200.
STOP

```



```

AGAPITO 4.0
STRES3D MODEL 2
5000. 0.0
10000. 0.0 1.0E-6
0 3 0 1 1 14 1 20 20 50. 0. 0. 0. 0. 0. 0. 0. 0. 0.
1 1 0 1 1 0.
00 1500. 00
3
1 0.0 50. -500. -200. 90. 1000. 100. -200. -200. 20 2
1 0.0 1050. -500. -200. 90. 1000. 100. -200. -200. 20 2
1 0.0 -950. -500. -200. 90. 1000. 100. -200. -200. 20 2
20
40 00. 00. -0.5 00. 0. -1000.
40 16.7 00. -0.5 16.7 0. -1000.
40 33.3 00. -0.5 33.3 0. -1000.
40 50. 00. -0.5 50. 0. -1000.
40 75. 00. -0.5 75. 0. -1000.
40 100. 00. -0.5 100. 0. -1000.
30 150. 00. -0.5 150. 0. -1000.
30 200. 00. -0.5 200. 0. -1000.
30 250. 00. -0.5 250. 0. -1000.
30 300. 00. -0.5 300. 0. -1000.
30 350. 00. -0.5 350. 0. -1000.
30 400. 00. -0.5 400. 0. -1000.
30 500. 00. -0.5 500. 0. -1000.
20 0.0 00. -200. 500. 0.0 -200.
STOP

```

```

AGAPITO 4.0
STRESS3D MODEL 3
5000. 0.0
10000. 0.20 1.0E-6 0.00 0.0 0.0 0.0 0.0 0.0 0.0
0 3 0 1 1 14 1 20 20 100. 0.00 0.00 0.0 0.0
1 1 0 1 1 0.
00 1500. 0.00
3
1 0.0 50. -500. -200. 90. 1000. 100. -200. -200. 20 2
1 0.0 1050. -500. -200. 90. 1000. 100. -200. -200. 20 2
1 0.0 -950. -500. -200. 90. 1000. 100. -200. -200. 20 2
20.
40 0.00 0.00 -0.5 00 0. -1000.
40 16.7 0.00 -0.5 16.7 0. -1000.
40 33.3 0.00 -0.5 33.3 0. -1000.
40 50. 0.00 -0.5 50. 0. -1000.
40 75. 0.00 -0.5 75. 0. -1000.
40 100. 0.00 -0.5 100. 0. -1000.
30 150. 0.00 -0.5 150. 0. -1000.
30 200. 0.00 -0.5 200. 0. -1000.
30 250. 0.00 -0.5 250. 0. -1000.
30 300. 0.00 -0.5 300. 0. -1000.
30 350. 0.00 -0.5 350. 0. -1000.
30 400. 0.00 -0.5 400. 0. -1000.
30 500. 0.00 -0.5 500. 0. -1000.
20 0.0 0.00 -200. 500. 0.0 -200.
STOP

```

STRESS3D VERSION 4.0 (MAY 1989)
J.F.T. AGAPITO AND ASSOCS. (303)242 4220

STRESS3D MODEL 1

QA NUMBER: AGAPITO 4.0
INPUT FILE: 10.DAT
DATE: 05/25/89

TEMPERATURES DISPLACEMENTS AND STRESSES AT TIME .20000E+02

PT	XCOORD	YCOORD	ELEV	TEMP	U	V	W	SIGXX	SIGYY	SIGZZ	SIGXY	SIGYZ	SIGXZ
1	0	0	-5	2061E-01	3511E-09	3856E-09	2460E-02	1441E+00	7524E-01	1401E-01	2328E-09	8108E-09	6072E-08
2	0	0	-26.1	1084E+01	3112E-07	5166E-09	2474E-02	3943E-01	2612E-01	6916E-02	1187E-07	2436E-08	5279E-08
3	0	0	-51.8	2185E+01	5413E-08	9895E-09	2446E-02	1557E-01	6582E-02	3838E-03	1257E-07	1866E-08	7465E-08
4	0	0	-77.4	3371E+01	5539E-07	4198E-08	2388E-02	1720E-02	1162E-01	8085E-02	8149E-08	2710E-08	8269E-08
5	0	0	-103.0	4702E+01	3194E-07	5755E-08	2300E-02	1712E-01	3072E-01	1640E-01	1397E-08	4984E-09	8877E-08
6	0	0	-128.6	6272E+01	1881E-08	2066E-07	2180E-02	3296E-01	5232E-01	2551E-01	2445E-08	6123E-08	1230E-07
7	0	0	-154.3	8242E+01	2998E-07	5239E-09	2018E-02	5198E-01	7861E-01	3528E-01	1583E-07	1724E-08	1236E-07
8	0	0	-179.9	1089E+02	3183E-07	3944E-08	1795E-02	7943E-01	1131E+00	4425E-01	2782E-07	6312E-08	1457E-07
9	0	0	-205.5	1295E+02	3621E-09	1787E-09	1504E-02	1037E+00	1394E+00	4770E-01	1921E-07	1570E-08	1783E-07
10	0	0	-231.2	1010E+02	2281E-09	3865E-10	1223E-02	7348E-01	1054E+00	4448E-01	1565E-08	1273E-10	1180E-07
11	0	0	-256.8	8180E+01	2304E-09	2647E-09	1017E-02	5696E-01	8248E-01	3908E-01	2177E-08	1321E-08	1127E-07
12	0	0	-282.4	6810E+01	2298E-09	1492E-09	8542E-03	4689E-01	6638E-01	3378E-01	2810E-08	1321E-08	1127E-07
13	0	0	-308.0	5780E+01	2184E-09	1992E-09	7211E-03	3995E-01	5445E-01	2928E-01	2177E-08	4293E-09	6801E-08
14	0	0	-333.7	4971E+01	1513E-09	2683E-10	6093E-03	3474E-01	4523E-01	2557E-01	1755E-08	1710E-08	5705E-08
15	0	0	-359.3	4314E+01	1367E-09	2092E-10	5141E-03	3059E-01	3788E-01	2247E-01	1701E-08	3902E-09	6666E-08
16	0	0	-384.9	3769E+01	1560E-09	1141E-09	4323E-03	2717E-01	3184E-01	1987E-01	1459E-08	4311E-09	5511E-08
17	0	0	-410.6	3308E+01	1188E-09	1633E-09	3617E-03	2425E-01	2685E-01	1766E-01	1137E-08	4311E-09	5511E-08
18	0	0	-436.2	2912E+01	1139E-09	1851E-09	3004E-03	2172E-01	2265E-01	1575E-01	8149E-09	6958E-09	3781E-08
19	0	0	-461.8	2570E+01	7583E-10	1050E-09	2472E-03	1950E-01	1909E-01	1409E-01	5093E-09	6421E-09	2812E-08
20	0	0	-487.4	2272E+01	5996E-10	1010E-09	2010E-03	1753E-01	1605E-01	1263E-01	6621E-09	5557E-09	2805E-08
21	0	0	-513.3	2071E+01	7766E-10	2547E-10	1608E-03	1576E-01	1344E-01	1135E-01	4129E-09	4011E-09	1397E-08
22	0	0	-538.7	1780E+01	4513E-10	4747E-09	1259E-03	1471E-01	1191E-01	9249E-02	9190E-02	1230E-08	1381E-08
23	0	0	-564.3	1576E+01	9788E-10	3365E-10	9571E-04	1274E-01	9249E-02	9190E-02	9190E-02	1230E-08	1381E-08
24	0	0	-589.3	1395E+01	2751E-10	1942E-09	6957E-04	1144E-01	7568E-02	8284E-02	3474E-09	3474E-09	118E-08
25	0	0	-615.6	1234E+01	9891E-10	940E-10	4703E-04	1026E-01	6114E-02	7473E-02	4820E-09	9722E-09	1140E-08
26	0	0	-641.2	1091E+01	2672E-10	3911E-10	2769E-04	9190E-02	4855E-02	6747E-02	3893E-09	8304E-09	6894E-09
27	0	0	-666.6	9839E+00	5184E-10	1965E-10	2117E-04	8219E-02	3767E-02	2876E-02	2874E-09	6994E-09	9059E-09
28	0	0	-692.5	8505E+00	3047E-10	1082E-09	2868E-05	5317E-02	2826E-02	2134E-02	4466E-09	4466E-09	1231E-08
29	0	0	-718.1	7495E+00	2399E-10	1401E-09	1470E-04	6537E-02	2017E-02	4984E-02	2017E-09	5803E-09	6285E-09
30	0	0	-743.7	5966E+00	1637E-10	7230E-10	2459E-04	5812E-02	1321E-02	4511E-02	3274E-10	5803E-09	6285E-09
31	0	0	-769.3	5796E+00	1364E-10	4047E-10	3277E-04	5155E-02	7254E-03	4086E-02	2674E-09	7594E-09	6239E-09
32	0	0	-795.0	5085E+00	8481E-10	9959E-10	3945E-04	4562E-02	2184E-03	3704E-02	1082E-09	8977E-09	5239E-09
33	0	0	-820.6	4453E+00	6116E-10	1210E-09	4481E-04	4026E-02	2109E-03	3361E-02	2092E-09	7258E-09	5602E-09
34	0	0	-846.2	3892E+00	4707E-10	7412E-10	4901E-04	3544E-02	5717E-03	3052E-02	3275E-10	3229E-09	4538E-09
35	0	0	-871.9	3396E+00	1478E-11	3820E-10	5221E-04	3111E-02	8725E-03	2728E-03	1637E-10	4875E-09	2759E-09
36	0	0	-897.5	2957E+00	1819E-10	8322E-10	5453E-04	2722E-02	1120E-02	2525E-02	6185E-10	7685E-09	8249E-09
37	0	0	-923.1	2570E+00	5753E-10	1073E-09	5610E-04	2374E-02	1322E-02	2300E-02	6639E-10	7476E-09	4857E-09
38	0	0	-948.7	2228E+00	9800E-10	8276E-10	5703E-04	2064E-02	1483E-02	2098E-02	7185E-10	3047E-09	2728E-09
39	0	0	-974.4	1928E+00	1774E-10	1091E-09	3740E-04	1787E-02	1609E-02	1915E-02	1683E-09	5248E-09	3092E-09
40	0	0	-1000.0	1664E+00	3206E-10	7594E-10	2730E-04	1542E-02	1704E-02	1751E-02	2365E-10	2310E-09	4575E-09
41	16.7	0	-5	2047E-01	1354E-03	1938E-07	2439E-02	7248E-01	1518E-01	2539E-01	2603E-02	4214E-07	187E-02
42	16.7	0	-26.1	1076E+01	7310E-04	1608E-08	2459E-02	3873E-01	6542E-02	1220E-02	9313E-08	2241E-08	4739E-02
43	16.7	0	-51.8	2169E+01	6036E-04	1906E-08	2436E-02	1541E-01	8135E-02	2328E-08	1445E-10	5279E-02	1445E-10
44	16.7	0	-77.4	3342E+01	5974E-04	3747E-08	2379E-02	1873E-02	1138E-01	8135E-02	2328E-08	1445E-10	5279E-02
45	16.7	0	-103.0	4654E+01	6520E-04	5006E-08	2292E-02	1729E-01	3019E-01	1595E-01	6752E-08	1441E-08	5279E-02
46	16.7	0	-128.6	6191E+01	7484E-04	2707E-08	2172E-02	3312E-01	5137E-01	2436E-01	1700E-07	3260E-08	5840E-02
47	16.7	0	-154.3	8103E+01	8778E-04	5599E-08	2172E-02	3312E-01	3380E-01	0000E+00	2910E-10	6088E-02	6088E-02
48	16.7	0	-179.9	1066E+02	1006E-03	1220E-07	1789E-02	7836E-01	1104E+00	1374E+00	1060E-07	4214E-07	187E-02
49	16.7	0	-205.5	1279E+02	1041E-03	1482E-07	1502E-02	1014E+00	4808E-01	4808E-01	1060E-07	4214E-07	187E-02
50	16.7	0	-231.2	9915E+01	9486E-04	2169E-09	1225E-02	7294E-01	1031E+00	4275E-01	1779E-08	2274E-10	3202E-02
51	16.7	0	-256.8	8069E+01	8111E-04	8095E-10	1019E-02	5702E-01	8111E-01	3768E-01	3984E-08	4271E-08	3659E-02
52	16.7	0	-282.4	6810E+01	8111E-04	8095E-10	1019E-02	5702E-01	8111E-01	3768E-01	3984E-08	4271E-08	3659E-02
53	16.7	0	-308.0	5737E+01	6821E-04	1364E-09	8568E-03	4706E-01	6556E-01	3281E-01	2787E-08	1516E-08	3213E-02
54	16.7	0	-333.7	4942E+01	4832E-04	2015E-09	6111E-03	3488E-01	5189E-01	2862E-01	1948E-08	5202E-09	2670E-02
55	16.7	0	-359.3	4294E+01	4087E-04	1455E-10	5156E-03	3070E-01	3761E-01	2214E-01	1626E-08	1665E-08	2202E-02
56	16.7	0	-384.9	3754E+01	3467E-04	2451E-09	4336E-03	2725E-01	3167E-01	1962E-01	1663E-08	2665E-08	1145E-02
57	16.7	0	-410.6	3296E+01	2947E-04	3138E-09	3627E-03	2432E-01	2672E-01	1747E-01	1120E-08	4275E-08	1284E-02
58	16.7	0	-436.2	2904E+01	2508E-04	1828E-09	3013E-03	2178E-01	2255E-01	1560E-01	1064E-08	1238E-08	1089E-02
59	16.7	0	-461.8	2564E+01	2136E-04	1392E-09	2480E-03	1954E-01	1902E-01	1397E-01	1133E-08	1219E-08	9279E-03
60	16.7	0	-487.4	2267E+01	1819E-04	9597E-10	1614E-03	1579E-01	1539E-01	1254E-01	1570E-09	1023E-08	7941E-03
61	16.7	0	-513.3	2006E+01	1548E-04	6639E-10	1614E-03	1579E-01	1539E-01	1254E-01	1570E-09	1023E-08	7941E-03
62	16.7	0	-538.7	1776E+01	1316E-04	5457E-10	1264E-03	1420E-01	1115E-01	1014E-01	1354E-09	6057E-09	587E-03
63	16.7	0	-564.3	1573E+01	1117E-04	4366E-10	9612E-04	1276E-01	9219E-02	9138E-02	1548E-09	2028E-09	5056E-03
64	16.7	0	-589.3	1393E+01	9458E-05	9095E-11	6992E-04	1146E-01	7545E-02	8241E-02	3347E-09	2055E-09	4361E-03
65	16.7	0	-615.6	1232E+01	7990E-05	2105E-09	4734E-04	1028E-01	6095E-02	7437E-02	4147E-09	1901E-09	3762E-03
66	16.7	0	-641.2	1090E+01	6729E-05	9597E-10	2795E-04	9204E-02	4840E-02	6716E-02	2710E-09	6457E-09	3245E-03
67	16.7	0	-666.8	9627E+00	5647E-05	4547E-10	1140E-04	8231E-02	3754E-02	6069E-02	1637E-09	1437E-09	2797E-03
68	16.7	0	-692.5	8495E+00	4720E-05	5275E-10	2662E-05	7347E-02	2816E-02	5488E-02	2019E-09	4511E-09	2409E-03
69	16.7	0	-718.1	7487E+00	3926E-05	8367E-10	1452E-04	6546E-02	2008E-02	4965E-02	2510E-09	1330E-09	2072E-03
70	16.7	0	-743.7	6589E+00	3247E-05	1810E-09	2444E-04	5820E-02	1314E-02	4495E-02	1164E-09	3574E-09	1779E-03
71	16.7	0	-769.3	5790E+00	2668E-05	6685E-10	3264E-04	5162E-02	7198E-03	4073E-02	2219E-09	1070E-08	1524E-03
72	16.7	0	-795.0	5080E+00	2176E-05	6548E-10	3934E-04	4568E-02	2138E-03	3693E-02	1910E-09	8613E-09	1304E-03
73	16.7	0	-820.6	4449E+00	1758E-05	9860E-10	4471E-04	4031E-02	2146E-03	3351E-02</			

102 33 3 0 -538.7 1766E+01 -2597E-04 9095E-12 1278E-03 1427E-01 1104E-01 9956E-02 2929E-09 2095E-08 1154E-02
103 33 3 0 -564.3 1565E+01 -2205E-04 4638E-10 9734E-04 1282E-01 9131E-02 8984E-02 2256E-09 1388E-08 9960E-03
104 33 3 0 -589.9 1386E+01 1868E-04 2046E-09 7098E-04 1151E-01 7474E-02 8113E-02 5039E-09 8667E-09 8599E-01
105 33 3 0 -615.6 1227E+01 1578E-04 4093E-11 4827E-04 1032E-01 6038E-02 4473E-02 7330E-02 7423E-03
106 33 3 0 -641.2 1059E+01 1329E-04 1683E-09 2610E-04 8266E-02 3717E-02 5993E-02 3511E-09 9395E-09 5525E-03
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235	100.0	0	-871.9	3299E+00	-5670E-05	7503E-10	4974E-04	3241E-02	9572E-03	2535E-02	1537E-09	1037E-09	4343E-03
236	100.0	0	-897.5	2877E+00	-4322E-05	9595E-10	5242E-04	2835E-02	189E-02	232E-02	9459E-10	5575E-09	3668E-03
237	100.0	0	-923.1	2503E+00	-3200E-05	5912E-11	5430E-04	2471E-02	1378E-02	2130E-02	1746E-09	1664E-09	3085E-03
238	100.0	0	-948.7	2172E+00	-2273E-05	1687E-09	5549E-04	2447E-02	1528E-02	1954E-02	3274E-10	4056E-09	2584E-03
239	100.0	0	-974.4	1882E+00	-1511E-05	2365E-10	5609E-04	1859E-02	1645E-02	1794E-02	7094E-10	4984E-09	2154E-03
240	100.0	0	-1000.0	1626E+00	-8924E-06	3547E-10	5618E-04	1603E-02	1733E-02	1649E-02	1128E-09	6494E-09	1785E-03
241	150.0	0	-3.5	877E+01	4825E-03	1825E-08	2003E-02	1694E-01	4668E-01	2232E-02	3228E-08	5078E-09	3265E-02
242	150.0	0	-69.4	8998E+01	3630E-03	1134E-08	2003E-02	1694E-01	4668E-01	2232E-02	3228E-08	5078E-09	3265E-02
243	150.0	0	-103.9	2578E+01	3601E-03	4620E-08	1875E-02	2312E-01	7969E-02	1058E-02	1071E-07	2503E-08	1709E-01
244	150.0	0	-138.4	3309E+01	3746E-03	8411E-08	1739E-02	3570E-01	1872E-01	2365E-02	1746E-07	5530E-08	1611E-01
245	150.0	0	-172.8	3868E+01	3904E-03	4409E-08	1559E-02	4576E-01	2716E-01	3438E-02	9313E-08	1601E-08	1197E-01
246	150.0	0	-207.3	4166E+01	3932E-03	1364E-08	1361E-02	5038E-01	3212E-01	2761E-02	1222E-08	1317E-08	5889E-02
