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FOIL ACTIVATION PROGRAMS, B512/RP

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ABSTRACT

Programs have been written in Fortran for the IBM-704, which calculate cutoff-energy values and various activation integrals for foils in slab geometry. Both the absorbing foil and the covers are of arbitrary thicknesses, and have absorption cross sections consisting of a $1/v$ part and/or Breit-Wigner resonances. The angular dependence of the neutron flux is either isotropic or beam, whereas the energy dependence is either Maxwellian with several epithermal options or of a flux input for a suitable number of energy values.

I. INTRODUCTION

The original versions of the programs described in this report were written by W. L. Boettinger during the summer of 1962. In their original form they were roughly equivalent to those described in Ref. 1. When the programs were later modified in order to conform to the IBM-704 monitor system, it was decided to add several features. These included generalization of the foil and cover cross sections to a form consisting of a $1/v$ part and/or Breit-Wigner resonances, calculation of various activation integrals, addition of several epithermal flux options besides a $1/E$ form, a rough treatment of "outer flux depression" in the isotropic flux case, and optional output of various functions.

In the following sections the theoretical treatment is developed, first for the isotropic-flux case and then for the beam-flux case. The calculations in the Fortran programs are then described along with the input and output features. Input and output sheets for sample problems are given in the appendices.

II. DEVELOPMENT OF THEORY

A. Isotropic-flux Case

1. Flux Relations without Outer Flux Depression

We consider a plane absorbing foil of thickness t and cross section Σ_1 between plane covers of thickness ℓ_0 and cross section Σ_2 . The

origin of the z-axis is at the center of the absorbing foil as shown in Fig. 1. Both the foil and cover are infinite in the x and y directions, and have scattering cross sections which can be ignored.

Fig. 1

Slab Foil between Covers
for Flux Calculations with-
out Outer Flux Depression

The monoenergetic transport equation in slab geometry is

$$\mu \frac{\partial \phi}{\partial z} + \Sigma \phi = 0, \quad (1)$$

where μ is the cosine of the angle between the neutron trajectory and the z-axis, $\phi(\mu, z)$ is the angular flux, and Σ is the absorption (total) cross section of the foil or cover as the case may be. The desired solution of Eq. (1) is

$$4\pi\phi(\mu, z) = \begin{cases} \phi_0 e^{\frac{\Sigma_1 t + 2\Sigma_2 \ell_0}{2\mu}} e^{-(\Sigma z)/\mu} & \text{for } \mu < 0 \\ \phi_0 e^{\frac{-(\Sigma_1 t + 2\Sigma_2 \ell_0)}{2\mu}} e^{-(\Sigma z)/\mu} & \text{for } \mu > 0, \end{cases} \quad (2)$$

where

$$\Sigma z = \begin{cases} \frac{-\Sigma_1 t}{2} + \Sigma_2 \left(z + \frac{t}{2} \right) & \text{for } \frac{-t}{2} - \ell_0 \leq z \leq \frac{-t}{2} \\ \Sigma_1 z & \text{for } \frac{-t}{2} \leq z \leq \frac{t}{2} \\ \frac{\Sigma_1 t}{2} + \Sigma_2 \left(z - \frac{t}{2} \right) & \text{for } \frac{t}{2} \leq z \leq \frac{t}{2} + \ell_0. \end{cases} \quad (3)$$

This solution represents an isotropic flux incident on the covers but a peaked flux out of the covers as a result of the absorption.

From Eqs. (2) and (3) it is easily shown that the flux on the surface of the foil is

$$\begin{aligned}\frac{\phi_s^*}{\phi_0} &= 2\pi \int_{-1}^1 \frac{\phi}{\phi_0}(\mu, t/2) d\mu = 2\pi \int_{-1}^1 \frac{\phi}{\phi_0}(\mu, -t/2) d\mu \\ &= \frac{1}{2} [E_2(\tau_2) + E_2(\tau_1 + \tau_2)],\end{aligned}\quad (4)$$

the flux on the outer surface of the covers is

$$\begin{aligned}\frac{\phi_{sc}^*}{\phi_0} &= 2\pi \int_{-1}^1 \frac{\phi}{\phi_0}(\mu, t/2 + \ell_0) d\mu = 2\pi \int_{-1}^1 \frac{\phi}{\phi_0}(\mu, -t/2 - \ell_0) d\mu \\ &= \frac{1}{2} [1 + E_2(\tau_1 + 2\tau_2)],\end{aligned}\quad (5)$$

and the average flux in the foil is

$$\begin{aligned}\frac{\bar{\phi}A^*}{\phi_0} &= \frac{1}{t} \int_{-t/2}^{t/2} 2\pi \int_{-1}^1 \frac{\phi}{\phi_0}(\mu, z) d\mu dz \\ &= \frac{1}{\tau_1} [E_3(\tau_2) - E_3(\tau_1 + \tau_2)].\end{aligned}\quad (6)$$

In the above equations,

$$\tau_1 = \Sigma_1 t; \quad \tau_2 = \Sigma_2 \ell_0,$$

and the definition

$$E_n(x) = \int_0^1 \mu^{n-2} e^{-x/\mu} d\mu = \int_1^\infty e^{-x\mu} \mu^{-n} d\mu \quad (7)$$

has been used. Asterisks denote fluxes for the case when covers are present on the absorbing foil.

For the case of a bare foil, the surface flux is

$$\frac{\phi_s}{\phi_0} = \frac{1}{2} [1 + E_2(\tau_1)], \quad (8)$$

which is obtained by setting $\tau_2 = 0$ in either Eq. (4) or (5). Likewise, setting $\tau_2 = 0$ in Eq. (6) gives for the average flux in a bare foil

$$\frac{\bar{\phi}_A}{\phi_0} = \frac{1}{\tau_1} \left[\frac{1}{2} - E_3(\tau_1) \right]. \quad (9)$$

The quantity $\bar{\phi}_A/\phi_0$ in Eq. (9) is usually referred to as the self-shielding factor.

2. Flux Relations Including Outer Flux Depression

Consider an absorbing foil of thickness t and cross section Σ_1 between covers of thickness ℓ_0 and cross section Σ_2 as in the section above. However, the origin of the z -axis is now taken on the outer side of the right-hand cover, as shown in Fig. 2. The medium outside the "sandwich" is an isotropically scattering medium with total cross section $\Sigma = \Sigma_a + \Sigma_s$ and a uniform source.

Fig. 2

Slab Foil between Covers for Flux Calculations Including Outer Flux Depression

The flux in the medium outside the foils is

$$\begin{aligned} \phi_M^*(z) &= \int_{-\infty}^{-2\ell_0-t} [\Sigma_s \phi_M^*(z') + \Sigma_a \phi_0] \frac{1}{2} E_1 [\Sigma(z - z' - 2\ell_0 - t) + \tau_1 + 2\tau_2] dz' \\ &\quad + \int_0^{\infty} [\Sigma_s \phi_M^*(z') + \Sigma_a \phi_0] \frac{1}{2} E_1(\Sigma |z - z'|) dz' \\ &= \int_0^{\infty} [\Sigma_s \phi_M^*(-z'' - 2\ell_0 - t) + \Sigma_a \phi_0] \frac{1}{2} E_1[\Sigma(z + z'') + \tau_1 + 2\tau_2] dz'' \\ &\quad + \int_0^{\infty} [\Sigma_s \phi_M^*(z') + \Sigma_a \phi_0] \frac{1}{2} E_1(\Sigma |z - z'|) dz' \\ &= \int_0^{\infty} [\Sigma_s \phi_M^*(z') + \Sigma_a \phi_0] \frac{1}{2} \{ E_1[\tau_1 + 2\tau_2 + \Sigma(z + z')] + E_1(\Sigma |z - z'|) \} dz'. \end{aligned} \quad (10)$$

Equation (10) is derived from the integral transport equation with isotropic scattering. Use has been made of the facts that the slab-geometry single-collision kernel is $\frac{1}{2} E_1(\Sigma |z - z'|)$ and that the source density at large distances from the foils is $\Sigma_a \phi_0$. In Eq. (10) and those following an * is used to denote quantities for the case when covers are present on the absorbing foil. The * will be omitted in the case of a bare foil. Writing $\gamma = \Sigma_s/\Sigma$ and $Z = \Sigma z$ in Eq. (10) gives

$$\begin{aligned} \phi_M^*(Z) = & \frac{\gamma}{2} \int_0^\infty \phi_M^*(Z') [E_1(Z' + Z + \tau_1 + 2\tau_2) + E_1(|Z - Z'|)] dZ' \\ & + (1 - \gamma) \frac{\phi_0}{2} [2 - E_2(Z) + E_2(\tau_1 + 2\tau_2 + Z)]; \end{aligned} \quad (11)$$

the substitution $\phi_M^*(Z) = \phi_0[1 - f_M^*(Z)]$ yields

$$\begin{aligned} f_M^*(Z) = & \frac{\gamma}{2} \int_0^\infty dZ' f_M^*(Z') [E_1(|Z - Z'|) + E_1(Z + Z' + \tau_1 + 2\tau_2)] \\ & + \frac{1}{2} [E_2(Z) - E_2(Z + \tau_1 + 2\tau_2)]. \end{aligned} \quad (12)$$

Also, from Eq. (11) we get for the flux on the outer surface of the cover

$$\phi_M^*(0) = \frac{\phi_0}{2} [1 + E_2(\tau_1 + 2\tau_2)] - \frac{\gamma}{2} \phi_0 \int_0^\infty f_M^*(Z) [E_1(Z + \tau_1 + 2\tau_2) + E_1(Z)] dZ. \quad (13)$$

Apart from the integral involving $f_M^*(Z)$, Eq. (13) agrees with Eq. (5) or with Eq. (8) for $\tau_2 = 0$.

For the flux in the foil, we have

$$\begin{aligned} \phi_A^*(z) = & \int_{-\infty}^{-z\ell_0-t} [\Sigma_s \phi_M^*(z') + \Sigma_a \phi_0] \frac{1}{2} E_1[-\Sigma z' - \Sigma t - 2\Sigma \ell_0 + \Sigma_2 \ell_0 + \Sigma_1(\ell_0 + t + z)] dz' \\ & + \int_0^\infty [\Sigma_s \phi_M^*(z') + \Sigma_a \phi_0] \frac{1}{2} E_1[\Sigma z' + \Sigma_2 \ell_0 - \Sigma_1(z + \ell_0)] dz' \\ = & \int_0^\infty [\Sigma_s \phi_M^*(z') + \Sigma_a \phi_0] \frac{1}{2} \{E_1[\Sigma z' + \Sigma_2 \ell_0 + \Sigma_1(\ell_0 + t + z)] + E_1[\Sigma z' + \Sigma_2 \ell_0 - \Sigma_1(\ell_0 + z)]\} dz' \\ = & \frac{\gamma}{2} \int_0^\infty \phi_M^*(Z') [E_1(Z' + \alpha Z + \Sigma_1 \ell_0 + \Sigma_1 t + \Sigma_2 \ell_0) + E_1(Z' - \alpha Z - \Sigma_1 \ell_0 + \Sigma_2 \ell_0)] dZ' + \frac{(1 - \gamma)}{2} \phi_0 \\ & \cdot [E_2(\alpha Z + \Sigma_1 t + \Sigma_1 \ell_0 + \Sigma_2 \ell_0) + E_2(-\alpha Z - \Sigma_1 \ell_0 + \Sigma_2 \ell_0)], \end{aligned} \quad (14)$$

where the definition $\alpha = \Sigma_1/\Sigma$ has been used. The average flux in the foil is

$$\begin{aligned}\bar{\phi}_A^* &= \frac{1}{\Sigma t} \int_{-\Sigma(\ell_0+t)}^{-\Sigma\ell_0} \phi_A^*(Z) dZ \\ &= \frac{\phi_0}{\tau_1} [E_3(\tau_2) - E_3(\tau_1 + \tau_2)] \\ &\quad - \frac{\gamma\phi_0}{\tau_1} \int_0^\infty f_M^*(Z) [E_2(\tau_2 + Z) - E_2(\tau_1 + \tau_2 + Z)] dZ.\end{aligned}\quad (15)$$

If $f_M^*(Z)$ is ignored, Eq. (15) agrees with Eq. (6) or, in the case of a bare foil, with Eq. (9). The flux on the surface of the foil is

$$\begin{aligned}\phi_A^*(-\ell_0) &= \frac{\phi_0}{2} [E_2(\tau_2) + E_2(\tau_1 + \tau_2)] \\ &\quad - \frac{\gamma\phi_0}{2} \int_0^\infty f_M^*(Z) [E_1(Z + \tau_1 + \tau_2) + E_1(Z + \tau_2)] dZ,\end{aligned}\quad (16)$$

which is in agreement with Eq. (4) when $f_M^*(Z)$ is neglected in the integral.

In order to determine an approximation for $f_M^*(Z)$, we use the method applied for the case of a bare foil in Ref. 3. Equation (12) is of the form

$$f_0(Z) = \int_0^\infty f_0(Z') K(Z, Z') dZ' + S(Z), \quad (17)$$

where $K(Z, Z')$ is a symmetric kernel. It may be shown (Ref. 3) that the functional

$$F(f) = \int_0^\infty f(Z) dZ \left\{ 2S(Z) - f(Z) + \int_0^\infty f(Z') dZ' K(Z, Z') \right\} \quad (18)$$

is an extremum for $f(Z) \rightarrow f_0(Z)$ and that F has an upper bound given by

$$F(f_0) = \int_0^\infty f_0(Z) S(Z) dZ. \quad (19)$$

We assume a trial function of the form

$$f_M^{*(n)}(Z) = \sum_{i=1}^n A_i^* h_i(Z), \quad (20)$$

calculate $F(f_M^{*(n)})$, and find the extremum with respect to the A_i^* . This leads to equations which may be solved for the A_i^* . For the $h_i(Z)$ we take

$$h_i(Z) = e^{-a_i Z} \quad (21)$$

with the $a_i (i=1, n)$ being the values which occur in the P_{2n-1} spherical harmonics approximation. On substituting for $f_M^{*(n)}(Z)$ in the version of Eq. (18) obtained by comparison of Eq. (17) and Eq. (12), we get

$$F(f_M^{*(n)}) = - \sum_i \sum_j A_i^* A_j^* C_{ij}^* + \sum_i A_i^* S_i^*; \quad (22)$$

$$C_{ij}^* = \frac{1}{a_1 + a_j} - \frac{\gamma}{2} \left\{ \frac{\ln(1+a_j)}{a_j(a_1+a_j)} + \frac{\ln(1+a_1)}{a_1(a_1+a_j)} + \frac{E_1(\tau^*)}{a_1 a_j} + \frac{e^{a_j \tau^*} E_1[\tau^*(1+a_j)]}{a_j(a_j - a_1)} + \frac{e^{a_1 \tau^*} E_1[\tau^*(1+a_1)]}{a_1(a_1 - a_j)} \right\}, \quad (23)$$

$$C_{ii}^* = \frac{1}{2a_1} - \frac{\gamma}{2a_1^2} \left\{ \ln(1+a_1) + E_1(\tau^*) + e^{a_1 \tau^*} (a_1 \tau^* - 1) E_1[\tau^*(1+a_1)] - e^{\tau^*} \frac{a_1}{1+a_1} \right\}, \quad (24)$$

$$S_i^* = \frac{1}{a_1^2} \left\{ \ln\left(\frac{1}{1+a_i}\right) + a_i + E_1(\tau^*) - a_i E_2(\tau^*) - e^{a_i \tau^*} E_1[\tau^*(1+a_i)] \right\}. \quad (25)$$

In the above equations, $\tau^* = \tau_1 + 2\tau_2$. On setting $\frac{\partial F}{\partial A_i^*} = 0$, we get

$$\sum_j C_{ij}^* A_j^* - \frac{1}{2} S_i^* = 0 \quad (i = 1, n) \quad (26)$$

as the equations determining the A_i^* .

Substitution of $f_M^{*(n)}(Z)$ in Eq. (15) gives

$$\frac{\bar{\phi}_A^*}{\phi_0} = \frac{\alpha^*}{\tau_1} \left(\frac{1}{1 + \alpha' g_C} \right), \quad (27)$$

where

$$g_C = \frac{\gamma \sum_{i=1}^n A_i^* S_i^{**}}{\alpha' \left(\alpha^* - \gamma \sum_{i=1}^n A_i^* S_i^{**} \right)}; \quad (28)$$

$$\alpha^* = E_3(\tau_2) - E_3(\tau_1 + \tau_2); \quad (29)$$

$$\alpha' = \frac{1}{2} - E_3(\tau_1 + 2\tau_2); \quad (30)$$

$$S_i^{**} = \frac{1}{a_i^2} \left\{ e^{\tau_2 a_i} E_1[\tau_2(1+a_i)] - E_1(\tau_2) + a_i E_2(\tau_2) - e^{(\tau_1 + \tau_2)a_i} E_1[(\tau_1 + \tau_2)(1+a_i)] \right. \\ \left. + E_1(\tau_1 + \tau_2) - a_i E_2(\tau_1 + \tau_2) \right\}. \quad (31)$$

The equations for the bare foil may be derived from the above equations for the covered foil by setting $\tau_2 = 0$. This gives

$$C_{ij} = \frac{1}{a_i + a_j} - \frac{\gamma}{2} \left\{ \frac{\ln(1+a_j)}{a_j(a_i + a_j)} + \frac{\ln(1+a_i)}{a_i(a_i + a_j)} + \frac{E_1(\tau_1)}{a_i a_j} + \frac{e^{a_j \tau_1} E_1[\tau_1(1+a_j)]}{a_j(a_j - a_i)} + \frac{e^{a_i \tau_1} E_1[\tau_1(1+a_i)]}{a_i(a_i - a_j)} \right\}; \quad (32)$$

$$C_{ii} = \frac{1}{2a_i} - \frac{\gamma}{2a_i^2} \left\{ \ln(1+a_i) + E_1(\tau_1) + e^{a_i \tau_1} (a_i \tau_1 - 1) E_1[\tau_1(1+a_i)] - \frac{e^{-\tau_1 a_i}}{1+a_i} \right\}; \quad (33)$$

$$S_i = \frac{1}{a_i^2} \left\{ \ln \frac{1}{1+a_i} + a_i + E_1(\tau_1) - a_i E_2(\tau_1) - e^{a_i \tau_1} E_1[\tau_1(1+a_i)] \right\}; \quad (34)$$

$$\sum_j C_{ij} A_j - \frac{1}{2} S_i = 0 \quad (i = 1, n); \quad (35)$$

$$\frac{\bar{\phi}_A}{\phi_0} = \frac{\alpha}{\tau_1} \left(\frac{1}{1 + \alpha g_B} \right); \quad (36)$$

$$g_B = \frac{\gamma \sum_{i=1}^n A_i S_i}{\alpha \left(\alpha - \gamma \sum_{i=1}^n A_i S_i \right)}; \quad (37)$$

$$\alpha = \frac{1}{2} - E_3(\tau_1). \quad (38)$$

We now restrict ourselves to the P_1 or diffusion-theory approximation for $f_M^*(Z)$ or $f_M(Z)$. Thus, Eq. (20) consists of only one term with

$$a_1 = \sqrt{3(1-\gamma)} = \sqrt{\frac{3\Sigma_a}{\Sigma}} = \frac{\lambda}{L}. \quad (39)$$

For the case of the bare foil,

$$A_1 = S_1/2C_{11} \quad (40)$$

and

$$g_B = \frac{\gamma S_1^2/2C_{11}}{\alpha \left(\alpha - \frac{\gamma S_1^2}{2C_{11}} \right)}. \quad (41)$$

In the limit of large τ_1 ,

$$g_B \rightarrow g_\infty = \frac{\frac{\gamma [a_1 - \ln(1+a_1)]^2}{a_1^2 [a_1 - \gamma \ln(1+a_1)]}}{\frac{1}{2} \left(\frac{1}{2} - \frac{\gamma [a_1 - \ln(1+a_1)]^2}{a_1^2 [a_1 - \gamma \ln(1+a_1)]} \right)}. \quad (42)$$

For small a_1 , this becomes

$$g_\infty \rightarrow \frac{3}{2a_1} - \frac{15}{16} = \frac{3L}{2\lambda} - \frac{15}{16}. \quad (43)$$

In the case of small τ_1 , we have

$$g_B \rightarrow g_0 = \frac{\gamma [\ln(1+a_1)]^2}{a_1 - \gamma \left(2\ln(1+a_1) - \frac{a_1}{1+a_1} \right)}, \quad (44)$$

which, for small a_1 , gives

$$g_0 \rightarrow \frac{3}{2a_1} - \frac{3}{8} = \frac{3L}{2\lambda} - \frac{3}{8}. \quad (45)$$

It may be seen from comparison of the g_B values given by Eqs. (43) and (45) with the transport calculation values of Ritchie and Eldridge listed in Table 9-2 of Ref. 2 that Eqs. (43) and (45) are rather good approximations.

We now treat the case of the covered foil. For small τ_2 , we have $g_c = g_\infty$ for large τ_1 and $g_c = g_0$ for small τ_1 as might be expected. For large τ_2 we get

$$g_c \rightarrow g_2 = \frac{2\gamma \left(\frac{a_1 - \ln(1+a_1)}{a_1 - \gamma \ln(1+a_1)} \right)}{1 + a_1 - \gamma \left(\frac{a_1 - \ln(1+a_1)}{a_1 - \gamma \ln(1+a_1)} \right)} \quad (46)$$

for τ_1 either small or large. This becomes, for small a_1 ,

$$g_2 \rightarrow \frac{6}{5a_1} - \frac{4}{5} = \frac{6L}{5\lambda} - \frac{4}{5}. \quad (47)$$

Thus, for a_1 sufficiently small, $g_B \approx 3/2a_1$ for the bare foil; for the covered foil $g_C \approx 3/2a_1$ for small τ_2 and $g_C \approx 6/5a_1 = 0.8(3/2a_1)$ for large τ_2 .

So far we have considered only foils which are of infinite extent in the x and y directions. For bare foils of finite radius, Ritchie and Eldridge have suggested multiplying their value of g for an infinite foil by a fraction g_S^R/g_S^∞ determined from Skyrme's work (Ref. 4), where superscripts R and ∞ denote the foil radius and the subscript s denotes Skyrme. It may be seen from values in Table 9-2 of Ref. 2 that

$$g_S^R/g_S^\infty \approx 0.35(2R/L) \quad (48)$$

is roughly true if R is not too large. Combination of Eq. (48) with the result given above for an infinite bare foil that $g_B \approx 3L/2\lambda$ yields

$$g_B \approx 1.05 R/\lambda. \quad (49)$$

Thus, the value of g_B for a bare foil depends in a first approximation only on the radius of the foil and the total mean free path in the surrounding medium.

It was shown above that g_C for an infinite covered foil varies from about $3L/2\lambda$ to $0.8(3L/2\lambda)$ as the thickness of the covers in absorption lengths increases. Since g_S^R/g_S^∞ for a bare foil depends to a first approximation only on R/L and not on the thickness of the foil in absorption lengths, it might be reasonable to use the bare foil value of g_S^R/g_S^∞ as a multiplying factor to convert the value of g_C for an infinite covered foil to that for a foil of finite radius. Here we have assumed that the radii of the foil and covers are nearly the same. Thus one might use a value of g_C in the range from $0.8 g_B$ to g_B . Numerical results for three problems differing only in values of g_B and g_C are given in Section III-A3.

3. Equation for the Cutoff Energy

The cutoff energy is defined by the equation

$$\int_{X_C}^{\infty} \Sigma_1(X) \phi_0(X) \frac{\bar{\phi}_A}{\phi_0}(X) t \, dX = \int_0^{\infty} \Sigma_1(X) \phi_0(X) \frac{\bar{\phi}_A^*}{\phi_0}(X) t \, dX. \quad (50)$$

In Eq. (50) the energy unit is $X = E/E_M$, where E_M is the Maxwellian neutron energy. Thus $X_C = E_C/E_M$, where E_C is the cutoff energy. The

quantity $\Sigma_1(X)$ is the cross section of the absorbing foil, $\phi_0(X)$ is the energy dependence of the flux far from the foil, $\frac{\bar{\phi}_A}{\phi_0}(X)$ and $\frac{\bar{\phi}_A^*}{\phi_0}(X)$ are the expressions for the average fluxes in the absorbing foil when bare or covered, respectively, and t is the foil thickness.