247	150.0	0	-241.8	4179E+01	3753E-03	6730E-09	1525E-02	5021E-01	3345E-01	8836E-02	1373E-08	2490E-08	2177E-03
248	150.0	0	-276.6	3840E+01	3530E-03	936E-09	936E-03	6858E-02	3203E-01	3740E-02	1405E-08	476E-02	1405E-02
249	150.0	0	-310.7	3650E+01	3014E-03	9550E-10	7843E-03	4094E-01	2904E-01	4208E-02	7003E-09	8877E-09	6297E-02
250	150.0	0	-345.2	3280E+01	2593E-03	1037E-09	6372E-03	3560E-01	2542E-01	5811E-02	2434E-08	5020E-08	6886E-02
251	150.0	0	-379.6	2908E+01	2195E-03	1264E-09	5132E-03	3078E-01	2174E-01	6684E-02	2001E-10	8413E-09	6706E-02
252	150.0	0	-414.1	2557E+01	1836E-03	1655E-09	4093E-03	2658E-01	1827E-01	7012E-02	2638E-09	9604E-09	6163E-02
253	150.0	0	-448.6	2234E+01	1523E-03	1284E-09	3225E-03	2397E-01	1513E-01	6975E-02	0000E+00	4256E-09	5481E-02
254	150.0	0	-483.0	1944E+01	1250E-03	2592E-09	5146E-03	1986E-01	1264E-01	6714E-02	1264E-10	4784E-09	476E-02
255	150.0	0	-517.7	1685E+01	1023E-03	2592E-09	1897E-03	1897E-01	9924E-02	1833E-02	7467E-09	4105E-02	4105E-02
256	150.0	0	-551.9	1455E+01	8301E-04	2515E-09	1395E-03	1484E-01	7832E-02	5858E-02	4911E-10	1131E-08	3494E-02
257	150.0	0	-586.4	1253E+01	6882E-04	1869E-09	9800E-04	1282E-01	6041E-02	5375E-02	1801E-09	3492E-09	2949E-02
258	150.0	0	-620.9	1076E+01	5336E-04	2615E-09	6380E-04	1105E-01	4518E-02	4896E-02	4366E-10	3729E-09	2473E-02
259	150.0	0	-655.3	9203E+00	4223E-04	2192E-09	3581E-04	9497E-02	3232E-02	4436E-02	8549E-10	1473E-09	2060E-02
260	150.0	0	-689.8	848E+00	3307E-04	2131E-09	514E-04	8142E-02	2153E-02	1401E-02	8913E-10	1706E-02	1706E-02
261	150.0	0	-724.3	6670E+00	2558E-04	9732E-10	127E-05	6858E-02	1487E-02	360E-02	4918E-09	1405E-02	1405E-02
262	150.0	0	-758.7	5648E+00	1949E-04	1683E-10	1956E-04	5923E-02	2155E-03	3239E-02	3456E-10	2728E-09	1149E-02
263	150.0	0	-793.2	4766E+00	1458E-04	4775E-10	3079E-04	5022E-02	8853E-04	2909E-02	7458E-10	1328E-09	9346E-03
264	150.0	0	-827.7	4006E+00	1064E-04	3365E-10	3932E-04	4239E-02	5751E-03	2611E-02	7458E-10	4802E-09	7549E-03
265	150.0	0	-862.1	3354E+00	7515E-05	9004E-10	4559E-04	3560E-02	9609E-02	2344E-02	7549E-10	2756E-09	6055E-03
266	150.0	0	-896.6	2797E+00	5057E-05	1937E-09	4999E-04	2974E-02	1261E-02	2105E-02	2083E-09	1566E-09	4818E-03
267	150.0	0	-931.1	2323E+00	3146E-05	2183E-10	5283E-04	2471E-02	1687E-02	1687E-02	3820E-10	5821E-10	3802E-03
268	150.0	0	-965.1	1921E+00	1683E-05	9736E-09	5440E-04	2040E-02	1347E-02	1702E-02	4156E-09	2972E-03	2972E-03
269	150.0	0	-1000.0	1581E+00	5809E-06	7458E-10	5495E-04	1672E-02	1765E-02	1533E-02	4366E-10	4293E-09	2299E-03
270	200.0	0	-35.0	6688E+00	4128E-03	4293E-08	1801E-02	4396E-02	1773E-01	1327E-02	2142E-07	3793E-09	9548E-02
271	200.0	0	-69.4	1306E+01	3717E-03	1281E-08	1763E-02	1763E-02	7685E-02	2369E-02	4424E-08	1301E-08	1296E-01
272	200.0	0	-103.9	1893E+01	3585E-03	1961E-07	1687E-02	2329E-02	113E-02	3825E-02	3535E-08	5093E-09	1438E-01
273	200.0	0	-138.4	2397E+01	3563E-03	6265E-08	1574E-02	1432E-02	8790E-02	5311E-02	9546E-08	1609E-08	1357E-01
274	200.0	0	-172.8	2782E+01	3598E-03	140E-07	1432E-02	3880E-01	1483E-01	6293E-02	1048E-08	240E-07	072E-01
275	200.0	0	-207.3	3017E+01	3505E-03	7094E-10	1274E-02	4247E-01	1884E-01	6155E-02	9204E-08	1502E-08	6372E-02
276	200.0	0	-241.8	3096E+01	3461E-03	6548E-10	1105E-02	4330E-01	2087E-01	5091E-02	1532E-08	9741E-09	2266E-02
277	200.0	0	-276.2	3041E+01	3221E-03	3638E-11	9405E-03	4160E-01	2117E-01	3292E-02	6548E-10	1097E-08	1177E-02
278	200.0	0	-310.7	2889E+01	2911E-03	1301E-08	7882E-03	3839E-01	2023E-01	1308E-02	1532E-08	1400E-08	3526E-02
279	200.0	0	-345.2	2678E+01	2569E-03	1464E-08	6521E-04	3454E-01	1851E-01	4535E-03	1161E-08	4834E-02	4834E-02
280	200.0	0	-379.6	2438E+01	2223E-03	2246E-09	5336E-03	3063E-01	1640E-01	1816E-02	4002E-09	2292E-09	5358E-02
281	200.0	0	-414.1	2192E+01	1893E-03	1110E-09	4315E-03	2693E-01	1418E-01	2763E-02	2474E-09	2401E-09	5369E-02
282	200.0	0	-448.6	1952E+01	1591E-03	9095E-11	3443E-03	2355E-01	1200E-01	3355E-02	3638E-09	1073E-09	5079E-02
283	200.0	0	-483.0	1724E+01	1322E-03	1091E-10	2705E-03	2054E-01	9955E-02	3670E-02	5348E-09	2110E-09	4631E-02
284	200.0	0	-517.5	1514E+01	1087E-03	1855E-09	2082E-03	1786E-01	8091E-02	3785E-02	1091E-08	1564E-09	4117E-02
285	200.0	0	-551.9	1322E+01	8852E-04	8549E-10	1559E-02	1550E-01	646E-02	3761E-02	2469E-09	4329E-09	3093E-02
286	200.0	0	-586.4	1138E+01	7133E-04	1133E-03	1342E-01	4961E-02	4961E-02	4961E-02	4020E-09	1346E-09	1346E-09
287	200.0	0	-620.9	9942E+00	5685E-04	6094E-10	7610E-04	1159E-01	3688E-02	3471E-02	4948E-09	1255E-09	2629E-02
288	200.0	0	-655.3	8565E+00	4477E-04	1392E-09	4630E-04	9976E-02	2593E-02	3265E-02	1346E-09	1255E-09	2213E-02
289	200.0	0	-689.8	7347E+00	3478E-04	9095E-12	2196E-04	8559E-02	1662E-02	3044E-02	3020E-09	1273E-10	1846E-02
290	200.0	0	-724.3	6277E+00	2657E-04	4684E-10	12295E-05	7317E-02	8787E-03	2820E-02	3636E-10	7603E-09	1527E-02
291	200.0	0	-758.7	5340E+00	1990E-04	7776E-10	1338E-04	6230E-02	2263E-03</				

334	300.0	0	-103.9	1054E+01	2487E-03	6839E-09	1363E-02	2387E-01	6077E-02	4647E-02	1027E-08	1222E-08	9389E-02
335	300.0	0	-138.4	1334E+01	2342E-03	1324E-08	1288E-02	2774E-01	1660E-02	5742E-02	8615E-08	6403E-09	9291E-02
336	300.0	0	-172.8	1559E+01	2268E-03	2037E-09	1196E-02	3091E-01	2005E-02	6658E-02	7218E-08	6112E-09	8133E-02
337	300.0	0	-207.3	1720E+01	2223E-03	1537E-09	1091E-02	3320E-01	4829E-02	7200E-02	1375E-08	6572E-02	6747E-02
338	300.0	0	-241.8	1816E+01	2140E-03	1091E-09	9780E-03	3405E-01	6807E-02	7070E-02	6221E-08	1392E-08	4330E-02
339	300.0	0	-276.2	1851E+01	2025E-03	6276E-10	8625E-03	3378E-01	8005E-02	6534E-02	2470E-08	7603E-09	2714E-02
340	300.0	0	-310.7	1833E+01	1875E-03	2319E-09	7491E-03	3259E-01	8529E-02	5685E-02	6039E-09	4384E-09	4159E-02
341	300.0	0	-345.2	1772E+01	1698E-03	1892E-09	6413E-03	3072E-01	8511E-02	4662E-02	3492E-09	3347E-09	9627E-03
342	300.0	0	-379.6	1681E+01	1505E-03	8185E-11	5413E-03	2843E-01	8090E-02	3598E-02	5311E-09	1455E-10	1911E-02
343	300.0	0	-414.1	1568E+01	1306E-03	2692E-09	4506E-03	2593E-01	7396E-02	2587E-02	3074E-09	3802E-09	2478E-02
344	300.0	0	-448.6	1444E+01	1122E-03	4638E-10	3695E-03	2375E-01	6537E-02	1689E-02	2256E-09	4165E-09	2741E-02
345	300.0	0	-483.0	1314E+01	9290E-04	1719E-09	2981E-03	2089E-02	5597E-02	3039E-03	4457E-09	2401E-09	2775E-02
346	300.0	0	-517.5	1184E+01	7617E-04	5275E-10	2359E-03	1852E-01	4638E-02	1893E-03	8640E-09	8404E-09	2459E-02
347	300.0	0	-551.9	1058E+01	6126E-04	8276E-10	1822E-03	1631E-01	3705E-02	1893E-03	8640E-09	8404E-09	2459E-02
348	300.0	0	-586.4	9386E+00	4824E-04	7459E-10	1364E-03	1429E-01	2825E-02	5685E-03	1728E-09	1637E-09	2198E-02
349	300.0	0	-620.9	8266E+00	3709E-04	2055E-09	9757E-04	1244E-01	2018E-02	8514E-03	1455E-09	1564E-09	1921E-02
350	300.0	0	-655.3	7233E+00	2769E-04	4275E-10	6506E-04	1078E-01	1292E-02	1055E-02	2346E-09	8731E-10	1644E-02
351	300.0	0	-689.8	6291E+00	1989E-04	7276E-10	3810E-04	9296E-02	6513E-03	1194E-02	3201E-09	2055E-09	1383E-02
352	300.0	0	-724.3	5440E+00	1352E-04	7958E-10	1599E-04	7975E-02	9008E-04	1281E-02	1346E-09	2747E-09	1145E-02
353	300.0	0	-758.7	4678E+00	8393E-05	1319E-10	1899E-05	6806E-02	3769E-03	1328E-02	1673E-09	5166E-09	9322E-01
354	300.0	0	-793.2	4001E+00	4341E-05	5093E-10	1615E-05	5779E-02	7726E-03	1344E-02	8367E-10	6603E-09	7486E-03
355	300.0	0	-827.7	3404E+00	1201E-05	1246E-09	2729E-04	4880E-02	1097E-02	1336E-02	2938E-09	4802E-09	5907E-03
356	300.0	0	-862.1	2880E+00	1177E-05	3411E-10	3576E-04	4098E-02	1357E-02	1310E-02	6548E-09	5402E-09	4577E-03
357	300.0	0	-896.6	2425E+00	2924E-05	8686E-10	4201E-04	3421E-02	1558E-02	1271E-02	7822E-09	3874E-09	3473E-03
358	300.0	0	-931.1	2049E+00	1156E-05	4547E-11	4697E-04	2838E-02	1709E-02	1223E-02	1537E-09	4802E-09	2569E-03
359	300.0	0	-965.5	1693E+00	4927E-05	1819E-11	4924E-04	2617E-02	1168E-02	1168E-02	1892E-09	2747E-09	1840E-03
360	300.0	0	-1000.0	1403E+00	5457E-05	1737E-09	5082E-04	1913E-02	1883E-02	1110E-02	1091E-09	1259E-09	1259E-03
361	350.0	0	-5	4199E-02	3297E-03	2765E-09	1313E-02	1449E-01	3308E-01	1722E-02	2270E-08	3331E-08	3363E-02
362	350.0	0	-35.0	2916E+00	2400E-03	1564E-08	1303E-02	2024E-01	1624E-01	1969E-02	2328E-08	5239E-09	3478E-02
363	350.0	0	-69.4	5675E+00	1912E-03	1164E-08	1276E-02	2194E-01	1147E-01	2273E-02	1572E-07	2910E-09	6313E-02
364	350.0	0	-103.9	8210E+00	1641E-03	6399E-08	1233E-02	2420E-01	7534E-02	3360E-02	1024E-07	0000E+00	7292E-02
365	350.0	0	-138.4	1042E+01	1492E-03	1038E-08	1173E-02	2664E-01	4065E-02	4639E-02	1490E-07	3201E-09	7292E-02
366	350.0	0	-172.8	1224E+01	1411E-03	7847E-04	5730E-03	2492E-01	5067E-02	6102E-02	1801E-08	1601E-08	6603E-02
367	350.0	0	-207.3	1362E+01	1369E-03	2001E-09	1008E-02	3028E-01	1390E-02	6139E-02	2765E-09	4547E-10	1478E-02
368	350.0	0	-241.8	1453E+01	1308E-03	1091E-09	9147E-03	3108E-01	3145E-02	6552E-02	2765E-09	4547E-10	1478E-02
369	350.0	0	-276.2	1499E+01	1234E-03	4820E-10	8170E-03	3106E-01	4373E-02	6523E-02	9677E-09	2638E-09	2683E-02
370	350.0	0	-310.7	1505E+01	1142E-03	1346E-09	7187E-03	3029E-01	5105E-02	6136E-02	1251E-08	2963E-09	1363E-02
371	350.0	0	-345.2	1476E+01	1033E-03	9277E-10	6230E-03	2893E-01	5409E-02	5497E-02	1062E-08	7585E-09	2759E-03
372	350.0	0	-379.6	1341E+01	9137E-03	5730E-04	5324E-03	2715E-01	5166E-02	4714E-02	1746E-09	8185E-10	5429E-03
373	350.0	0	-414.1	1245E+01	7847E-04	5730E-04	5324E-03	2715E-01	5166E-02	4714E-02	1746E-09	8185E-10	5429E-03
374	350.0	0	-448.6	1125E+01	6575E-04	6821E-10	3716E-03	2292E-01	4579E-02	3052E-02	1301E-08	4893E-09	1429E-02
375	350.0	0	-483.0	1156E+01	5356E-04	1355E-09	3029E-03	2070E-01	3979E-02	2284E-02	8749E-09	1478E-02	1576E-02
376	350.0	0	-517.5	1054E+01	4228E-04	6730E-10	2421E-03	1852E-01	3319E-02	1598E-02	7312E-09	1146E-09	1589E-02
377	350.0	0	-551.9	9513E+00	3216E-04	8004E-10	1880E-03	1644E-01	2640E-02	1005E-02	1219E-08	1728E-09	1509E-02
378	350.0	0	-586.4	8513E+00	2531E-04	1819E-10	1483E-03	1493E-01	1973E-02	1049E-03	5239E-09	1601E-09	1373E-02
379	350.0	0	-620.9	7365E+00	1359E-04	1300E-09	1039E-03	1347E-01	1847E-02	6202E-02	1801E-08	6730E-09	1208E-02
380	350.0	0	-655.3	6666E+00	9446E-05	9095E-12	7082E-04	1103E-01	7592E-03	2357E-03	2110E-09	4056E-09	8579E-03
381	350.0	0	-689.8	5836E+00	4302E-05	1273E-09	4315E-04	9540E-02	2346E-03	4944E-03	1928E-09	4056E-09	8579E-03
382	350.0	0	-724.3	5077E+00	2057E-06	5684E-10	2032E-04	8201E-02	2278E-03	6916E-03	1219E-09	6603E-09	6958E-03
383	350.0	0	-758.7	4388E+00	2970E-05	1091E-09	1740E-05	7009E-02	6268E-03	8367E-03	6730E-09	8476E-09	5497E-03
384	350.0	0	-793.2	3771E+00	5352E-05	1546E-10	1314E-04	5958E-02	9639E-03	9384E-03	2401E-09	1346E-09	4219E-03
385	350.0	0	-827.7	3215E+00	7064E-05	1073E-09	1183E-04	5032E-02	1242E-02	1004E-02	4911E-10	7731E-09	3128E-03
386	350.0	0	-862.1	2736E+00	8219E-05	4229E-10	3379E-04	4225E-02	1461E-02	1639E-02	1056E-02	4366E-10	2674E-03
387	350.0	0	-896.6	2311E+00	8920E-05	6321E-10	4045E-04	3562E-02	1639E-02	1056E-02	4366E-10	2674E-03	1478E-02
388	350.0	0	-931.1	1942E+00	9256E-05	3092E-10	4517E-04	2923E-02	1767E-02	1052E-02	7276E-11	3129E-09	8747E-04
389	350.0	0	-965.5	1623E+00	9305E-05	9823E-10	4828E-04	2406E-02	1856E-02	1034E-02	3911E-10	3001E-09	4077E-04
390	350.0	0	-1000.0	1348E+00	9133E-05	4138E-10	5007E-04	1966E-02	1911E-02	1005E-02	4275E-10	1637E-10	5175E-05
391	400.0	0	-35.0	420E-02	1238E-03	4366E-09	1191E-02	5587E-01	2210E-02	3080E-02	1397E-07	2397E-09	2594E-03
392	400.0	0	-69.4	4629E+00	9020E-04	2219E-08	1168E-02	2355E-01	1130E-01	4849E-03	6054E-08	6348E-08	2300E-02
393	400.0	0	-103.9	6713E+00	6863E-04	6337E-08	1134E-02	2461E-01	8228E-02	2164E-02	2736E-07	8695E-09	5031E-02
394	400.0	0	-138.4	8554E+00	5575E-04	3398E-08	1084E-02	2614E-01	5397E-02	3666E-02	2736E-07	8695E-09	5031E-02
395	400.0	0	-172.8	1010E+01	4853E-04	1120E-08	1022E-02	2758E-01	2896E-02	4907E-02	3260E-08	2183E-09	4834E-02
396	400.0	0	-207.3	1130E+01	4632E-04	7640E-09	9420E-03	2869E-01	7027E-03	5459E-02	5130E-09	1655E-09	4122E-02
397	400.0	0	-241.8	1215E+01	4227E-04	9458E-10	8614E-03	3272E-01	8807E-03	6051E-02	7494E-09	8185E-10	3428E-02
398	400.0	0	-276.2	1266E+01	3846E-04	7276E-11	7606E-03	2925E-01	2093E-02	6272E-02	6057E-09	2616E-09	1811E-02
399	400.0	0	-310.7	1284E+01	3420E-04	1064E-09	6887E-03	2867E-01	2909E-02	6161E-02	9059E-09	4566E-09	1811E-02
400	400.0	0	-345.2	1273E+01	2925E-04	6821E-10	6023E-03	2760E-01	3375E-02	5785E-02	2656E-09	9641E-10	1096E-02
401	400.0	0	-379.6	1239E+01	2369E-04	1237E-09	5190E-03	2613E-01	3543E-02	5220E-02	8731E-10	1637E-10	5169E-03
402	400.0	0	-414.1	1185E+01	1777E-04	2829E-09	4405E-03	2438E-01	3471E-02	4541E-02	2346E-09	3074E-09	8648E-04
403	400.0	0	-448.6	1175E+01	1993E-04	3678E-09	3678E-03	2245E-01	3219E-02	3812E-02	1812E-09	3602E-09	2036E-03
404	400.0	0	-483.0	1040E+01	6058E-05	9212E-10	3020E-03	2088E-01	2377E-02	3392E-02	6195E-09	7094E-10	3743E-03
405	400.0	0	-517.5	9566E+00	7875E-06	5912E-10	2429E-03	1842E-01	2377E-02	3392E-02	6195E-09	7094E-10	3743E-03
406	400.0	0	-551.9	8709E+00	3856E-05	1519E-09	1908E-03	1645E-01	1872E-02	1760E-02	8440E-09	2110E-09	4603E-03
407	400.0	0	-586.4	7855E+00	7784E-05	2365E-10	1454E-03	1456E-01					

450	500.0	.0	-1000.0	.1267E+00	.2210E-04	.6594E-10	.5215E-04	.1909E-02	.1898E-02	.1003E-02	.2046E-09	.1801E-09	.4904E-03
451	500.0	.0	-200.0	.1357E+02	.3837E-09	.7685E-10	.1578E-02	.1118E+00	.1474E+00	.4601E-01	.1248E-06	.1521E-08	.4579E-09
452	26.3	.0	-200.0	.1245E+02	.1610E-03	.4911E-10	.1573E-02	.1054E+00	.1328E+00	.3947E-01	.1661E-08	.6139E-10	.2110E-02
453	52.6	.0	-200.0	.9838E+01	.2924E-03	.2092E-10	.1554E-02	.8837E-01	.1007E+00	.2438E-01	.1769E-07	.2442E-08	.4033E-02
454	78.9	.0	-200.0	.7199E+01	.3567E-03	.1264E-09	.1523E-02	.7098E-01	.6826E-01	.9815E-02	.5184E-09	.2083E-09	.5585E-02
455	105.3	.0	-200.0	.5733E+01	.3868E-03	.1910E-10	.1484E-02	.6098E-01	.5046E-01	.3008E-02	.9277E-09	.1430E-08	.6636E-02
456	131.6	.0	-200.0	.4698E+01	.3965E-03	.1583E-09	.1439E-02	.5372E-01	.3810E-01	.9981E-03	.4873E-08	.3855E-09	.7169E-02
457	157.9	.0	-200.0	.3911E+01	.3918E-03	.1573E-09	.1390E-02	.4820E-01	.2886E-01	.3600E-02	.2034E-08	.3092E-09	.7313E-02
458	184.2	.0	-200.0	.3292E+01	.3761E-03	.1546E-10	.1340E-02	.4397E-01	.2170E-01	.5420E-02	.3602E-09	.1213E-08	.7273E-02
459	210.5	.0	-200.0	.2794E+01	.3514E-03	.2638E-10	.1289E-02	.4067E-01	.1605E-01	.6689E-02	.1593E-08	.1330E-08	.7228E-02
460	236.8	.0	-200.0	.2389E+01	.3195E-03	.6730E-10	.1237E-02	.3798E-01	.1157E-01	.7435E-02	.6439E-09	.1247E-08	.7246E-02
461	263.2	.0	-200.0	.2057E+01	.2821E-03	.1255E-09	.1185E-02	.3567E-01	.8021E-02	.7645E-02	.1350E-08	.1570E-08	.7266E-02
462	289.5	.0	-200.0	.1783E+01	.2409E-03	.2401E-09	.1134E-02	.3362E-01	.5238E-02	.7378E-02	.1181E-08	.7822E-09	.7153E-02
463	315.8	.0	-200.0	.1563E+01	.1973E-03	.2501E-09	.1085E-02	.3183E-01	.3068E-02	.6808E-02	.4293E-09	.3502E-09	.6142E-02
464	342.1	.0	-200.0	.1383E+01	.1519E-03	.1810E-09	.1040E-02	.3036E-01	.1381E-02	.6165E-02	.4511E-09	.7713E-09	.6142E-02
465	368.4	.0	-200.0	.1239E+01	.1052E-03	.7367E-10	.9991E-03	.2928E-01	.7408E-04	.5642E-02	.6257E-09	.6057E-09	.5306E-02
466	394.7	.0	-200.0	.1127E+01	.5712E-04	.2055E-09	.9643E-03	.2859E-01	.9213E-03	.5325E-02	.8185E-09	.5039E-09	.4414E-02
467	421.1	.0	-200.0	.1042E+01	.7464E-05	.4184E-10	.9356E-03	.2822E-01	.1645E-02	.5194E-02	.1099E-08	.7276E-10	.3580E-02
468	447.4	.0	-200.0	.9837E+00	.4370E-04	.3274E-10	.9129E-03	.2808E-01	.2115E-02	.5170E-02	.5784E-09	.1364E-08	.2864E-02
469	473.7	.0	-200.0	.9491E+00	.9612E-04	.1819E-10	.8956E-03	.2810E-01	.2340E-02	.5162E-02	.9823E-09	.7658E-09	.2265E-02
470	500.0	.0	-200.0	.9376E+00	.1494E-03	.2437E-09	.8637E-03	.2822E-01	.2320E-02	.5108E-02	.7676E-09	.7403E-09	.1737E-02

STRESS3D VERSION 4.0 (MAY 1989)
J.F.T. AGAPITO AND ASSOCS. (303)242 4220

STRESS3D MODEL 2

QA NUMBER: AGAPITO 4.0
INPUT FILE: 11.DAT
DATE: 05/25/89

TEMPERATURES DISPLACEMENTS AND STRESSES AT TIME .20000E+02

PT	XCOORD	YCOORD	ELEV	TEMP	U	V	W	SIGXX	SIGYY	SIGZZ	SIGXY	SIGYZ	SIGZX
1	.0	.0	-5	.2081E-01	.1472E-08	.5832E-08	.2438E-02	.9994E-01	.5651E-01	.8137E-02	.9197E-08	.5590E-08	.5365E-08
2	.0	.0	-26.1	.1084E+01	.9237E-08	.1128E-08	.2455E-02	.3386E-01	.2336E-01	.1376E-02	.8557E-08	.638E-08	.6405E-08
3	.0	.0	-51.8	.2185E+01	.3893E-09	.1100E-08	.2437E-02	.1473E-01	.5835E-02	.4320E-02	.1548E-07	.2547E-09	.9913E-08
4	.0	.0	-77.4	.3371E+01	.2354E-07	.1975E-08	.2388E-02	.1113E-02	.1169E-01	.1094E-01	.1804E-07	.7640E-10	.7723E-08
5	.0	.0	-103.0	.4702E+01	.3058E-09	.3745E-09	.2315E-02	.1606E-01	.3031E-01	.1761E-01	.2403E-08	.1066E-08	.9339E-08
6	.0	.0	-128.6	.6272E+01	.4195E-09	.1728E-09	.2198E-02	.3192E-01	.5196E-01	.2616E-01	.1720E-08	.6960E-08	.1258E-07
7	.0	.0	-154.3	.8241E+01	.4443E-09	.2250E-09	.2038E-02	.5110E-01	.7828E-01	.3555E-01	.5598E-08	.1509E-08	.1248E-07
8	.0	.0	-179.9	.1089E+02	.4690E-09	.3141E-09	.1816E-02	.7872E-01	.1128E+00	.4426E-01	.1188E-07	.756E-08	.1391E-07
9	.0	.0	-205.3	.1295E+02	.4727E-09	.1761E-10	.1499E-02	.1030E+00	.1397E+00	.4894E-01	.1908E-07	.2020E-07	.1833E-07
10	.0	.0	-231.2	.1010E+02	.3101E-09	.6139E-11	.1221E-02	.7289E-01	.1055E+00	.4539E-01	.3648E-08	.1402E-09	.8788E-08
11	.0	.0	-256.8	.8180E+01	.3203E-09	.1453E-09	.1017E-02	.5647E-01	.8258E-01	.3974E-01	.8872E-09	.1084E-08	.1139E-07
12	.0	.0	-282.4	.6810E+01	.3346E-09	.1750E-09	.8564E-03	.4647E-01	.6646E-01	.3426E-01	.2534E-08	.1039E-08	.1086E-07
13	.0	.0	-308.0	.5780E+01	.3326E-09	.2851E-09	.7245E-03	.3960E-01	.5452E-01	.2964E-01	.2069E-08	.6463E-09	.6361E-08
14	.0	.0	-333.7	.4971E+01	.2490E-09	.2819E-10	.6136E-03	.3443E-01	.4528E-01	.2583E-01	.1551E-08	.9049E-09	.5239E-08
15	.0	.0	-359.3	.4314E+01	.2422E-09	.1666E-09	.5191E-03	.3032E-01	.3791E-01	.2267E-01	.1482E-08	.5495E-09	.6242E-08
16	.0	.0	-384.9	.3769E+01	.2553E-09	.1353E-10	.4379E-03	.2691E-01	.3189E-01	.2002E-01	.1171E-08	.1871E-08	.5007E-08
17	.0	.0	-410.6	.3308E+01	.2117E-09	.9572E-10	.3676E-03	.2402E-01	.2689E-01	.1776E-01	.8899E-09	.5232E-09	.4909E-08
18	.0	.0	-436.2	.2912E+01	.2158E-09	.1725E-09	.3067E-03	.2151E-01	.2269E-01	.1583E-01	.6535E-09	.1935E-08	.3524E-08
19	.0	.0	-461.8	.2570E+01	.1779E-09	.2057E-09	.2538E-03	.1930E-01	.1913E-01	.1415E-01	.2974E-09	.1178E-08	.2540E-08
20	.0	.0	-487.4	.2272E+01	.1246E-09	.1246E-09	.2077E-03	.1734E-01	.1608E-01	.1267E-01	.4593E-09	.2519E-08	.2605E-08
21	.0	.0	-513.1	.2010E+01	.1572E-09	.2898E-10	.1677E-03	.1259E-01	.1347E-01	.1137E-01	.1296E-09	.2867E-09	.2266E-08
22	.0	.0	-538.7	.1780E+01	.1400E-09	.5127E-10	.1330E-03	.1401E-01	.1227E-01	.1022E-01	.4093E-09	.5264E-09	.1250E-08
23	.0	.0	-564.3	.1576E+01	.2017E-09	.5230E-10	.1028E-03	.1258E-01	.9278E-01	.9197E-02	.2929E-09	.8433E-09	.1751E-08
24	.0	.0	-589.9	.1395E+01	.1116E-09	.7662E-10	.7674E-04	.1129E-01	.7597E-02	.8283E-02	.1965E-09	.8336E-09	.1149E-08
25	.0	.0	-615.6	.1234E+01	.1830E-09	.3024E-10	.5426E-04	.1012E-01	.6141E-02	.7465E-02	.2765E-09	.3488E-09	.1156E-08
26	.0	.0	-641.2	.1091E+01	.1107E-09	.3513E-10	.3494E-04	.9059E-02	.4881E-02	.6733E-02	.1783E-09	.3408E-09	.6833E-09
27	.0	.0	-666.8	.9639E+00	.3336E-09	.3979E-10	.1843E-04	.8095E-02	.3791E-02	.6076E-02	.1348E-09	.4297E-09	.9256E-09
28	.0	.0	-692.5	.8150E+00	.3396E-09	.1010E-10	.4389E-04	.2850E-02	.2850E-02	.5149E-02	.2478E-09	.7149E-09	.2551E-08
29	.0	.0	-718.1	.7495E+00	.1019E-09	.2558E-10	.7458E-05	.6427E-02	.2039E-02	.4957E-02	.3638E-10	.1144E-09	.9572E-09
30	.0	.0	-743.7	.6596E+00	.9769E-10	.2228E-10	.1738E-04	.5708E-02	.1343E-02	.4481E-02	.1114E-09	.7549E-09	.6673E-09
31	.0	.0	-769.3	.5796E+00	.7790E-10	.5775E-10	.2560E-04	.5058E-02	.7465E-03	.4054E-02	.1351E-09	.1489E-09	.6407E-09
32	.0	.0	-795.0	.5085E+00	.1658E-09	.6992E-10	.3232E-04	.4470E-02	.2387E-03	.3670E-02	.2274E-10	.5839E-09	.6362E-09
33	.0	.0	-820.8	.4453E+00	.1334E-09	.4138E-10	.3774E-04	.3940E-02	.1914E-03	.3324E-02	.1007E-09	.2231E-09	.6053E-09
34	.0	.0	-846.6	.3892E+00	.3105E-10	.8572E-11	.4200E-04	.3463E-02	.5530E-03	.3014E-02	.3956E-10	.1521E-09	.5368E-09
35	.0	.0	-871.9	.3396E+00	.8699E-10	.3274E-10	.4527E-04	.3034E-02	.8544E-03	.2735E-02	.7117E-10	.2538E-10	.5682E-09
36	.0	.0	-897.5	.2957E+00	.5886E-10	.9334E-10	.4767E-04	.2650E-02	.1103E-02	.2484E-02	.3729E-09	.3827E-09	.9186E-09
37	.0	.0	-923.1	.2570E+00	.1215E-09	.4263E-10	.4932E-04	.2307E-02	.1305E-02	.2258E-02	.9550E-11	.4807E-09	.5459E-09
38	.0	.0	-948.7	.2228E+00	.3217E-10	.5093E-10	.5032E-04	.2000E-02	.1467E-02	.2055E-02	.1410E-10	.2228E-10	.3172E-09
39	.0	.0	-974.4	.1928E+00	.4835E-10	.1331E-09	.5078E-04	.1728E-02	.1594E-02	.1872E-02	.7799E-10	.2983E-09	.3702E-09
40	.0	.0	-1000.0	.1664E+00	.9439E-10	.3638E-10	.5077E-04	.1486E-02	.1688E-02	.1708E-02	.4115E-10	.1796E-10	.5225E-09
41	16.7	.0	.0	.1010E-03	.1010E-03	.1010E-03	.1010E-03	.1010E-03	.1010E-03	.1010E-03	.1010E-03	.1010E-03	.1010E-03
42	16.7	.0	-26.1	.1076E+01	.6645E-04	.1273E-09	.2445E-02	.3354E-01	.2298E-01	.3241E-03	.7800E-07	.8008E-08	.2846E-02
43	16.7	.0	-51.8	.2169E+01	.6052E-04	.1513E-08	.2429E-02	.1460E-01	.5901E-02	.4840E-02	.1746E-08	.1077E-08	.3607E-02
44	16.7	.0	-77.4	.3342E+01	.6168E-04	.1306E-08	.2381E-02	.1301E-02	.1141E-01	.1071E-01	.1350E-07	.4889E-08	.4162E-02
45	16.7	.0	-103.0	.4654E+01	.6722E-04	.1148E-08	.2308E-02	.1624E-01	.2978E-01	.1708E-01	.3161E-08	.2738E-08	.5027E-02
46	16.7	.0	-128.6	.6191E+01	.7676E-04	.3263E-10	.2190E-02	.3210E-01	.5100E-01	.2516E-01	.4005E-08	.7059E-09	.5623E-02
47	16.7	.0	-154.3	.8103E+01	.8923E-04	.3341E-10	.2130E-02	.5102E-01	.7659E-01	.3403E-01	.3504E-08	.1831E-08	.5928E-02
48	16.7	.0	-179.9	.1066E+02	.1010E-03	.2643E-09	.1810E-02	.1017E-01	.1017E-01	.1017E-01	.4587E-08	.1996E-08	.4587E-02
49	16.7	.0	-205.5	.1279E+02	.1057E-03	.2387E-09	.1498E-02	.1007E+00	.1376E+00	.4927E-01	.1068E-07	.4150E-07	.3426E-03
50	16.7	.0	-231.2	.9915E+01	.9618E-04	.1158E-09	.1224E-02	.7238E-01	.1032E+00	.4363E-01	.1828E-08	.4790E-09	.3399E-02
51	16.7	.0	-256.8	.8069E+01	.8217E-04	.1447E-09	.1020E-02	.5655E-01	.8121E-01	.3832E-01	.3821E-08	.5258E-08	.3799E-02
52	16.7	.0	-282.4	.6743E+01	.6908E-04	.4297E-09	.8591E-03	.4666E-01	.6564E-01	.3327E-01	.2631E-08	.5131E-09	.3312E-02
53	16.7	.0	-308.0	.5737E+01	.5804E-04	.3979E-10	.7267E-03	.3977E-01	.5399E-01	.2896E-01	.1669E-08	.5787E-10	.2739E-02
54	16.7	.0	-333.7	.4767E+01	.4893E-04	.3979E-10	.6154E-03	.3457E-01	.4493E-01	.2135E-01	.1392E-08	.3217E-09	.2251E-02
55	16.7	.0	-359.3	.4294E+01	.4141E-04	.3934E-10	.5206E-03	.3043E-01	.3766E-01	.2232E-01	.1380E-08	.1808E-08	.1861E-02
56	16.7	.0	-384.9	.3754E+01	.3515E-04	.2262E-10	.4391E-03	.2700E-01	.3171E-01	.1976E-01	.1347E-08	.2286E-08	.1552E-02
57	16.7	.0	-410.6	.3296E+01	.2990E-04	.1680E-09	.3687E-03	.2409E-01	.2676E-01	.1757E-01	.8149E-09	.1012E-08	.1305E-02
58	16.7	.0	-436.2	.2904E+01	.2548E-04	.1584E-09	.3076E-03	.2156E-01	.2259E-01	.1568E-01	.8308E-09	.1087E-09	.1105E-02
59	16.7	.0	-461.8	.2564E+01	.2172E-04	.4661E-11	.2545E-03	.1935E-01	.1905E-01	.1403E-01	.9868E-09	.1477E-08	.9406E-03
60	16.7	.0	-487.4	.2267E+01	.1672E-04	.1271E-10	.6154E-03	.1738E-01	.1602E-01	.1258E-01	.4120E-09	.2769E-09	.8046E-03
61	16.7	.0	-513.1	.2006E+01	.1679E-04	.5082E-10	.1683E-03	.156E-01	.1433E-01	.1108E-01	.1108E-09	.6905E-09	.6905E-03
62	16.7	.0	-538.7	.1776E+01	.1345E-04	.5332E-10	.1334E-03	.1403E-01	.1118E-01	.1016E-01	.1810E-09	.3006E-09	.5940E-03