In the analytical flux case, we assume that the energy dependence of the flux is given by

$$\phi_0(X) = \frac{2r}{\sqrt{\pi}} X e^{-X} + (X_0^{1/2}/X) \Delta(X), \quad (51)$$

where r is a constant, $X_0 = E_{2200\text{m/sec}}/E_M$, and $\Delta(X)$ is a function determining the epithermal dependence of the flux. Five options are available in the Fortran programs for $\Delta(X)$, namely:

$$(1) \Delta = \begin{cases} 0 & \text{for } X < \mu \\ 1 & \text{for } X > \mu \end{cases} \quad (52)$$

$$(2) \Delta = \begin{cases} 0 & \text{for } X < \mu \exp\left(\frac{-8 \ln 10}{n}\right) \\ \left[1 + \left(\frac{\mu}{X}\right)^n\right]^{-1} & \text{for } \mu \exp\left(\frac{-8 \ln 10}{n}\right) < X < \mu \exp\left(\frac{8 \ln 10}{n}\right) \\ 1 & \text{for } X > \mu \exp\left(\frac{8 \ln 10}{n}\right) \end{cases} \quad (53)$$

$$(3) \Delta = \begin{cases} 0 & \text{for } X < a \\ \sum_{i=1}^{10} F_i(X)^{i-1} & \text{for } a < X < b \\ 1 & \text{for } X > b \end{cases} \quad (54)$$

$$(4) \Delta = \begin{cases} 0 & \text{for } X \leq 1 \\ \frac{1}{(a-1)h} X(X-1) & \text{for } 1 \leq X \leq a \\ \frac{1}{h} X & \text{for } a \leq X \leq h \\ 1 & \text{for } X \geq h \end{cases} \quad (55)$$

$$(5) \Delta = \begin{cases} 0 & \text{for } X < a \\ \sum_{i=1}^{10} G_i (\ln X)^{i-1} & \text{for } a < X < b \\ 1 & \text{for } X > b \end{cases} \quad (56)$$

Thus, the parameters necessary to specify the epithermal flux in the five cases are:

- (1) μ
- (2) μ, n
- (3) a, b, F_i ($i = 1, 10$)
- (4) a, h
- (5) a, b, G_i ($i = 1, 10$).

The ratio $\frac{\bar{\phi}_A}{\phi_0}(X)$ is

$$\frac{\bar{\phi}_A}{\phi_0}(X) = (1 + \epsilon_B) \left(\frac{\frac{1}{2} - E_3[\tau_1(X)]}{\Sigma_1(X)t} \right) \left(\frac{1}{1 + \left(\frac{1}{2} - E_3[\tau_1(X)] \right) g_B} \right). \quad (57)$$

This expression agrees with Eq. (36) except for ϵ_B , which is omitted in Eq. (36). The quantity ϵ_B is the "edge correction" referred to in Ref. 5. It depends somewhat on τ_1 , but is roughly equal to $t/(\pi R)$, where t is the foil thickness and R the radius. Thus, ϵ_B is normally rather small and has been taken equal to zero in all problems run so far. Note that g_B has been assumed to be independent of energy in Eq. (57).

For $\frac{\bar{\phi}_A^*}{\phi_0}(X)$, we have

$$\frac{\bar{\phi}_A^*}{\phi_0}(X) = (1 + \epsilon_c) \left(\frac{E_3[\tau_2(X)] - E_3[\tau_1(X) + \tau_2(X)]}{\Sigma_1(X)t} \right) \left(\frac{1}{1 + \left(\frac{1}{2} - E_3[\tau_1(X) + 2\tau_2(X)] \right) g_c} \right). \quad (58)$$

Equation (58) is in agreement with Eq. (27) except for the introduction of an "edge correction" ϵ_c analogous to ϵ_B . Like g_B , the quantity g_c must be independent of energy.

The cross sections $\Sigma_1(X)$ and $\Sigma_2(X)$ are given by

$$\Sigma_1(X) = G_A \sigma^A(X) \quad (59)$$

and

$$\Sigma_2(X) = G_F \sigma^F(X), \quad (60)$$

where

$$\sigma^A(X) = \frac{\sigma_{a0}^A E_0^{1/2}}{E_M^{1/2} X^{1/2}} + \sum_{i=1}^{NA} \frac{\alpha_i^A}{E_M^{1/2} X^{1/2} [E_M^2 (X - X_i^A)^2 + \beta_i^A]} \quad (61)$$

and

$$\sigma^F(X) = \frac{\sigma_{a0}^F E_0^{1/2}}{E_M^{1/2} X^{1/2}} + \sum_{i=1}^{NF} \frac{\alpha_i^F}{E_M^{1/2} X^{1/2} [E_M^2 (X - X_i^F)^2 + \beta_i^F]}. \quad (62)$$

In Eqs. (61) and (62) the first term represents a $1/v$ cross section with σ_{a0}^A or σ_{a0}^F being the 2200-m/sec absorption cross section in barns. The remaining terms represent single-level Breit-Wigner resonances characterized by the parameters α_i , β_i , and $X_i = E_i/E_M$, where E_i is the energy at the peak of the i resonance. The quantities G_A and G_F are of the form $0.6025 \times 2.54 \times 10^{-3} (\rho/A) \text{ b}^{-1} \text{ mil}^{-1}$, where ρ and A are the density and mass number of the absorbing foil or cover, as the case may be. This normalization of G_A and G_F allows the absorbing foil thickness, t , and the cover thickness, ℓ_0 , to be expressed in mils.

Substitution of the various expressions given above into Eq. (50) gives the following equation for the cutoff energy:

$$\begin{aligned} (1 + \epsilon_B) \int_{X_c}^{\infty} \left(\frac{2r}{\sqrt{\pi}} X e^{-X} + \frac{X_0^{1/2}}{X} \Delta(X) \right) \frac{\left\{ \frac{1}{2} - E_3[\tau_1(X)] \right\}}{\left[1 + \left(\frac{1}{2} - E_3[\tau_1(X)] \right) g_B \right]} dX \\ = (1 + \epsilon_c) \int_0^{\infty} \left(\frac{2r}{\sqrt{\pi}} X e^{-X} + \frac{X_0^{1/2}}{X} \Delta(X) \right) \frac{\left\{ E_3[\tau_2(X)] - E_3[\tau_1(X) + \tau_2(X)] \right\}}{\left\{ 1 + \left(\frac{1}{2} - E_3[\tau_1(X) + 2\tau_2(X)] \right) g_c \right\}} dX. \end{aligned} \quad (63)$$

For $g_B = g_c = \epsilon_B = \epsilon_c = 0$ and $\Delta(X)$ given by Eq. (52), Eq. (63) is equivalent to that used by Hickman and Leng (Ref. 1), providing the absorbing foil is a $1/v$ absorber and the cover cross section is represented by a single resonance.

For $t = 0$, Eq. (63) becomes

$$\begin{aligned}
 (1 + \epsilon_B) \int_{X_c}^{\infty} \left(\frac{2r}{\sqrt{\pi}} X e^{-X} + \frac{X_0^{1/2}}{X} \Delta(X) \right) \Sigma_1(X) dX \\
 = (1 + \epsilon_c) \int_0^{\infty} \left(\frac{2r}{\sqrt{\pi}} X e^{-X} + \frac{X_0^{1/2}}{X} \Delta(X) \right) \frac{E_2[\tau_2(X)]}{\left\{ 1 + \left(\frac{1}{2} - E_3[2\tau_2(X)] \right) g_c \right\}} \Sigma_1(X) dX.
 \end{aligned} \tag{64}$$

For the isotropic-flux case with input flux, we have in place of Eqs. (63) and (64)

$$\begin{aligned}
 (1 + \epsilon_B) \int_{X_c}^{\infty} \phi(X) \frac{\left(\frac{1}{2} - E_3[\tau_1(X)] \right) dX}{\left\{ 1 + \left(\frac{1}{2} - E_3[\tau_1(X)] \right) g_B \right\}} \\
 = (1 + \epsilon_c) \int_0^{\infty} \phi(X) \frac{\left\{ E_3[\tau_2(X)] - E_3[\tau_1(X) + \tau_2(X)] \right\}}{\left\{ 1 + \left(\frac{1}{2} - E_3[\tau_1(X) + 2\tau_2(X)] \right) g_c \right\}} dX
 \end{aligned} \tag{65}$$

and

$$(1 + \epsilon_B) \int_{X_c}^{\infty} \phi(X) \Sigma_1(X) dX = (1 + \epsilon_c) \int_0^{\infty} \frac{\phi(X) E_2[\tau_2(X)] \Sigma_1(X)}{\left\{ 1 + \left(\frac{1}{2} - E_3[2\tau_2(X)] \right) g_c \right\}} dX. \tag{66}$$

In Eqs. (65) and (66), $\phi(X)$ is the input flux which must be read into the computer for each mesh point of the integration.

The description of the Fortran program written to calculate X_c and the various integrals in the cutoff-energy equation for the isotropic-flux case with analytical flux is given in Section III-A below. The corresponding program for the isotropic-flux case with input flux is described in Section III-B.

B. Beam-flux Case

1. Flux Relations

In deriving the flux relations for the beam-flux case, we refer again to Fig. 1. The solution of Eq. (1) appropriate to this case is

$$4\pi\phi(\mu, z) = \begin{cases} \phi_0 e^{\frac{\Sigma_1 t + 2\Sigma_2 \ell_0}{2\mu}} e^{-\Sigma z/\mu} \delta(\mu + 1) & \text{for } \mu < 0 \\ \phi_0 e^{\frac{-(\Sigma_1 t + 2\Sigma_2 \ell_0)}{2\mu}} e^{-\Sigma z/\mu} \delta(\mu - 1) & \text{for } \mu > 0, \end{cases} \quad (67)$$

where Σz is again given by Eq. (3). The flux at the absorbing foil surface is

$$\begin{aligned} \frac{\phi_s^*}{\phi_0} &= 2\pi \int_{-1}^1 \frac{\phi}{\phi_0}(\mu, t/2) d\mu = 2\pi \int_{-1}^1 \frac{\phi}{\phi_0}(\mu, -t/2) d\mu \\ &= \frac{1}{2} e^{-\tau_2} (1 + e^{-\tau_1}), \end{aligned} \quad (68)$$

the flux at the outer surface of the cover is

$$\begin{aligned} \frac{\phi_{sc}^*}{\phi_0} &= 2\pi \int_{-1}^1 \frac{\phi}{\phi_0}(\mu, t/2 + \ell_0) d\mu = 2\pi \int_{-1}^1 \frac{\phi}{\phi_0}(\mu, -t/2 - \ell_0) d\mu \\ &= \frac{1}{2} (1 + e^{-(\tau_1 + 2\tau_2)}), \end{aligned} \quad (69)$$

and the average flux in the foil is

$$\begin{aligned} \frac{\bar{\phi}_A^*}{\phi_0} &= \frac{1}{t} \int_{-t/2}^{t/2} 2\pi \int_{-1}^1 \frac{\phi}{\phi_0}(\mu, z) d\mu dz \\ &= \frac{1}{\tau_1} e^{-\tau_2} (1 - e^{-\tau_1}). \end{aligned} \quad (70)$$

For a bare foil, the surface flux is

$$\frac{\phi_s}{\phi_0} = \frac{1}{2} (1 + e^{-\tau_1}), \quad (71)$$

as is found by setting $\tau_2 = 0$ in either Eq. (68) or (69). Also, the average flux in the bare foil is

$$\frac{\bar{\phi}_A}{\phi_0} = \frac{1}{\tau_1} (1 - e^{-\tau_1}), \quad (72)$$

as determined from Eq. (70) with $\tau_2 = 0$.

2. Equation for the Cutoff Energy

The cutoff energy is defined by Eq. (50) with $\frac{\bar{\phi}_A^*}{\phi_0}(X)$ and $\frac{\bar{\phi}_A}{\phi_0}(X)$ given by Eqs. (70) and (72), respectively. The other quantities in Eq. (50) are the same as given in Section II-A3. Thus, the explicit form of the cutoff-energy equation for the beam-flux case with analytical flux is

$$\begin{aligned} & \int_{X_c}^{\infty} \left[\frac{2r}{\sqrt{\pi}} X e^{-X} + \frac{X_0^{1/2}}{X} \Delta(X) \right] \{1 - \exp[-\tau_1(X)]\} dX \\ &= \int_0^{\infty} \left[\frac{2r}{\sqrt{\pi}} X e^{-X} + \frac{X_0^{1/2}}{X} \Delta(X) \right] \exp[-\tau_2(X)] \{1 - \exp[-\tau_1(X)]\} dX. \end{aligned} \quad (73)$$

For the case with $t = 0$, we have

$$\int_{X_c}^{\infty} \left[\frac{2r}{\sqrt{\pi}} X e^{-X} + \frac{X_0^{1/2}}{X} \Delta(X) \right] \Sigma_1(X) dX = \int_0^{\infty} \left[\frac{2r}{\sqrt{\pi}} X e^{-X} + \frac{X_0^{1/2}}{X} \Delta(X) \right] \exp[-\tau_2(X)] \Sigma_1(X) dX. \quad (74)$$

For the beam-flux case with input flux, Eqs. (73) and (74) are replaced by

$$\int_{X_c}^{\infty} \phi(X) \{1 - \exp[-\tau_1(X)]\} dX = \int_0^{\infty} \phi(X) \exp[-\tau_2(X)] \{1 - \exp[-\tau_1(X)]\} dX \quad (75)$$

for $t \neq 0$ and

$$\int_{X_c}^{\infty} \phi(X) \Sigma_1(X) dX = \int_0^{\infty} \phi(X) \exp[-\tau_2(X)] \Sigma_1(X) dX \quad (76)$$

for $t = 0$.

It should be noted that the calculation of the cutoff energy for the beam flux case with $t = 0$ involves the same equation, Eq. (74), as for the calculation of the cutoff energy for a point absorber at the center of a spherical shell cover of thickness ℓ_0 in an isotropic flux.

III. DESCRIPTION OF FORTRAN PROGRAMS

A. Isotropic-flux Case with Analytical Flux

1. Outline of Calculations

The program first calculates the values of X at which the integrands of Eq. (63) or (64) are evaluated. In the input the entire range of X from zero to the chosen upper limit, X_T , is divided into M subranges specified by the maximum value of X in the subrange and the number of mesh intervals per subrange. The number of mesh intervals per subrange must be even because Simpson's rule is used in the integrations. One can use wider mesh intervals for large X in order to save machine time while retaining adequate accuracy.

After calculation of the values of X , the computer evaluates all the functions and the integrands on both sides of Eq. (63) or (64) for these X values. The E_3 and E_2 functions are evaluated from the E_1 function according to the recursion relations (see Ref. 6)

$$E_3(x) = \frac{1}{2} [e^{-x} - xe^{-x} + x^2 E_1(x)] \quad (77)$$

and

$$E_2(x) = e^{-x} - xE_1(x). \quad (78)$$

The E_1 functions are computed by means of a Fortran-II subroutine written by G. Duffy (Ref. 7). For x over the range $(0,1)$, this subroutine calculates E_1 from

$$E_1(x) = -\gamma - \ln x + \sum_{n=1}^{\infty} (-1)^{n+1} \frac{x^n}{n \cdot n!}, \quad (79)$$

where $\gamma = 0.577215665$ is Euler's constant and the remainder after m terms of the sum satisfies the inequality

$$|R_m| < \frac{1}{(m+1)(m+1)!}$$

for $x \leq 1$. A convergence criterion is specified in the input such that convergence occurs when the n^{th} term of the series is less than the convergence criterion times the n^{th} partial sum. For x over the range $(1, \infty)$ the subroutine uses

$$E_1(x) = \frac{e^{-x}}{x} \left\{ \frac{a_0 + a_1x + a_2x^2 + a_3x^3 + x^4}{b_0 + b_1x + b_2x^2 + b_3x^3 + x^4} \right\}, \quad (80)$$

where the numerical values of the coefficients involved are given in Ref. 8. The error for this approximation is $\leq 2 \times 10^{-8}$.

After evaluation of the integrands in Eq. (63) or (64), the computer is used to calculate the integrals, by Simpson's rule, on both sides for each of the M subranges of X . The integrals involving the Maxwellian and epithermal components of the flux are determined separately. The integrals on the right side over the subranges are then summed to give the total integrals from 0 to X_T for the covered foil.

Next, the integrals on the left-hand side are evaluated from X_C to X_T for the bare foil. This is done by addition of the contributions from the subranges of X with $X > X_C$, addition of the Simpson's rule contributions from all the groups of two mesh intervals lying in the subrange containing X_C having $X > X_C$, and finally addition of the contribution given by the trapezoidal rule for the remaining increment of X . This last contribution is for either one mesh interval plus part of a second, or for a fraction of one mesh interval, depending on where X_C happens to lie. Of course, this process determines X_C and is controlled by comparing the sum (Maxwellian plus epithermal) of the bare-foil integrals as X is decreased with the sum of the covered-foil integrals from 0 to X_T . After the evaluation of the bare-foil integrals from X_C to X_T , the corresponding integrals from 0 to X_T are found by summing the contributions from the M subranges. The evaluation for the bare foil is then completed by finding the integrals from 0 to X_C by subtraction. Next, the integrals from X_C to X_T for the covered foil are evaluated by adding the various contributions in the same manner as for the integrals for the bare foil. Finally, the integrals from X_C to X_T for the covered foil are subtracted from those from 0 to X_T to give the cover-foil integrals from 0 to X_C and thereby to complete the calculation. The listing of the Fortran program is in Appendix A.

2. Input and Output Data

The information to be specified on each input card is given below. Symbols which are not defined here have been defined above. Since the program is to be used with the Argonne Monitor System, all input is put on tape 7. For running problems in sequence, the data cards for the various problems are stacked in sequence. The input sheet for a sample problem is presented in Appendix A.

Card Type 1: KRONA, 0 if the absorbing foil has no $1/v$ contribution to its cross section, 1 otherwise. FORMAT, I1

KRONF, 0 if the cover has no $1/v$ contribution to its cross section, 1 otherwise. FORMAT, I1

KRONT, 0 if $t = 0$, 1 otherwise FORMAT, I1

KRONM, 0 if $r = 0$, 1 otherwise FORMAT, I1

NE, 1, 2, 3, 4 or 5, depending on epithermal flux option. See Eqs. (52) through (56). FORMAT, I1

NP, 0 for no print-out of functions for each value of X, 1 if print-out is desired. FORMAT, I1

M, number of subranges of X. $1 \leq M \leq 105$. FORMAT, I3

NA, number of absorber resonances. $0 \leq NA \leq 100$. FORMAT, I3

NF, number of cover resonances. $0 \leq NF \leq 100$. FORMAT, I3

NPROB, problem number. FORMAT, I3

Card Type 2: G_A , t , σ_{a0}^A , G_F , ℓ_0 , σ_{a0}^F . FORMAT, 6E12.6

Card Type 3: E_M , r , g_B , g_c , ϵ_B , ϵ_c . FORMAT, 6E12.6

Card Type 4: CONCRI, convergence criterion for E_1 functions in range (0,1) as discussed in Section III-A1. FORMAT, E12.6

Card Type 5: X TOP (J), $J = 1, M$. Maximum values of X in the M subranges of X. The values are arranged in the order of decreasing X six to a card. FORMAT, 6E12.6

Card Type 6: N(J), $J = 1, M$. Number of mesh intervals (even) in subrange of X having upper limit X TOP (J) arranged 18 to a card. The sum of the N(J) must be ≤ 2500 . FORMAT, 18I4

Card Type 7: α_1^A , β_1^A , E_1^A , α_2^A , β_2^A , $E_2^A \dots$. Resonance parameters for the NA absorbing foil resonances, with six parameters to a card. FORMAT, 6E12.6

Card Type 8: α_1^F , β_1^F , E_1^F , α_2^F , β_2^F , $E_2^F \dots$. Resonance parameters for the NF cover resonances with six parameters to a card. FORMAT, 6E12.6

Card Type 9: Epithermal flux parameters corresponding to NE.

For NE = 1: μ (Eq. (52))	FORMAT, E12.6
For NE = 2: μ, n (Eq. (53))	FORMAT, E12.6, I2
For NE = 3: $a, b, F_1, F_2 \dots F_{10}$ on two cards (Eq. (54)).	FORMAT, 6E12.6
For NE = 4: $a, h.$ (Eq. (55))	FORMAT, 2E12.6
For NE = 5: $a, b, G_1, G_2 \dots G_{10}$ on two cards (Eq. (56)).	FORMAT, 6E12.6

The output for problems run with the Argonne Monitor System is on tape 6. The output from the sample is in Appendix A. This problem required about 2 min of machine time on the IBM 704. Most of the headings in the output are self-explanatory. The ones which are not are explained in the following.

The quantities listed under TOTAL 1 and TOTAL 2 are the integrals for the bare foil for the M subranges of X corresponding to the integrands on the left side of Eq. (63) for $t \neq 0$ or Eq. (64) for $t = 0$. TOTAL 1 refers to the Maxwellian integrals; TOTAL 2 refers to the epithermal integrals. Similarly, TOTAL 3 and TOTAL 4 are the integrals for the covered foil corresponding to TOTAL 1 and TOTAL 2, respectively. Under the optional printout headed VALUES OF FUNCTIONS AT EACH MESH POINT, the quantities P and Q are

$$P = \frac{(1 + \epsilon_B) \left[\frac{1}{2} - E_3(\tau_1) \right]}{1 + \left[\frac{1}{2} - E_3(\tau_1) \right] g_B} \quad (81)$$

and

$$Q = \frac{(1 + \epsilon_C) \left[E_3(\tau_2) - E_3(\tau_1 + \tau_2) \right]}{1 + \left[\frac{1}{2} - E_3(\tau_1 + 2\tau_2) \right] g_C} \quad (82)$$

for $t \neq 0$, and

$$P = (1 + \epsilon_B) \Sigma_1 \quad (83)$$

and

$$Q = \frac{(1 + \epsilon_c) E_2(\tau_2) \Sigma_1}{1 + \left[\frac{1}{2} - E_3(2\tau_2) \right] g_c} \quad (84)$$

for $t = 0$.

The sample problem has the same input as one of the problems in Table III of Ref. 1. The cutoff energy is 0.5145 eV as determined here and 0.516 eV in Ref. 1.

3. Example of Effects of Outer Flux Depression

Three problems were run which differed only in the values of g_B and g_c . The problem with $g_B = g_c = 0$ is that in Appendix A. These problems considered a $1/v$ absorbing foil with G_A , t , and σ_{a0}^A chosen to yield $\tau_1(X)$ corresponding to $N = 2$ in Table III of Ref. 1. The same parameters were used for the cadmium cover as in Ref. 1 with the cover thickness l_0 , taken to be 20 mils. The flux was Maxwellian, having $E_M = 0.0506$ eV and $r = 10$, plus a $1/E$ tail starting at $X = 5$ (i.e., $NE = 1$ and $\mu = 5$). Results of the problems are given in Table I. The quantity denoted by δ is the ratio of the activation from 0 to X_T for the bare foil to that for the covered foil. Since the use of infinity rather than $X_T = 10^6$ for the upper limits of the integrals would decrease δ by only about 0.06, δ may be regarded as the cadmium ratio. It is seen from Table I that the particular non-zero values of g_B and g_c used here decrease the cadmium ratio by about 5% from the value for no depression of outer flux.

Table I

EXAMPLE OF EFFECTS OF OUTER FLUX DEPRESSION

Problem	g_B	g_c	E_c (eV)	δ
1	0	0	0.514475	17.34
2	0.5	0.5	0.543894	16.59
3	0.5	0.4	0.533499	16.44

Problem	Bare-foil Integrals			Covered-foil Integrals		
	0 to X_c	X_c to X_T	0 to X_T	0 to X_c	X_c to X_T	0 to X_T
1	2.22172	0.135967	2.35769	0.0116444	0.124323	0.135967
2	2.01916	0.129494	2.14866	0.0112421	0.118252	0.129494
3	2.01798	0.130679	2.14866	0.0110380	0.119641	0.130679

B. Isotropic-flux Case with Input Flux

The calculation for the isotropic-flux case with input flux proceeds in the same manner as for the analytical flux case, except that the integrals in Eq. (65) or (66) involve the input flux in place of the Maxwellian and epithermal components of the analytical flux, as in Eq. (63) or (64).

The input information is specified below. Appendix B contains the Fortran listing, as well as input and output sheets for a sample problem.

Card Type 1: NFLUX, number of problems to be run using the same input flux.	FORMAT, I4
M, number of subranges of X. $1 \leq M \leq 105$.	FORMAT, I4
L, number of values of X at which the flux is specified with X = 0 excluded. Thus L is the total number of mesh intervals. $L \leq 2500$.	FORMAT, I4
EMAXW, corresponds to E_M for the analytical flux case. This quantity merely provides a normalization for X.	FORMAT, E12.6
Card Type 2: Same as Card Type 5 for the analytical flux case.	
Card Type 3: Same as Card Type 6 for the analytical flux case.	
Card Type 4: FLUX (I), $I = 1, L$. The input flux is given corresponding to the values of X determined by Card Types 2 and 3. The values are given six to a card starting with X_T and ending with the value of X closest to zero.	FORMAT, 6E12.6

The following group of cards will occur NFLUX times.

Card Type 5: KRONA, 0 if the absorbing foil has no $1/v$ cross section, 1 otherwise.	FORMAT, I1
KRONF, 0 if the cover has no $1/v$ cross section, 1 otherwise.	FORMAT, I1
KRONT, 0 if $t = 0$, 1 otherwise.	FORMAT, I1
NP, 0 for no print-out of functions for each value of X, 1 if print-out is desired.	FORMAT, I1
NA, number of absorber resonances. $0 \leq NA \leq 100$.	FORMAT, I4
NF, number of cover resonances. $0 \leq NF \leq 100$.	FORMAT, I4
NPROB, problem number.	FORMAT, I4

Card Type 6: Same as Card Type 2 for the analytical flux case.

Card Type 7: $g_B, g_C, \epsilon_B, \epsilon_C, \text{CONCRI}$. FORMAT, 5E12.6

Card Type 8: Same as Card Type 7 for the analytical flux case.

Card Type 9: Same as Card Type 8 for the analytical flux case.

In the output for the sample problem, the numbers listed under TOTAL 1 and TOTAL 2 are the bare- and covered-foil integrals, respectively, for the M subranges of X. Other output quantities are as for the analytical flux case or are self-explanatory.

The sample problem corresponds to that for the isotropic-flux case with analytical flux, except that X_T was taken to be 80 rather than 10^6 . The input flux for this case was determined by adding the Maxwellian and epithermal components in the output of the analytical flux case. Cutoff energies for the two cases differ by about 0.0002 eV. Part of this slight difference occurs because X_T in the input flux case is 80 rather than 10^6 , and part occurs because the double-valued flux at $X = 5$ is not allowed for in the input flux case. The sample problem required a little less than a minute of machine time on the IBM-704.

C. Beam-flux Case with Analytical Flux

The beam-flux calculations are carried out in the same way as those for the isotropic-flux case, with either Eq. (73) or Eq. (74) being involved. Since exponentials occur in the beam-flux calculations rather than E_n functions, somewhat less machine time is required.

The input information is described below. The Fortran listing along with input and output sheets for a sample problem are in Appendix C.

Card Type 1: Same as for the isotropic-flux case with analytical flux.

Card Type 2: Same as for the isotropic-flux case with analytical flux.

Card Type 3: E_M, r . FORMAT, 2E12.6

Card Type 4: Same as Card Type 5 for the isotropic, analytical flux case.

Card Type 5: Same as Card Type 6 for the isotropic, analytical flux case.

Card Type 6: Same as Card Type 7 for the isotropic, analytical flux case.

Card Type 7: Same as Card Type 8 for the isotropic, analytical flux case.

Card Type 8: Same as Card Type 9 for the isotropic, analytical flux case.

In the optional output, the quantities P and Q are

$$P = 1 - \exp(-\tau_1) \quad (85)$$

for $t \neq 0$,

$$P = \Sigma_1 \quad (86)$$

for $t = 0$,

and

$$Q = \exp(-\tau_2). \quad (87)$$

The sample problem yielded a cutoff energy of 0.3959 eV as compared with 0.398 eV for the corresponding problem in Table IV of Ref. 1. It required a little more than a minute of IBM-704 time.

D. Beam-flux Case with Input Flux

Calculations for the beam-flux case with input flux are done in the same manner as for the other cases. Either Eq. (75) or Eq. (76) is involved.

Appendix D displays the Fortran listing along with sample problem input and output sheets. Input description follows.

Card Types 1 through 6: Same as Card Types 1 through 6 for the isotropic-flux case with input flux.

Card Type 7: Same as Card Type 8 for the isotropic-flux case with input flux.

Card Type 8: Same as Card Type 9 for the isotropic-flux case with input flux.

The sample problem differs from that for the beam-flux case with analytical flux only in having $X_T = 80$ rather than 10^6 . The cutoff energies for the two cases differ by 0.00003 eV for the same reasons that the corresponding isotropic-flux cutoff energies differed. In view of the output descriptions in the sections above, the labelling of the output is easily understood. Machine time for the sample problem was around half a minute.

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The authors wish to thank G. Duffy for supplying the E_1 subroutine and for assistance with problems involving Fortran.

APPENDIX A

Fortran Listing and Input and Output Sheets for
Isotropic-flux Case with Analytical Flux


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C      ISOTROPIC FLUX PROGRAM WITH ANALYTICAL FLUX
      DIMENSION X(2510),P(2510),Q(2510),FLUXM(2510),FLUXE(2510),
      XXINTE1(2510),XINTE2(2510),XINTE3(2510),XINTE4(2510),XTOP(105),
      XN(105),TOTAL1(105),TOTAL2(105),TOTAL3(105),TOTAL4(105),ALPA(100),
      XBETA(100),XRESA(100),ERESA(100),ALPC(100),BETC(100),XRESC(100),
      XERESC(100),F(10),G(10),XN(105),DELTAX(105)
C      READ INPUT AND WRITE INPUT DATA
      3 FORMAT(6I1,4I3/6E12.6/6E12.6/E12.6/(6E12.6))
      4 FORMAT(18I4)
      5 FORMAT(6E12.6)
      6 FORMAT(E12.6,I2)
      10 READ INPUT TAPE7,3,KRONA,KRONF,KRONT,KRUNM,NE,NP,M,NA,NF,
      XNPRUB,GA,TA,SIGAO,GF,TF,SIGFO,EMAXW,RAT,GB,GC,EPSE,
      XEPSC,CONCRI,(XTOP(J),J=1,M)
      READ INPUT TAPE7,4,(N(J),J=1,M)
      IF(NA)14,14,12
      12 READ INPUT TAPE7,5,(ALPA(J),BETA(J),ERESA(J),J=1,NA)
      14 IF(NF)18,18,16
      16 READ INPUT TAPE7,5,(ALPC(J),BETC(J),ERESC(J),J=1,NF)
      18 GO TO(20,22,24,26,28),NE
      20 READ INPUT TAPE7,30,XMU
      GO TO40
      22 READ INPUT TAPE7,6,XMU,NTRAN
      GO TO40
      24 READ INPUT TAPE7,5,XONE,XTWO,(F(J),J=1,10)
      GO TO40
      26 READ INPUT TAPE7,32,XONE,XTWO
      GO TO40
      28 READ INPUT TAPE7,5,XONE,XTWO,(G(J),J=1,10)
      30 FORMAT(E12.6)
      32 FORMAT(2E12.6)
      40 WRITE OUTPUT TAPE6,42,NPRUB,GA,TA,SIGAO,GF,TF,SIGFO,EMAXW,
      XRAT,GB,GC,EPSE,EPSC,CONCRI
      42 FORMAT(39HISOTROPIC FLUX PROGRAM PROBLEM NUMBER 13/55H0
      X INPUT DATA/99H0 GA
      X T SIGMA A 0 GF LO SIGMA F 0
      X EM R/1H 8E13.6/63H0 GB GC EPSILON
      XB EPSILON C CONCRI/1H 5E13.6)
      44 FORMAT(36H0 FOIL RESONANCE PARAMETERS/42H ALPHA
      X BETA ERES/(1H 3E15.6))
      46 FORMAT(36H0 COVER RESONANCE PARAMETERS/42H ALPHA
      X BETA ERES/(1H 3E15.6))
      48 FORMAT(71H0 SUBINTEGRAL UPPER LIMITS AND NUMBER OF MESH INTERVALS
      XPER SUBINTEGRAL/(1H E15.6,I5))
      50 FORMAT(36H0 EPITHERMAL FLUX PARAMETERS OPTION 11)
      52 FORMAT(11H MU/1H E15.6)
      54 FORMAT(18H MU N/1H E15.6,13)
      56 FORMAT(25H A B/1H 2E15.6/71H F1
      X F2 F3 F4 F5/1H 5E15.6/7
      X2H F6 F7 F8 F9
      X F10/1H 5E15.6)
      58 FORMAT(25H A H/1H 2E15.6)
      60 FORMAT(25H A B/1H 2E15.6/71H G1
      X G2 G3 G4 G5/1H 5E15.6/7
      X2H G6 G7 G8 G9
      X G10/1H 5E15.6)
      IF(NA)68,68,66
      66 WRITE OUTPUT TAPE6,44,(ALPA(J),BETA(J),ERESA(J),J=1,NA)
      68 IF(NF)72,72,70
      70 WRITE OUTPUT TAPE6,46,(ALPC(J),BETC(J),ERESC(J),J=1,NF)
      72 WRITE OUTPUT TAPE6,48,(XTOP(J),N(J),J=1,M)
      WRITE OUTPUT TAPE6,50,NE

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      GOTO(74,76,78,80,82),NE
74  WRITE OUTPUT TAPE6,52,XMU
      GO T090
76  WRITE OUTPUT TAPE6,54,XMU,NTRAN
      GO T090
78  WRITE OUTPUT TAPE6,56,XONE,XTWO,(F(J),J=1,10)
      GO T090
80  WRITE OUTPUT TAPE6,58,XONE,XTWO
      GO T090
82  WRITE OUTPUT TAPE6,60,XONE,XTWO,(G(J),J=1,10)
C   CALCULATE VARIOUS CONSTANTS
90  CONST1=1./(SQRTF(EMAXW))
      CONST3=(EMAXW)**2.
      XZERO=0.0253/EMAXW
      CONST5=SQRTF(XZERO)
      CONST7=1.+EPSB
      CONST8=1.+EPSC
      IF(KRONA-1)94,92,94
92  CONST2=0.15906*SIGAO
94  IF(KRONF-1)98,96,98
96  CONST4=0.15906*SIGFO
98  IF(NA)102,102,100
100 DO101J=1,NA
101 XRESA(J)=(ERESA(J))/EMAXW
102 IF(NF)110,110,104
104 DO105J=1,NF
105 XRESC(J)=(ERESC(J))/EMAXW
110 IF(NE-2)114,112,114
112 XNTRAN=NTRAN
      D=18.4207/XNTRAN
      XONE=XMU*(EXPF(-D))
      XTWO=XMU*(EXPF(D))
114 IF(NE-4)118,116,118
116 CONST6=1.0/((XONE-1.)*XTWO)
C   CALCULATE X AND DELTAX
118 XTOP(M+1)=0.0
      N(M+1)=1
      I1=1
      I2=N(1)
      DO122J=1,M
      XN(J)=N(J)
      DELTAX(J)=(XTOP(J)-XTOP(J+1))/XN(J)
      X(I1)=XTOP(J)
      DO120I=1,I2
120 X(I+1)=X(I)-DELTAX(J)
      I1=I1+N(J)
122 I2=I2+N(J+1)
      X(I2)=0.0
      L=I2-1
C   CALCULATION OF FUNCTIONS AT EACH MESH POINT
      DO300I=1,L
      A=CONST1/(SQRTF(X(I)))
C   FOIL CROSS SECTION FUNCTIONS
      IF(KRONA-1)126,124,126
124 SIGA=GA*CONST2*A
      GO T0128
126 SIGA=0.0
128 IF(NA)134,134,130
130 DO132J=1,NA
132 SIGA=SIGA+(GA*A*ALPA(J))/(CONST3*((X(I)-XRESA(J))**2.)+BETA(J))
134 IF(KRONF)138,138,136
136 SIGATA=TA*SIGA

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      CALL EONE(SIGATA,VALE1,CONCR1)
      E3A=((1.-SIGATA)*(EXP(-SIGATA))+((SIGATA)**2.)*(VALE1))/2.
      HALPHA=0.5-E3A
      P(I)=CONST7*HALPHA/(1.+(GB*HALPHA))
      GO TO140
138 P(I)=CONST7*SIGA
C   COVER CROSS SECTION FUNCTIONS
140 IF(KRONT-1)144,142,144
142 SIGF=GF*CONST4*A
      GO TO146
144 SIGF=0.0
146 IF(NF)152,152,148
148 DUISOJ=1,NF
150 SIGF=SIGF+(GF*A*ALPC(J))/(CONST3*((X(I)-XRESC(J))**2.)+BETC(J))
152 SIGFTF=TF*SIGF
      CALL EONE(SIGFTF,VALE2,CONCR1)
      IF(KRONT)156,156,153
153 SIGSUM=SIGATA+SIGFTF
      CALL EONE(SIGSUM,VALE3,CONCR1)
      E3F=((1.-SIGFTF)*(EXP(-SIGFTF))+((SIGFTF)**2.)*(VALE2))/2.
      E3SUM=((1.-SIGSUM)*(EXP(-SIGSUM))+((SIGSUM)**2.)*(VALE3))/2.
      Q(I)=CONST8*(E3F-E3SUM)
      IF(GC-0.000001)162,162,154
154 SISTAR=SIGSUM+SIGFTF
      CALL EONE(SISTAR,VALE4,CONCR1)
      E3STAR=((1.-SISTAR)*(EXP(-SISTAR))+((SISTAR)**2.)*(VALE4))/2.
      Q(I)=Q(I)/(1.+(0.5-E3STAR)*GC)
      GO TO162
156 E2F=EXP(-SIGFTF)-(SIGFTF*VALE2)
      J(I)=CONST8*SIGA*E2F
      IF(GC-0.000001)162,162,157
157 SIG2F=2.*SIGFTF
      CALL EONE(SIG2F,VALE5,CONCR1)
      E32F=((1.-SIG2F)*(EXP(-SIG2F))+((SIG2F)**2.)*(VALE5))/2.
      Q(I)=Q(I)/(1.+(0.5-E32F)*GC)
C   MAXWELLIAN FLUX CALCULATION
162 IF(KRONM-1)166,164,164
164 FLUXM(I)=(1.1283791)*RAT*X(I)*EXP(-X(I))
      GO TO168
166 FLUXM(I)=0.0
C   EPITHERMAL FLUX CALCULATION
168 GO TO(170,190,210,230,250),NE
C   OPTION 1 FOR DELTA
170 IF(X(I)-XMU)180,175,175
175 DELTA=1.0
      GO TO270
180 DELTA=0.0
      GO TO270
C   OPTION 2 FOR DELTA
190 IF(X(I)-XTWO)200,195,195
195 DELTA=1.0
      GO TO270
200 IF(X(I)-XONE)207,205,205
205 DELTA=1./(1.+(XMU/X(I))*XNTRAN)
      GO TO270
207 DELTA=0.0
      GO TO270
C   OPTION 3 FOR DELTA
210 IF(X(I)-XTWO)214,212,212
212 DELTA=1.0
      GO TO270
214 IF(X(I)-XONE)220,216,216

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216 DELTA=0.0
    DO219J=1,10
    K=11-J
218 DELTA=F(K)+X(I)*DELTA
    GO TO270
220 DELTA=0.0
    GO TO270
C    OPTION 4 FOR DELTA
230 IF(X(I)-XTWO)234,232,232
232 DELTA=1.0
    GO TO270
234 IF(X(I)-XONE)238,236,236
236 DELTA=X(I)/XTWO
    GO TO270
238 IF(X(I)-1.0)242,240,240
240 DELTA=CONST6*X(I)*(X(I)-1.)
    GO TO270
242 DELTA=0.0
    GO TO270
C    OPTION 5 FOR DELTA
250 IF(X(I)-XTWO)254,252,252
252 DELTA=1.0
    GO TO270
254 IF(X(I)-XONE)260,256,256
256 DELTA=0.0
    DO258J=1,10
    K=11-J
258 DELTA=G(K)+(LOGF(X(I)))*DELTA
    GO TO270
260 DELTA=0.0
270 FLUXE(I)=CONST5*DELTA/X(I)
C    CALCULATE INTEGRANDS
    IF(KRONM)280,280,290
280 XINTE1(I)=0.0
    XINTE3(I)=0.0
    GO TO295
290 XINTE1(I)=FLUXM(I)*P(I)
    XINTE3(I)=FLUXM(I)*Q(I)
295 XINTE2(I)=FLUXE(I)*P(I)
300 XINTE4(I)=FLUXE(I)*Q(I)
C    CALCULATE SUBINTEGRALS
    XINTE1(12)=0.0
    XINTE2(12)=0.0
    XINTE3(12)=0.0
    XINTE4(12)=0.0
    L1=1
    L2=N(I)-1
    DO340J=1,M
    TOTAL1(J)=0.0
    TOTAL2(J)=0.0
    TOTAL3(J)=0.0
    TOTAL4(J)=0.0
    DO330I=L1,L2,2
    IF(KRONM)315,315,310
310 SUM1=(XINTE1(I)+4.*XINTE1(I+1)+XINTE1(I+2))*(DELTAX(J))/3.
    TOTAL1(J)=TOTAL1(J)+SUM1
    SUM3=(XINTE3(I)+4.*XINTE3(I+1)+XINTE3(I+2))*(DELTAX(J))/3.
    TOTAL3(J)=TOTAL3(J)+SUM3
315 IF(NE-I)316,316,320
316 IF(XTOP(J)-XMU-0.001)330,330,320
320 SUM2=(XINTE2(I)+4.*XINTE2(I+1)+XINTE2(I+2))*(DELTAX(J))/3.
    TOTAL2(J)=TOTAL2(J)+SUM2

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      SUM4=(XINTE4(I)+4.*XINTE4(I+1)+XINTE4(I+2))*(DELTAX(J))/3.
      TOTAL4(J)=TOTAL4(J)+SUM4
330  CONTINUE
      LI=LI+N(J)
340  L2=L2+N(J+1)
C    CALCULATE RIGHT INTEGRALS XTOP TO ZERO
      RIGHT1=0.0
      IF(KRONM)360,360,350
350  DO355J=1,M
355  RIGHT1=RIGHT1+TOTAL3(J)
360  RIGHT4=0.0
      DO365J=1,M
365  RIGHT4=RIGHT4+TOTAL4(J)
      RIGHT7=RIGHT1+RIGHT4
C    CALCULATE LEFT INTEGRALS XTOP TO XCUT
      J=1
      XLEFT3=0.0
      XLEFT6=0.0
370  XLEFT3=XLEFT3+TOTAL1(J)
      XLEFT6=XLEFT6+TOTAL2(J)
      XLEFT9=XLEFT3+XLEFT6
      IF(XLEFT9-RIGHT7)380,390,390
380  J=J+1
      GO TO370
390  XLEFT3=XLEFT3-TOTAL1(J)
      XLEFT6=XLEFT6-TOTAL2(J)
      XLEFT9=XLEFT3+XLEFT6
      LJC=J
      LJCM=LJC-1
      I=1
      IF(LJCM)405,405,395
395  DO400K=1,LJCM
400  I=I+N(K)
405  LIC=I
      IF(NE-1)406,406,410
406  IF(XTOP(LJC)-XMO-0.001)407,407,410
407  XINTE2(LIC)=0.0
      XINTE4(LIC)=0.0
410  XSUM1=(XINTE1(I)+4.*XINTE1(I+1)+XINTE1(I+2))*(DELTAX(LJC))/3.
      XSUM2=(XINTE2(I)+4.*XINTE2(I+1)+XINTE2(I+2))*(DELTAX(LJC))/3.
      XLEFT3=XLEFT3+XSUM1
      XLEFT6=XLEFT6+XSUM2
      XLEFT9=XLEFT3+XLEFT6
      IF(XLEFT9-RIGHT7)420,430,430
420  I=I+2
      GO TO410
430  XLEFT3=XLEFT3-XSUM1
      XLEFT6=XLEFT6-XSUM2
      XLEFT9=XLEFT3+XLEFT6
440  T1=(XINTE1(I)+XINTE1(I+1))*(DELTAX(LJC))/2.
      T2=(XINTE2(I)+XINTE2(I+1))*(DELTAX(LJC))/2.
      XLEFT3=XLEFT3+T1
      XLEFT6=XLEFT6+T2
      XLEFT9=XLEFT3+XLEFT6
      IF(XLEFT9-RIGHT7)450,460,460
450  I=I+1
      GO TO440
460  XLEFT3=XLEFT3-T1
      XLEFT6=XLEFT6-T2
      XLEFT9=XLEFT3+XLEFT6
      LCUT=I
C    CALCULATE XCUT AND ECUT