63	16.7	.0	-564.3	.1573E+01	.1144E-04	.5730E-10	.1032E-03	.1260E-01	.9248E-02	.9144E-02	.3483E-09	.5803E-09	.5119E-03
64	16.7	.0	-589.9	.1393E+01	.9713E-05	.1570E-09	.7711E-04	.1131E-01	.7573E-02	.8239E-02	.1437E-09	.3076E-09	.4415E-03
65	16.7	.0	-615.6	.1232E+01	.8229E-05	.1866E-09	.5457E-04	.1014E-01	.6122E-02	.7429E-02	.2592E-09	.5091E-09	.3810E-03
66	16.7	.0	-641.2	.1090E+01	.6953E-05	.3224E-10	.3522E-03	.9073E-02	.4866E-02	.6702E-02	.1196E-09	.8329E-09	.3287E-03
67	16.7	.0	-666.8	.9627E+00	.5856E-05	.1570E-09	.1867E-04	.8107E-02	.3779E-02	.6050E-02	.1637E-10	.4559E-09	.2835E-03
68	16.7	.0	-692.5	.8495E+00	.4915E-05	.8106E-10	.4598E-05	.7231E-02	.2840E-02	.5465E-02	.7253E-10	.4257E-10	.4442E-03
69	16.7	.0	-718.1	.7487E+00	.4108E-05	.2979E-10	.7282E-05	.6436E-02	.2031E-02	.4939E-02	.9300E-10	.8915E-09	.2102E-03
70	16.7	.0	-743.7	.6589E+00	.3417E-05	.4195E-10	.1723E-04	.5716E-02	.1336E-02	.4466E-02	.5184E-10	.2563E-09	.1806E-03
71	16.7	.0	-769.3	.5790E+00	.2827E-05	.2592E-10	.2547E-04	.5064E-02	.7409E-03	.4041E-02	.7572E-10	.1058E-08	.1548E-03
72	16.7	.0	-795.0	.5080E+00	.2324E-05	.3342E-10	.3221E-04	.4476E-02	.2341E-03	.3658E-02	.4320E-10	.2588E-09	.1325E-03
73	16.7	.0	-820.8	.4449E+00	.1896E-05	.5431E-10	.3764E-04	.3945E-02	.1951E-03	.331			

103	33.3	0	-564.3	1565E+01	-2259E-04	4775E-11	1045E-03	1267E-01	9161E-02	8989E-02	4638E-10	1367E-08	1008E-02
104	33.3	0	-589.9	1386E+01	-1919E-04	6617E-10	7818E-04	1136E-01	7502E-02	8110E-02	3683E-10	1921E-09	8706E-03
105	33.3	0	-615.6	1227E+01	-1626E-04	1705E-11	5551E-04	1018E-01	6065E-02	7321E-02	2174E-09	5646E-09	7517E-03
106	33.3	0	-641.2	1085E+01	-1374E-04	5809E-09	3603E-04	9113E-02	4819E-02	6611E-02	1501E-09	9391E-09	6490E-03
107	33.3	0	-666.6	950E+01	-1157E-04	1815E-09	1913E-04	8142E-02	3745E-02	5974E-02	1749E-09	4418E-09	5599E-03
108	33.3	0	-692.5	8465E+00	-9712E-05	2512E-10	5206E-05	7261E-02	2810E-02	5400E-02	1005E-09	4629E-09	4826E-03
109	33.3	0	-718.1	7462E+00	-8117E-05	2751E-10	6754E-05	6463E-02	2006E-02	4884E-02	5593E-10	1052E-08	4154E-03
110	33.3	0	-743.7	6568E+00	-6751E-05	3877E-10	1677E-04	5739E-02	1316E-02	4419E-02	8049E-02	1864E-09	3569E-03
111	33.3	0	-769.3	5773E+00	-5584E-05	1214E-09	2507E-04	5085E-02	7244E-03	4001E-02	1266E-09	1210E-09	3061E-03
112	33.3	0	-795.0	5065E+00	-4589E-05	3558E-10	3187E-04	4493E-02	2206E-03	3625E-02	7731E-11	2851E-09	2620E-03
113	33.3	0	-820.6	4437E+00	-3742E-05	2581E-10	3735E-04	3960E-02	2061E-03	3286E-02	1774E-10	3470E-09	2217E-03
114	33.3	0	-846.2	3879E+00	-3025E-05	5502E-10	4167E-04	3480E-02	5650E-03	2982E-02	6594E-09	10494E-09	1904E-03
115	33.3	0	-871.9	3385E+00	-2420E-05	3388E-10	4498E-04	3050E-02	8642E-03	2707E-02	8617E-10	5230E-11	1617E-03
116	33.3	0	-897.5	2948E+00	-1910E-05	1023E-11	4742E-04	2663E-02	1111E-02	1111E-02	9777E-10	1375E-09	1368E-03
117	33.3	0	-923.1	2562E+00	-1483E-05	5571E-11	4911E-04	2318E-02	1312E-02	2238E-02	9391E-10	6071E-09	1153E-03
118	33.3	0	-948.7	2222E+00	-1127E-05	1023E-11	5015E-04	2010E-02	1472E-02	2038E-02	5230E-10	2935E-09	9685E-04
119	33.3	0	-974.4	1923E+00	-8328E-06	3604E-10	5065E-04	1736E-02	1598E-02	1858E-02	8663E-10	4115E-10	8096E-04
120	50.0	0	-1000.0	1660E+00	-5905E-06	4718E-10	5065E-04	1493E-02	1693E-02	1696E-02	8617E-10	1364E-09	6741E-04
121	50.0	0	-26.1	1017E+01	-1926E-03	2383E-08	2385E-02	2894E-01	2210E-01	2515E-02	3376E-08	2095E-08	5121E-02
122	50.0	0	-51.8	2043E+01	-1764E-03	1037E-08	2374E-02	1263E-01	6637E-02	4944E-02	2270E-08	2270E-08	8455E-02
123	50.0	0	-77.4	3127E+01	-1269E-03	1193E-08	2326E-02	2971E-02	9280E-02	8582E-02	1698E-07	4191E-08	1078E-01
124	50.0	0	-103.0	4303E+01	-1202E-03	1311E-09	2251E-02	1756E-01	2580E-01	1319E-01	1242E-08	2735E-08	1295E-01
125	50.0	0	-128.6	5615E+01	-2127E-03	8572E-10	2133E-02	3328E-01	4415E-01	1806E-01	1230E-08	2634E-08	4432E-01
126	50.0	0	-154.3	7113E+01	-2422E-03	6173E-10	1974E-02	5081E-01	6449E-01	2284E-01	8417E-09	3487E-08	1492E-01
127	50.0	0	-179.9	8851E+01	-2730E-03	1825E-09	1764E-02	7170E-01	8766E-01	2671E-01	9676E-08	8837E-08	1279E-01
128	50.0	0	-205.5	1006E+02	-2852E-03	1845E-09	1492E-02	8700E-01	8598E-01	2932E-01	1676E-07	4726E-07	1841E-02
129	50.0	0	-231.2	8522E+01	-2584E-03	3878E-09	1242E-02	6973E-01	8598E-01	2935E-01	2399E-08	1772E-09	8187E-02
130	50.0	0	-256.8	7274E+01	-2241E-03	4854E-10	1041E-02	5707E-01	7142E-01	2825E-01	2680E-08	1133E-08	8901E-02
131	50.0	0	-282.4	6251E+01	-1916E-03	1970E-09	8782E-03	4782E-01	5957E-01	2756E-01	2739E-08	8123E-08	1232E-02
132	50.0	0	-308.0	5418E+01	-1632E-03	1007E-09	7429E-03	4089E-01	5012E-01	2410E-01	3217E-08	2863E-08	7022E-02
133	50.0	0	-333.7	4723E+01	-1390E-03	2365E-10	6289E-03	3551E-01	4229E-01	2186E-01	1285E-08	1668E-08	5968E-02
134	50.0	0	-359.3	4137E+01	-1185E-03	8174E-10	5319E-03	3119E-01	3580E-01	1976E-01	1591E-08	1583E-08	5055E-02
135	50.0	0	-384.9	3638E+01	-1011E-03	8640E-11	4486E-03	2761E-01	3035E-01	1783E-01	2083E-09	1379E-08	4290E-02
136	50.0	0	-410.6	3209E+01	-865E-03	7667E-10	3767E-03	2458E-01	2575E-01	1609E-01	6635E-09	3783E-09	3654E-02
137	50.0	0	-436.7	2746E+01	-739E-03	1751E-09	3144E-03	2191E-01	2182E-01	1437E-01	3124E-09	1324E-09	1242E-02
138	50.0	0	-461.8	2511E+01	-6307E-04	2450E-09	2604E-03	1968E-01	1846E-01	1310E-01	4247E-09	1808E-09	2680E-02
139	50.0	0	-487.4	2225E+01	-5388E-04	1183E-09	2134E-03	1765E-01	1556E-01	1183E-01	3106E-09	1253E-08	2306E-02
140	50.0	0	-513.1	1973E+01	-4600E-04	5014E-10	1726E-03	1585E-01	1306E-01	1069E-01	1478E-09	2567E-09	1988E-02
141	50.0	0	-538.7	1750E+01	-3922E-04	2240E-10	1372E-03	1423E-01	1089E-01	9661E-02	3138E-09	7228E-09	1717E-02
142	50.0	0	-564.3	1551E+01	-3338E-04	2190E-09	1063E-03	1271E-01	9016E-02	8734E-02	1260E-09	6062E-09	1484E-02
143	50.0	0	-589.9	1351E+01	-2859E-04	1474E-10	789E-03	1061E-01	7306E-02	7306E-02	1216E-09	1216E-09	1216E-09
144	50.0	0	-615.6	1218E+01	-2404E-04	2686E-10	5705E-04	1026E-01	5971E-02	7143E-02	2551E-09	1024E-09	1099E-02
145	50.0	0	-641.2	1078E+01	-2031E-04	9334E-10	3736E-04	9180E-02	4743E-02	6462E-02	2683E-10	4454E-09	9582E-03
146	50.0	0	-666.8	9529E+00	-1711E-04	8833E-10	2053E-04	8200E-02	3679E-02	5847E-02	2965E-09	3531E-09	8273E-03
147	50.0	0	-692.5	8414E+00	-1436E-04	1046E-10	6213E-05	7312E-02	2759E-02	5293E-02	9231E-10	8267E-09	7135E-03
148	50.0	0	-718.1	7420E+00	-1200E-04	6764E-10	5882E-05	6506E-02	4793E-02	1965E-02	1965E-02	11330E-09	6144E-03
149	50.0	0	-743.7	6533E+00	-9977E-05	2333E-10	6022E-04	7777E-02	1282E-02	4342E-02	1041E-09	5207E-10	5281E-03
150	50.0	0	-769.3	5773E+00	-8248E-05	3476E-10	4933E-04	5118E-02	1479E-02	8496E-02	1599E-09	1433E-09	1433E-09
151	50.0	0	-795.0	5065E+00	-6775E-05	8367E-10	3131E-04	4522E-02	1982E-03	3569E-02	3229E-10	4718E-09	3878E-03
152	50.0	0	-820.6	4417E+00	-5522E-05	6855E-10	3686E-04	3985E-02	2244E-03	3239E-02	1446E-09	3101E-09	3311E-03
153	50.0	0	-846.2	3863E+00	-4460E-05	5093E-10	4125E-04	3502E-02	5799E-03	2942E-02	3206E-10	1050E-09	2819E-03
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155	50.0	0	-897.5	2936E+00	-2808E-05	1751E-10	4712E-04	2680E-02	1121E-02	2432E-02	9277E-10	5346E-09	2025E-03
156	50.0	0	-923.1	2552E+00	-2176E-05	2603E-10	4895E-04	2432E-02	1320E-02	2214E-02	1048E-09	2681E-09	1707E-03
157	50.0	0	-948.7	2214E+00	-1659E-05	1865E-10	4993E-04	2022E-02	1479E-02	7018E-02	1535E-09	1535E-09	1535E-09
158	50.0	0	-974.4	1916E+00	-1214E-05	3047E-10	5044E-04	1737E-02	1603E-02	1841E-02	2228E-10	5364E-09	1198E-03
159	50.0	0	-1000.0	1654E+00	-8561E-06	4036E-10	5049E-04	1502E-02	1697E-02	1681E-02	5525E-10	4779E-09	9968E-04
160	75.0	0	-26.1	1800E-01	-3144E-03	3420E-09	2301E-02	4040E-01	4291E-01	1057E-02	2014E-07	6399E-08	4407E-02
161	75.0	0	-51.8	9436E+00	-2747E-03	2299E-08	2321E-02	2513E-01	2219E-01	1116E-02	7276E-08	1281E-08	6462E-02
162	75.0	0	-77.4	1887E+01	-2520E-03	3158E-08	2307E-02	9519E-02	7806E-02	3063E-02	6054E-08	3842E-08	1065E-01
163	75.0	0	-103.0	2646E+01	-2843E-03	5798E-08	2258E-02	6524E-02	6524E-02	8585E-02	7101E-08	9022E-08	1388E-01
164	75.0	0	-128.6	4966E+01	-2882E-03	1893E-09	2064E-02	3413E-01	3648E-01	1073E-01	3944E-08	1328E-08	1735E-01
165	75.0	0	-154.3	6067E+01	-3187E-03	4854E-10	1908E-02	4978E-01	5180E-01	1209E-01	2292E-09	2512E-08	1690E-01
166	75.0	0	-179.9	7059E+01	-3467E-03	2842E-10	1711E-02	6529E-01	6557E-01	1175E-01	2490E-08	1293E-08	1258E-01
167	75.0	0	-205.5	7486E+01	-3546E-03	7026E-10	1480E-02	7285E-01	7227E-01	1202E-01	9986E-09	1972E-08	1832E-01
168	75.0	0	-231.2	7108E+01	-3328E-03	3829E-09	1255E-02	6622E-01	6850E-01	1579E-01	3756E-08	1383E-08	6416E-02
169	75.0	0	-256.8	6406E+01	-2974E-03	6037E-10	1061E-02	6212E-01	6076E-01	1824E-01	3583E-08	2334E-08	9014E-02
170	75.0	0	-282.4	5688E+01	-2801E-03	2365E-10	8980E-03	4550E-01	5273E-01	3066E-01	3993E-08	3081E-08	1247E-02
171	75.0	0	-308.0	5031E+01	-2252E-03	1494E-09	7609E-03	4544E-01	4544E-01	1865E-01	7963E-09	5161E-10	8525E-02
172	75.0	0	-333.7	4448E+01	-1941E-03	1364E-11	6448E-03	3642E-01	3900E-01	1778E-01	4989E-09	1301E-08	7588E-02
173	75.0	0	-359.3	3936E+01	-1670E-03	4286E-10	5456E-03	3200E-01	3342E-01	1665E-01	1291E-08	1644E-08	6640E-02
174	75.0	0	-384.9	3488E+01	-1435E-03	1546E-10	4805E-03	2831E-01	2859E-01	1543E-01	6562E-09	1016E-08	5769E-02
175	75.0	0	-410.6	3094E+01	-1232E-03	2387E-10	7870E-03	2247E-01	2447E-01	1240E-01	1234E-08	1703E-08	5000E-02
176	75.0	0	-436.7	2747E+01	-1057E-03	9899E-10	1223E-03	2					

219	100	0	0	-461.8	2349E+01	1139E-03	4434E-11	2779E-03	2059E-01	1662E-01	1038E-01	2169E-09	7021E-09	4556E-02
220	100	0	0	-487.4	2096E+01	9782E-04	1846E-09	2287E-03	1844E-01	1411E-01	9602E-02	8640E-11	1067E-08	3992E-02
221	100	0	0	-513.1	1869E+01	8386E-04	1762E-11	1280E-03	1653E-01	1191E-01	8851E-02	2883E-02	1104E-08	3492E-02
222	100	0	0	-538.7	1665E+01	7174E-04	8674E-10	1489E-03	1481E-01	9974E-02	8134E-02	6598E-09	2453E-09	3050E-02
223	100	0	0	-564.3	1482E+01	6121E-04	8117E-10	1167E-03	1328E-01	8276E-02	7459E-02	2260E-09	4320E-11	7461E-02
224	100	0	0	-589.9	1318E+01	5209E-04	7751E-10	1189E-03	1189E-01	6789E-02	6828E-02	1432E-09	4013E-09	2317E-02
225	100	0	0	-615.6	1171E+01	4419E-04	7294E-09	6485E-04	1064E-01	5487E-02	6242E-02	1241E-09	5580E-09	2016E-02
226	100	0	0	-641.2	1039E+01	3736E-04	6477E-09	4417E-04	9515E-02	4350E-02	5071E-02	2199E-09	3038E-09	1750E-02
227	100	0	0	-666.8	9212E+00	3147E-04	8549E-10	2646E-04	8493E-02	3359E-02	5203E-02	1592E-09	7326E-09	1152E-02
228	100	0	0	-692.5	8152E+00	2639E-04	4843E-10	1137E-04	7676E-02	2498E-02	4747E-02	1005E-09	7954E-09	1517E-02
229	100	0	0	-718.1	7202E+00	2202E-04	1012E-09	1410E-05	6730E-02	1752E-02	4329E-02	5889E-10	1031E-08	1133E-02
230	100	0	0	-743.7	6353E+00	1828E-04	1273E-10	2147E-04	5972E-02	1108E-02	3847E-02	4320E-10	4143E-09	9754E-03
231	100	0	0	-769.3	5594E+00	1507E-04	2694E-10	2107E-04	5288E-02	1346E-02	3680E-02	6958E-10	9450E-09	879E-03
232	100	0	0	-795.0	4916E+00	1234E-04	4206E-11	2842E-04	4671E-02	8192E-04	3283E-02	6139E-10	1106E-09	2644E-03
233	100	0	0	-820.6	4313E+00	1002E-04	1637E-10	3438E-04	4115E-02	3193E-03	2995E-02	3683E-10	2176E-09	6131E-03
234	100	0	0	-846.2	3776E+00	8046E-05	1853E-10	3912E-02	3615E-02	6572E-03	2734E-02	4775E-11	3115E-10	5220E-03
235	100	0	0	-871.9	3299E+00	6384E-05	1421E-10	4280E-04	3166E-02	9392E-03	2497E-02	4525E-10	3756E-09	4430E-03
236	100	0	0	-897.5	2877E+00	4987E-05	1335E-10	4556E-04	2764E-02	1172E-02	2282E-02	2569E-10	1232E-09	3745E-03
237	100	0	0	-923.1	2503E+00	3819E-05	7390E-11	4752E-04	2405E-02	1361E-02	2087E-02	9140E-10	3820E-10	3154E-03
238	100	0	0	-948.7	2172E+00	2848E-05	3729E-10	4879E-04	2085E-02	1512E-02	1910E-02	1010E-09	4404E-09	2644E-03