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470 XMESH=(RIGHT7-XLEFT9)*(DELTAX(LJC))/(T1+T2)
    XCUT=X(1)-XMESH
    ECUT=XCUT*EMAXW
    XLEFT3=XLEFT3+T1*XMESH/(DELTAX(LJC))
    XLEFT6=XLEFT6+T2*XMESH/(DELTAX(LJC))
    XLEFT9=XLEFT3+XLEFT6
C   CALCULATE LEFT INTEGRALS XTOP TO ZERO
    XLEFT1=0.0
    IF(KRONM)485,485,475
475 DO480J=1,M
480 XLEFT1=XLEFT1+TOTAL1(J)
485 XLEFT4=0.0
    DO490J=1,M
490 XLEFT4=XLEFT4+TOTAL2(J)
    XLEFT7=XLEFT1+XLEFT4
C   CALCULATE LEFT INTEGRALS XCUT TO ZERO
    XLEFT2=XLEFT1-XLEFT3
    XLEFT5=XLEFT4-XLEFT6
    XLEFT8=XLEFT7-XLEFT9
C   CALCULATE RIGHT INTEGRALS XTOP TO XCUT
    RIGHT3=0.0
    IF(KRONM)515,515,500
500 IF(LJCM)515,515,505
505 DO510J=1,LJCM
510 RIGHT3=RIGHT3+TOTAL3(J)
515 RIGHT6=0.0
    IF(LJCM)530,530,520
520 DO525J=1,LJCM
525 RIGHT6=RIGHT6+TOTAL4(J)
530 IF(LCUT-LIC-2)550,535,535
535 LSTOP=LCUT-2
    DO540I=LIC,LSTOP,2
    XSUM3=(XINTE3(I)+4.*XINTE3(I+1)+XINTE3(I+2))*(DELTAX(LJC))/3.
    XSUM4=(XINTE4(I)+4.*XINTE4(I+1)+XINTE4(I+2))*(DELTAX(LJC))/3.
    RIGHT3=RIGHT3+XSUM3
540 RIGHT6=RIGHT6+XSUM4
550 LV=LIC
555 IF(LCUT-LV)580,565,560
560 LV=LV+2
    GO TO555
565 I=LCUT
570 RIGHT3=RIGHT3+(XMESH)*(XINTE3(I)+XINTE3(I+1))/2.
    RIGHT6=RIGHT6+(XMESH)*(XINTE4(I)+XINTE4(I+1))/2.
    RIGHT9=RIGHT3+RIGHT6
    GO TO590
580 I=LCUT-1
    RIGHT3=RIGHT3+(XINTE3(I)+XINTE3(I+1))*(DELTAX(LJC))/2.
    RIGHT6=RIGHT6+(XINTE4(I)+XINTE4(I+1))*(DELTAX(LJC))/2.
    I=I+1
    GO TO570
C   CALCULATE RIGHT INTEGRALS XCUT TO ZERO
590 RIGHT2=RIGHT1-RIGHT3
    RIGHT5=RIGHT4-RIGHT6
    RIGHT8=RIGHT7-RIGHT9
C   WRITE STANDARD OUTPUT DATA
    WRITE OUTPUT TAPE6,600,XCUT,ECUT,(TOTAL1(J),TOTAL2(J),
    XTOTAL3(J),TOTAL4(J),J=1,M)
    WRITE OUTPUT TAPE6,610,XLEFT2,XLEFT3,XLEFT1,XLEFT5,
    XXLEFT6,XLEFT4,XLEFT8,XLEFT9,XLEFT7,RIGHT2,RIGHT3,
    XRIGHT1,RIGHT5,RIGHT6,RIGHT4,RIGHT8,RIGHT9,RIGHT7
600 FORMAT(55H0
    X31H0          XCUT          CUTOFF ENERGY/1H 2E15.6/38H0

```

OUTPUT DATA/

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      X      SUBINTEGRALS/52H      TOTAL 1      TOTAL 2      TOTAL
      X3      TOTAL 4/(1H 4E15.6))
610 FORMAT(71H0                                INTEGRAL
      XS FOR BARE FOIL/1COH      MAXWELLIAN
      X      EPITHERMAL      SUM/116H      0 TO
      X XCUT      XCUT TO XTOP      0 TO XTOP      0 TO XCUT      XCUT TO XTOP      0 TO
      XXTOP      0 TO XCUT      XCUT TO XTOP      0 TO XTOP/1H 9E13.6/73H0
      X      INTEGRALS FOR COVERED FOIL/1
      X00H      MAXWELLIAN      EPITHERM
      XAL      SUM/116H      0 TO XCUT      XCUT TO X
      XTOP      0 TO XTOP      0 TO XCUT      XCUT TO XTOP      0 TO XTOP      0 TO XCUT
      X      XCUT TO XTOP      0 TO XTOP/1H 9E13.6)
C      WRITE OPTIONAL OUTPUT DATA
      IF(NP)630,630,620
620 WRITE OUTPUT TAPE6,625,(X(I),P(I),Q(I),FLUXM(I),FLUXE(I),
      XXINTE1(I),XXINTE2(I),XXINTE3(I),XXINTE4(I),I=1,I2)
625 FORMAT(78H0                                VALUES OF FUNCTI
      XONS AT EACH MESH POINT/117H
      X      FLUXES      BARE FOIL INTEGRANDS      COVERED FOI
      XL INTEGRANDS/117H      X      P      Q      MAXWELL
      XIAN      EPITHERMAL      MAXWELLIAN      EPITHERMAL      MAXWELLIAN      EPITHERM
      XAL/(1H 9E13.6))
630 GO TO 10
      END ( 1 , 1 , 0 , 1 , 0 )

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ANL-30

ISOTROPIC FLUX PROGRAM PROBLEM NUMBER 1

INPUT DATA

GA T SIGMA A 0 GF LO SIGMA F U EM R
 0.153035E-03 0.100000E 03 0.314320E 02 0.118040E-03 0.200000E 02 0. 0.506000E-01 0.100000E 02
 GB GC EPSILON B EPSILON C CONCRI
 0. 0. 0. 0. 1.000000E-03

COVER RESONANCE PARAMETERS

ALPHA BETA ERES
 0.109000E 02 0.336000E-02 0.178000E-00

SUBINTEGRAL UPPER LIMITS AND NUMBER OF MESH INTERVALS PER SUBINTEGRAL

0.100000E 07 50
 0.100000E 06 50
 0.100000E 05 50
 0.100000E 04 50
 0.250000E 03 50
 0.800000E 02 100
 0.300000E 02 100
 0.100000E 02 50
 0.500000E 01 40
 0.300000E 01 30
 0.150000E 01 30

EPITHERMAL FLUX PARAMETERS OPTION 1

MU
 0.500000E 01

OUTPUT DATA

XCUT CUTOFF ENERGY
 0.101675E 02 0.514475E 00

TOTAL 1	SUBINTEGRALS		TOTAL 4
	TOTAL 2	TOTAL 3	
0.	0.103716E-02	0.	0.103716E-02
0.	0.326355E-02	0.	0.326355E-02
0.	0.101869E-01	0.	0.101869E-01
0.	0.145932E-01	0.	0.145922E-01
0.735716E-33	0.218156E-01	0.733253E-33	0.217880E-01
0.177161E-11	0.306980E-01	0.170850E-11	0.302175E-01
0.481569E-03	0.550011E-01	0.276478E-03	0.435146E-01
0.497510E-01	0.507264E-01	0.264497E-02	0.797626E-02
0.240412E-00	0.	0.385534E-05	0.
0.677158E 00	0.	0.256198E-04	0.
0.120256E 01	0.	0.440285E-03	0.

INTEGRALS FOR BARE FOIL

MAXWELLIAN		EPITHERMAL		SUM	
0 TO XCUR	XCUT TO XTOP	0 TO XTOP	0 TO XCUR	XCUT TO XTOP	0 TO XTOP
0.216995E 01	0.412127E-03	0.217037E 01	0.517669E-01	0.135555E-00	0.187322E-00
				0.222172E 01	0.137967E-00
					0.235769E 01

INTEGRALS FOR COVERED FOIL

MAXWELLIAN		EPITHERMAL		SUM	
0 TO XCUR	XCUT TO XTOP	0 TO XTOP	0 TO XCUR	XCUT TO XTOP	0 TO XTOP
0.314937E-02	0.241838E-03	0.339120E-02	0.849502E-02	0.124081E-00	0.132576E-00
				0.116444E-01	0.124323E-00
					0.135967E-00

VALUES OF FUNCTIONS AT EACH MESH POINT
 FLUXES

BARE FOIL INTEGRANDS

COVERED FOIL INTEGRANDS

X	P	Q	MAXWELLIAN	FPITHERMAL	MAXWELLIAN	FPITHERMAL	MAXWELLIAN	EPITHERMAL
0.100000E 07	0.339609E-03	0.339609E-03	.	0.717107E-06	0.	0.240140E-09	.	0.240140E-09
0.982000E 06	0.342716E-03	0.342716E-03	.	0.720068E-06	0.	0.246778E-09	.	0.246778E-09
0.964000E 06	0.345889E-03	0.345889E-03	.	0.733513E-06	0.	0.253715E-09	.	0.253715E-09
0.946000E 06	0.349160E-03	0.349160E-03	.	0.747470E-06	0.	0.260987E-09	.	0.260987E-09
0.928000E 06	0.352524E-03	0.352524E-03	.	0.761969E-06	0.	0.268612E-09	.	0.268612E-09
0.910000E 06	0.355996E-03	0.355996E-03	.	0.777040E-06	0.	0.276623E-09	.	0.276623E-09
0.892000E 06	0.359565E-03	0.359565E-03	.	0.792721E-06	0.	0.285035E-09	.	0.285035E-09
0.874000E 06	0.363234E-03	0.363234E-03	.	0.809047E-06	0.	0.293874E-09	.	0.293874E-09
0.856000E 06	0.367031E-03	0.367031E-03	.	0.826059E-06	0.	0.303189E-09	.	0.303189E-09
0.838000E 06	0.370946E-03	0.370946E-03	.	0.843803E-06	0.	0.313005E-09	.	0.313005E-09
0.820000E 06	0.374975E-03	0.374975E-03	.	0.862325E-06	0.	0.323368E-09	.	0.323368E-09
0.802000E 06	0.379171E-03	0.379171E-03	.	0.881679E-06	0.	0.334307E-09	.	0.334307E-09
0.784000E 06	0.383493E-03	0.383493E-03	.	0.901922E-06	0.	0.345880E-09	.	0.345880E-09
0.766000E 06	0.387963E-03	0.387963E-03	.	0.923116E-06	0.	0.358135E-09	.	0.358135E-09
0.748000E 06	0.392601E-03	0.392601E-03	.	0.945330E-06	0.	0.371137E-09	.	0.371137E-09
0.730000E 06	0.397395E-03	0.397395E-03	.	0.968639E-06	0.	0.384933E-09	.	0.384933E-09
0.712000E 06	0.402387E-03	0.402387E-03	.	0.993127E-06	0.	0.399622E-09	.	0.399622E-09
0.694000E 06	0.407554E-03	0.407554E-03	.	0.101889E-05	0.	0.415251E-09	.	0.415251E-09
0.676000E 06	0.412948E-03	0.412948E-03	.	0.104602E-05	0.	0.431951E-09	.	0.431951E-09
0.658000E 06	0.418544E-03	0.418544E-03	.	0.107463E-05	0.	0.449780E-09	.	0.449780E-09
0.640000E 06	0.424378E-03	0.424378E-03	.	0.110485E-05	0.	0.468875E-09	.	0.468875E-09
0.622000E 06	0.430468E-03	0.430468E-03	.	0.113683E-05	0.	0.489368E-09	.	0.489368E-09
0.604000E 06	0.436824E-03	0.436824E-03	.	0.117071E-05	0.	0.511393E-09	.	0.511393E-09
0.586000E 06	0.443473E-03	0.443473E-03	.	0.120667E-05	0.	0.535125E-09	.	0.535125E-09
0.568000E 06	0.450429E-03	0.450429E-03	.	0.124491E-05	0.	0.560741E-09	.	0.560741E-09
0.550000E 06	0.457726E-03	0.457726E-03	.	0.128565E-05	0.	0.588475E-09	.	0.588475E-09
0.532000E 06	0.465389E-03	0.465389E-03	.	0.132915E-05	0.	0.618571E-09	.	0.618571E-09
0.514000E 06	0.473462E-03	0.473462E-03	.	0.137569E-05	0.	0.651339E-09	.	0.651339E-09
0.496000E 06	0.481959E-03	0.481959E-03	.	0.142562E-05	0.	0.687090E-09	.	0.687090E-09
0.478000E 06	0.490930E-03	0.490930E-03	.	0.147930E-05	0.	0.726234E-09	.	0.726234E-09
0.460000E 06	0.500422E-03	0.500422E-03	.	0.153719E-05	0.	0.769243E-09	.	0.769243E-09
0.442000E 06	0.510491E-03	0.510491E-03	.	0.159979E-05	0.	0.816679E-09	.	0.816679E-09
0.424000E 06	0.521198E-03	0.521198E-03	.	0.166770E-05	0.	0.869204E-09	.	0.869204E-09
0.406000E 06	0.532597E-03	0.532597E-03	.	0.174164E-05	0.	0.927594E-09	.	0.927594E-09
0.388000E 06	0.544786E-03	0.544786E-03	.	0.182244E-05	0.	0.992841E-09	.	0.992841E-09
0.370000E 06	0.557858E-03	0.557858E-03	.	0.191110E-05	0.	0.106612E-08	.	0.106612E-08
0.352000E 06	0.571914E-03	0.571914E-03	.	0.200883E-05	0.	0.114888E-08	.	0.114888E-08
0.334000E 06	0.587095E-03	0.587095E-03	.	0.211709E-05	0.	0.124293E-08	.	0.124293E-08
0.316000E 06	0.603538E-03	0.603538E-03	.	0.223768E-05	0.	0.135052E-08	.	0.135052E-08
0.298000E 06	0.621453E-03	0.621453E-03	.	0.237284E-05	0.	0.147461E-08	.	0.147461E-08
0.280000E 06	0.641078E-03	0.641078E-03	.	0.252538E-05	0.	0.161897E-08	.	0.161897E-08
0.262000E 06	0.662688E-03	0.662688E-03	.	0.269888E-05	0.	0.178852E-08	.	0.178852E-08
0.244000E 06	0.686631E-03	0.686631E-03	.	0.289798E-05	0.	0.198984E-08	.	0.198984E-08
0.226000E 06	0.713382E-03	0.713382E-03	.	0.312879E-05	0.	0.223202E-08	.	0.223202E-08
0.208000E 06	0.743531E-03	0.743531E-03	.	0.339955E-05	0.	0.252767E-08	.	0.252767E-08
0.190000E 06	0.777863E-03	0.777863E-03	.	0.372161E-05	0.	0.289491E-08	.	0.289491E-08
0.172000E 06	0.817433E-03	0.817433E-03	.	0.411109E-05	0.	0.336054E-08	.	0.336054E-08
0.154000E 06	0.863738E-03	0.863738E-03	.	0.459160E-05	0.	0.396594E-08	.	0.396594E-08
0.136000E 06	0.918940E-03	0.918940E-03	.	0.519931E-05	0.	0.477786E-08	.	0.477786E-08
0.118000E 06	0.986319E-03	0.986319E-03	.	0.599243E-05	0.	0.591045E-08	.	0.591045E-08
0.100000E 06	0.107110E-02	0.107110E-02	.	0.707107E-05	0.	0.757381E-08	.	0.757381E-08
0.982000E 05	0.108084E-02	0.108084E-02	.	0.720068E-05	0.	0.778276E-08	.	0.778276E-08
0.964000E 05	0.109085E-02	0.109085E-02	.	0.733513E-05	0.	0.800151E-08	.	0.800151E-08
0.946000E 05	0.110113E-02	0.110113E-02	.	0.747470E-05	0.	0.823064E-08	.	0.823064E-08
0.928000E 05	0.111172E-02	0.111172E-02	.	0.761969E-05	0.	0.847098E-08	.	0.847098E-08
0.910000E 05	0.112263E-02	0.112263E-02	.	0.777040E-05	0.	0.872327E-08	.	0.872327E-08
0.892000E 05	0.113385E-02	0.113385E-02	.	0.792721E-05	0.	0.898828E-08	.	0.898828E-08
0.874000E 05	0.114542E-02	0.114542E-02	.	0.809047E-05	0.	0.926700E-08	.	0.926700E-08
0.856000E 05	0.115735E-02	0.115735E-02	.	0.826059E-05	0.	0.956044E-08	.	0.956044E-08
0.838000E 05	0.116967E-02	0.116967E-02	.	0.843803E-05	0.	0.986971E-08	.	0.986971E-08
0.820000E 05	0.118239E-02	0.118239E-02	.	0.862325E-05	0.	0.101960E-07	.	0.101960E-07

0.802000E	05	0.119554E-02	0.119554E-02	0.	0.881679E-05	0.	0.105408E-07	0.
0.784000E	05	0.120913E-02	0.120913E-02	0.	0.901922E-05	0.	0.109054E-07	0.
0.766000E	05	0.122319E-02	0.122319E-02	0.	0.923116E-05	0.	0.112914E-07	0.
0.748000E	05	0.123775E-02	0.123775E-02	0.	0.945330E-05	0.	0.117009E-07	0.
0.730000E	05	0.125287E-02	0.125287E-02	0.	0.968639E-05	0.	0.121358E-07	0.
0.712000E	05	0.126854E-02	0.126854E-02	0.	0.993127E-05	0.	0.125982E-07	0.
0.694000E	05	0.128482E-02	0.128482E-02	0.	0.101889E-04	0.	0.130908E-07	0.
0.676000E	05	0.130174E-02	0.130174E-02	0.	0.104602E-04	0.	0.136164E-07	0.
0.658000E	05	0.131934E-02	0.131934E-02	0.	0.107463E-04	0.	0.141780E-07	0.
0.640000E	05	0.133768E-02	0.133768E-02	0.	0.110485E-04	0.	0.147794E-07	0.
0.622000E	05	0.135681E-02	0.135681E-02	0.	0.113683E-04	0.	0.154246E-07	0.
0.604000E	05	0.137679E-02	0.137679E-02	0.	0.117071E-04	0.	0.161182E-07	0.
0.586000E	05	0.139768E-02	0.139768E-02	0.	0.120667E-04	0.	0.168654E-07	0.
0.568000E	05	0.141955E-02	0.141955E-02	0.	0.124491E-04	0.	0.176720E-07	0.
0.550000E	05	0.144249E-02	0.144249E-02	0.	0.128565E-04	0.	0.185453E-07	0.
0.532000E	05	0.146657E-02	0.146657E-02	0.	0.132915E-04	0.	0.194929E-07	0.
0.514000E	05	0.149190E-02	0.149190E-02	0.	0.137569E-04	0.	0.205240E-07	0.
0.496000E	05	0.151860E-02	0.151860E-02	0.	0.142562E-04	0.	0.216494E-07	0.
0.478000E	05	0.154679E-02	0.154679E-02	0.	0.147930E-04	0.	0.228816E-07	0.
0.460000E	05	0.157661E-02	0.157661E-02	0.	0.153719E-04	0.	0.242355E-07	0.
0.442000E	05	0.160822E-02	0.160822E-02	0.	0.159979E-04	0.	0.257281E-07	0.
0.424000E	05	0.164183E-02	0.164183E-02	0.	0.166770E-04	0.	0.273809E-07	0.
0.406000E	05	0.167764E-02	0.167764E-02	0.	0.174164E-04	0.	0.292184E-07	0.
0.388000E	05	0.171591E-02	0.171591E-02	0.	0.182244E-04	0.	0.312714E-07	0.
0.370000E	05	0.175691E-02	0.175691E-02	0.	0.191110E-04	0.	0.335764E-07	0.
0.352000E	05	0.180103E-02	0.180103E-02	0.	0.200883E-04	0.	0.361795E-07	0.
0.334000E	05	0.184863E-02	0.184863E-02	0.	0.211709E-04	0.	0.391370E-07	0.
0.316000E	05	0.190024E-02	0.190024E-02	0.	0.223768E-04	0.	0.425214E-07	0.
0.298000E	05	0.195645E-02	0.195645E-02	0.	0.237284E-04	0.	0.464235E-07	0.
0.280000E	05	0.201796E-02	0.201797E-02	0.	0.252538E-04	0.	0.509613E-07	0.
0.262000E	05	0.208569E-02	0.208569E-02	0.	0.269888E-04	0.	0.562904E-07	0.
0.244000E	05	0.216077E-02	0.216077E-02	0.	0.289798E-04	0.	0.626185E-07	0.
0.226000E	05	0.224457E-02	0.224457E-02	0.	0.312879E-04	0.	0.702278E-07	0.
0.208000E	05	0.233900E-02	0.233900E-02	0.	0.339955E-04	0.	0.795156E-07	0.
0.190000E	05	0.244649E-02	0.244649E-02	0.	0.372161E-04	0.	0.910488E-07	0.
0.172000E	05	0.257036E-02	0.257036E-02	0.	0.411109E-04	0.	0.105670E-06	0.
0.154000E	05	0.271524E-02	0.271524E-02	0.	0.459160E-04	0.	0.124673E-06	0.
0.136000E	05	0.288785E-02	0.288785E-02	0.	0.519931E-04	0.	0.150149E-06	0.
0.118000E	05	0.309838E-02	0.309838E-02	0.	0.599243E-04	0.	0.185668E-06	0.
0.100000E	05	0.336311E-02	0.336311E-02	0.	0.707107E-04	0.	0.237807E-06	0.
0.982000E	04	0.339349E-02	0.339350E-02	0.	0.720068E-04	0.	0.244354E-06	0.
0.964000E	04	0.342472E-02	0.342472E-02	0.	0.733513E-04	0.	0.251208E-06	0.
0.946000E	04	0.345682E-02	0.345682E-02	0.	0.747470E-04	0.	0.258387E-06	0.
0.928000E	04	0.348986E-02	0.348986E-02	0.	0.761969E-04	0.	0.265916E-06	0.
0.910000E	04	0.352386E-02	0.352386E-02	0.	0.777040E-04	0.	0.273818E-06	0.
0.892000E	04	0.355887E-02	0.355888E-02	0.	0.792721E-04	0.	0.282119E-06	0.
0.874000E	04	0.359496E-02	0.359497E-02	0.	0.809047E-04	0.	0.290849E-06	0.
0.856000E	04	0.363218E-02	0.363219E-02	0.	0.826059E-04	0.	0.300040E-06	0.
0.838000E	04	0.367058E-02	0.367058E-02	0.	0.843803E-04	0.	0.309725E-06	0.
0.820000E	04	0.371023E-02	0.371023E-02	0.	0.862325E-04	0.	0.319942E-06	0.
0.802000E	04	0.375119E-02	0.375119E-02	0.	0.881679E-04	0.	0.330735E-06	0.
0.784000E	04	0.379355E-02	0.379356E-02	0.	0.901922E-04	0.	0.342149E-06	0.
0.766000E	04	0.383738E-02	0.383739E-02	0.	0.923116E-04	0.	0.354236E-06	0.
0.748000E	04	0.388278E-02	0.388278E-02	0.	0.945330E-04	0.	0.367051E-06	0.
0.730000E	04	0.392984E-02	0.392984E-02	0.	0.968639E-04	0.	0.380660E-06	0.
0.712000E	04	0.397866E-02	0.397866E-02	0.	0.993127E-04	0.	0.395132E-06	0.
0.694000E	04	0.402934E-02	0.402935E-02	0.	0.101889E-03	0.	0.410544E-06	0.
0.676000E	04	0.408203E-02	0.408204E-02	0.	0.104602E-03	0.	0.426987E-06	0.
0.658000E	04	0.413685E-02	0.413686E-02	0.	0.107463E-03	0.	0.444559E-06	0.
0.640000E	04	0.419395E-02	0.419395E-02	0.	0.110485E-03	0.	0.463371E-06	0.
0.622000E	04	0.425350E-02	0.425351E-02	0.	0.113683E-03	0.	0.483551E-06	0.
0.604000E	04	0.431567E-02	0.431567E-02	0.	0.117071E-03	0.	0.505238E-06	0.

0.586000E	04	0.438065E-02	0.438065E-02	0.	0.120667E-03	0.	0.528599E-06	0.	0.528599E-06
0.568000E	04	0.444868E-02	0.444868E-02	0.	0.124491E-03	0.	0.553819E-06	0.	0.553819E-06
0.550000E	04	0.452000E-02	0.452001E-02	0.	0.128565E-03	0.	0.581113E-06	0.	0.581115E-06
0.532000E	04	0.459488E-02	0.459488E-02	0.	0.132915E-03	0.	0.610727E-06	0.	0.610728E-06
0.514000E	04	0.467362E-02	0.467363E-02	0.	0.137569E-03	0.	0.642947E-06	0.	0.642949E-06
0.496000E	04	0.475658E-02	0.475660E-02	0.	0.142562E-03	0.	0.678108E-06	0.	0.678110E-06
0.478000E	04	0.484416E-02	0.484417E-02	0.	0.147930E-03	0.	0.716597E-06	0.	0.716599E-06
0.460000E	04	0.493676E-02	0.493676E-02	0.	0.153719E-03	0.	0.758873E-06	0.	0.758873E-06
0.442000E	04	0.503494E-02	0.503494E-02	0.	0.159979E-03	0.	0.805485E-06	0.	0.805485E-06
0.424000E	04	0.513925E-02	0.513925E-02	0.	0.166770E-03	0.	0.857075E-06	0.	0.857075E-06
0.406000E	04	0.525035E-02	0.525036E-02	0.	0.174164E-03	0.	0.914424E-06	0.	0.914425E-06
0.388000E	04	0.536904E-02	0.536904E-02	0.	0.182244E-03	0.	0.978476E-06	0.	0.978476E-06
0.370000E	04	0.549620E-02	0.549621E-02	0.	0.191110E-03	0.	0.105038E-05	0.	0.105038E-05
0.352000E	04	0.563292E-02	0.563291E-02	0.	0.200883E-03	0.	0.113156E-05	0.	0.113155E-05
0.334000E	04	0.578043E-02	0.578044E-02	0.	0.211709E-03	0.	0.122377E-05	0.	0.122377E-05
0.316000E	04	0.594026E-02	0.594027E-02	0.	0.223768E-03	0.	0.132924E-05	0.	0.132924E-05
0.298000E	04	0.611423E-02	0.611422E-02	0.	0.237284E-03	0.	0.145081E-05	0.	0.145081E-05
0.280000E	04	0.630453E-02	0.630454E-02	0.	0.252538E-03	0.	0.159213E-05	0.	0.159214E-05
0.262000E	04	0.651392E-02	0.651392E-02	0.	0.269888E-03	0.	0.175803E-05	0.	0.175803E-05
0.244000E	04	0.674583E-02	0.674583E-02	0.	0.289798E-03	0.	0.195493E-05	0.	0.195493E-05
0.226000E	04	0.700462E-02	0.700462E-02	0.	0.312879E-03	0.	0.219160E-05	0.	0.219160E-05
0.208000E	04	0.729594E-02	0.729594E-02	0.	0.339955E-03	0.	0.248029E-05	0.	0.248029E-05
0.190000E	04	0.762725E-02	0.762724E-02	0.	0.372161E-03	0.	0.283857E-05	0.	0.283857E-05
0.172000E	04	0.800865E-02	0.800865E-02	0.	0.411109E-03	0.	0.329243E-05	0.	0.329242E-05
0.154000E	04	0.845427E-02	0.845425E-02	0.	0.459160E-03	0.	0.388186E-05	0.	0.388185E-05
0.136000E	04	0.898445E-02	0.898442E-02	0.	0.519931E-03	0.	0.467130E-05	0.	0.467128E-05
0.118000E	04	0.963001E-02	0.962996E-02	0.	0.599243E-03	0.	0.577072E-05	0.	0.577069E-05
0.100000E	04	0.104432E-01	0.104401E-01	0.	0.707107E-03	0.	0.738233E-05	0.	0.738228E-05
0.985000E	03	0.105174E-01	0.105173E-01	0.	0.717875E-03	0.	0.755018E-05	0.	0.755013E-05
0.970000E	03	0.105964E-01	0.105963E-01	0.	0.728976E-03	0.	0.772452E-05	0.	0.772445E-05
0.955000E	03	0.106772E-01	0.106771E-01	0.	0.740426E-03	0.	0.790567E-05	0.	0.790561E-05
0.940000E	03	0.107599E-01	0.107598E-01	0.	0.752241E-03	0.	0.809404E-05	0.	0.809397E-05
0.925000E	03	0.108446E-01	0.108445E-01	0.	0.764440E-03	0.	0.829001E-05	0.	0.828994E-05
0.910000E	03	0.109313E-01	0.109312E-01	0.	0.777040E-03	0.	0.849406E-05	0.	0.849398E-05
0.895000E	03	0.110202E-01	0.110201E-01	0.	0.790063E-03	0.	0.870662E-05	0.	0.870654E-05
0.880000E	03	0.111112E-01	0.111111E-01	0.	0.803530E-03	0.	0.892822E-05	0.	0.892814E-05
0.865000E	03	0.112047E-01	0.112046E-01	0.	0.817464E-03	0.	0.915941E-05	0.	0.915933E-05
0.850000E	03	0.113005E-01	0.113004E-01	0.	0.831890E-03	0.	0.940077E-05	0.	0.940067E-05
0.835000E	03	0.113988E-01	0.113987E-01	0.	0.846834E-03	0.	0.965294E-05	0.	0.965283E-05
0.820000E	03	0.114998E-01	0.114997E-01	0.	0.862325E-03	0.	0.991661E-05	0.	0.991650E-05
0.805000E	03	0.116036E-01	0.116035E-01	0.	0.878394E-03	0.	0.101926E-04	0.	0.101924E-04
0.790000E	03	0.117103E-01	0.117101E-01	0.	0.895072E-03	0.	0.104815E-04	0.	0.104814E-04
0.775000E	03	0.118200E-01	0.118198E-01	0.	0.912396E-03	0.	0.107845E-04	0.	0.107844E-04
0.760000E	03	0.119328E-01	0.119327E-01	0.	0.930404E-03	0.	0.111024E-04	0.	0.111022E-04
0.745000E	03	0.120490E-01	0.120489E-01	0.	0.949137E-03	0.	0.114362E-04	0.	0.114360E-04
0.730000E	03	0.121688E-01	0.121686E-01	0.	0.968639E-03	0.	0.117871E-04	0.	0.117870E-04
0.715000E	03	0.122921E-01	0.122919E-01	0.	0.988961E-03	0.	0.121564E-04	0.	0.121563E-04
0.700000E	03	0.124194E-01	0.124192E-01	0.	0.101015E-02	0.	0.125455E-04	0.	0.125453E-04
0.685000E	03	0.125508E-01	0.125505E-01	0.	0.103227E-02	0.	0.129558E-04	0.	0.129556E-04
0.670000E	03	0.126864E-01	0.126862E-01	0.	0.105538E-02	0.	0.133890E-04	0.	0.133888E-04
0.655000E	03	0.128266E-01	0.128264E-01	0.	0.107955E-02	0.	0.138470E-04	0.	0.138467E-04
0.640000E	03	0.129716E-01	0.129714E-01	0.	0.110485E-02	0.	0.143318E-04	0.	0.143315E-04
0.625000E	03	0.131218E-01	0.131215E-01	0.	0.113137E-02	0.	0.148456E-04	0.	0.148452E-04
0.610000E	03	0.132773E-01	0.132770E-01	0.	0.115919E-02	0.	0.153909E-04	0.	0.153905E-04
0.595000E	03	0.134385E-01	0.134382E-01	0.	0.118841E-02	0.	0.159706E-04	0.	0.159702E-04
0.580000E	03	0.136059E-01	0.136055E-01	0.	0.121915E-02	0.	0.165876E-04	0.	0.165872E-04
0.565000E	03	0.137797E-01	0.137793E-01	0.	0.125152E-02	0.	0.172456E-04	0.	0.172451E-04
0.550000E	03	0.139605E-01	0.139601E-01	0.	0.128565E-02	0.	0.179483E-04	0.	0.179478E-04
0.535000E	03	0.141487E-01	0.141482E-01	0.	0.132169E-02	0.	0.187003E-04	0.	0.186996E-04
0.520000E	03	0.143448E-01	0.143443E-01	0.	0.135982E-02	0.	0.195064E-04	0.	0.195057E-04
0.505000E	03	0.145494E-01	0.145489E-01	0.	0.140021E-02	0.	0.203723E-04	0.	0.203715E-04
0.490000E	03	0.147632E-01	0.147626E-01	0.	0.144308E-02	0.	0.213043E-04	0.	0.213035E-04

0.475000E 03	0.149867E-01	0.149861E-01	0.	0.148865E-02	0.	0.223099E-04	0.	0.223090E-04
0.460000E 03	0.152210E-01	0.152202E-01	0.	0.153719E-02	0.	0.233975E-04	0.	0.233964E-04
0.445000E 03	0.154667E-01	0.154659E-01	0.	0.158900E-02	0.	0.245766E-04	0.	0.245753E-04
0.430000E 03	0.157248E-01	0.157240E-01	0.	0.164443E-02	0.	0.258585E-04	0.	0.258571E-04
0.415000E 03	0.159966E-01	0.159956E-01	0.	0.170387E-02	0.	0.272562E-04	0.	0.272545E-04
0.400000E 03	0.162832E-01	0.162821E-01	0.	0.176777E-02	0.	0.287849E-04	0.	0.287830E-04
0.385000E 03	0.165860E-01	0.165848E-01	0.	0.183664E-02	0.	0.304625E-04	0.	0.304603E-04
0.370000E 03	0.169066E-01	0.169053E-01	0.	0.191110E-02	0.	0.323102E-04	0.	0.323076E-04
0.355000E 03	0.172469E-01	0.172454E-01	0.	0.199185E-02	0.	0.343532E-04	0.	0.343502E-04
0.340000E 03	0.176089E-01	0.176072E-01	0.	0.207973E-02	0.	0.366217E-04	0.	0.366181E-04
0.325000E 03	0.179952E-01	0.179932E-01	0.	0.217571E-02	0.	0.391523E-04	0.	0.391480E-04
0.310000E 03	0.184084E-01	0.184061E-01	0.	0.228099E-02	0.	0.419894E-04	0.	0.419842E-04
0.295000E 03	0.188520E-01	0.188494E-01	0.	0.239697E-02	0.	0.451878E-04	0.	0.451815E-04
0.280000E 03	0.193299E-01	0.193269E-01	0.	0.252538E-02	0.	0.488155E-04	0.	0.488077E-04
0.265000E 03	0.198469E-01	0.198433E-01	0.	0.266833E-02	0.	0.529579E-04	0.	0.529483E-04
0.250000E 03	0.204084E-01	0.204041E-01	0.	0.282843E-02	0.	0.577237E-04	0.	0.577116E-04
0.246600E 03	0.205426E-01	0.205381E-01	0.	0.286742E-02	0.	0.589043E-04	0.	0.588916E-04
0.243200E 03	0.206795E-01	0.206749E-01	0.	0.290751E-02	0.	0.601258E-04	0.	0.601124E-04
0.239800E 03	0.208192E-01	0.208144E-01	0.	0.294874E-02	0.	0.613903E-04	0.	0.613761E-04
0.236400E 03	0.209619E-01	0.209568E-01	0.	0.299115E-02	0.	0.627000E-04	0.	0.626850E-04
0.233000E 03	0.211075E-01	0.211023E-01	0.	0.303479E-02	0.	0.640570E-04	0.	0.640411E-04
0.229600E 03	0.212563E-01	0.212509E-01	0.	0.307973E-02	0.	0.654639E-04	0.	0.654470E-04
0.226200E 03	0.214084E-01	0.214027E-01	0.	0.312602E-02	0.	0.669232E-04	0.	0.669054E-04
0.222800E 03	0.215638E-01	0.215579E-01	0.	0.317373E-02	0.	0.684378E-04	0.	0.684189E-04
0.219400E 03	0.217228E-01	0.217166E-01	0.	0.322291E-02	0.	0.700106E-04	0.	0.699905E-04
0.216000E 03	0.218854E-01	0.218788E-01	0.	0.327364E-02	0.	0.716449E-04	0.	0.716235E-04
0.212600E 03	0.220517E-01	0.220449E-01	0.	0.332600E-02	0.	0.733439E-04	0.	0.733212E-04
0.209200E 03	0.222220E-01	0.222148E-01	0.	0.338005E-02	0.	0.751115E-04	0.	0.750872E-04
0.205800E 03	0.223964E-01	0.223888E-01	0.	0.343589E-02	0.	0.769515E-04	0.	0.769256E-04
0.202400E 03	0.225750E-01	0.225671E-01	0.	0.349361E-02	0.	0.788681E-04	0.	0.788406E-04
0.199000E 03	0.227580E-01	0.227497E-01	0.	0.355330E-02	0.	0.808660E-04	0.	0.808365E-04
0.195600E 03	0.229457E-01	0.229369E-01	0.	0.361507E-02	0.	0.829501E-04	0.	0.829185E-04
0.192200E 03	0.231381E-01	0.231290E-01	0.	0.367902E-02	0.	0.851255E-04	0.	0.850918E-04
0.188800E 03	0.233356E-01	0.233260E-01	0.	0.374527E-02	0.	0.873982E-04	0.	0.873620E-04
0.185400E 03	0.235384E-01	0.235282E-01	0.	0.381395E-02	0.	0.897742E-04	0.	0.897354E-04
0.182000E 03	0.237466E-01	0.237359E-01	0.	0.388520E-02	0.	0.922604E-04	0.	0.922186E-04
0.178600E 03	0.239606E-01	0.239492E-01	0.	0.395916E-02	0.	0.948639E-04	0.	0.948189E-04
0.175200E 03	0.241806E-01	0.241686E-01	0.	0.403600E-02	0.	0.975928E-04	0.	0.975443E-04
0.171800E 03	0.244069E-01	0.243942E-01	0.	0.411587E-02	0.	0.100456E-03	0.	0.100403E-03
0.168400E 03	0.246398E-01	0.246263E-01	0.	0.419897E-02	0.	0.103462E-03	0.	0.103405E-03
0.165000E 03	0.248796E-01	0.248653E-01	0.	0.428550E-02	0.	0.106622E-03	0.	0.106560E-03
0.161600E 03	0.251268E-01	0.251116E-01	0.	0.437566E-02	0.	0.109946E-03	0.	0.109880E-03
0.158200E 03	0.253816E-01	0.253654E-01	0.	0.446970E-02	0.	0.113448E-03	0.	0.113376E-03
0.154800E 03	0.256445E-01	0.256273E-01	0.	0.456787E-02	0.	0.117141E-03	0.	0.117062E-03
0.151400E 03	0.259159E-01	0.258975E-01	0.	0.467045E-02	0.	0.121039E-03	0.	0.120953E-03
0.148000E 03	0.261964E-01	0.261768E-01	0.	0.477775E-02	0.	0.125160E-03	0.	0.125066E-03
0.144600E 03	0.264863E-01	0.264653E-01	0.	0.489009E-02	0.	0.129520E-03	0.	0.129418E-03
0.141200E 03	0.267864E-01	0.267638E-01	0.	0.500784E-02	0.	0.134142E-03	0.	0.134029E-03
0.137800E 03	0.270971E-01	0.270729E-01	0.	0.513140E-02	0.	0.139046E-03	0.	0.138922E-03
0.134400E 03	0.274191E-01	0.273931E-01	0.	0.526121E-02	0.	0.144258E-03	0.	0.144121E-03
0.131000E 03	0.277532E-01	0.277251E-01	0.	0.539776E-02	0.	0.149805E-03	0.	0.149654E-03
0.127600E 03	0.281000E-01	0.280698E-01	0.	0.554159E-02	0.	0.155719E-03	0.	0.155551E-03
0.124200E 03	0.284606E-01	0.284278E-01	0.	0.569329E-02	0.	0.162034E-03	0.	0.161848E-03
0.120800E 03	0.288357E-01	0.288002E-01	0.	0.585353E-02	0.	0.168791E-03	0.	0.168583E-03
0.117400E 03	0.292265E-01	0.291878E-01	0.	0.602306E-02	0.	0.176033E-03	0.	0.175800E-03
0.114000E 03	0.296339E-01	0.295919E-01	0.	0.620269E-02	0.	0.183810E-03	0.	0.183549E-03
0.110600E 03	0.300394E-01	0.300034E-01	0.	0.639337E-02	0.	0.192181E-03	0.	0.191887E-03
0.107200E 03	0.305042E-01	0.304539E-01	0.	0.659614E-02	0.	0.201210E-03	0.	0.200878E-03
0.103800E 03	0.309699E-01	0.309146E-01	0.	0.681220E-02	0.	0.210973E-03	0.	0.210596E-03
0.100400E 03	0.314582E-01	0.313972E-01	0.	0.704289E-02	0.	0.221557E-03	0.	0.221127E-03
0.970000E 02	0.319710E-01	0.319035E-01	0.	0.728976E-02	0.	0.233061E-03	0.	0.232569E-03
0.936000E 02	0.325104E-01	0.324355E-01	0.	0.755456E-02	0.	0.245601E-03	0.	0.245036E-03

0.902000E	02	0.337788E-01	0.329954E-01	0.	0.783932E-02	0.	0.259315E-03	0.	0.258661E-03
0.868000E	02	0.336790E-01	0.335857E-01	0.196882E-34	0.814639E-02	0.663079E-36	0.274362E-03	0.661241E-36	0.273602E-03
0.834000E	02	0.343141E-01	0.342092E-01	0.566831E-33	0.847850E-02	0.194503E-34	0.290932E-03	0.193908E-34	0.290042E-03
0.800000E	02	0.349876E-01	0.348691E-01	0.162925E-31	0.883883E-02	0.570034E-33	0.309250E-03	0.565103E-33	0.308202E-03
0.795000E	02	0.350902E-01	0.349694E-01	0.266938E-31	0.889442E-02	0.936691E-33	0.312107E-03	0.733467E-33	0.311033E-03
0.790000E	02	0.351936E-01	0.350706E-01	0.437339E-31	0.895072E-02	0.153915E-32	0.315008E-03	0.153377E-32	0.313907E-03
0.785000E	02	0.352980E-01	0.351727E-01	0.716486E-31	0.900773E-02	0.252906E-32	0.317955E-03	0.252008E-32	0.316826E-03
0.780000E	02	0.354034E-01	0.352757E-01	0.117376E-30	0.906547E-02	0.415552E-32	0.320949E-03	0.414053E-32	0.319791E-03
0.775000E	02	0.355097E-01	0.353796E-01	0.192280E-30	0.912396E-02	0.682782E-32	0.323989E-03	0.68280E-32	0.322802E-03
0.770000E	02	0.356171E-01	0.354845E-01	0.314971E-30	0.918320E-02	0.112183E-31	0.327079E-03	0.111766E-31	0.325861E-03
0.765000E	02	0.357254E-01	0.355903E-01	0.515927E-30	0.924323E-02	0.184317E-31	0.330218E-03	0.183620E-31	0.328969E-03
0.760000E	02	0.358348E-01	0.356970E-01	0.845061E-30	0.930404E-02	0.302826E-31	0.333408E-03	0.301661E-31	0.332126E-03
0.755000E	02	0.359452E-01	0.358047E-01	0.138410E-29	0.936565E-02	0.497519E-31	0.336650E-03	0.495574E-31	0.335335E-03
0.750000E	02	0.360567E-01	0.359134E-01	0.226689E-29	0.942809E-02	0.817364E-31	0.339946E-03	0.814117E-31	0.338595E-03
0.745000E	02	0.361692E-01	0.360231E-01	0.371255E-29	0.949137E-02	0.134280E-30	0.343295E-03	0.133738E-30	0.341909E-03
0.740000E	02	0.362828E-01	0.361338E-01	0.607988E-29	0.955505E-02	0.220595E-30	0.346700E-03	0.219689E-30	0.345277E-03
0.735000E	02	0.363976E-01	0.362456E-01	0.995630E-29	0.962050E-02	0.362385E-30	0.350163E-03	0.367872E-30	0.348701E-03
0.730000E	02	0.365134E-01	0.363584E-01	0.163035E-28	0.968639E-02	0.595297E-30	0.353684E-03	0.592768E-30	0.352181E-03
0.725000E	02	0.366304E-01	0.364722E-01	0.266958E-28	0.975320E-02	0.977879E-30	0.357264E-03	0.973655E-30	0.355721E-03
0.720000E	02	0.367486E-01	0.365872E-01	0.437104E-28	0.982093E-02	0.160630E-29	0.360906E-03	0.152924E-29	0.359320E-03
0.715000E	02	0.368680E-01	0.367032E-01	0.715658E-28	0.988961E-02	0.263849E-29	0.364610E-03	0.262669E-29	0.362980E-03
0.710000E	02	0.369886E-01	0.368203E-01	0.117167E-27	0.995925E-02	0.433384E-29	0.368378E-03	0.431413E-29	0.366703E-03
0.705000E	02	0.371104E-01	0.369386E-01	0.191815E-27	0.100299E-01	0.711833E-29	0.372213E-03	0.708539E-29	0.370490E-03
0.700000E	02	0.372334E-01	0.370580E-01	0.314007E-27	0.101015E-01	0.116915E-28	0.376114E-03	0.116365E-28	0.374343E-03
0.695000E	02	0.373577E-01	0.371786E-01	0.514012E-27	0.101742E-01	0.192023E-28	0.380085E-03	0.191103E-28	0.378262E-03
0.690000E	02	0.374833E-01	0.373004E-01	0.841366E-27	0.102479E-01	0.315372E-28	0.384126E-03	0.313832E-28	0.382251E-03
0.685000E	02	0.376102E-01	0.374234E-01	0.137713E-26	0.103227E-01	0.517940E-28	0.388240E-03	0.515367E-28	0.386311E-03
0.680000E	02	0.377385E-01	0.375475E-01	0.225392E-26	0.103986E-01	0.850596E-28	0.392428E-03	0.846293E-28	0.390443E-03
0.675000E	02	0.378681E-01	0.376730E-01	0.368877E-26	0.104757E-01	0.139687E-27	0.396693E-03	0.138967E-27	0.394649E-03
0.670000E	02	0.379991E-01	0.377997E-01	0.603670E-26	0.105538E-01	0.229389E-27	0.401036E-03	0.228185E-27	0.398931E-03
0.665000E	02	0.381315E-01	0.379276E-01	0.987856E-26	0.106332E-01	0.376684E-27	0.405459E-03	0.374670E-27	0.403292E-03
0.660000E	02	0.382654E-01	0.380569E-01	0.161645E-25	0.107137E-01	0.618542E-27	0.409965E-03	0.615173E-27	0.407732E-03
0.655000E	02	0.384007E-01	0.381875E-01	0.264489E-25	0.107955E-01	0.101566E-26	0.414555E-03	0.101002E-26	0.412254E-03
0.650000E	02	0.385375E-01	0.383195E-01	0.432740E-25	0.108786E-01	0.166767E-26	0.419232E-03	0.165824E-26	0.416861E-03
0.645000E	02	0.386758E-01	0.384528E-01	0.707979E-25	0.109629E-01	0.273817E-26	0.423999E-03	0.272238E-26	0.421554E-03
0.640000E	02	0.388157E-01	0.385875E-01	0.115821E-24	0.110485E-01	0.449568E-26	0.428856E-03	0.446925E-26	0.426336E-03
0.635000E	02	0.389571E-01	0.387237E-01	0.189465E-24	0.111355E-01	0.738101E-26	0.433808E-03	0.733678E-26	0.431209E-03
0.630000E	02	0.391001E-01	0.388612E-01	0.309915E-24	0.112239E-01	0.121177E-25	0.438857E-03	0.121437E-25	0.436175E-03
0.625000E	02	0.392448E-01	0.390002E-01	0.506909E-24	0.113137E-01	0.198935E-25	0.444004E-03	0.197696E-25	0.441237E-03
0.620000E	02	0.393912E-01	0.391408E-01	0.829065E-24	0.114049E-01	0.326579E-25	0.449254E-03	0.324503E-25	0.446398E-03
0.615000E	02	0.395392E-01	0.392828E-01	0.135587E-23	0.114977E-01	0.536102E-25	0.454609E-03	0.532625E-25	0.451661E-03
0.610000E	02	0.396890E-01	0.394264E-01	0.221128E-23	0.115919E-01	0.880019E-25	0.460072E-03	0.874195E-25	0.457027E-03
0.605000E	02	0.398406E-01	0.395715E-01	0.362572E-23	0.116877E-01	0.144451E-24	0.465645E-03	0.143475E-24	0.462500E-03
0.600000E	02	0.399939E-01	0.397182E-01	0.592840E-23	0.117851E-01	0.237100E-24	0.471333E-03	0.235465E-24	0.468084E-03
0.595000E	02	0.401491E-01	0.398666E-01	0.969282E-23	0.118841E-01	0.389159E-24	0.477138E-03	0.386420E-24	0.473780E-03
0.590000E	02	0.403062E-01	0.400166E-01	0.158465E-22	0.119849E-01	0.638712E-24	0.483065E-03	0.634121E-24	0.479593E-03
0.585000E	02	0.404652E-01	0.401682E-01	0.259050E-22	0.120873E-01	0.104825E-23	0.489115E-03	0.104056E-23	0.485525E-03
0.580000E	02	0.406262E-01	0.403216E-01	0.423451E-22	0.121915E-01	0.172032E-23	0.495294E-03	0.171742E-23	0.491581E-03
0.575000E	02	0.407892E-01	0.404767E-01	0.692134E-22	0.122975E-01	0.282316E-23	0.501605E-03	0.280153E-23	0.497763E-03
0.570000E	02	0.409542E-01	0.406336E-01	0.113121E-21	0.124054E-01	0.463279E-23	0.508052E-03	0.459653E-23	0.504075E-03
0.565000E	02	0.411212E-01	0.407923E-01	0.184869E-21	0.125152E-01	0.760206E-23	0.514639E-03	0.754125E-23	0.510522E-03
0.560000E	02	0.412905E-01	0.409528E-01	0.302101E-21	0.126269E-01	0.124739E-22	0.521371E-03	0.123719E-22	0.517107E-03
0.555000E	02	0.414619E-01	0.411152E-01	0.493633E-21	0.127407E-01	0.204669E-22	0.528251E-03	0.202958E-22	0.523835E-03
0.550000E	02	0.416355E-01	0.412795E-01	0.806515E-21	0.128565E-01	0.335803E-22	0.535286E-03	0.332932E-22	0.530709E-03
0.545000E	02	0.418114E-01	0.414457E-01	0.131766E-20	0.129744E-01	0.550930E-22	0.542479E-03	0.546111E-22	0.537734E-03
0.540000E	02	0.419896E-01	0.416138E-01	0.215252E-20	0.130946E-01	0.903833E-22	0.549835E-03	0.895745E-22	0.544915E-03
0.535000E	02	0.421702E-01	0.417840E-01	0.351604E-20	0.132169E-01	0.148272E-21	0.557361E-03	0.146914E-21	0.552257E-03
0.530000E	02	0.423532E-01	0.419562E-01	0.574280E-20	0.133416E-01	0.243226E-21	0.565060E-03	0.240946E-21	0.559764E-03
0.525000E	02	0.425387E-01	0.421305E-01	0.937895E-20	0.134687E-01	0.398968E-21	0.572940E-03	0.395140E-21	0.567443E-03
0.520000E	02	0.427267E-01	0.423069E-01	0.153160E-19	0.135982E-01	0.654402E-21	0.581007E-03	0.647972E-21	0.575298E-03