239	100	0	0	-974.4	1882E+00	2046E-05	1160E-10	4948E-04	1801E-02	1630E-02	1750E-02	1364E-11	4441E-09	2220E-03
240	100	0	0	-1000.0	1626E+00	1390E-05	6696E-10	4967E-04	1548E-02	1718E-02	1604E-02	3593E-10	6882E-09	1832E-03
241	150	0	0	-35.0	8917E+00	2197E-03	3183E-08	2023E-02	2023E-01	3745E-01	1030E-02	1537E-07	3145E-08	2173E-03
242	150	0	0	-69.4	1755E+01	3730E-03	1768E-08	1990E-02	8618E-02	4803E-02	1137E-02	1292E-07	1688E-08	1001E-01
243	150	0	0	-103.9	2578E+01	3693E-03	3809E-10	1900E-02	2248E-01	7427E-02	1988E-02	9582E-09	2514E-08	1766E-01
244	150	0	0	-138.4	3309E+01	3817E-03	2171E-10	1761E-02	3535E-01	1833E-01	3146E-02	1009E-08	4684E-08	1633E-01
245	150	0	0	-172.8	3868E+01	3957E-03	2365E-10	1580E-02	4550E-01	2688E-01	4042E-02	4202E-09	2160E-11	1211E-01
246	150	0	0	-207.3	4166E+01	3970E-03	2763E-10	1737E-02	5071E-01	3200E-01	3558E-02	1403E-08	1512E-08	5757E-02
247	150	0	0	-241.8	4179E+01	3793E-03	2117E-09	1162E-02	5033E-01	3344E-01	1371E-02	8754E-09	1039E-08	3599E-03
248	150	0	0	-276.2	3975E+01	3461E-03	2262E-10	9650E-03	4623E-01	2044E-01	591E-02	2913E-08	4445E-02	1458E-02
249	150	0	0	-310.7	3605E+01	3052E-03	4206E-11	7922E-03	4085E-01	2906E-01	4078E-02	1089E-08	8329E-08	2644E-03
250	150	0	0	-345.2	3280E+01	2629E-03	5957E-10	6448E-03	3547E-01	2546E-01	5741E-02	2568E-08	2854E-09	7000E-02
251	150	0	0	-379.6	2908E+01	2229E-03	3956E-10	5207E-03	3062E-01	2178E-01	6645E-02	2447E-09	1942E-08	6804E-02
252	150	0	0	-414.1	2557E+01	1869E-03	8106E-10	4168E-03	2642E-01	1831E-01	6988E-02	7703E-09	1427E-08	6247E-02
253	150	0	0	-448.6	2234E+01	1553E-03	2942E-09	3300E-03	2281E-01	1516E-01	6956E-02	3520E-09	1405E-09	5552E-02
254	150	0	0	-483.0	1944E+01	1281E-03	1080E-10	2571E-09	1970E-01	1118E-01	6577E-02	1587E-09	2693E-09	4837E-02
255	150	0	0	-517.5	1685E+01	1049E-03	1077E-09	1972E-03	1702E-01	9955E-02	6298E-02	6307E-09	2499E-09	4159E-02
256	150	0	0	-551.9	1455E+01	8541E-04	5684E-12	1471E-03	1470E-01	7862E-02	5836E-02	2919E-09	8351E-09	3539E-02
257	150	0	0	-586.4	1253E+01	6904E-04	4025E-10	1055E-03	1268E-01	6069E-02	5350E-02	3183E-10	1571E-09	2989E-02
258	150	0	0	-620.9	1076E+01	5540E-04	2819E-10	7132E-04	1092E-01	4544E-02	4867E-02	1728E-09	3665E-09	2507E-02
259	150	0	0	-655.9	9203E+00	4410E-04	2228E-10	4330E-04	9378E-02	3257E-02	4403E-02	2851E-09	7765E-09	2091E-02
260	150	0	0	-689.8	8808E+00	3470E-04	1808E-10	4054E-04	8031E-02	3058E-02	2860E-02	1758E-09	1733E-02	1458E-02
261	150	0	0	-724.3	6670E+00	2715E-04	1660E-10	2237E-05	6856E-02	1278E-02	356E-02	4525E-10	4258E-02	1170E-02
262	150	0	0	-758.7	5648E+00	2093E-04	6105E-10	1228E-04	5829E-02	5369E-03	3200E-02	9618E-10	4140E-09	1170E-02
263	150	0	0	-793.2	4766E+00	1589E-04	6253E-11	2360E-04	4935E-02	6826E-04	2867E-02	2321E-09	8117E-10	9521E-03
264	150	0	0	-827.7	4006E+00	1183E-04	5184E-10	3223E-04	4158E-02	5559E-03	2568E-02	2979E-10	2478E-10	7701E-03
265	150	0	0	-862.7	3354E+00	8602E-05	1774E-10	3861E-04	3486E-02	9427E-03	2300E-02	1182E-10	1446E-09	6185E-03
266	150	0	0	-897.5	2874E+00	6044E-05	1421E-10	4703E-04	2406E-02	1243E-02	2060E-02	9800E-10	5630E-09	4930E-03
267	150	0	0	-931.1	2323E+00	4043E-05	1040E-09	4608E-04	1982E-02	1637E-02	1656E-02	9277E-10	2638E-09	3897E-03
268	150	0	0	-965.5	1921E+00	2497E-05	8527E-11	4778E-04	1982E-02	1637E-02	1656E-02	9277E-10	2638E-09	3897E-03
269	150	0	0	-1000.0	1581E+00	1319E-05	5423E-10	4845E-04	1619E-02	1751E-02	1487E-02	1091E-09	1992E-09	2363E-03
270	200	0	0	-35.0	9617E-02	5439E-03	1750E-08	1810E-02	2097E-03	3204E-01	3088E-04	3492E-08	4437E-08	1223E-03
271	200	0	0	-69.4	1668E+00	4409E-03	6694E-08	1814E-02	3404E-02	1753E-01	7142E-03	6577E-08	4620E-09	8291E-02
272	200	0	0	-103.9	1306E+01	3665E-03	2823E-08	1778E-02	1299E-01	8004E-02	2183E-02	7101E-08	7522E-09	1292E-01
273	200	0	0	-138.4	2397E+01	3648E-03	7458E-10	1590E-02	2277E-01	8620E-03	3807E-02	5962E-09	5581E-09	1437E-01
274	200	0	0	-172.8	2782E+01	3660E-03	7969E-10	1448E-02	3846E-01	1461E-01	6470E-02	8140E-08	2838E-08	1385E-01
275	200	0	0	-207.3	3017E+01	3626E-03	1550E-09	1285E-02	4241E-01	1461E-01	6463E-02	8804E-09	4864E-09	6817E-02
276	200	0	0	-241.8	3096E+01	3494E-03	5252E-10	1115E-02	4322E-01	1461E-01	6463E-02	8804E-09	4864E-09	6817E-02
277	200	0	0	-276.2	3041E+01	3260E-03	1107E-09	9497E-03	4150E-01	2118E-01	3475E-02	1191E-09	1122E-08	1128E-02
278	200	0	0	-310.7	2850E+01	3107E-03	1569E-10	7970E-03	3826E-01	1845E-01	1440E-02	1591E-08	1251E-10	3548E-02
279	200	0	0	-345.2	2678E+01	2612E-03	1339E-10	6807E-03	3640E-01	1845E-01	1440E-02	1591E-08	1251E-10	3548E-02
280	200	0	0	-379.6	2438E+01	2264E-03	7208E-10	5418E-03	3048E-01	1644E-01	1745E-02	1510E-08	8201E-08	4425E-02
281	200	0	0	-414.1	2192E+01	1933E-03	5741E-10	4396E-03	2677E-01	1421E-01	2708E-02	3897E-09	5438E-10	5438E-02
282	200	0	0	-448.6	1952E+01	1629E-03	8129E-10	3523E-03	2340E-01	1203E-01	3309E-02	2487E-09	1008E-08	5145E-02
283	200	0	0	-483.0	1724E+01	1358E-03	7287E-10	2784E-03	2039E-01	9987E-02	3629E-02	1851E-09	2597E-09	4693E-02
284	200	0	0	-517.5	1522E+01	1211E-03	1278E-10	2161E-03	1737E-01	8122E-02	3746E-02	6603E-09	5880E-09	4174E-02
285	200	0	0	-551.9	1322E+01	9163E-04	1452E-10	1637E-03	1373E-01	6455E-02	3122E-02	5821E-09	9022E-09	3645E-02
286	200	0	0	-586.4	1149E+01	7420E-04	5173E-10	1201E-03	1329E-01	4989E-02	2645E-02	2645E-09	2738E-02	2738E-02
287	200	0	0	-620.9	9942E+00	5950E-04	1296E-10	8380E-04	1147E-01	3714E-02	3431E-02	8231E-10	4594E-09	2670E-02
288	200	0	0	-655.3	8565E+00	4721E-04	6287E-10	5392E-04	9862E-02	2619E-02	3224E-02	2501E-10	3893E-09	2250E-02
289	200	0	0	-689.8	7347E+00	3702E-04	3308E-10	2950E-04	8453E-02	1686E-02	3001E-02	8504E-10	5737E-09	1878E-02
290	200	0	0	-724.3	6274E+00	2863E-04	7230							

335	300.0	0	-138.4	1334E+01	2473E-03	1282E-09	1282E-02	2740E-01	1674E-02	4957E-02	3183E-11	2133E-09	9055E-02
336	300.0	0	-172.8	1559E+01	2371E-03	1512E-09	1202E-02	3056E-01	1968E-02	6170E-02	7567E-09	1160E-08	8061E-02
337	300.0	0	-207.3	1720E+01	2271E-03	1175E-10	1095E-02	3211E-01	4807E-02	6840E-02	6880E-09	1024E-08	6309E-02
338	300.0	0	-241.8	1816E+01	2205E-03	2043E-09	9958E-03	3358E-01	6810E-02	6945E-02	6240E-09	6708E-10	4221E-02
339	300.0	0	-276.2	1851E+01	2087E-03	3388E-10	8717E-03	3349E-01	8026E-02	6523E-02	1757E-08	1058E-08	2157E-02
340	300.0	0	-310.7	1833E+01	1936E-03	3001E-10	7584E-03	3235E-01	8558E-02	5728E-02	2756E-09	4127E-09	3709E-03
341	300.0	0	-345.2	1772E+01	1758E-03	8549E-10	6505E-03	3051E-01	8543E-02	4727E-02	8413E-10	7503E-09	1011E-02
342	300.0	0	-379.6	1681E+01	1563E-03	1620E-09	5504E-03	2824E-01	8124E-02	3669E-02	2324E-09	5321E-10	1965E-02
343	300.0	0	-414.3	1568E+01	1362E-03	2375E-09	4358E-03	2575E-01	7430E-02	2665E-02	4461E-09	4752E-09	2537E-02
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346	300.0	0	-517.5	1184E+01	8088E-04	9353E-10	2443E-03	1830E-01	4669E-02	3700E-03	6544E-09	8504E-09	2724E-02
347	300.0	0	-551.9	1058E+01	6565E-04	2410E-10	1905E-03	1618E-01	3734E-02	1252E-03	9636E-09	2533E-09	2510E-02
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350	300.0	0	-655.3	7233E+00	3117E-04	2251E-10	7294E-04	1068E-01	1317E-02	9947E-03	7729E-09	6971E-09	1423E-02
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353	300.0	0	-758.7	4678E+00	1108E-04	3763E-10	5520E-05	6724E-02	3557E-03	1271E-02	7662E-10	3361E-09	9639E-03
354	300.0	0	-793.2	4001E+00	6796E-05	2615E-10	8882E-05	5702E-02	7526E-03	1288E-02	7935E-09	1063E-08	7755E-03
355	300.0	0	-827.7	3404E+00	3441E-05	1359E-09	2017E-04	4810E-02	1078E-02	1281E-02	2244E-09	2187E-09	6140E-03
356	300.0	0	-862.1	2880E+00	8648E-06	2547E-10	2881E-04	4040E-02	1396E-02	1256E-02	1091E-09	6885E-09	479E-03
357	300.0	0	-896.6	2425E+00	1065E-05	4229E-10	3521E-04	3361E-02	1541E-02	1218E-02	1673E-09	4829E-09	3644E-03
358	300.0	0	-931.1	2031E+00	2466E-05	6582E-10	3975E-04	2783E-02	1693E-02	1171E-02	9982E-09	3233E-09	2713E-03
359	300.0	0	-965.5	1693E+00	3436E-05	2046E-11	4274E-04	2288E-02	1800E-02	1117E-02	7458E-10	1046E-10	1960E-03
360	300.0	-1000.0	1403E+00	4063E-05	7265E-10	4447E-04	1866E-02	1869E-02	1869E-02	1060E-02	2374E-09	2260E-09	1356E-03
361	350.0	0	-1.5	199E-02	3237E-03	1477E-08	1313E-02	2689E-01	2509E-01	8133E-03	9430E-08	2079E-08	9205E-04
362	350.0	0	-35.0	2916E+00	2088E-03	3489E-08	1030E-02	3085E-01	1581E-01	1198E-02	3399E-07	5064E-08	3245E-03
363	350.0	0	-69.4	5675E+00	2088E-03	1259E-08	1278E-02	2224E-01	1141E-01	1716E-02	2002E-07	1281E-08	5458E-02
364	350.0	0	-103.9	8210E+00	1813E-03	7708E-10	1235E-02	2446E-01	7521E-02	3041E-02	8868E-09	8856E-10	6798E-02
365	350.0	0	-138.4	1042E+01	1637E-03	1364E-11	1177E-02	2664E-01	4075E-02	4276E-02	6385E-09	5616E-10	6898E-02
366	350.0	0	-172.8	1224E+01	1530E-03	2351E-09	1103E-02	2864E-01	1107E-02	5422E-02	2215E-09	6241E-09	3767E-02
367	350.0	0	-207.3	1362E+01	1456E-03	3324E-09	1018E-02	3011E-01	1304E-02	6234E-02	1311E-08	8520E-09	5334E-02
368	350.0	0	-241.8	1453E+01	1388E-03	9245E-09	9245E-03	3085E-01	3130E-02	6621E-02	1311E-08	8520E-09	5334E-02
369	350.0	0	-276.2	1499E+01	1310E-03	1642E-09	8267E-03	3081E-01	4389E-02	6590E-02	1818E-08	6303E-09	3939E-02
370	350.0	0	-310.7	1505E+01	1216E-03	1917E-09	7284E-03	3005E-01	5134E-02	6207E-02	1177E-08	7424E-09	1296E-02
371	350.0	0	-345.2	1476E+01	1104E-03	6617E-10	6326E-03	2872E-01	5442E-02	5573E-02	3593E-09	5266E-09	2146E-03
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373	350.0	0	-414.3	1344E+01	8490E-04	4559E-09	4575E-03	2492E-01	5098E-02	3956E-02	6921E-09	1395E-08	1163E-02
374	350.0	0	-448.6	1254E+01	7184E-04	9517E-09	4575E-03	2492E-01	5098E-02	3956E-02	6921E-09	1395E-08	1163E-02
375	350.0	0	-483.0	1156E+01	5929E-04	7123E-09	3118E-03	2055E-01	4012E-02	2361E-02	1355E-08	3351E-09	1493E-02
376	350.0	0	-517.5	1054E+01	4764E-04	3956E-10	2508E-03	1838E-01	3350E-02	1674E-02	8336E-09	1328E-08	1650E-02
377	350.0	0	-551.9	9513E+00	3715E-04	6366E-11	1975E-03	1631E-01	2669E-02	1078E-02	1321E-08	6557E-09	1557E-02
378	350.0	0	-586.4	8515E+00	2794E-04	4138E-10	1515E-03	1437E-01	2002E-02	5769E-03	4493E-09	2324E-09	1427E-02
379	350.0	0	-620.9	7662E+00	2003E-04	2444E-09	1212E-03	1257E-01	1368E-02	1643E-03	1910E-10	3020E-09	1227E-02
380	350.0	0	-655.3	6666E+00	1333E-04	9517E-09	4575E-03	2492E-01	5098E-02	3956E-02	6921E-09	1395E-08	1163E-02
381	350.0	0	-689.8	5836E+00	7930E-05	4263E-10	5093E-04	9448E-02	2583E-03	4280E-03	1478E-09	5495E-09	1076E-02
382	350.0	0	-724.3	5077E+00	3534E-05	7026E-10	2792E-04	8116E-02	2054E-03	6270E-03	1455E-10	6889E-09	7319E-03
383	350.0	0	-758.7	4388E+00	7728E-07	3376E-10	9164E-05	6932E-02	6058E-03	7738E-03	5546E-10	4261E-09	5816E-03
384	350.0	0	-793.2	3771E+00	2567E-05	3126E-10	5891E-05	5885E-02	9440E-03	8773E-03	3595E-09	1371E-08	4498E-03
385	350.0	0	-827.7	3221E+00	4522E-05	1705E-11	1775E-04	4966E-02	1223E-02	9450E-03	2046E-11	8122E-09	3369E-03
386	350.0	0	-862.1	2816E+00	6005E-05	1138E-10	2689E-04	1465E-02	1448E-02	8383E-03	3190E-09	2042E-09	2423E-03
387	350.0	0	-896.6	2311E+00	6809E-05	2353E-10	2689E-04	1465E-02	1448E-02	8383E-03	3190E-09	2042E-09	2423E-03
388	350.0	0	-931.1	1942E+00	7335E-05	8492E-10	3860E-04	2872E-02	1752E-02	9972E-03	1353E-09	2225E-09	1250E-03
389	350.0	0	-965.5	1623E+00	7559E-05	3945E-10	4187E-04	2359E-02	1842E-02	9809E-03	8185E-11	1858E-09	5290E-03
390	350.0	-1000.0	1348E+00	7547E-05	3320E-10	4382E-04	1921E-02	1897E-02	9541E-03	1733E-09	9572E-09	1503E-04	9572E-09
391	400.0	0	-5	3420E-02	1899E-03	2161E-08	1204E-02	3781E-01	1949E-01	1589E-02	3201E-07	6749E-09	8075E-04
392	400.0	0	-35.0	2376E+00	1406E-03	1036E-07	1197E-02	2363E-01	1472E-01	8231E-04	5821E-08	2727E-08	2118E-02