0.515000E	02	0.429173E-01	0.424854E-01	0.250090E-19	0.137302E-01	0.107332E-20	0.589265E-03	0.106252E-20	0.583335E-03
0.510000E	02	0.431106E-01	0.426661E-01	0.408326E-19	0.138648E-01	0.176032E-20	0.597722E-03	0.174217E-20	0.591559E-03

0.505000E	02	0.433067E-01	0.428491E-01	0.666615E-19	0.140021E-01	0.288689E-20	0.606385E-03	0.285639E-20	0.599978E-03
0.500000E	02	0.435055E-01	0.430343E-01	0.108818E-18	0.141421E-01	0.473418E-20	0.615261E-03	0.468291E-20	0.608597E-03
0.495000E	02	0.437072E-01	0.432219E-01	0.177617E-18	0.142850E-01	0.776312E-20	0.624356E-03	0.767692E-20	0.617424E-03
0.490000E	02	0.439118E-01	0.434118E-01	0.289882E-18	0.144308E-01	0.127292E-19	0.633680E-03	0.125843E-19	0.626465E-03
0.485000E	02	0.441194E-01	0.436041E-01	0.473058E-18	0.145795E-01	0.208710E-19	0.643239E-03	0.206273E-19	0.635727E-03
0.480000E	02	0.443301E-01	0.437988E-01	0.771900E-18	0.147314E-01	0.342184E-19	0.653044E-03	0.338083E-19	0.645218E-03
0.475000E	02	0.445439E-01	0.439961E-01	0.125939E-17	0.148865E-01	0.560982E-19	0.663101E-03	0.554083E-19	0.654946E-03
0.470000E	02	0.447610E-01	0.441958E-01	0.205453E-17	0.150448E-01	0.919627E-19	0.673421E-03	0.908016E-19	0.664918E-03
0.465000E	02	0.449814E-01	0.443981E-01	0.335131E-17	0.152066E-01	0.150747E-18	0.684014E-03	0.148792E-18	0.675145E-03
0.460000E	02	0.452052E-01	0.446031E-01	0.546596E-17	0.153719E-01	0.247090E-18	0.694889E-03	0.243799E-18	0.685634E-03
0.455000E	02	0.454325E-01	0.448107E-01	0.891389E-17	0.155408E-01	0.404980E-18	0.706057E-03	0.399438E-18	0.696395E-03
0.450000E	02	0.456633E-01	0.450210E-01	0.145350E-16	0.157135E-01	0.663718E-18	0.717530E-03	0.654382E-18	0.707438E-03
0.445000E	02	0.458979E-01	0.452342E-01	0.236979E-16	0.158900E-01	0.108769E-17	0.729320E-03	0.107196E-17	0.718772E-03
0.440000E	02	0.461363E-01	0.454501E-01	0.386323E-16	0.160706E-01	0.178235E-17	0.741438E-03	0.175584E-17	0.730410E-03
0.435000E	02	0.463785E-01	0.456688E-01	0.629701E-16	0.162553E-01	0.292046E-17	0.753897E-03	0.287577E-17	0.742362E-03
0.430000E	02	0.466247E-01	0.458905E-01	0.102627E-15	0.164443E-01	0.478495E-17	0.766713E-03	0.471960E-17	0.754639E-03
0.425000E	02	0.468751E-01	0.461151E-01	0.167235E-15	0.166378E-01	0.783918E-17	0.779898E-03	0.771209E-17	0.767255E-03
0.420000E	02	0.471296E-01	0.463428E-01	0.272481E-15	0.168359E-01	0.128419E-16	0.793469E-03	0.126275E-16	0.780221E-03
0.415000E	02	0.473885E-01	0.465735E-01	0.443897E-15	0.170387E-01	0.210356E-16	0.807440E-03	0.206738E-16	0.793552E-03
0.410000E	02	0.476519E-01	0.468073E-01	0.723045E-15	0.172465E-01	0.344545E-16	0.821829E-03	0.338438E-16	0.807262E-03
0.405000E	02	0.479199E-01	0.470442E-01	0.117756E-14	0.174594E-01	0.564287E-16	0.836654E-03	0.553975E-16	0.821365E-03
0.400000E	02	0.481927E-01	0.472844E-01	0.191750E-14	0.176777E-01	0.924095E-16	0.851934E-03	0.906679E-16	0.835875E-03
0.395000E	02	0.484703E-01	0.475277E-01	0.312191E-14	0.179014E-01	0.151320E-15	0.867688E-03	0.148377E-15	0.850815E-03
0.390000E	02	0.487530E-01	0.477744E-01	0.508200E-14	0.181309E-01	0.247763E-15	0.883938E-03	0.242790E-15	0.866195E-03
0.385000E	02	0.490408E-01	0.480244E-01	0.827138E-14	0.183664E-01	0.405636E-15	0.900704E-03	0.397228E-15	0.882036E-03
0.380000E	02	0.493341E-01	0.482778E-01	0.134601E-13	0.186081E-01	0.664042E-15	0.918012E-03	0.649824E-15	0.898357E-03
0.375000E	02	0.496328E-01	0.485346E-01	0.219000E-13	0.188562E-01	0.108696E-14	0.935885E-03	0.106290E-14	0.915177E-03
0.370000E	02	0.499373E-01	0.487948E-01	0.356255E-13	0.191110E-01	0.177904E-14	0.954351E-03	0.173834E-14	0.932517E-03
0.365000E	02	0.502476E-01	0.490585E-01	0.579428E-13	0.193728E-01	0.291149E-14	0.973437E-03	0.284259E-14	0.950400E-03
0.360000E	02	0.505641E-01	0.493257E-01	0.942228E-13	0.196419E-01	0.476429E-14	0.993173E-03	0.464761E-14	0.968848E-03
0.355000E	02	0.508868E-01	0.495964E-01	0.153190E-12	0.199185E-01	0.779533E-14	0.101359E-02	0.759766E-14	0.987886E-03
0.350000E	02	0.512161E-01	0.498707E-01	0.249010E-12	0.202031E-01	0.127533E-13	0.103472E-02	0.124183E-13	0.100754E-02
0.345000E	02	0.515521E-01	0.501485E-01	0.404683E-12	0.204958E-01	0.208622E-13	0.105660E-02	0.202942E-13	0.102784E-02
0.340000E	02	0.518950E-01	0.504299E-01	0.657539E-12	0.207973E-01	0.341230E-13	0.107927E-02	0.331596E-13	0.104880E-02
0.335000E	02	0.522452E-01	0.507148E-01	0.106816E-11	0.211077E-01	0.558360E-13	0.110277E-02	0.541714E-13	0.107047E-02
0.330000E	02	0.526628E-01	0.510033E-01	0.173481E-11	0.214275E-01	0.912557E-13	0.112715E-02	0.884809E-13	0.109287E-02
0.325000E	02	0.529682E-01	0.512953E-01	0.281688E-11	0.217571E-01	0.149205E-12	0.115244E-02	0.144492E-12	0.111604E-02
0.320000E	02	0.533417E-01	0.515907E-01	0.457279E-11	0.220971E-01	0.243920E-12	0.117870E-02	0.235914E-12	0.114000E-02
0.315000E	02	0.537235E-01	0.518896E-01	0.742146E-11	0.224478E-01	0.398707E-12	0.120598E-02	0.385096E-12	0.116481E-02
0.310000E	02	0.541139E-01	0.521917E-01	0.120417E-10	0.228099E-01	0.651623E-12	0.123433E-02	0.628477E-12	0.119049E-02
0.305000E	02	0.545134E-01	0.524971E-01	0.195332E-10	0.231838E-01	0.106482E-11	0.126383E-02	0.102544E-11	0.121708E-02
0.300000E	02	0.549222E-01	0.528057E-01	0.316768E-10	0.235702E-01	0.173976E-11	0.129453E-02	0.167272E-11	0.124464E-02
0.298000E	02	0.550884E-01	0.529299E-01	0.384322E-10	0.237284E-01	0.211717E-11	0.130716E-02	0.203421E-11	0.125594E-02
0.296000E	02	0.552562E-01	0.530546E-01	0.466262E-10	0.238887E-01	0.257639E-11	0.132000E-02	0.247374E-11	0.126741E-02
0.294000E	02	0.554256E-01	0.531798E-01	0.565646E-10	0.240512E-01	0.313513E-11	0.133306E-02	0.307809E-11	0.127904E-02
0.292000E	02	0.555967E-01	0.533054E-01	0.686181E-10	0.242160E-01	0.381494E-11	0.134633E-02	0.365771E-11	0.129084E-02
0.290000E	02	0.557644E-01	0.534314E-01	0.832363E-10	0.243830E-01	0.464204E-11	0.135982E-02	0.444743E-11	0.130282E-02
0.288000E	02	0.559438E-01	0.535579E-01	0.100964E-09	0.245523E-01	0.564830E-11	0.137355E-02	0.547741E-11	0.131497E-02
0.286000E	02	0.561199E-01	0.536847E-01	0.122461E-09	0.247240E-01	0.687251E-11	0.138751E-02	0.657429E-11	0.132730E-02
0.284000E	02	0.562978E-01	0.538119E-01	0.148528E-09	0.248981E-01	0.836182E-11	0.140171E-02	0.799260E-11	0.133982E-02
0.282000E	02	0.564774E-01	0.539395E-01	0.180135E-09	0.250747E-01	0.101736E-10	0.141616E-02	0.971641E-11	0.135252E-02
0.280000E	02	0.566589E-01	0.540674E-01	0.218457E-09	0.252538E-01	0.123776E-10	0.143085E-02	0.118114E-10	0.136541E-02
0.278000E	02	0.568422E-01	0.541956E-01	0.264919E-09	0.254355E-01	0.150585E-10	0.144581E-02	0.143574E-10	0.137849E-02
0.276000E	02	0.570273E-01	0.543241E-01	0.321244E-09	0.256198E-01	0.183197E-10	0.146103E-02	0.174513E-10	0.139177E-02
0.274000E	02	0.572144E-01	0.544530E-01	0.389525E-09	0.258068E-01	0.222865E-10	0.147652E-02	0.212108E-10	0.140526E-02
0.272000E	02	0.574034E-01	0.545820E-01	0.472295E-09	0.259966E-01	0.271113E-10	0.149229E-02	0.257788E-10	0.141894E-02
0.270000E	02	0.575943E-01	0.547113E-01	0.572260E-09	0.261891E-01	0.329797E-10	0.150835E-02	0.313288E-10	0.143284E-02
0.268000E	02	0.577873E-01	0.548408E-01	0.694219E-09	0.263846E-01	0.401170E-10	0.152469E-02	0.387715E-10	0.144695E-02
0.266000E	02	0.579823E-01	0.549704E-01	0.841593E-09	0.265830E-01	0.487975E-10	0.154134E-02	0.462627E-10	0.146128E-02
0.264000E	02	0.581793E-01	0.551001E-01	0.102019E-08	0.267843E-01	0.593543E-10	0.155830E-02	0.562129E-10	0.147582E-02
0.262000E	02	0.583785E-01	0.552300E-01	0.123663E-08	0.269888E-01	0.721926E-10	0.157557E-02	0.682990E-10	0.149059E-02
0.260000E	02	0.585799E-01	0.553599E-01	0.149889E-08	0.271964E-01	0.878049E-10	0.159316E-02	0.829785E-10	0.150559E-02

0.258000E	02	0.587834E-01	0.554898E-01	0.181667E-08	0.274072E-01	0.106790E-09	0.161109E-02	0.10 807E-09	0.152082E-02
0.256000E	02	0.589892E-01	0.556197E-01	0.220168E-08	0.276214E-01	0.129875E-09	0.162936E-02	0.122457E-09	0.153629E-02
0.254000E	02	0.591972E-01	0.557496E-01	0.266813E-08	0.278388E-01	0.157946E-09	0.164798E-02	0.148747E-09	0.155209E-02
0.252000E	02	0.594075E-01	0.558793E-01	0.323320E-08	0.280598E-01	0.192077E-09	0.166696E-02	0.187669E-09	0.156796E-02
0.250000E	02	0.596202E-01	0.560088E-01	0.391770E-08	0.282843E-01	0.233574E-09	0.168631E-02	0.219426E-09	0.158417E-02
0.248000E	02	0.598354E-01	0.561382E-01	0.474681E-08	0.285124E-01	0.284027E-09	0.170605E-02	0.266477E-09	0.160063E-02
0.246000E	02	0.600529E-01	0.562670E-01	0.575100E-08	0.287442E-01	0.345365E-09	0.172617E-02	0.323592E-09	0.161735E-02
0.244000E	02	0.602730E-01	0.563957E-01	0.696718E-08	0.289798E-01	0.419933E-09	0.174670E-02	0.392919E-09	0.163434E-02
0.242000E	02	0.604956E-01	0.565240E-01	0.843998E-08	0.292193E-01	0.510582E-09	0.176764E-02	0.477062E-09	0.165159E-02
0.240000E	02	0.607208E-01	0.566519E-01	0.102234E-07	0.294628E-01	0.620775E-09	0.178900E-02	0.579176E-09	0.166912E-02
0.238000E	02	0.609487E-01	0.567791E-01	0.123829E-07	0.297104E-01	0.754719E-09	0.181081E-02	0.703088E-09	0.168693E-02
0.236000E	02	0.611793E-01	0.569058E-01	0.149974E-07	0.299621E-01	0.917527E-09	0.183306E-02	0.854436E-09	0.170502E-02
0.234000E	02	0.614126E-01	0.570317E-01	0.181626E-07	0.302182E-01	0.111541E-08	0.185578E-02	0.103584E-08	0.172340E-02
0.232000E	02	0.616487E-01	0.571568E-01	0.219942E-07	0.304787E-01	0.135592E-08	0.187898E-02	0.125712E-08	0.174207E-02
0.230000E	02	0.618878E-01	0.572810E-01	0.266322E-07	0.307438E-01	0.164821E-08	0.190266E-02	0.152552E-08	0.176103E-02
0.228000E	02	0.621297E-01	0.574043E-01	0.322458E-07	0.310134E-01	0.200342E-08	0.192686E-02	0.185105E-08	0.178031E-02
0.226000E	02	0.623747E-01	0.575265E-01	0.390396E-07	0.312879E-01	0.243508E-08	0.195157E-02	0.224581E-08	0.179988E-02
0.224000E	02	0.626227E-01	0.576474E-01	0.472611E-07	0.315673E-01	0.295961E-08	0.197683E-02	0.272448E-08	0.181977E-02
0.222000E	02	0.628738E-01	0.577670E-01	0.572094E-07	0.318516E-01	0.359697E-08	0.200263E-02	0.331482E-08	0.183997E-02
0.220000E	02	0.631281E-01	0.578852E-01	0.692462E-07	0.321412E-01	0.437138E-08	0.202901E-02	0.40 833E-08	0.186050E-02
0.218000E	02	0.633857E-01	0.580017E-01	0.838086E-07	0.324361E-01	0.531227E-08	0.205598E-02	0.486104E-08	0.188135E-02
0.216000E	02	0.636466E-01	0.581165E-01	0.101425E-06	0.327364E-01	0.645535E-08	0.208356E-02	0.589446E-08	0.190253E-02
0.214000E	02	0.639109E-01	0.582295E-01	0.122734E-06	0.330424E-01	0.784402E-08	0.211177E-02	0.714671E-08	0.192404E-02
0.212000E	02	0.641787E-01	0.583403E-01	0.148506E-06	0.333541E-01	0.953093E-08	0.214062E-02	0.866389E-08	0.194589E-02
0.210000E	02	0.644501E-01	0.584490E-01	0.179675E-06	0.336717E-01	0.115800E-07	0.217015E-02	0.105018E-07	0.196808E-02
0.208000E	02	0.647251E-01	0.585552E-01	0.217365E-06	0.339955E-01	0.140690E-07	0.220036E-02	0.127278E-07	0.199061E-02
0.206000E	02	0.650038E-01	0.586588E-01	0.262937E-06	0.343256E-01	0.170919E-07	0.223129E-02	0.154236E-07	0.201350E-02
0.204000E	02	0.652863E-01	0.587596E-01	0.318034E-06	0.346621E-01	0.207633E-07	0.226296E-02	0.186876E-07	0.203673E-02
0.202000E	02	0.655728E-01	0.588573E-01	0.384640E-06	0.350053E-01	0.252219E-07	0.229539E-02	0.226389E-07	0.206032E-02
0.200000E	02	0.658632E-01	0.589518E-01	0.465148E-06	0.353553E-01	0.306362E-07	0.232861E-02	0.274213E-07	0.208426E-02
0.198000E	02	0.661577E-01	0.590427E-01	0.562452E-06	0.357124E-01	0.372105E-07	0.236265E-02	0.332087E-07	0.210856E-02
0.196000E	02	0.664564E-01	0.591298E-01	0.680041E-06	0.360769E-01	0.451931E-07	0.239754E-02	0.402107E-07	0.213322E-02
0.194000E	02	0.667594E-01	0.592129E-01	0.822128E-06	0.364488E-01	0.548848E-07	0.243330E-02	0.486806E-07	0.215842E-02
0.192000E	02	0.670668E-01	0.592915E-01	0.993798E-06	0.368285E-01	0.666508E-07	0.246997E-02	0.589238E-07	0.218362E-02
0.190000E	02	0.673787E-01	0.593654E-01	0.120118E-05	0.372161E-01	0.809341E-07	0.250757E-02	0.713087E-07	0.220935E-02
0.188000E	02	0.676952E-01	0.594343E-01	0.145168E-05	0.376120E-01	0.982720E-07	0.254615E-02	0.862798E-07	0.223444E-02
0.186000E	02	0.680164E-01	0.594977E-01	0.175423E-05	0.380165E-01	0.119316E-06	0.258574E-02	0.104372E-06	0.226189E-02
0.184000E	02	0.683425E-01	0.595552E-01	0.211958E-05	0.384297E-01	0.144857E-06	0.262638E-02	0.126232E-06	0.228869E-02
0.182000E	02	0.686736E-01	0.596065E-01	0.256072E-05	0.388520E-01	0.175854E-06	0.266810E-02	0.152636E-06	0.231583E-02
0.180000E	02	0.690097E-01	0.596511E-01	0.309330E-05	0.392837E-01	0.213468E-06	0.271096E-02	0.184519E-06	0.234331E-02
0.178000E	02	0.693511E-01	0.596884E-01	0.373619E-05	0.397251E-01	0.259109E-06	0.275498E-02	0.223007E-06	0.237113E-02
0.176000E	02	0.696980E-01	0.597181E-01	0.451211E-05	0.401765E-01	0.314485E-06	0.280022E-02	0.269455E-06	0.239926E-02
0.174000E	02	0.700503E-01	0.597395E-01	0.544848E-05	0.406383E-01	0.381668E-06	0.284672E-02	0.325489E-06	0.242771E-02
0.172000E	02	0.704083E-01	0.597520E-01	0.657830E-05	0.411108E-01	0.463167E-06	0.289454E-02	0.393066E-06	0.245646E-02
0.170000E	02	0.707721E-01	0.597551E-01	0.794132E-05	0.415945E-01	0.562024E-06	0.294373E-02	0.474534E-06	0.248548E-02
0.168000E	02	0.711420E-01	0.597480E-01	0.958544E-05	0.420897E-01	0.681927E-06	0.299434E-02	0.572711E-06	0.251477E-02
0.166000E	02	0.715180E-01	0.597301E-01	0.115683E-04	0.425968E-01	0.827342E-06	0.304644E-02	0.690976E-06	0.254431E-02
0.164000E	02	0.719004E-01	0.597005E-01	0.139593E-04	0.431162E-01	0.100368E-05	0.310008E-02	0.833378E-06	0.257406E-02
0.162000E	02	0.722894E-01	0.596585E-01	0.168420E-04	0.436485E-01	0.121750E-05	0.315532E-02	0.107477E-05	0.260401E-02
0.160000E	02	0.726850E-01	0.596032E-01	0.203169E-04	0.441941E-01	0.147674E-05	0.321225E-02	0.121095E-05	0.263411E-02
0.158000E	02	0.730876E-01	0.595335E-01	0.245050E-04	0.447536E-01	0.179101E-05	0.327093E-02	0.145887E-05	0.266434E-02
0.156000E	02	0.734973E-01	0.594487E-01	0.295515E-04	0.453273E-01	0.217196E-05	0.333143E-02	0.175680E-05	0.269465E-02
0.154000E	02	0.739143E-01	0.593474E-01	0.356316E-04	0.459160E-01	0.263369E-05	0.339385E-02	0.211464E-05	0.272499E-02
0.152000E	02	0.743390E-01	0.592287E-01	0.429553E-04	0.465201E-01	0.319325E-05	0.345826E-02	0.254419E-05	0.275533E-02
0.150000E	02	0.747714E-01	0.590912E-01	0.517754E-04	0.471404E-01	0.387132E-05	0.352476E-02	0.305947E-05	0.278558E-02
0.148000E	02	0.752118E-01	0.589338E-01	0.623954E-04	0.477774E-01	0.469287E-05	0.359343E-02	0.367720E-05	0.281571E-02
0.146000E	02	0.756607E-01	0.587549E-01	0.751801E-04	0.484319E-01	0.568817E-05	0.366439E-02	0.441720E-05	0.284561E-02
0.144000E	02	0.761181E-01	0.585530E-01	0.905673E-04	0.491046E-01	0.689381E-05	0.373775E-02	0.537298E-05	0.287522E-02
0.142000E	02	0.765844E-01	0.583264E-01	0.109083E-03	0.497962E-01	0.835404E-05	0.381361E-02	0.636241E-05	0.290443E-02
0.140000E	02	0.770599E-01	0.580736E-01	0.131357E-03	0.505076E-01	0.101224E-04	0.389211E-02	0.762840E-05	0.293316E-02
0.138000E	02	0.775449E-01	0.577926E-01	0.158148E-03	0.512396E-01	0.122636E-04	0.397337E-02	0.913980E-05	0.296127E-02
0.136000E	02	0.780396E-01	0.574815E-01	0.190363E-03	0.519931E-01	0.148559E-04	0.405752E-02	0.107424E-04	0.298864E-02

0.134000E	02	0.785446E-01	0.571380E-01	0.229091E-03	0.527691E-01	0.179939E-04	0.414473E-02	0.13 898E-04	0.301512E-02
0.132000E	02	0.790600E-01	0.567601E-01	0.275636E-03	0.535686E-01	0.217918E-04	0.423514E-02	0.156451E-04	0.304056E-02
0.130000E	02	0.795864E-01	0.563452E-01	0.331562E-03	0.543928E-01	0.263878E-04	0.432892E-02	0.186819E-04	0.306477E-02
0.128000E	02	0.801240E-01	0.558908E-01	0.398740E-03	0.552427E-01	0.319487E-04	0.442626E-02	0.222859E-04	0.308755E-02
0.126000E	02	0.806734E-01	0.553941E-01	0.479412E-03	0.561195E-01	0.386758E-04	0.452735E-02	0.265566E-04	0.310869E-02
0.124000E	02	0.812348E-01	0.548522E-01	0.576261E-03	0.570247E-01	0.468125E-04	0.463239E-02	0.316092E-04	0.312793E-02
0.122000E	02	0.818089E-01	0.542638E-01	0.692494E-03	0.579595E-01	0.566522E-04	0.474161E-02	0.375774E-04	0.314510E-02
0.120000E	02	0.823961E-01	0.536224E-01	0.831949E-03	0.589255E-01	0.685494E-04	0.485523E-02	0.446111E-04	0.315973E-02
0.118000E	02	0.829970E-01	0.529262E-01	0.999209E-03	0.599242E-01	0.829313E-04	0.497353E-02	0.528843E-04	0.317156E-02
0.116000E	02	0.836120E-01	0.521713E-01	0.119975E-02	0.609574E-01	0.100314E-03	0.509677E-02	0.625926E-04	0.318023E-02
0.114000E	02	0.842417E-01	0.513541E-01	0.144011E-02	0.620268E-01	0.121318E-03	0.522524E-02	0.739558E-04	0.318533E-02
0.112000E	02	0.848868E-01	0.504706E-01	0.172810E-02	0.631344E-01	0.146693E-03	0.535928E-02	0.872182E-04	0.318643E-02
0.110000E	02	0.855479E-01	0.495166E-01	0.207301E-02	0.642823E-01	0.177342E-03	0.549922E-02	0.102649E-03	0.318304E-02
0.108000E	02	0.862257E-01	0.484880E-01	0.248595E-02	0.654728E-01	0.214353E-03	0.564543E-02	0.12 539E-03	0.317464E-02