393	400.0	0	-103.9	6233E+00	1059E-03	4502E-08	1138E-02	2363E-01	1472E-01	8231E-04	5821E-08	2727E-08	2118E-02
394	400.0	0	-138.4	8554E+00	6990E-04	1785E-09	1088E-02	2631E-01	5416E-02	3607E-02	1402E-08	1969E-09	481E-02
395	400.0	0	-172.8	1010E+01	6100E-04	1889E-09	1026E-02	2757E-01	2902E-02	4743E-02	5211E-09	1143E-08	4679E-02
396	400.0	0	-207.3	1130E+01	5541E-04	7412E-10	9526E-03	2854E-01	7953E-03	5618E-02	5430E-09	3020E-09	4160E-02
397	400.0	0	-241.8	1215E+01	5122E-04	9391E-10	8718E-03	2905E-01	8737E-03	6164E-02	7703E-09	9220E-09	3413E-02
398	400.0	0	-276.2	1266E+01	4719E-04	2055E-10	7861E-03	2901E-01	2109E-02	6364E-02	7844E-09	1828E-09	2574E-02
399	400.0	0	-310.7	1284E+01	4059E-04	4502E-08	6987E-02	2845E-01	2946E-02	6746E-02	1225E-08	4607E-09	1755E-02
400	400.0	0	-345.2	1273E+01	3735E-04	1321E-09	6121E-03	2737E-01	3410E-02	588E-02	1330E-09	7412E-10	1642E-02
401	400.0	0	-379.6	1239E+01	3140E-04	6071E-10	5287E-03	2592E-01	3579E-02	5304E-02	3092E-09	6003E-10	4497E-03
402	400.0	0	-414.3	1185E+01	2507E-04	7594E-10	4500E-03	2419E-01	3507E-02	4626E-02	1210E-09	3415E-09	1767E-04
403	400.0	0	-448.6	1117E+01	1867E-04	4297E-10	3772E-03	2228E-01	3253E-02	3898E-02	1660E-08	4575E-09	2722E-03
404	400.0	0	-483.0	1040E+01	1250E-04	1935E-09	3111E-03	2029E-01	2871E-02	3169E-02	2046E-10	2269E-09	4411E-03
405	400.0	0	-517.5	9566E+00	6793E-04	1102E-09	2518E-03	1828E-01	2408E-02	2477E-02	8190E-09	2351E-09	5152E-03
406	400.0	0	-551.9	8709E+00	5172E-05	1899E-10	1899E-03	1802E-01	1902E-02	1813E-02	8035E-09	3729E-09	5204E-03
407	400.0	0	-586.4	7855E+00	2621E-05	6298E-10	1538E-03	1445E-01	3683E-02	1280E-02	4798E-09	4798E-09	4798E-09
408	400.0	0	-620.9	7024E+00	6205E-05	6412E-10	1145E-03						

451	0	.0	-200.0	.1357E+02	.4810E-09	.6878E-10	.1574E-02	.1110E+00	.1477E+00	.4732E-01	.1247E-06	.2592E-10	.9829E-09
452	26.3	.0	-200.0	.1245E+02	.1637E-03	.1688E-09	.1568E-02	.1048E+00	.1331E+00	.4065E-01	.1790E-08	.1113E-08	.1668E-02
453	52.6	.0	-200.0	.9838E+01	.2972E-03	.7549E-10	.1552E-02	.8790E-01	.1008E+00	.2517E-01	.1789E-07	.3637E-08	.3237E-02
454	78.9	.0	-200.0	.7199E+01	.3627E-03	.6651E-10	.1527E-02	.7082E-01	.6835E-01	.1002E-01	.2319E-10	.1200E-08	.4629E-02
455	105.3	.0	-200.0	.5733E+01	.3928E-03	.2797E-10	.1492E-02	.6115E-01	.5044E-01	.2605E-02	.9354E-09	.5923E-09	.5797E-02
456	131.6	.0	-200.0	.4698E+01	.4013E-03	.2990E-10	.1450E-02	.5409E-01	.3799E-01	.1814E-02	.5170E-08	.1704E-08	.6704E-02
457	157.9	.0	-200.0	.3911E+01	.3951E-03	.2526E-09	.1403E-02	.4857E-01	.2871E-01	.4478E-02	.2281E-08	.1193E-08	.7328E-02
458	184.2	.0	-200.0	.3292E+01	.3782E-03	.8185E-11	.1352E-02	.4411E-01	.2157E-01	.6816E-02	.1060E-09	.5073E-09	.7672E-02
459	210.5	.0	-200.0	.2794E+01	.3533E-03	.2645E-09	.1299E-02	.4047E-01	.1597E-01	.6810E-02	.1378E-08	.3868E-09	.7768E-02
460	236.8	.0	-200.0	.2389E+01	.3224E-03	.7424E-10	.1245E-02	.3748E-01	.1154E-01	.7108E-02	.1000E-10	.4486E-09	.7654E-02
461	263.2	.0	-200.0	.2057E+01	.2868E-03	.1776E-09	.1192E-02	.3503E-01	.8021E-02	.7084E-02	.1211E-08	.1073E-08	.7362E-02
462	289.5	.0	-200.0	.1785E+01	.2475E-03	.6207E-10	.1141E-02	.3304E-01	.5224E-02	.6870E-02	.6494E-09	.5482E-09	.6926E-02
463	315.8	.0	-200.0	.1563E+01	.2054E-03	.9618E-10	.1093E-02	.3144E-01	.3013E-02	.6558E-02	.1501E-09	.9618E-10	.6388E-02
464	342.1	.0	-200.0	.1383E+01	.1608E-03	.1523E-10	.1049E-02	.3018E-01	.1281E-02	.6205E-02	.8072E-09	.5032E-09	.5780E-02
465	368.4	.0	-200.0	.1239E+01	.1143E-03	.7185E-10	.1010E-02	.2920E-01	.5051E-04	.5848E-02	.1131E-08	.3984E-09	.5123E-02
466	394.7	.0	-200.0	.1127E+01	.6620E-04	.5480E-10	.9751E-03	.2849E-01	.1043E-02	.5519E-02	.5161E-09	.6498E-09	.4434E-02
467	421.1	.0	-200.0	.1042E+01	.1684E-04	.6844E-10	.9459E-03	.2799E-01	.1742E-02	.5238E-02	.7985E-09	.6189E-09	.3731E-02
468	447.4	.0	-200.0	.9837E+00	.3354E-04	.1496E-09	.9222E-03	.2770E-01	.2179E-02	.5011E-02	.1402E-08	.7078E-09	.3028E-02
469	473.7	.0	-200.0	.9491E+00	.8469E-04	.5222E-10	.9043E-03	.2760E-01	.2378E-02	.4842E-02	.1764E-08	.2419E-09	.2329E-02
470	500.0	.0	-200.0	.8376E+00	.1364E-03	.1201E-09	.8922E-03	.2767E-01	.2348E-02	.4735E-02	.4593E-10	.1246E-09	.1638E-02

STRES3D VERSION 4.0 (MAY 1989)
J.F.T. AGAPITO AND ASSOCS. (303)242 4220

STRES3D MODEL 3

QA NUMBER: AGAPITO 4.0
INPUT FILE: 12A.DAT
DATE: 05/25/89

TEMPERATURES DISPLACEMENTS AND STRESSES AT TIME .20000E+02

PT	XCOORD	YCOORD	ELEV	TEMP	U	V	W	SIGXX	SIGYY	SIGZZ	SIGXY	SIGYZ	SIGZX
1	.0	.0	-5	2061E-01	-2683E-08	1444E-08	2847E-02	-1509E+00	-7786E-01	-1401E-01	-6112E-09	1045E-09	6371E-08
2	.0	.0	-26.1	1084E+01	3023E-07	1245E-08	2866E-02	-4628E-01	-2867E-01	-6921E-02	-1538E-07	1794E-08	5450E-08
3	.0	.0	-51.8	2185E+01	4377E-08	9459E-09	2842E-02	-2246E-01	-9063E-02	-3655E-03	-2310E-09	8503E-09	9127E-08
4	.0	.0	-77.4	3371E+01	6234E-07	2260E-07	2789E-02	-5191E-02	-9207E-02	-8045E-02	-1079E-07	-2698E-08	1028E-07
5	.0	.0	-103.0	4702E+01	3319E-07	4894E-08	2708E-02	-1020E-01	-2838E-01	-1633E-01	-6417E-08	-2944E-10	7527E-08
6	.0	.0	-128.6	6272E+01	2359E-08	9951E-08	2590E-02	-2606E-01	-5005E-01	-2540E-01	-2896E-08	-6680E-08	1342E-07
7	.0	.0	-154.3	8241E+01	2365E-07	2161E-07	2433E-02	-4512E-01	-7641E-01	-3513E-01	-2577E-07	-1100E-08	1376E-07
8	.0	.0	-179.9	1089E+02	3373E-07	2292E-07	2214E-02	-7265E-01	-110E+00	-4404E-01	-2036E-07	-5352E-08	1421E-07
9	.0	.0	-205.5	1295E+02	3003E-09	4994E-09	1926E-02	-9699E-01	-1374E+00	-4744E-01	-1904E-07	-3004E-07	1819E-07
10	.0	.0	-231.2	1010E+02	1282E-09	1583E-09	1649E-02	-6682E-01	-1034E+00	-4414E-01	-3528E-08	-1337E-08	-9002E-08
11	.0	.0	-256.8	8180E+01	1535E-09	5514E-09	1446E-02	-5039E-01	-8057E-01	-3867E-01	-8584E-09	-6908E-09	-1164E-07
12	.0	.0	-282.4	6810E+01	1500E-09	4551E-09	1287E-02	-4042E-01	-6455E-01	-3330E-01	-2707E-08	-1377E-08	-1096E-07
13	.0	.0	-308.0	5780E+01	1244E-09	3804E-09	1157E-02	-3360E-01	-5269E-01	-2873E-01	-2185E-08	-2436E-09	-6519E-08
14	.0	.0	-333.7	4971E+01	7082E-10	3085E-09	1048E-02	-2851E-01	-4353E-01	-2493E-01	-1766E-08	-6180E-08	-2065E-08
15	.0	.0	-359.3	4314E+01	6676E-10	2277E-09	9549E-03	-2540E-01	-3623E-01	-2170E-01	-1868E-08	-1822E-08	-6375E-08
16	.0	.0	-384.9	3769E+01	6219E-10	4561E-09	8750E-03	-2122E-01	-3029E-01	-1707E-01	-1422E-08	-6396E-09	-4087E-08
17	.0	.0	-410.6	3308E+01	2218E-10	3191E-09	8060E-03	-1845E-01	-2536E-01	-1677E-01	-1188E-08	-2549E-10	-4080E-08
18	.0	.0	-436.2	2912E+01	3908E-11	3637E-09	7460E-03	-1607E-01	-2123E-01	-1478E-01	-9157E-09	-5591E-09	-3518E-08
19	.0	.0	-461.8	2570E+01	2341E-10	1776E-09	6938E-03	-1401E-01	-1773E-01	-1303E-01	-5529E-09	-7488E-09	-2449E-08
20	.0	.0	-487.4	2272E+01	1625E-10	2834E-09	6482E-03	-1220E-01	-1476E-01	-1149E-01	-6985E-09	-5433E-09	-2417E-08
21	.0	.0	-513.1	2010E+01	2797E-10	1084E-09	6083E-03	-1050E-01	-1221E-01	-1013E-01	-6180E-09	-2065E-09	-2065E-09
22	.0	.0	-538.7	1780E+01	5617E-10	4039E-09	5734E-03	-9172E-02	-1002E-01	-8906E-02	-2588E-09	-1839E-08	-1099E-08
23	.0	.0	-564.3	1576E+01	2090E-10	2279E-09	5429E-03	-7903E-02	-8138E-02	-7815E-02	-5494E-09	-3724E-09	-1484E-08
24	.0	.0	-589.9	1395E+01	6413E-10	1897E-09	5161E-03	-6770E-02	-6515E-02	-6836E-02	-4356E-09	-3252E-09	-8470E-09
25	.0	.0	-615.6	1234E+01	2977E-10	1712E-09	4927E-03	-5757E-02	-5116E-02	-5956E-02	-5384E-09	-8766E-09	-8491E-08
26	.0	.0	-641.1	1089E+01	3403E-10	1766E-09	4544E-03	-4042E-02	-2675E-02	-3927E-02	-5163E-09	-7160E-09	-3038E-08
27	.0	.0	-666.8	9639E+00	3951E-11	1559E-09	3841E-03	-3848E-03	-1152E-02	-1885E-02	-3805E-09	-7803E-09	-6861E-09
28	.0	.0	-692.5	8505E+00	2430E-10	2836E-09	4383E-03	-3320E-02	-1985E-02	-3805E-02	-2195E-09	-7803E-09	-6861E-09
29	.0	.0	-718.1	7495E+00	6944E-10	1411E-09	4245E-03	-2677E-02	-1223E-02	-3225E-02	-2535E-09	-3602E-09	-6124E-09
30	.0	.0	-743.7	6596E+00	4868E-10	3817E-09	4124E-03	-2105E-02	-5736E-03	-2702E-02	-8106E-10	-8623E-09	-2675E-09
31	.0	.0	-769.3	5796E+00	7224E-10	4106E-09	4017E-03	-1599E-02	-2271E-04	-2231E-02	-3553E-09	-8612E-09	-2780E-09
32	.0	.0	-795.0	5085E+00	1201E-10	3880E-09	3824E-03	-1535E-02	-4416E-03	-1808E-02	-1877E-09	-9484E-09	-2158E-09
33	.0	.0	-820.6	4445E+00	3951E-11	1559E-09	3841E-03	-3848E-03	-1152E-02	-1885E-02	-3805E-09	-7803E-09	-6861E-09
34	.0	.0	-846.2	3892E+00	1076E-09	4102E-09	3769E-03	-4173E-03	-1152E-02	-1885E-02	-3805E-09	-7803E-09	-6861E-09
35	.0	.0	-871.9	3396E+00	3970E-10	2735E-09	3704E-03	-1180E-03	-1415E-02	-7763E-03	-8228E-10	-3191E-09	-1672E-09
36	.0	.0	-897.5	2957E+00	8796E-10	1070E-09	3647E-03	-1403E-03	-1628E-02	-5004E-03	-9118E-10	-1202E-08	-4849E-09
37	.0	.0	-923.1	2570E+00	1973E-10	2427E-09	3596E-03	-3621E-03	-1796E-02	-2533E-03	-1425E-09	-9565E-09	-2123E-09
38	.0	.0	-948.7	2228E+00	1675E-09	4505E-11	3550E-03	-5510E-03	-1925E-02	-3230E-04	-1542E-09	-3995E-09	-8851E-10
39	.0	.0	-974.4	1928E+00	7022E-10	2248E-09	3509E-03	-7102E-03	-2020E-02	-1652E-03	-2188E-09	-6839E-09	-2861E-10
40	.0	.0	-1000.0	1664E+00	1471E-10	1471E-09	3471E-03	-8488E-03	-4503E-03	-8301E-03	-1426E-02	-7824E-10	-2498E-09
41	16.7	.0	-5	2047E-01	-1469E-03	1285E-08	2820E-02	-7936E-01	-6151E-01	-2136E-02	-2176E-08	7460E-08	2373E-09
42	16.7	.0	-26.1	1076E+01	8369E-04	1446E-08	2851E-02	-4559E-01	-2794E-01	-3607E-02	-1460E-07	-2976E-08	2766E-02
43	16.7	.0	-51.8	2169E+01	7103E-04	1862E-07	2832E-02	-2230E-01	-9023E-02	-1202E-02	-8185E-09	-7822E-09	-4174E-02
44	16.7	.0	-77.4	3342E+01	7047E-04	9106E-08	2780E-02	-5040E-02	-8966E-02	-8095E-02	-9393E-08	-6075E-09	-4720E-02
45	16.7	.0	-103.0	4654E+01	7595E-04	1154E-07	2698E-02	-1038E-01	-2785E-01	-1588E-01	-2910E-09	-2310E-08	-5254E-02
46	16.7	.0	-128.6	6591E+01	8656E-04	8440E-07	2582E-02	-2622E-01	-4910E-01	-2445E-01	-1906E-07	-4240E-08	-5809E-02
47	16.7	.0	-154.3	8103E+01	8945E-04	1630E-07	2425E-02	-4503E-01	-7816E-01	-3421E-01	-6124E-09	-8980E-08	-6052E-02
48	16.7	.0	-179.9	1066E+02	1112E-03	1747E-07	2208E-02	-7155E-01	-1082E+00	-4241E-01	-1640E-08	-9860E-08	-4652E-02
49	16.7	.0	-205.5	1279E+02	1146E-03	5254E-09	1925E-02	-9463E-01	-1353E+00	-4782E-01	-1085E-07	-4155E-07	-1205E-03
50	16.7	.0	-231.2	9915E+01	1052E-03	2462E-09	1652E-02	-6628E-01	-1011E+00	-4242E-01	-1807E-08	-1704E-09	-3253E-02
51	16.7	.0	-256.8	8069E+01	9131E-04	2045E-09	1449E-02	-5045E-01	-7921E-01	-3728E-01	-3994E-08	-1662E-08	-3711E-02
52	16.7	.0	-282.4	6743E+01	7824E-04	4763E-10	1290E-02	-4060E-01	-6373E-01	-3233E-01	-2785E-08	-1672E-08	-3271E-02
53	16.7	.0	-308.0	5737E+01	6715E-04	3659E-09	1155E-02	-3855E-01	-2217E-01	-2806E-01	-1947E-08	-3248E-09	-2730E-02
54	16.7	.0	-333.7	4942E+01	7794E-04	2973E-10	1050E-02	-3765E-01	-2217E-01	-2446E-01	-1781E-08	-1345E-09	-2264E-02
55	16.7	.0	-359.3	4294E+01	5026E-04	2412E-10	9564E-03	-2461E-01	-3599E-01	-2142E-01	-1640E-08	-1286E-08	-1888E-02
56	16.7	.0	-384.9	3754E+01	4382E-04	6404E-09	8763E-03	-2130E-01	-3011E-01	-1882E-01	-1836E-08	-2412E-08	-1591E-02
57	16.7	.0	-410.6	3296E+01	3836E-04	4862E-09	8071E-03	-1851E-01	-2523E-01	-1658E-01	-1125E-08	-1336E-08	-1351E-02
58	16.7	.0	-436.2	2904E+01	3371E-04	2187E-09	7469E-03	-1613E-01	-2113E-01	-1463E-01	-1061E-08	-1586E-08	-1156E-02
59	16.7	.0	-461.8	2564E+01	2972E-04	3476E-09	6946E-03	-1405E-01	-1766E-01	-1291E-01	-1072E-08	-1327E-08	-9950E-03
60	16.7	.0	-487.4	2261E+01	1865E-04	1386E-09	6245E-03	-1223E-01	-1470E-01	-1140E-01	-6546E-09	-1339E-08	-8609E-03
61	16.7	.0	-513.1	2006E+01	2369E-04	4283E-09	6089E-03	-1050E-01	-1221E-01	-1013E-01	-6180E-09	-2065E-09	-2065E-09
62	16.7	.0	-538.7	1776E+01	2068E-04	3591E-09	5740E-03	-9197E-02	-9984E-02	-8842E-02	-4225E-09	-1138E-09	-6519E-03
63	16.7	.0	-564.3	1573E+01	1841E-04	3012E-09	5433E-03	-7924E-02	-8108E-02	-7762E-02	-5878E-09	-1742E-09	-5696E-03
64	16.7	.0	-589.9	1393E+01	1642E-04	1233E-09	5165E-03	-6788E-02	-6491E-02	-6792E-02	-4155E-09	-1491E-09	-4986E-03
65	16.7	.0	-615.6	1232E+01	1467E-04	2273E-09	4930E-03	-5773E-02	-5097E-02	-5918E-02	-4185E-09	-9763E-09	-4370E-03
66	16.7	.0	-641.1	1090E+01	1313E-04	1695E-09	4742E-03	-4865E-02	-3896E-02	-5132E-02	-3458E-09	-4385E-09	-3834E-03
67	16.7	.0	-666.8	9627E+00	1178E-04	1289E-09	4544E-03	-4054E-02	-2862E-02	-4422E-02	-1920E-09	-3151E-11	-3366E-03
68	16.7	.0	-692.5	8495E+00	1058E-04	1008E-09	4385E-03	-3330E-02	-1418E-02	-7687E-03	-1834E-09	-7599E-09	-2957E-03
69	16.7	.0	-718.1	7487E+00	9520E-05	5401E-09	4247E-03	-2686E-02	-1214E-02	-3206E-02	-3612E-09	-1764E-09	-2579E-03
70	16.7	.0	-743.7	6589E+00	8582E-05	2072E-09	4125E-03	-2114E-02	-5666E-03	-2686E-02	-1101E-09	-3020E-09	-2281E-03
71	16.7	.0	-769.3	5790E+00	7752E-05	5363E-10	4019E-03	-1607E-02	-1707E-04	-2217E-02	-2569E-09	-1011E-08	-2003E-03
72	16.7	.0	-795.0	5080E+00	7014E-05	2992E-09	3925E-03	-1159E-02	-4463E-03	-1796E-02	-2432E-09	-1060E-08	-1758E-03
73	16.7	.0	-820.6	4449E+00	6359E-05	1977E-09	3842E-03	-7658E-03	-8339E-03	-1416			

102	33	3	0	-538.7	1.766E+01	-4098E-04	1719E-09	5755E-03	9271E-02	9873E-02	8653E-02	2927E-09	2262E-08	1285E-02
103	33	3	0	-364.3	1.565E+01	-3649E-04	3257E-09	5447E-03	7988E-02	8020E-02	7605E-02	3487E-09	1584E-08	1124E-02
104	33	3	0	-389.9	1.282E+01	-2410E-04	2441E-09	4404E-03	5820E-02	5040E-02	5800E-02	5084E-09	2612E-08	8844E-03
105	33	3	0	-615.6	1.085E+01	-2606E-04	3148E-09	4733E-03	4906E-02	5039E-02	4131E-09	2160E-08	7581E-03	3965E-03
106	33	3	0	-641.2	1.085E+01	-2606E-04	3148E-09	4733E-03	4906E-02	5039E-02	4131E-09	2160E-08	7581E-03	3965E-03
107	33	3	0	-666.8	9.590E+00	-2337E-04	3087E-10	4551E-03	4090E-02	2824E-02	4343E-02	4575E-09	9493E-04	6154E-03
108	33	3	0	-692.5	8.65E+00	-2100E-04	4151E-09	4392E-03	3362E-02	1943E-02	3715E-02	1466E-09	1020E-08	5815E-03
109	33	3	0	-718.1	7.462E+00	-1891E-04	3031E-09	4253E-03	2713E-02	1189E-02	3149E-02	2377E-09	5576E-08	5141E-03
110	33	3	0	-743.7	6.568E+00	-1705E-04	2587E-09	4130E-03	2138E-02	4461E-03	2637E-02	3213E-09	1073E-08	4517E-03
111	33	3	0	-769.3	5.77E+00	-1540E-04	1219E-09	4024E-03	1488E-02	3273E-06	2176E-02	3352E-09	1228E-08	3965E-03
112	33	3	0	-795.0	5.065E+00	-1394E-04	2134E-09	3929E-03	1178E-02	4600E-03	1760E-02	1783E-09	2265E-08	3483E-03
113	33	3	0	-820.6	4.437E+00	-1264E-04	1428E-09	3846E-03	7823E-03	8450E-03	1385E-02	2464E-09	5399E-08	3057E-03
114	33	3	0	-846.2	3.879E+00	-1147E-04	1806E-09	3772E-03	4363E-03	1164E-02	1049E-02	1505E-09	2381E-08	2681E-03
115	33	3	0	-871.9	3.385E+00	-1045E-04	1042E-09	3708E-03	1352E-03	1425E-02	7461E-03	1064E-09	8717E-09	2349E-03
116	33	3	0	-897.5	2.948E+00	-9529E-05	4382E-09	3650E-03	1252E-03	1636E-02	4745E-03	4499E-10	9568E-09	2057E-03
117	33	3	0	-923.1	2.562E+00	-8706E-05	7305E-10	3598E-03	3488E-03	1802E-02	2311E-03	7452E-10	4578E-09	1800E-03
118	33	3	0	-948.7	2.22E+00	-7969E-05	2050E-09	3552E-03	3392E-03	1930E-02	1324E-04	1865E-09	1137E-08	1274E-03
119	33	3	0	-974.4	1.923E+00	-7307E-05	1324E-09	3510E-03	6998E-03	2024E-02	1815E-03	6486E-10	6924E-09	1374E-03
120	50	0	0	-1000.0	1.660E+00	-6713E-05	3654E-09	3472E-03	8336E-03	2090E-02	3552E-03	3658E-10	7589E-09	1199E-03
121	50	0	0	-26.1	1.938E-01	-3201E-03	1306E-08	2745E-02	5298E-01	5585E-01	2143E-02	2012E-07	1677E-08	7217E-02
122	50	0	0	-51.8	1.017E+01	-2393E-03	3402E-08	2773E-02	3676E-01	2571E-01	1298E-02	1137E-07	3005E-08	3633E-02
123	50	0	0	-77.4	2.043E+01	-2080E-03	2959E-08	2673E-02	1955E-01	9151E-02	3753E-02	1986E-08	2929E-08	9206E-02
124	50	0	0	-103.0	4.303E+01	-2165E-03	7640E-10	2638E-02	1250E-01	3678E-02	1295E-02	3678E-08	1187E-07	1187E-07
125	50	0	0	-128.6	5.615E+01	-2398E-03	3166E-08	2523E-02	1189E-01	2400E-01	12765E-01	9968E-08	1187E-07	1187E-07
126	50	0	0	-154.3	7.113E+01	-2702E-03	8009E-08	2368E-02	4465E-01	6264E-01	1777E-01	7785E-08	1488E-08	1481E-01
127	50	0	0	-179.9	8.851E+01	-3018E-03	1341E-07	2161E-02	6746E-01	8582E-01	2670E-01	8513E-06	6088E-08	1292E-02
128	50	0	0	-205.5	1.006E+02	-3122E-03	1442E-07	1916E-02	8767E-01	1017E+00	2827E-01	1700E-07	6628E-08	1263E-02
129	50	0	0	-231.2	8.522E+01	-2859E-03	2821E-07	1899E-02	6345E-01	8389E-01	2843E-01	2508E-08	6489E-08	7823E-02
130	50	0	0	-256.8	7.74E+01	-2518E-03	2020E-07	1468E-02	5084E-01	6997E-01	1515E-01	2897E-08	1105E-08	8701E-02
131	50	0	0	-282.4	6.255E+01	-2193E-03	2437E-07	1308E-02	4165E-01	5777E-01	2551E-01	2877E-08	1000E-08	8038E-02
132	50	0	0	-308.0	5.418E+01	-1906E-03	3601E-10	1175E-02	3481E-01	4830E-01	2329E-01	2659E-08	1822E-08	7019E-02
133	50	0	0	-333.7	4.723E+01	-1660E-03	1782E-09	1063E-02	2954E-01	4055E-01	2103E-01	1748E-08	7495E-09	6022E-02
134	50	0	0	-359.3	4.137E+01	-1450E-03	6892E-11	9677E-03	2533E-01	3413E-01	1889E-01	1873E-08	1656E-09	5150E-02
135	50	0	0	-384.9	3.638E+01	-1271E-03	1957E-09	8859E-03	2188E-01	2874E-01	1691E-01	3254E-09	1433E-08	4414E-02
136	50	0	0	-410.6	3.209E+01	-1117E-03	5408E-09	8153E-03	1899E-01	2423E-01	7347E-01	1028E-08	2680E-09	3797E-02
137	50	0	0	-436.2	2.837E+01	-9849E-04	7466E-10	7540E-03	1652E-01	2036E-01	1347E-01	7459E-09	1451E-09	1645E-02
138	50	0	0	-461.8	2.511E+01	-8704E-04	2464E-10	7007E-03	1438E-01	1706E-01	1199E-01	6968E-09	8897E-09	2846E-02
139	50	0	0	-487.4	2.225E+01	-7710E-04	1672E-09	6542E-03	1250E-01	1423E-01	1065E-01	5541E-09	1186E-08	2477E-02
140	50	0	0	-513.1	1.973E+01	-6845E-04	1671E-09	6135E-03	1085E-01	1179E-01	9441E-02	3788E-09	4188E-09	2161E-02
141	50	0	0	-538.7	1.750E+01	-6088E-04	1312E-09	5780E-03	9391E-02	9692E-02	8343E-02	3960E-09	6851E-09	1891E-02
142	50	0	0	-564.3	1.564E+01	-5425E-04	1042E-09	5466E-03	8467E-02	4473E-02	4493E-02	4493E-09	1594E-08	1657E-02
143	50	0	0	-589.9	1.371E+01	-4844E-04	2961E-09	5196E-03	6932E-02	6303E-02	6445E-02	4832E-09	4832E-09	1454E-02
144	50	0	0	-615.6	1.218E+01	-4332E-04	3807E-09	4957E-03	5897E-02	4945E-02	5626E-02	5282E-09	1418E-08	1277E-02
145	50	0	0	-641.2	1.078E+01	-3881E-04	3490E-10	4748E-03	3772E-02	4885E-02	2616E-02	1150E-08	1122E-02	1122E-02
146	50	0	0	-666.8	9.529E+00	-3483E-04	4157E-09	4564E-03	4148E-02	2762E-02	4213E-02	4688E-09	1240E-08	9866E-03
147	50	0	0	-692.5	8.414E+00	-3131E-04	1964E-09	4403E-03	3413E-02	1892E-02	3605E-02	3415E-09	2813E-09	8675E-03
148	50	0	0	-718.1	7.202E+00	-2819E-04	1049E-09	4762E-03	2759E-02	1148E-02	3054E-02	7662E-09	4574E-09	7627E-03
149	50	0	0	-743.7	6.533E+00	-2543E-04	5846E-10	4139E-03	3178E-02	5121E-03	2556E-02	3452E-09	4711E-09	6781E-03
150	50	0	0	-769.3	5.744E+00	-2298E-04	3719E-09	4030E-03	1663E-02	2750E-04	2106E-02	1203E-09	8236E-09	5891E-03
151	50	0	0	-795.0	5.041E+00	-2081E-04	1641E-09	3935E-03	1209E-02	4827E-03	1700E-02	2166E-09	1532E-08	5174E-03
152	50	0	0	-820.6	4.417E+00	-1887E-04	3896E-09	3851E-03	8097E-03	8636E-03	1335E-02	5519E-10	3636E-09	4542E-03
153	50	0	0	-846.2	3.863E+00	-1715E-04	1816E-09	3777E-03	4604E-03	1179E-02	1005E-02	2766E-09	5847E-09	3984E-03
154	50	0	0	-871.9	3.371E+00	-1562E-04	8357E-10	3711E-03	1565E-03	1438E-02	7086E-03	2523E-09	5560E-09	3493E-03
155	50	0	0	-897.5	2.936E+00	-1424E-04	1897E-09	3653E-03	1364E-03	1646E-02	4423E-03	7029E-09	8743E-09	3059E-03
156	50	0	0	-923.1	2.533E+00	-1302E-04	1192E-09	3554E-03	3226E-02	1810E-02	2035E-02	6556E-09	2677E-03	2677E-03
157	50	0	0	-948.7	2.214E+00	-1192E-04	2473E-10	3554E-03	3246E-03	1937E-02	1043E-04	6715E-10	6556E-09	2677E-03
158	50	0	0	-974.4	1.916E+00	-1093E-04	2764E-09	3512E-03	6869E-03	2030E-02	2017E-03	1595E-09	1297E-08	2045E-03
159	50	0	0	-1000.0	1.654E+00	-1004E-04	2332E-09	3473E-03	8223E-03	2094E-02	3725E-03	2304E-09	6168E-09	1784E-03
160	75	0	0	-26.1	1.800E-01	-4112E-03	2366E-08	2670E-02	4297E-01	5377E-01	2164E-02	2226E-08	6301E-08	2900E-02
161	75	0	0	-51.8	1.938E+01	-3344E-03	2432E-08	2694E-02	2931E-01	2483E-01	1405E-02	8906E-08	1084E-08	5297E-02
162	75	0	0	-77.4	2.043E+01	-2917E-03	2778E-08	2684E-02	1552E-02	9922E-02	7347E-02	1895E-08	6465E-08	1118E-01
163	75	0	0	-103.0	4.303E+01	-3043E-03	7174E-07	2565E-02	1313E-01	1947E-01	8629E-02	2270E-08	3507E-08	1690E-01
164	75	0	0	-128.6	5.615E+01	-3296E-03	1401E-09	2452E-02	2786E-01	3465E-01	1099E-01	7334E-08	1157E-08	1790E-01
165	75	0	0	-154.3	6.067E+01	-3615E-03	1896E-07	2301E-02	4341E-01	4996E-01	1234E-01	5248E-07	8476E-09	1719E-01
166	75	0	0	-179.9	7.059E+01	-3904E-03	4647E-08	2108E-02	5888E-01	6373E-01	1195E-01	1293E-07	3045E-08	1267E-01
167	75	0	0	-205.5	7.948E+01	-3962E-03	5065E-08	1901E-02	6628E-01	7012E-01	1146E-01	5975E-07	1332E-07	2505E-02
168	75	0	0	-231.2	7.406E+01	-3748E-03	1948E-08	1648E-02	1915E-02	1324E-01	1555E-01	1299E-08	5225E-08	5225E-08
169	75	0	0	-256.8	6.406E+01	-3393E-03	1428E-08	1488E-02	5035E-01	6881E-01	1263E-01	2903E-08	8915E-08	8915E-08
170	75	0	0	-282.4	5.688E+01	-3020E-03	1063E-09	1327E-02	4223E-01	5087E-01	1831E-01	6717E-09	1955E-08	9151E-02
171	75	0	0	-308.0	5.031E+01	-2666E-03	3786E-09	1193E-02	3566E-01	4362E-01	1794E-01	7838E-09	7940E-09	8569E-02
172	75	0	0	-333.7	4.448E+01	-2349E-03	2741E-09	1079E-02	3039E-01	3726E-01	1702E-01	7344E-09	6211E-09	7703E-02
173	75	0	0	-359.3	3.936E+01	-2070E-03	7989E							

218	100	0	0	-436.2	2641E+01	1818E-03	1884E-09	7748E-03	1753E-01	1800E-01	1013E-01	5174E-09	8585E-03	5221E-02
219	100	0	0	-461.8	2349E+01	1619E-03	1931E-09	7190E-03	1526E-01	1522E-01	9270E-02	3635E-09	3365E-09	4901E-02
220	100	0	0	-487.4	2096E+01	1443E-03	3793E-10	6704E-03	1278E-01	1278E-01	8418E-02	5343E-09	1160E-08	4344E-02
221	100	0	0	-513.1	1869E+01	1288E-03	1516E-09	6278E-03	1151E-01	1064E-01	7591E-02	4771E-09	1160E-08	3846E-02
222	100	0	0	-538.7	1665E+01	1151E-03	6659E-10	5905E-03	9963E-02	8767E-02	6801E-02	9780E-09	1410E-08	3404E-02
223	100	0	0	-564.3	1482E+01	1030E-03	1639E-09	5579E-03	8590E-02	7130E-02	6055E-02	4685E-09	8041E-09	3012E-02
224	100	0	0	-589.9	1318E+01	9224E-04	3826E-09	5042E-03	7368E-02	5702E-02	5356E-02	6372E-10	1152E-08	2663E-02
225	100	0	0	-615.6	1171E+01	8275E-04	3125E-09	3042E-03	6280E-02	4457E-02	4705E-02	3825E-09	2784E-09	2384E-02
226	100	0	0	-641.2	1039E+01	7433E-04	1162E-09	4822E-03	5310E-02	3376E-02	4102E-02	1319E-09	2612E-09	2080E-02
227	100	0	0	-666.8	9212E+00	6687E-04	1539E-09	4629E-03	4445E-02	2438E-02	3546E-02	2395E-09	9248E-04	1837E-02
228	100	0	0	-692.5	8152E+00	6025E-04	2530E-09	4460E-03	3675E-02	1629E-02	3035E-02	3471E-09	9606E-09	1621E-02
229	100	0	0	-718.1	7202E+00	5437E-04	4557E-09	4312E-03	2990E-02	9320E-03	2567E-02	2092E-09	8000E-09	1430E-02
230	100	0	0	-743.7	6353E+00	4915E-04	1382E-09	4182E-03	2382E-02	3357E-03	2139E-02	3308E-09	1894E-09	1400E-02
231	100	0	0	-769.3	5594E+00	4450E-04	3455E-09	4067E-03	1844E-03	1719E-03	1748E-02	2803E-09	7652E-09	1110E-02
232	100	0	0	-795.0	4916E+00	4036E-04	6698E-10	3967E-03	1369E-02	6008E-03	1393E-02	1671E-09	4549E-09	9767E-03
233	100	0	0	-820.6	4313E+00	3667E-04	2026E-09	3878E-03	9510E-03	9602E-03	1071E-02	1982E-09	8960E-10	8588E-03
234	100	0	0	-846.2	3776E+00	3337E-04	3241E-09	3800E-03	5854E-03	1258E-02	7782E-03	2133E-09	5333E-09	7544E-03
235	100	0	0	-871.9	3299E+00	3043E-04	5745E-10	3731E-03	2670E-03	1502E-02	5138E-03	2219E-09	4357E-10	6622E-03
236	100	0	0	-897.5	2877E+00	2780E-04	4067E-09	3670E-03	8755E-03	1698E-02	2750E-03	1829E-09	7898E-09	2806E-03
237	100	0	0	-923.1	2503E+00	2544E-04	1716E-09	3615E-03	2460E-03	1854E-02	5988E-04	2474E-09	4768E-09	5086E-03
238	100	0	0	-948.7	2172E+00	2333E-04	8623E-10	3566E-03	4484E-03	1971E-02	1337E-03	6244E-10	3104E-09	4451E-03
239	100	0	0	-974.4	1882E+00	2143E-04	2755E-09	3521E-03	6197E-03	2057E-02	3074E-03	1529E-09	7529E-09	3890E-03