0.106000E	02	0.869208E-01	0.473785E-01	0.298012E-02	0.667081E-01	0.259034E-03	0.579832E-02	0.141194E-03	0.316053E-02
0.104000E	02	0.876343E-01	0.461869E-01	0.357125E-02	0.679909E-01	0.312963E-03	0.595834E-02	0.164945E-03	0.314029E-02
0.102000E	02	0.883667E-01	0.449074E-01	0.427805E-02	0.693211E-01	0.378037E-03	0.612594E-02	0.192116E-03	0.311316E-02
0.100000E	02	0.891191E-01	0.435358E-01	0.512283E-02	0.707107E-01	0.456542E-03	0.630176E-02	0.223027E-03	0.307845E-02
0.990000E	01	0.895030E-01	0.428143E-01	0.566499E-02	0.714249E-01	0.501664E-03	0.639275E-02	0.239974E-03	0.305801E-02
0.980000E	01	0.898923E-01	0.420685E-01	0.613190E-02	0.721538E-01	0.551211E-03	0.648607E-02	0.257960E-03	0.303540E-02
0.970000E	01	0.902870E-01	0.412977E-01	0.670765E-02	0.728976E-01	0.605614E-03	0.658171E-02	0.277010E-03	0.301050E-02
0.960000E	01	0.906874E-01	0.404964E-01	0.733667E-02	0.736570E-01	0.665343E-03	0.667976E-02	0.297109E-03	0.298284E-02
0.950000E	01	0.910934E-01	0.396736E-01	0.802381E-02	0.744323E-01	0.730917E-03	0.678029E-02	0.318334E-03	0.295300E-02
0.940000E	01	0.915054E-01	0.388247E-01	0.877434E-02	0.752241E-01	0.802899E-03	0.688341E-02	0.340661E-03	0.292055E-02
0.930000E	01	0.919233E-01	0.379494E-01	0.959398E-02	0.760330E-01	0.881911E-03	0.698920E-02	0.364086E-03	0.288540E-02
0.920000E	01	0.923474E-01	0.370474E-01	0.104890E-01	0.768594E-01	0.968630E-03	0.709777E-02	0.388590E-03	0.284744E-02
0.910000E	01	0.927779E-01	0.361186E-01	0.114661E-01	0.777040E-01	0.106380E-02	0.720921E-02	0.414140E-03	0.280656E-02
0.900000E	01	0.932148E-01	0.351629E-01	0.125328E-01	0.785674E-01	0.116824E-02	0.732365E-02	0.44 689E-03	0.276266E-02
0.890000E	01	0.936584E-01	0.341863E-01	0.136969E-01	0.794502E-01	0.128283E-02	0.744118E-02	0.468248E-03	0.271611E-02
0.880000E	01	0.941088E-01	0.331789E-01	0.149674E-01	0.803530E-01	0.140856E-02	0.756193E-02	0.496601E-03	0.266602E-02
0.870000E	01	0.945663E-01	0.321454E-01	0.163535E-01	0.812766E-01	0.154649E-02	0.768603E-02	0.525690E-03	0.261267E-02
0.860000E	01	0.950309E-01	0.310863E-01	0.178657E-01	0.822217E-01	0.169780E-02	0.781361E-02	0.555379E-03	0.255597E-02
0.850000E	01	0.955030E-01	0.300022E-01	0.195151E-01	0.831890E-01	0.186375E-02	0.794480E-02	0.585496E-03	0.249586E-02
0.840000E	01	0.959826E-01	0.288940E-01	0.213138E-01	0.841794E-01	0.204575E-02	0.807976E-02	0.615840E-03	0.243228E-02
0.830000E	01	0.964701E-01	0.277753E-01	0.232749E-01	0.851936E-01	0.224533E-02	0.821863E-02	0.646468E-03	0.236628E-02
0.820000E	01	0.969656E-01	0.266264E-01	0.254129E-01	0.862325E-01	0.246417E-02	0.836159E-02	0.676654E-03	0.229607E-02
0.810000E	01	0.974694E-01	0.254587E-01	0.277430E-01	0.872971E-01	0.270410E-02	0.850880E-02	0.706301E-03	0.222247E-02
0.800000E	01	0.979817E-01	0.242641E-01	0.302823E-01	0.883883E-01	0.296711E-02	0.866044E-02	0.734773E-03	0.214467E-02
0.790000E	01	0.985027E-01	0.230612E-01	0.332487E-01	0.895072E-01	0.325539E-02	0.881670E-02	0.762144E-03	0.206414E-02
0.780000E	01	0.990327E-01	0.218456E-01	0.360622E-01	0.906547E-01	0.357134E-02	0.897778E-02	0.787801E-03	0.198041E-02
0.770000E	01	0.995721E-01	0.206205E-01	0.393439E-01	0.918320E-01	0.391755E-02	0.914390E-02	0.811292E-03	0.189362E-02
0.760000E	01	0.100121E-00	0.193736E-01	0.429170E-01	0.930403E-01	0.429689E-02	0.931528E-02	0.831459E-03	0.180253E-02
0.750000E	01	0.100680E-00	0.181328E-01	0.468066E-01	0.942809E-01	0.471247E-02	0.949217E-02	0.848733E-03	0.170957E-02
0.740000E	01	0.101249E-00	0.169037E-01	0.510395E-01	0.955549E-01	0.516768E-02	0.967480E-02	0.862759E-03	0.161524E-02
0.730000E	01	0.101828E-00	0.156718E-01	0.556452E-01	0.968639E-01	0.566623E-02	0.986345E-02	0.872058E-03	0.151803E-02
0.720000E	01	0.102418E-00	0.144499E-01	0.606550E-01	0.982092E-01	0.621217E-02	0.100584E-01	0.876457E-03	0.141911E-02
0.710000E	01	0.103019E-00	0.132433E-01	0.661031E-01	0.995925E-01	0.680990E-02	0.102600E-01	0.875425E-03	0.131894E-02
0.700000E	01	0.103632E-00	0.120578E-01	0.720263E-01	0.101015E-00	0.746425E-02	0.104684E-01	0.869479E-03	0.121802E-02
0.690000E	01	0.104257E-00	0.108993E-01	0.784642E-01	0.102479E-00	0.818045E-02	0.106842E-01	0.855206E-03	0.111695E-02
0.680000E	01	0.104894E-00	0.977413E-02	0.854595E-01	0.103986E-00	0.896421E-02	0.109076E-01	0.835293E-03	0.101638E-02
0.670000E	01	0.105544E-00	0.868870E-02	0.930585E-01	0.105538E-00	0.982177E-02	0.111389E-01	0.808557E-03	0.916991E-03
0.660000E	01	0.106207E-00	0.764954E-02	0.101311E-00	0.107137E-00	0.107599E-01	0.113787E-01	0.774979E-03	0.819552E-03
0.650000E	01	0.106884E-00	0.666309E-02	0.112269E-00	0.108786E-00	0.117860E-01	0.116274E-01	0.734732E-03	0.724848E-03
0.640000E	01	0.107574E-00	0.573556E-02	0.119991E-00	0.110485E-00	0.129080E-01	0.118854E-01	0.688217E-03	0.633696E-03
0.630000E	01	0.108280E-00	0.487272E-02	0.130539E-00	0.112239E-00	0.141347E-01	0.121532E-01	0.636079E-03	0.546910E-03
0.620000E	01	0.109001E-00	0.407962E-02	0.141978E-00	0.114049E-00	0.154756E-01	0.124314E-01	0.579215E-03	0.465279E-03
0.610000E	01	0.109737E-00	0.336046E-02	0.154379E-00	0.115919E-00	0.169410E-01	0.127206E-01	0.518784E-03	0.389542E-03
0.600000E	01	0.110490E-00	0.271822E-02	0.167818E-00	0.117851E-00	0.185421E-01	0.130213E-01	0.456165E-03	0.320345E-03
0.590000E	01	0.111259E-00	0.215447E-02	0.182376E-00	0.119849E-00	0.202911E-01	0.133343E-01	0.392924E-03	0.258210E-03
0.580000E	01	0.112047E-00	0.166920E-02	0.198141E-00	0.121915E-00	0.222010E-01	0.136601E-01	0.33 736E-03	0.203500E-03
0.570000E	01	0.112852E-00	0.126063E-02	0.215204E-00	0.124054E-00	0.242863E-01	0.139997E-01	0.271293E-03	0.156386E-03
0.560000E	01	0.113677E-00	0.925162E-03	0.233665E-00	0.126269E-00	0.265623E-01	0.143539E-01	0.216178E-03	0.116819E-03

0.550000E	01	0.114522E-00	0.657442E-03	0.253628E-00	0.128565E-00	0.290459E-01	0.147235E-01	0.166746E-03	0.845239E-04
0.540000E	01	0.115387E-00	0.450589E-03	0.275206E-00	0.130946E-00	0.317552E-01	0.151094E-01	0.124005E-03	0.590027E-04
0.530000E	01	0.116274E-00	0.296527E-03	0.298517E-00	0.133416E-00	0.347098E-01	0.155129E-01	0.885182E-04	0.395615E-04
0.520000E	01	0.117184E-00	0.186452E-03	0.323688E-00	0.135982E-00	0.379309E-01	0.159349E-01	0.603522E-04	0.253541E-04
0.510000E	01	0.118117E-00	0.111419E-03	0.353851E-00	0.138648E-00	0.414413E-01	0.163767E-01	0.397915E-04	0.154481E-04
0.500000E	01	0.119074E-00	0.629149E-04	0.380148E-00	0.141421E-00	0.452659E-01	0.168397E-01	0.239170E-04	0.889750E-05
0.495000E	01	0.119563E-00	0.461986E-04	0.395642E-00	0.	0.473041E-01	0.	0.182781E-04	0.
0.490000E	01	0.120058E-00	0.333730E-04	0.411726E-00	0.	0.494310E-01	0.	0.137405E-04	0.
0.485000E	01	0.120560E-00	0.236988E-04	0.428419E-00	0.	0.516500E-01	0.	0.101530E-04	0.
0.480000E	01	0.121068E-00	0.165325E-04	0.445741E-00	0.	0.539652E-01	0.	0.736921E-05	0.
0.475000E	01	0.121584E-00	0.113226E-04	0.463714E-00	0.	0.563802E-01	0.	0.525045E-05	0.
0.470000E	01	0.122107E-00	0.760873E-05	0.482357E-00	0.	0.588992E-01	0.	0.367013E-05	0.
0.465000E	01	0.122638E-00	0.501426E-05	0.501694E-00	0.	0.615264E-01	0.	0.251562E-05	0.
0.460000E	01	0.123175E-00	0.324027E-05	0.521745E-00	0.	0.642662E-01	0.	0.169060E-05	0.
0.455000E	01	0.123721E-00	0.205253E-05	0.542533E-00	0.	0.671229E-01	0.	0.111356E-05	0.
0.450000E	01	0.124275E-00	0.127477E-05	0.564082E-00	0.	0.701013E-01	0.	0.719072E-06	0.
0.445000E	01	0.124837E-00	0.776545E-06	0.586414E-00	0.	0.732061E-01	0.	0.455377E-06	0.
0.440000E	01	0.125407E-00	0.464293E-06	0.609553E-00	0.	0.764424E-01	0.	0.283012E-06	0.
0.435000E	01	0.125986E-00	0.272787E-06	0.633524E-00	0.	0.798153E-01	0.	0.172817E-06	0.
0.430000E	01	0.126574E-00	0.157748E-06	0.658350E-00	0.	0.833300E-01	0.	0.103853E-06	0.
0.425000E	01	0.127171E-00	0.899831E-07	0.684057E-00	0.	0.869920E-01	0.	0.615536E-07	0.
0.420000E	01	0.127777E-00	0.507684E-07	0.710669E-00	0.	0.908070E-01	0.	0.367796E-07	0.
0.415000E	01	0.128393E-00	0.284297E-07	0.738211E-00	0.	0.947809E-01	0.	0.209871E-07	0.
0.410000E	01	0.129018E-00	0.158669E-07	0.766710E-00	0.	0.989195E-01	0.	0.121653E-07	0.
0.405000E	01	0.129654E-00	0.886763E-08	0.796191E-00	0.	0.103229E-00	0.	0.706032E-08	0.
0.400000E	01	0.130300E-00	0.499128E-08	0.826679E-00	0.	0.107716E-00	0.	0.412618E-08	0.
0.395000E	01	0.130956E-00	0.284678E-08	0.858200E-00	0.	0.112387E-00	0.	0.244310E-08	0.
0.390000E	01	0.131624E-00	0.165625E-08	0.890781E-00	0.	0.117248E-00	0.	0.147535E-08	0.
0.385000E	01	0.132303E-00	0.990219E-09	0.924446E-00	0.	0.122307E-00	0.	0.915405E-09	0.
0.380000E	01	0.132994E-00	0.612722E-09	0.959222E-00	0.	0.127571E-00	0.	0.587737E-09	0.
0.375000E	01	0.133696E-00	0.395364E-09	0.995134E-00	0.	0.133046E-00	0.	0.393440E-09	0.
0.370000E	01	0.134411E-00	0.267891E-09	0.103221E-01	0.	0.138740E-00	0.	0.276519E-09	0.
0.365000E	01	0.135139E-00	0.191841E-09	0.107047E-01	0.	0.144662E-00	0.	0.205359E-09	0.
0.360000E	01	0.135880E-00	0.146036E-09	0.110993E-01	0.	0.150818E-00	0.	0.162090E-09	0.
0.355000E	01	0.136634E-00	0.118659E-09	0.115064E-01	0.	0.157216E-00	0.	0.136533E-09	0.
0.350000E	01	0.137402E-00	0.103270E-09	0.119259E-01	0.	0.163865E-00	0.	0.123159E-09	0.
0.345000E	01	0.138185E-00	0.963922E-10	0.123583E-01	0.	0.170773E-00	0.	0.119124E-09	0.
0.340000E	01	0.138983E-00	0.965192E-10	0.128036E-01	0.	0.177948E-00	0.	0.123579E-09	0.
0.335000E	01	0.139796E-00	0.103506E-09	0.132621E-01	0.	0.185399E-00	0.	0.137270E-09	0.
0.330000E	01	0.140625E-00	0.118545E-09	0.137340E-01	0.	0.193134E-00	0.	0.162810E-09	0.
0.325000E	01	0.141470E-00	0.144373E-09	0.142194E-01	0.	0.201162E-00	0.	0.205289E-09	0.
0.320000E	01	0.142333E-00	0.186013E-09	0.147185E-01	0.	0.209492E-00	0.	0.273782E-09	0.
0.315000E	01	0.143213E-00	0.252022E-09	0.152313E-01	0.	0.218132E-00	0.	0.383863E-09	0.
0.310000E	01	0.144111E-00	0.356760E-09	0.157581E-01	0.	0.227092E-00	0.	0.562185E-09	0.
0.305000E	01	0.145028E-00	0.524064E-09	0.162988E-01	0.	0.236379E-00	0.	0.854163E-09	0.
0.300000E	01	0.145965E-00	0.793783E-09	0.168536E-01	0.	0.246004E-00	0.	0.133781E-08	0.
0.295000E	01	0.146923E-00	0.123096E-08	0.174224E-01	0.	0.255975E-00	0.	0.214463E-08	0.
0.290000E	01	0.147901E-00	0.194431E-08	0.180052E-01	0.	0.266299E-00	0.	0.350079E-08	0.
0.285000E	01	0.148901E-00	0.310804E-08	0.186020E-01	0.	0.276987E-00	0.	0.578159E-08	0.
0.280000E	01	0.149924E-00	0.500395E-08	0.192127E-01	0.	0.288045E-00	0.	0.961395E-08	0.
0.275000E	01	0.150971E-00	0.807785E-08	0.198371E-01	0.	0.299483E-00	0.	0.160241E-07	0.
0.270000E	01	0.152043E-00	0.130244E-07	0.204750E-01	0.	0.311308E-00	0.	0.266675E-07	0.
0.265000E	01	0.153140E-00	0.209058E-07	0.211262E-01	0.	0.323527E-00	0.	0.441658E-07	0.
0.260000E	01	0.154264E-00	0.333117E-07	0.217903E-01	0.	0.336147E-00	0.	0.725872E-07	0.
0.255000E	01	0.155417E-00	0.525795E-07	0.224670E-01	0.	0.349174E-00	0.	0.118130E-06	0.
0.250000E	01	0.156598E-00	0.820589E-07	0.231557E-01	0.	0.362614E-00	0.	0.190014E-06	0.
0.245000E	01	0.157810E-00	0.126460E-06	0.238561E-01	0.	0.376473E-00	0.	0.301684E-06	0.
0.240000E	01	0.159054E-00	0.192242E-06	0.245674E-01	0.	0.390754E-00	0.	0.472289E-06	0.
0.235000E	01	0.160331E-00	0.288060E-06	0.252889E-01	0.	0.405460E-00	0.	0.728473E-06	0.
0.230000E	01	0.161643E-00	0.425272E-06	0.260199E-01	0.	0.420593E-00	0.	0.110655E-05	0.
0.225000E	01	0.162992E-00	0.618420E-06	0.267593E-01	0.	0.436155E-00	0.	0.165485E-05	0.
0.220000E	01	0.164379E-00	0.885741E-06	0.275061E-01	0.	0.452144E-00	0.	0.243633E-05	0.

0.215000E	01	0.165807E-00	0.124948E-05	0.282592E	01	0.	0.468557E-00	0.	0.353093E-05	0.
0.210000E	01	0.167277E-00	0.173647E-05	0.290172E	01	0.	0.485392E-00	0.	0.503876E-05	0.
0.205000E	01	0.16872E-00	0.237787E-05	0.297787E	01	0.	0.502640E	00	0.708098E-05	0.
0.200000E	01	0.170354E-00	0.320961E-05	0.305419E	01	0.	0.520294E	00	0.987277E-05	0.
0.195000E	01	0.171966E-00	0.427182E-05	0.313051E	01	0.	0.538342E	00	0.133730E-04	0.
0.190000E	01	0.173631E-00	0.560837E-05	0.320663E	01	0.	0.556770E	00	0.179840E-04	0.
0.185000E	01	0.175351E-00	0.726599E-05	0.328233E	01	0.	0.575560E	00	0.239494E-04	0.
0.180000E	01	0.177130E-00	0.929301E-05	0.335736E	01	0.	0.594690E	00	0.312000E-04	0.
0.175000E	01	0.178972E-00	0.117387E-04	0.343145E	01	0.	0.614135E	00	0.407807E-04	0.
0.170000E	01	0.180881E-00	0.146503E-04	0.350432E	01	0.	0.633864E	00	0.513393E-04	0.
0.165000E	01	0.182862E-00	0.180720E-04	0.357563E	01	0.	0.653848E	00	0.646188E-04	0.
0.160000E	01	0.184917E-00	0.220420E-04	0.364505E	01	0.	0.674033E	00	0.803441E-04	0.
0.155000E	01	0.187053E-00	0.265911E-04	0.371219E	01	0.	0.694377E	00	0.987113E-04	0.
0.150000E	01	0.189276E-00	0.317392E-04	0.377663E	01	0.	0.714824E	00	0.119867E-03	0.
0.145000E	01	0.191591E-00	0.374925E-04	0.383792E	01	0.	0.735310E	00	0.143893E-03	0.
0.140000E	01	0.194006E-00	0.438421E-04	0.389557E	01	0.	0.755763E	00	0.177900E-03	0.
0.135000E	01	0.196528E-00	0.507596E-04	0.394904E	01	0.	0.776098E	00	0.207451E-03	0.
0.130000E	01	0.199167E-00	0.581964E-04	0.399775E	01	0.	0.796220E	00	0.232654E-03	0.
0.125000E	01	0.201932E-00	0.660797E-04	0.404108E	01	0.	0.816022E	00	0.267033E-03	0.
0.120000E	01	0.204833E-00	0.743121E-04	0.407833E	01	0.	0.835379E	00	0.303070E-03	0.
0.115000E	01	0.207884E-00	0.827676E-04	0.410879E	01	0.	0.854153E	00	0.340075E-03	0.
0.110000E	01	0.211098E-00	0.912919E-04	0.413165E	01	0.	0.872184E	00	0.377186E-03	0.
0.105000E	01	0.214491E-00	0.997013E-04	0.414606E	01	0.	0.889292E	00	0.413367E-03	0.
0.100000E	01	0.218082E-00	0.107783E-03	0.415107E	01	0.	0.905273E	00	0.447414E-03	0.
0.950000E	00	0.221891E-00	0.115295E-03	0.414571E	01	0.	0.919895E	00	0.477978E-03	0.
0.900000E	00	0.225943E-00	0.121969E-03	0.412888E	01	0.	0.932892E	00	0.503596E-03	0.
0.850000E	00	0.230267E-00	0.127514E-03	0.409943E	01	0.	0.943965E	00	0.527736E-03	0.
0.800000E	00	0.234897E-00	0.131623E-03	0.405611E	01	0.	0.952769E	00	0.533878E-03	0.
0.750000E	00	0.239874E-00	0.133981E-03	0.399756E	01	0.	0.958911E	00	0.535596E-03	0.
0.700000E	00	0.245245E-00	0.134275E-03	0.392236E	01	0.	0.961939E	00	0.526674E-03	0.
0.650000E	00	0.251071E-00	0.132215E-03	0.382893E	01	0.	0.961331E	00	0.506242E-03	0.
0.600000E	00	0.257423E-00	0.127555E-03	0.371561E	01	0.	0.956482E	00	0.473946E-03	0.
0.550000E	00	0.264394E-00	0.120124E-03	0.358060E	01	0.	0.946688E	00	0.43117E-03	0.
0.500000E	00	0.272098E-00	0.109867E-03	0.342198E	01	0.	0.931116E	00	0.375964E-03	0.
0.450000E	00	0.280681E-00	0.968976E-04	0.323769E	01	0.	0.908757E	00	0.313724E-03	0.
0.400000E	00	0.290352E-00	0.815635E-04	0.302550E	01	0.	0.878460E	00	0.246770E-03	0.
0.350000E	00	0.301379E-00	0.645222E-04	0.278304E	01	0.	0.838750E	00	0.179568E-03	0.
0.300000E	00	0.314147E-00	0.468152E-04	0.250777E	01	0.	0.787808E	00	0.117402E-03	0.
0.250000E	00	0.329224E-00	0.299048E-04	0.219696E	01	0.	0.723290E	00	0.656995E-04	0.
0.200000E	00	0.347508E-00	0.155951E-04	0.184768E	01	0.	0.642083E	00	0.288148E-04	0.
0.150000E	00	0.370483E-00	0.566474E-05	0.145681E	01	0.	0.539723E	00	0.825244E-05	0.
0.100000E	00	0.400932E-00	0.947575E-06	0.102100E	01	0.	0.409352E-00	0.	0.967474E-06	0.
0.500001E	01	0.444782E-00	0.139711E-07	0.536674E	00	0.	0.238703E-00	0.	0.749792E-08	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

* * ALL DATA PROCESSED.

APPENDIX B

Fortran Listing and Input and Output Sheets for
Isotropic-flux Case with Input Flux

704 INPUT DATA

FORM 1

COST CODE _____

PROGRAM B512/RP

PROBLEM Isotropic-Input

ORIGINATOR

DATE _____

PAGE 1 OF 1

[illegible]

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C      ISOTROPIC FLUX PROGRAM WITH INPUT FLUX
      DIMENSION X(2510),P(2510),Q(2510),FLUX(2510),XINTE1(2510),
      XXINTE3(2510),XTOP(105),N(105),XN(105),DELTAX(105),TOTAL1(105),
      XTOTAL3(105),ALPA(100),BETA(100),XRESA(100),ERESA(100),ALPC(100),
      XBETC(100),XRESC(100),ERESC(100)
C      READ INPUT AND WRITE INPUT DATA
3      READ INPUT TAPE7,6,NFLUX,M,L,EMAXW,(XTOP(J),J=1,M)
      READ INPUT TAPE7,4,(N(J),J=1,M)
      READ INPUT TAPE7,5,(FLUX(I),I=1,L)
4      FORMAT(1814)
5      FORMAT(6E12.6)
6      FORMAT(314,E12.6/(6E12.6))
7      FORMAT(411,314/6E12.6/5E12.6)
10     READ INPUT TAPE7,7,KRONA,KRONF,KRONT,NP,NA,NF,NPROB,GA,IA,
      XSIGA0,GF,TF,SIGFO,GB,GC,EPSEB,EPSC,CONCRI
      IF(NA)14,14,12
12     READ INPUT TAPE7,5,(ALPA(J),BETA(J),ERESA(J),J=1,NA)
14     IF(NF)40,40,16
16     READ INPUT TAPE7,5,(ALPC(J),BETC(J),ERESC(J),J=1,NF)
40     WRITE OUTPUT TAPE6,42,NPROB,GA,TA,SIGA0,GF,TF,SIGFO,EMAXW,
      XGB,GC,EPSEB,EPSC,CONCRI
42     FORMAT(39HISOTROPIC FLUX PROGRAM PROBLEM NUMBER 13/55H0
      X                               INPUT DATA/87H0          GA
      X T              SIGMA A 0          GF              LO          SIGMA F 0