240	100	0	0	-1000.0	1626E+00	1971E-04	2950E-09	3481E-03	7630E-03	2116E-02	4630E-03	1843E-09	9521E-09	3396E-03
241	150	0	0	-	1277E-01	5775E-03	1464E-09	2393E-02	2395E-01	4937E-01	2232E-02	7240E-09	3947E-09	6246E-02
242	150	0	0	-35.0	8911E+00	4953E-03	3116E-09	2404E-02	9552E-02	2018E-01	6898E-03	4206E-08	1044E-08	1029E-01
243	150	0	0	-69.4	1755E+01	4602E-03	1263E-09	2368E-02	3487E-02	4661E-01	3372E-02	4984E-09	1491E-01	1491E-01
244	150	0	0	-103.9	2578E+01	4575E-03	2550E-07	2250E-02	1600E-02	1139E-02	1139E-02	8006E-08	2063E-08	1685E-01
245	150	0	0	-138.4	3309E+01	4717E-03	9980E-08	2154E-02	2862E-02	1642E-01	2507E-02	1454E-07	7712E-08	1580E-01
246	150	0	0	-172.8	3868E+01	4881E-03	3427E-08	1981E-02	3875E-01	2496E-01	3655E-02	5908E-07	4820E-09	1159E-01
247	150	0	0	-207.3	4166E+01	4881E-03	4906E-09	1788E-02	4347E-01	3003E-01	3061E-02	1093E-08	8046E-09	5458E-02
248	150	0	0	-241.8	4179E+01	4685E-03	3144E-09	1584E-02	4343E-01	3148E-01	1282E-02	1241E-08	7183E-09	6982E-03
249	150	0	0	-276.2	3975E+01	4332E-03	3130E-09	1393E-02	3964E-01	3012E-01	1329E-02	4351E-09	4827E-02	4827E-02
250	150	0	0	-310.7	3650E+01	3900E-03	1641E-09	1225E-02	3448E-01	2725E-01	4273E-02	4973E-09	2499E-08	6854E-02
251	150	0	0	-345.2	3880E+01	3452E-03	5258E-09	1081E-02	2933E-01	2373E-01	5077E-02	2540E-08	3493E-09	7469E-02
252	150	0	0	-379.6	2908E+01	3024E-03	1233E-09	9596E-03	2471E-01	2015E-01	5831E-02	1812E-09	1166E-09	7307E-02
253	150	0	0	-414.1	2557E+01	2635E-03	1185E-09	8578E-03	2073E-01	1677E-01	6039E-02	1747E-09	1553E-08	6773E-02
254	150	0	0	-448.6	2234E+01	2288E-03	4656E-09	7723E-03	1734E-01	1372E-01	5883E-02	1324E-09	1288E-09	6094E-02
255	150	0	0	-483.0	1944E+01	1984E-03	2681E-09	7007E-03	1476E-01	1013E-01	1704E-02	1361E-09	7601E-09	5385E-02
256	150	0	0	-511.7	1685E+01	1720E-03	1263E-09	6451E-03	1201E-01	8608E-02	4989E-02	8008E-09	4705E-02	4705E-02
257	150	0	0	-551.9	1455E+01	1492E-03	2050E-09	5899E-03	9921E-02	6679E-02	4434E-02	1404E-09	1508E-08	4079E-02
258	150	0	0	-586.4	1253E+01	1296E-03	2084E-09	5474E-03	8127E-02	4967E-02	3951E-02	2467E-09	5054E-09	3516E-02
259	150	0	0	-620.9	1076E+01	1127E-03	1845E-09	5116E-03	6588E-02	3520E-02	3279E-02	2443E-09	8973E-10	3017E-02
260	150	0	0	-655.3	9203E+00	9818E-04	4086E-09	4816E-03	5268E-02	2307E-02	2734E-02	1361E-10	2847E-09	2580E-02
261	150	0	0	-689.8	7848E+00	8572E-04	1462E-09	4363E-03	4136E-02	1298E-02	2224E-02	6872E-09	1136E-08	2156E-02
262	150	0	0	-724.3	6872E+00	7507E-04	1263E-09	3818E-03	3261E-02	4661E-01	1755E-02	7295E-09	1870E-08	4870E-02
263	150	0	0	-758.7	5648E+00	6582E-04	4484E-09	4172E-03	2342E-02	2118E-03	1329E-02	9300E-10	7672E-09	1587E-02
264	150	0	0	-793.2	4766E+00	5792E-04	3860E-09	4022E-03	1642E-02	7571E-03	9444E-03	8376E-10	4132E-09	1341E-02
265	150	0	0	-827.7	4006E+00	5112E-04	2043E-09	3895E-03	1052E-02	1188E-02	6006E-03	2057E-09	3935E-09	1132E-02
266	150	0	0	-862.1	3354E+00	4526E-04	1166E-09	3788E-03	5591E-03	1522E-02	2948E-03	1882E-09	9174E-09	9529E-03
267	150	0	0	-896.6	2797E+00	4019E-04	1501E-09	3696E-03	1503E-03	1773E-02	2457E-04	2700E-09	1122E-08	8007E-03
268	150	0	0	-931.1	2323E+00	3199E-04	1964E-09	3618E-03	1189E-02	2364E-02	310E-03	6713E-09	6713E-09	6713E-09
269	150	0	0	-965.5	1925E+00	3199E-04	1964E-09	3618E-03	4575E-03	2077E-02	4212E-03	2578E-09	5212E-09	966E-03
270	150	0	0	-1000.0	1581E+00	2867E-04	1931E-09	3491E-03	6713E-03	2150E-02	6024E-03	1097E-09	9120E-09	4685E-03
271	200	0	0	-	9617E-02	6170E-03	1619E-09	2193E-02	6758E-02	4281E-01	8874E-03	3261E-07	1378E-08	4710E-02
272	200	0	0	-35.0	6688E+00	5424E-03	1584E-07	2201E-02	2862E-02	2038E-01	1337E-02	2003E-07	5090E-09	9434E-02
273	200	0	0	-69.4	1306E+01	5023E-03	1448E-07	2170E-02	6428E-02	1023E-01	2409E-02	2110E-08	2746E-09	1273E-01
274	200	0	0	-103.9	1893E+01	4874E-03	2697E-08	2120E-02	1600E-02	1726E-01	1014E-02	1181E-08	1334E-09	1415E-01
275	200	0	0	-138.4	2397E+01	4867E-03	1897E-08	1897E-02	6446E-02	5574E-02	5574E-02	8866E-08	8866E-08	8866E-08
276	200	0	0	-172.8	2782E+01	4890E-03	1979E-07	1857E-02	3164E-01	1259E-01	6528E-02	9473E-08	1103E-08	1020E-01
277	200	0	0	-207.3	3017E+01	4878E-03	2921E-07	1765E-02	3542E-01	1672E-01	6479E-02	7708E-09	1163E-09	5782E-02
278	200	0	0	-241.8	3096E+01	4710E-03	5757E-10	1541E-02	3639E-02	1885E-01	5520E-02	1363E-09	8556E-09	1608E-02
279	200	0	0	-276.2	3041E+01	4441E-03	9891E-10	1381E-02	3486E-01	1926E-01	3834E-02	5291E-09	3767E-09	1891E-02
280	200	0	0	-310.7	2889E+01	4099E-03	3558E-09	1232E-02	3184E-01	1841E-01	1969E-02	1399E-09	1264E-08	4289E-02
281	200	0	0	-345.2	2679E+01	3718E-03	1900E-09	9637E-03	1678E-02	1678E-02	310E-03	1181E-08	1334E-09	1415E-01
282	200	0	0	-379.6	2438E+01	3332E-03	3676E-09	9833E-03	2450E-01	1479E-01	9066E-03	5817E-09	8549E-10	6172E-02
283	200	0	0	-414.1	2192E+01	2960E-03	4007E-09	8830E-03	2103E-01	1266E-01	1730E-02	1961E-09	3686E-09	6195E-02
284	200	0	0	-448.6	1952E+01	2613E-03	3537E-09	7971E-03	1789E-01	1057E-01	2199E-02	1597E-09	1990E-09	5907E-02
285	200	0	0	-483.0	1724E+01	2298E-03	1283E-09	7238E-03	1512E-01	6818E-02	2396E-02	6194E-09	6329E-09	5452E-02
286	200	0	0	-517.5	1514E+01	2017E-03	1774E-09	6615E-03	1269E-01	6842E-02	2398E-02	1315E-08	2051E-09	4924E-02
287	200	0	0	-551.9	1322E+01	1768E-03	2190E-09	6086E-03	1058E-01	5261E-02	2267E-02	3380E-09	4359E-09	4379E-02
288	200	0	0	-586.4	1149E+01	1549E-03	1421E-09	5637E-03	8738E-02	1875E-02	3052E-02	3669E-09	3815E-09	3815E-09
289	200	0	0	-620.9	9942E+00	1358E-03	5781E-10							

334	300.0	0	-103.9	1054E+01	4495E-03	2799E-08	1786E-02	1603E-01	8677E-02	4759E-02	1448E-07	1965E-09	8849E-02
335	300.0	0	-138.4	1334E+01	4341E-03	5025E-08	1718E-02	2002E-01	4144E-02	5937E-02	4788E-08	1448E-08	8593E-02
336	300.0	0	-172.8	1559E+01	4246E-03	6530E-08	1632E-02	2331E-01	3633E-03	6953E-02	1700E-07	8222E-09	7292E-02
337	300.0	0	-207.3	1720E+01	4169E-03	4428E-08	1532E-02	2578E-01	2673E-02	7598E-02	1075E-08	1501E-09	1075E-02
338	300.0	0	-241.8	1816E+01	4068E-03	2117E-09	1424E-02	2878E-01	4684E-02	8626E-02	8626E-10	9738E-08	3270E-02
339	300.0	0	-276.2	1851E+01	3883E-03	2117E-09	1313E-02	2673E-01	5996E-02	7196E-02	1818E-08	9129E-10	1069E-02
340	300.0	0	-310.7	1833E+01	3678E-03	7244E-09	1203E-02	2577E-01	6630E-02	6487E-02	3575E-08	9576E-09	7940E-02
341	300.0	0	-345.2	1772E+01	3441E-03	4590E-09	1098E-02	2415E-01	6720E-02	5605E-02	7122E-10	9353E-09	2218E-02
342	300.0	0	-379.6	1681E+01	3183E-03	3337E-09	1000E-02	2213E-01	6406E-02	4681E-02	7374E-09	1737E-09	3193E-02
343	300.0	0	-414.1	1568E+01	2916E-03	3619E-09	9110E-03	1990E-01	5815E-02	3807E-02	1506E-09	5476E-09	3770E-02
344	300.0	0	-448.6	1444E+01	2650E-03	9251E-11	830E-03	1763E-01	5057E-02	3040E-02	4527E-09	8069E-09	4027E-02
345	300.0	0	-483.0	1314E+01	2395E-03	2574E-09	7592E-03	1541E-01	4214E-02	2403E-02	4653E-09	3004E-10	4046E-02
346	300.0	0	-517.5	1184E+01	2154E-03	2559E-09	6963E-03	1332E-01	3348E-02	1896E-02	1828E-09	6197E-09	3902E-02
347	300.0	0	-551.9	1058E+01	1932E-03	3887E-09	6413E-03	1139E-01	2504E-02	1510E-02	5452E-09	5605E-09	3654E-02
348	300.0	0	-586.4	9386E+00	1730E-03	3880E-11	5935E-03	9630E-02	1710E-02	1228E-02	7390E-11	4693E-09	3348E-02
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350	300.0	0	-655.3	7233E+00	1383E-03	1674E-09	5167E-03	6634E-02	3358E-03	9068E-03	4408E-09	1217E-08	2689E-02
351	300.0	0	-689.8	6291E+00	1237E-03	4317E-10	4863E-03	3388E-02	2314E-03	8352E-03	6395E-09	4410E-09	2361E-02
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353	300.0	0	-758.7	4678E+00	9843E-04	1682E-09	4381E-03	3345E-02	1125E-02	8065E-03	3046E-09	1105E-08	1785E-02
354	300.0	0	-793.2	4001E+00	8935E-04	5238E-10	4193E-03	2526E-02	1460E-02	8301E-03	2602E-09	9599E-09	1537E-02
355	300.0	0	-827.7	3404E+00	8046E-04	2903E-09	4032E-03	1825E-02	1726E-02	8694E-03	4049E-09	7400E-09	1317E-02
356	300.0	0	-862.1	2880E+00	7261E-04	1807E-09	3896E-03	1230E-02	1932E-02	9189E-03	1035E-09	9992E-09	1123E-02
357	300.0	0	-896.6	2425E+00	6568E-04	2272E-09	3779E-03	7296E-03	2084E-02	9743E-03	4118E-10	1980E-09	9542E-03
358	300.0	0	-931.1	2011E+00	5923E-04	1857E-09	3679E-03	1607E-01	1025E-01	3490E-02	1056E-07	6112E-09	6624E-02
359	300.0	0	-965.5	1603E+00	5408E-04	1044E-09	3433E-03	2899E-04	2250E-02	1091E-02	2934E-09	6348E-09	6810E-03
360	300.0	0	-1000.0	1403E+00	4923E-04	1491E-09	3518E-03	3068E-03	2277E-02	1147E-02	4690E-11	1174E-09	5722E-03
361	350.0	0	-5	4199E-02	5623E-03	2599E-08	1721E-02	6444E-02	3616E-01	1722E-02	3121E-08	4133E-08	3366E-02
362	350.0	0	-35.0	2916E+00	4760E-03	6939E-09	1718E-02	1210E-01	1920E-01	1984E-02	7232E-08	1892E-09	3245E-02
363	350.0	0	-69.4	5675E+00	4290E-03	6711E-09	1698E-02	1378E-01	1431E-01	2332E-02	4366E-09	4293E-09	3857E-02
364	350.0	0	-103.9	8210E+00	4020E-03	1690E-09	1662E-02	1607E-01	1025E-01	3490E-02	1056E-07	6112E-09	6624E-02
365	350.0	0	-138.4	1476E+01	3080E-03	4708E-09	1179E-02	1798E-01	1414E-02	1843E-02	9276E-09	1541E-09	2918E-02
366	350.0	0	-172.8	1224E+01	2879E-03	1863E-08	1541E-02	2089E-01	3556E-02	6089E-02	1295E-07	4129E-09	5567E-02
367	350.0	0	-207.3	1362E+01	2666E-03	3256E-09	1456E-02	2256E-01	8299E-03	6600E-02	9742E-09	1487E-08	4439E-02
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369	350.0	0	-276.2	1499E+01	2422E-03	7384E-09	1274E-02	2380E-01	2295E-02	7275E-02	5410E-09	8357E-10	1289E-02
370	350.0	0	-310.7	1505E+01	2263E-03	4748E-09	1179E-02	2330E-01	3145E-02	7040E-02	9166E-09	3664E-09	1040E-02
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373	350.0	0	-414.1	1344E+01	2668E-03	1372E-09	9145E-03	1900E-01	3441E-02	5230E-02	3038E-09	3613E-09	2646E-02
374	350.0	0	-448.6	1254E+01	2455E-03	2024E-09	8382E-03	1712E-01	3061E-02	4542E-02	1260E-09	9749E-09	2962E-02
375	350.0	0	-483.0	1156E+01	2246E-03	3472E-09	7690E-03	1520E-01	2563E-02	3802E-02	4390E-09	5293E-09	3080E-02
376	350.0	0	-517.5	1054E+00	2046E-03	3078E-09	7071E-03	1333E-01	2000E-02	3333E-02	9276E-09	4017E-09	3050E-02
377	350.0	0	-551.9	9511E+00	1857E-03	1244E-09	6232E-03	1153E-01	1414E-02	1843E-02	9276E-09	1541E-09	2918E-02
378	350.0	0	-586.4	8515E+00	1682E-03	4142E-09	6039E-03	8862E-02	8368E-03	2440E-02	3107E-09	1451E-09	2720E-02
379	350.0	0	-620.9	7562E+00	1522E-03	4701E-09	5617E-03	8325E-02	2894E-03	2113E-02	2917E-09	2329E-10	2487E-02
380	350.0	0	-655.3	6666E+00	1377E-03	3455E-09	5251E-03	6934E-02	2133E-03	1854E-02	1008E-09	2621E-09	2238E-02
381	350.0	0	-689.8	5836E+00	1246E-03	1826E-09	4935E-03	5687E-02	6625E-03	1657E-02	4166E-09	4446E-09	1990E-02
382	350.0	0	-724.3	5077E+00	1128E-03	1830E-09	4684E-03	4583E-02	1054E-02	1510E-02	2626E-09	107E-08	1751E-02
383	350.0	0	-758.7	4388E+00	1023E-03	1340E-09	4431E-03	3613E-01	8477E-02	1287E-02	4703E-09	2176E-09	1528E-02
384	350.0	0	-793.2	3717E+00	9284E-04	2826E-09	4052E-03	2770E-02	1661E-02	1336E-02	2176E-09	6537E-09	1328E-02
385	350.0	0	-827.7	3221E+00	8442E-04	3875E-09	4062E-03	2044E-02	1880E-02	1293E-02	2065E-09	9367E-09	1143E-02
386	350.0	0	-862.1	2736E+00	7690E-04	3616E-09	3917E-03	1424E-02	2048E-02	1272E-02	2160E-11	5757E-09	9801E-03
387	350.0	0	-896.6	2311E+00	7017E-04	3975E-09	3793E-03	9006E-03	2171E-02	1266E-02	1039E-09	4655E-09	8367E-03
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392	400.0	0	-35.0	2376E+00	3985E-03	6367E-08	1608E-02	1586E-01	1776E-01	1271E-02	6665E-08	9465E-09	2013E-02
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406	400.0	0	-517.5	8709E+00	1710E-03	1693E-09	6585E-03	1157E-01	6158E-03	3770E-02	3412E-09	1876E-09	2081E-02
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453	52.6	0	-200.0	.9838E+01	.3255E-03	.1022E-09	.1976E-02	.8159E-01	.9859E-01	.2412E-01	.1746E-07	.1222E-08	.3890E-02
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