      X EM/1H 7E13.6/63H0          GB              GC          EPSILON B          EPSILON
      X C              CONCRI/1H 5E13.6)
44     FORMAT(36H0          FOIL RESONANCE PARAMETERS/42H          ALPHA
      X          BETA          EKES/(1H 3E15.6))
46     FORMAT(36H0          COVER RESONANCE PARAMETERS/42H          ALPHA
      X          BETA          EKES/(1H 3E15.6))
48     FORMAT(71H0 SUBINTEGRAL UPPER LIMITS AND NUMBER OF MESH INTERVALS
      XPER SUBINTEGRAL/(1H E15.6,15))
      IF(NA)68,68,66
66     WRITE OUTPUT TAPE6,44,(ALPA(J),BETA(J),ERESA(J),J=1,NA)
68     IF(NF)72,72,70
70     WRITE OUTPUT TAPE6,46,(ALPC(J),BETC(J),ERESC(J),J=1,NF)
72     WRITE OUTPUT TAPE6,48,(XTOP(J),N(J),J=1,M)
C      CALCULATE VARIOUS CONSTANTS
90     CONST1=1./((SQRTF(EMAXW))
      CONST3=(EMAXW)**2.
      CONST7=1.+EPSEB
      CONST8=1.+EPSC
      IF(KRONA-1)94,92,94
92     CONST2=0.15906*SIGA0
94     IF(KRONT-1)98,96,98
96     CONST4=0.15906*SIGFO
98     IF(NA)102,102,100
100    DO101J=1,NA
101    XRESA(J)=(ERESA(J))/EMAXW
102    IF(NF)118,118,104
104    DO105J=1,NF
105    XRESC(J)=(ERESC(J))/EMAXW
C      CALCULATE X AND DELTAX
118    XTOP(M+1)=0.0
      N(M+1)=1
      I1=1
      I2=N(1)
      DO122J=1,M
      XN(J)=N(J)
      DELTAX(J)=(XTOP(J)-XTOP(J+1))/XN(J)
      X(I1)=XTOP(J)
      DO120I=11,I2

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120 X(I+1)=X(I)-DELTAX(J)
    I1=I1+N(J)
122 I2=I2+N(J+1)
    X(I2)=0.0
C    CALCULATION OF FUNCTIONS AT EACH MESH POINT
    DO300I=1,L
    A=CONST1/(SQRTF(X(I)))
C    FOIL CROSS SECTION FUNCTIONS
    IF(KRONA-1)126,124,126
124 SIGA=GA*CONST2*A
    GO TO128
126 SIGA=0.0
128 IF(NA)134,134,130
130 DO132J=1,NA
132 SIGA=SIGA+(GA*A*ALPA(J))/(CONST3*((X(I)-XRESA(J))*2.)+BETA(J))
134 IF(KRONT)138,138,136
136 SIGATA=TA*SIGA
    CALL EONE(SIGATA,VALE1,CONCRI)
    E3A=((1.-SIGATA)*(EXP(-SIGATA))+((SIGATA)**2.)*(VALE1))/2.
    HALPHA=0.5-E3A
    P(I)=CONST7*HALPHA/(1.+(GB*HALPHA))
    GO TO140
138 P(I)=CONST7*SIGA
C    COVER CROSS SECTION FUNCTIONS
140 IF(KRONF-1)144,142,144
142 SIGF=GF*CONST4*A
    GO TO146
144 SIGF=0.0
146 IF(NF)152,152,148
148 DO150J=1,NF
150 SIGF=SIGF+(GF*A*ALPC(J))/(CONST3*((X(I)-XRESC(J))*2.)+BETC(J))
152 SIGFTF=TF*SIGF
    CALL EONE(SIGFTF,VALE2,CONCRI)
    IF(KRONT)156,156,153
153 SIGSUM=SIGATA+SIGFTF
    CALL EONE(SIGSUM,VALE3,CONCRI)
    E3F=((1.-SIGFTF)*(EXP(-SIGFTF))+((SIGFTF)**2.)*(VALE2))/2.
    E3SUM=((1.-SIGSUM)*(EXP(-SIGSUM))+((SIGSUM)**2.)*(VALE3))/2.
    Q(I)=CONST8*(E3F-E3SUM)
    IF(GC-0.000001)290,290,154
154 SISTAR=SIGSUM+SIGFTF
    CALL EONE(SISTAR,VALE4,CONCRI)
    E3STAR=((1.-SISTAR)*(EXP(-SISTAR))+((SISTAR)**2.)*(VALE4))/2.
    Q(I)=Q(I)/(1.+(0.5-E3STAR)*GC)
    GO TO290
156 E2F=EXP(-SIGFTF)-(SIGFTF*VALE2)
    Q(I)=CONST8*SIGA*E2F
    IF(GC-0.000001)290,290,157
157 SIG2F=2.*SIGFTF
    CALL EONE(SIG2F,VALE5,CONCRI)
    E32F=((1.-SIG2F)*(EXP(-SIG2F))+((SIG2F)**2.)*(VALE5))/2.
    Q(I)=Q(I)/(1.+(0.5-E32F)*GC)
C    CALCULATE INTEGRANDS
290 XINTE1(I)=FLUX(I)*P(I)
300 XINTE3(I)=FLUX(I)*Q(I)
C    CALCULATE SUBINTEGRALS
    XINTE1(I2)=0.0
    XINTE3(I2)=0.0
    LI=1
    L2=N(I)-1
    DO340J=1,M
    TOTALI(J)=0.0

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TOTAL3(J)=0.0
DO330I=L1,L2,2
310 SUM1=(XINTE1(I)+4.*XINTE1(I+1)+XINTE1(I+2))*(DELTAX(J))/3.
TOTAL1(J)=TOTAL1(J)+SUM1
SUM3=(XINTE3(I)+4.*XINTE3(I+1)+XINTE3(I+2))*(DELTAX(J))/3.
330 TOTAL3(J)=TOTAL3(J)+SUM3
L1=L1+N(J)
340 L2=L2+N(J+1)
C CALCULATE RIGHT INTEGRAL XTUP TO ZERO
RIGHT1=0.0
DO355J=1,M
355 RIGHT1=RIGHT1+TOTAL3(J)
C CALCULATE LEFT INTEGRAL XTUP TO XCUT
J=1
XLEFT3=0.0
370 XLEFT3=XLEFT3+TOTAL1(J)
IF(XLEFT3-RIGHT1)380,390,390
380 J=J+1
GO TO370
390 XLEFT3=XLEFT3-TOTAL1(J)
LJC=J
LJCM=LJC-1
I=1
IF(LJCM)405,405,395
395 DO400K=1,LJCM
400 I=I+N(K)
405 LIC=I
410 XSUM1=(XINTE1(I)+4.*XINTE1(I+1)+XINTE1(I+2))*(DELTAX(LJC))/3.
XLEFT3=XLEFT3+XSUM1
IF(XLEFT3-RIGHT1)420,430,430
420 I=I+2
GO TO410
430 XLEFT3=XLEFT3-XSUM1
440 T1=(XINTE1(I)+XINTE1(I+1))*(DELTAX(LJC))/2.
XLEFT3=XLEFT3+T1
IF(XLEFT3-RIGHT1)450,460,460
450 I=I+1
GO TO440
460 XLEFT3=XLEFT3-T1
LCUT=I
C CALCULATE XCUT AND ECUT
470 XMESH=(RIGHT1-XLEFT3)*(DELTAX(LJC))/T1
XCUT=X(I)-XMESH
ECUT=XCUT*EMAXW
XLEFT3=XLEFT3+T1*XMESH/(DELTAX(LJC))
C CALCULATE LEFT INTEGRAL XTUP TO ZERO
XLEFT1=0.0
475 DO480J=1,M
480 XLEFT1=XLEFT1+TOTAL1(J)
C CALCULATE LEFT INTEGRAL XCUT TO ZERO
XLEFT2=XLEFT1-XLEFT3
C CALCULATE RIGHT INTEGRAL XTUP TO XCUT
RIGHT3=0.0
500 IF(LJCM)530,530,505
505 DO510J=1,LJCM
510 RIGHT3=RIGHT3+TOTAL3(J)
530 IF(LCUT-LIC-2)550,535,535
535 LSTOP=LCUT-2
DO540I=LIC,LSTOP,2
XSUM3=(XINTE3(I)+4.*XINTE3(I+1)+XINTE3(I+2))*(DELTAX(LJC))/3.
540 RIGHT3=RIGHT3+XSUM3
550 LV=LIC

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555 IF(LCUT-LV)580,565,560
560 LV=LV+2
    GO TO555
565 I=LCUT
570 RIGHT3=RIGHT3+(X*MESH)*(XINTE3(I)+XINTE3(I+1))/2.
    GO TO590
580 I=LCUT-1
    RIGHT3=RIGHT3+(XINTE3(I)+XINTE3(I+1))*(DELTA(LJC))/2.
    I=I+1
    GO TO570
C   CALCULATE RIGHT INTEGRAL XCUT TO ZERO
590 RIGHT2=RIGHT1-RIGHT3
C   WRITE STANDARD OUTPUT DATA
    WRITE OUTPUT TAPE6,600,XCUT,ECUT,(TOTAL1(J),TOTAL3(J),J=1,M)
    WRITE OUTPUT TAPE6,610,XLEFT2,XLEFT3,XLEFT1,RIGHT2,
    XRIGHT3,RIGHT1
600 FORMAT(5SH0                                OUTPUT DATA/
    X3IH0      XCUT      CUTOFF ENERGY/1H 2E15.6/23H0      SUBINTE
    XGRALS/28H      TOTAL 1      TOTAL 2/(1H 2E15.6))
610 FORMAT(36H0                                0 TO XCUT
    X      XCUT TO XTOP      0 TO XTOP/1H 3E15.6/38H0      INTEGRALS FO
    XR COVERED FOIL/44H      0 TO XCUT      XCUT TO XTOP      0 TO XTOP/1H
    X3E15.6)
C   WRITE OPTIONAL OUTPUT DATA
    IF(NP)630,630,620
620 WRITE OUTPUT TAPE6,625,(X(I),P(I),Q(I),FLUX(I),XINTE1(I),
    XXINTE3(I),I=1,12)
625 FORMAT(65H0                                VALUES OF FUNCTIONS AT EACH M
    XESH POINT/82H
    X                                X                                P
    X      Q      INTEGRANDS/91H      FLUX      BARE FOIL      COVERED FOIL/(1H 6E1
    X5.6))
630 NFLUX=NFLUX-1
    IF(NFLUX)3,3,10
    END ( 1 , 1 , 0 , 1 , 0 )

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ANL-30

ISCTROPIC FLUX PROGRAM PROBLEM NUMBER 1

INPUT DATA

GA	T	SIGMA A C	GF	LO	SIGMA F C	EM
0.153035E-03	0.100000E 03	0.314320E 02	0.118040E-03	0.200000E 02	0.	0.506000E-01
GB	GC	EPSILON B	EPSILON C	CCNCRI		
0.	0.	0.	0.	1.000000E-03		

COVER RESONANCE PARAMETERS

ALPHA	BETA	ERES
0.109000E 02	0.336000E-02	0.178000E-00

SUBINTEGRAL UPPER LIMITS AND NUMBER OF MESH INTERVALS PER SUBINTEGRAL

0.800000E 02	100
0.300000E 02	100
0.100000E 02	50
0.500000E 01	40
0.300000E 01	30
0.150000E 01	30

OUTPUT DATA

XCUT	CUTOFF ENERGY
0.101632E 02	0.514256E 00

SUBINTEGRALS

TOTAL 1	TOTAL 2
0.306980E-01	0.302175E-01
0.554827E-01	0.437910E-01
0.100477E-00	0.106212E-01
0.240693E-00	0.400364E-05
0.677158E 00	0.256198E-04
0.120256E 01	0.440285E-03

INTEGRALS FOR BARE FOIL

0 TO XCUT	XCUT TO XTOP	0 TO XTOP
0.222197E 01	0.850996E-01	0.230707E 01

INTEGRALS FOR COVERED FOIL

0 TO XCUT	XCUT TO XTOP	0 TO XTOP
0.116302E-01	0.734694E-01	0.850996E-01

VALUES OF FUNCTIONS AT EACH MESH POINT

INTEGRANDS

X	P	C	FLUX	BARE FOIL	COVERED FOIL
0.800000E 02	0.349876E-01	0.348691E-01	0.883883E-02	0.309250E-03	0.308202E-03
0.795000E 02	0.350902E-01	0.349694E-01	0.889442E-02	0.312107E-03	0.311032E-03
0.790000E 02	0.351936E-01	0.350706E-01	0.895072E-02	0.315008E-03	0.313907E-03
0.785000E 02	0.352980E-01	0.351727E-01	0.900773E-02	0.317955E-03	0.316826E-03
0.780000E 02	0.354034E-01	0.352757E-01	0.906547E-02	0.320948E-03	0.319791E-03
0.775000E 02	0.355097E-01	0.353796E-01	0.912396E-02	0.323989E-03	0.322802E-03
0.770000E 02	0.356171E-01	0.354845E-01	0.918320E-02	0.327079E-03	0.325861E-03
0.765000E 02	0.357254E-01	0.355903E-01	0.924323E-02	0.330218E-03	0.328969E-03
0.760000E 02	0.358348E-01	0.356970E-01	0.930404E-02	0.333408E-03	0.332126E-03
0.755000E 02	0.359452E-01	0.358047E-01	0.936565E-02	0.336650E-03	0.335334E-03
0.750000E 02	0.360567E-01	0.359134E-01	0.942809E-02	0.339945E-03	0.338595E-03
0.745000E 02	0.361692E-01	0.360231E-01	0.949137E-02	0.343295E-03	0.341905E-03
0.740000E 02	0.362828E-01	0.361338E-01	0.955550E-02	0.346701E-03	0.345277E-03
0.735000E 02	0.363976E-01	0.362456E-01	0.962050E-02	0.350163E-03	0.348701E-03
0.730000E 02	0.365134E-01	0.363584E-01	0.968639E-02	0.353683E-03	0.352181E-03

0.725000E 02	0.366304E-01	0.364722E-01	0.975320E-02	0.357264E-03	0.355721E-03
0.720000E 02	0.367486E-01	0.365872E-01	0.982093E-02	0.360906E-03	0.359320E-03
0.715000E 02	0.368680E-01	0.367032E-01	0.988961E-02	0.364610E-03	0.362980E-03
0.710000E 02	0.369886E-01	0.368203E-01	0.995925E-02	0.368378E-03	0.366703E-03
0.705000E 02	0.371104E-01	0.369386E-01	0.100299E-01	0.372213E-03	0.370490E-03
0.700000E 02	0.372334E-01	0.370580E-01	0.101015E-01	0.376113E-03	0.374342E-03
0.695000E 02	0.373577E-01	0.371786E-01	0.101742E-01	0.380085E-03	0.378263E-03
0.690000E 02	0.374833E-01	0.373004E-01	0.102479E-01	0.384125E-03	0.382250E-03
0.685000E 02	0.376102E-01	0.374234E-01	0.103227E-01	0.388239E-03	0.386310E-03
0.680000E 02	0.377385E-01	0.375475E-01	0.103986E-01	0.392427E-03	0.390442E-03
0.675000E 02	0.378681E-01	0.376730E-01	0.104757E-01	0.396695E-03	0.394651E-03
0.670000E 02	0.379991E-01	0.377997E-01	0.105538E-01	0.401035E-03	0.398930E-03
0.665000E 02	0.381315E-01	0.379276E-01	0.106332E-01	0.405460E-03	0.403292E-03
0.660000E 02	0.382654E-01	0.380569E-01	0.107137E-01	0.409964E-03	0.407731E-03
0.655000E 02	0.384007E-01	0.381875E-01	0.107955E-01	0.414554E-03	0.412253E-03
0.650000E 02	0.385375E-01	0.383195E-01	0.108786E-01	0.419234E-03	0.416862E-03
0.645000E 02	0.386758E-01	0.384528E-01	0.109629E-01	0.423999E-03	0.421554E-03
0.640000E 02	0.388157E-01	0.385875E-01	0.110485E-01	0.428855E-03	0.426334E-03
0.635000E 02	0.389571E-01	0.387237E-01	0.111355E-01	0.433807E-03	0.431207E-03
0.630000E 02	0.391001E-01	0.388612E-01	0.112239E-01	0.438856E-03	0.436174E-03
0.625000E 02	0.392448E-01	0.390002E-01	0.113137E-01	0.444004E-03	0.441237E-03
0.620000E 02	0.393912E-01	0.391408E-01	0.114049E-01	0.449252E-03	0.446397E-03
0.615000E 02	0.395392E-01	0.392828E-01	0.114977E-01	0.454610E-03	0.451662E-03
0.610000E 02	0.396890E-01	0.394264E-01	0.115919E-01	0.460071E-03	0.457027E-03
0.605000E 02	0.398406E-01	0.395715E-01	0.116877E-01	0.465645E-03	0.462500E-03
0.600000E 02	0.399939E-01	0.397182E-01	0.117851E-01	0.471333E-03	0.468083E-03
0.595000E 02	0.401491E-01	0.398666E-01	0.118841E-01	0.477136E-03	0.473778E-03
0.590000E 02	0.403062E-01	0.400166E-01	0.119849E-01	0.483066E-03	0.479594E-03
0.585000E 02	0.404652E-01	0.401682E-01	0.120873E-01	0.489115E-03	0.485526E-03
0.580000E 02	0.406262E-01	0.403216E-01	0.121915E-01	0.495294E-03	0.491581E-03
0.575000E 02	0.407892E-01	0.404767E-01	0.122975E-01	0.501605E-03	0.497763E-03
0.570000E 02	0.409542E-01	0.406336E-01	0.124054E-01	0.508053E-03	0.504076E-03
0.565000E 02	0.411212E-01	0.407923E-01	0.125152E-01	0.514641E-03	0.510524E-03
0.560000E 02	0.412905E-01	0.409528E-01	0.126269E-01	0.521371E-03	0.517107E-03
0.555000E 02	0.414619E-01	0.411152E-01	0.127407E-01	0.528253E-03	0.523836E-03
0.550000E 02	0.416355E-01	0.412795E-01	0.128565E-01	0.535286E-03	0.530709E-03
0.545000E 02	0.418114E-01	0.414457E-01	0.129744E-01	0.542477E-03	0.537732E-03
0.540000E 02	0.419896E-01	0.416138E-01	0.130946E-01	0.549837E-03	0.544916E-03
0.535000E 02	0.421702E-01	0.417840E-01	0.132169E-01	0.557359E-03	0.552255E-03
0.530000E 02	0.423532E-01	0.419562E-01	0.133416E-01	0.565059E-03	0.559763E-03
0.525000E 02	0.425387E-01	0.421305E-01	0.134687E-01	0.572940E-03	0.567443E-03
0.520000E 02	0.427267E-01	0.423069E-01	0.135982E-01	0.581006E-03	0.575297E-03
0.515000E 02	0.429173E-01	0.424854E-01	0.137302E-01	0.589264E-03	0.583333E-03
0.510000E 02	0.431106E-01	0.426661E-01	0.138648E-01	0.597720E-03	0.591558E-03
0.505000E 02	0.433067E-01	0.428491E-01	0.140021E-01	0.606384E-03	0.599978E-03
0.500000E 02	0.435055E-01	0.430343E-01	0.141421E-01	0.615259E-03	0.608596E-03
0.495000E 02	0.437072E-01	0.432219E-01	0.142850E-01	0.624357E-03	0.617425E-03
0.490000E 02	0.439118E-01	0.434118E-01	0.144308E-01	0.633682E-03	0.626467E-03
0.485000E 02	0.441194E-01	0.436041E-01	0.145795E-01	0.643239E-03	0.635726E-03
0.480000E 02	0.443301E-01	0.437988E-01	0.147314E-01	0.653044E-03	0.645218E-03
0.475000E 02	0.445439E-01	0.439961E-01	0.148865E-01	0.663103E-03	0.654947E-03
0.470000E 02	0.447610E-01	0.441958E-01	0.150448E-01	0.673420E-03	0.664917E-03
0.465000E 02	0.449814E-01	0.443981E-01	0.152066E-01	0.684014E-03	0.675145E-03
0.460000E 02	0.452052E-01	0.446031E-01	0.153719E-01	0.694889E-03	0.685634E-03
0.455000E 02	0.454325E-01	0.448107E-01	0.155408E-01	0.706057E-03	0.696394E-03
0.450000E 02	0.456633E-01	0.450210E-01	0.157135E-01	0.717531E-03	0.707438E-03
0.445000E 02	0.458979E-01	0.452342E-01	0.158900E-01	0.729318E-03	0.718771E-03
0.440000E 02	0.461363E-01	0.454501E-01	0.160706E-01	0.741437E-03	0.730410E-03
0.435000E 02	0.463785E-01	0.456688E-01	0.162553E-01	0.753896E-03	0.742361E-03
0.430000E 02	0.466247E-01	0.458905E-01	0.164443E-01	0.766711E-03	0.754637E-03
0.425000E 02	0.468751E-01	0.461151E-01	0.166378E-01	0.779898E-03	0.767255E-03
0.420000E 02	0.471296E-01	0.463428E-01	0.168359E-01	0.793470E-03	0.780223E-03

0.415000E 02	C.473885E-01	0.465735E-01	0.170387E-01	0.807439E-03	0.793552E-03
0.410000E 02	C.476519E-01	0.468073E-01	0.172465E-01	0.821829E-03	0.807262E-03
0.405000E 02	C.479199E-01	0.470442E-01	0.174594E-01	0.836653E-03	0.821364E-03
0.400000E 02	C.481927E-01	0.472844E-01	0.176777E-01	0.851936E-03	0.835875E-03
0.395000E 02	C.484703E-01	0.475277E-01	0.179014E-01	0.867687E-03	0.850813E-03
0.390000E 02	C.487530E-01	0.477744E-01	0.181309E-01	0.883935E-03	0.866193E-03
0.385000E 02	C.490408E-01	0.480244E-01	0.183664E-01	0.900704E-03	0.882036E-03
0.380000E 02	C.493341E-01	0.482778E-01	0.186081E-01	0.918013E-03	0.898358E-03
0.375000E 02	C.496328E-01	0.485346E-01	0.188562E-01	0.935886E-03	0.915178E-03
0.370000E 02	C.499373E-01	0.487948E-01	0.191110E-01	0.954352E-03	0.932517E-03
0.365000E 02	C.502476E-01	0.490585E-01	0.193728E-01	0.973438E-03	0.950400E-03
0.360000E 02	C.505641E-01	0.493257E-01	0.196419E-01	0.993175E-03	0.968850E-03
0.355000E 02	C.508868E-01	0.495964E-01	0.199185E-01	0.101359E-02	0.987886E-03
0.350000E 02	C.512161E-01	0.498707E-01	0.202031E-01	0.103472E-02	0.100754E-02
0.345000E 02	C.515521E-01	0.501485E-01	0.204958E-01	0.105660E-02	0.102783E-02
0.340000E 02	C.518950E-01	0.504299E-01	0.207973E-01	0.107928E-02	0.104881E-02
0.335000E 02	C.522452E-01	0.507148E-01	0.211077E-01	0.110278E-02	0.107047E-02
0.330000E 02	C.526028E-01	0.510033E-01	0.214275E-01	0.112715E-02	0.109287E-02
0.325000E 02	C.529682E-01	0.512953E-01	0.217571E-01	0.115244E-02	0.111604E-02
0.320000E 02	C.533417E-01	0.515907E-01	0.220971E-01	0.117870E-02	0.114000E-02
0.315000E 02	C.537235E-01	0.518966E-01	0.224478E-01	0.120597E-02	0.116481E-02
0.310000E 02	C.541139E-01	0.521917E-01	0.228099E-01	0.123433E-02	0.119049E-02
0.305000E 02	C.545134E-01	0.524971E-01	0.231838E-01	0.126383E-02	0.121708E-02
0.300000E 02	C.549222E-01	0.528037E-01	0.235702E-01	0.129453E-02	0.124464E-02
0.298000E 02	C.550884E-01	0.529299E-01	0.237284E-01	0.130716E-02	0.125594E-02
0.296000E 02	C.552562E-01	0.530546E-01	0.238887E-01	0.132000E-02	0.126741E-02
0.294000E 02	C.554256E-01	0.531798E-01	0.240512E-01	0.133305E-02	0.127904E-02
0.292000E 02	C.555967E-01	0.533054E-01	0.242160E-01	0.134633E-02	0.129084E-02
0.290000E 02	C.557694E-01	0.534314E-01	0.243830E-01	0.135983E-02	0.130282E-02
0.288000E 02	C.559438E-01	0.535579E-01	0.245523E-01	0.137355E-02	0.131497E-02
0.286000E 02	C.561199E-01	0.536847E-01	0.247240E-01	0.138751E-02	0.132730E-02
0.284000E 02	C.562978E-01	0.538119E-01	0.248981E-01	0.140171E-02	0.133981E-02
0.282000E 02	C.564774E-01	0.539395E-01	0.250747E-01	0.141615E-02	0.135252E-02
0.280000E 02	C.566589E-01	0.540674E-01	0.252538E-01	0.143085E-02	0.136541E-02
0.278000E 02	C.568422E-01	0.541956E-01	0.254355E-01	0.144581E-02	0.137849E-02
0.276000E 02	C.570273E-01	0.543241E-01	0.256198E-01	0.146103E-02	0.139177E-02
0.274000E 02	C.572144E-01	0.544530E-01	0.258068E-01	0.147652E-02	0.140526E-02
0.272000E 02	C.574034E-01	0.545820E-01	0.259966E-01	0.149229E-02	0.141895E-02
0.270000E 02	C.575943E-01	0.547113E-01	0.261891E-01	0.150834E-02	0.143284E-02
0.268000E 02	C.577873E-01	0.548408E-01	0.263846E-01	0.152469E-02	0.144695E-02
0.266000E 02	C.579823E-01	0.549704E-01	0.265830E-01	0.154134E-02	0.146128E-02
0.264000E 02	C.581793E-01	0.551001E-01	0.267843E-01	0.155829E-02	0.147582E-02
0.262000E 02	C.583785E-01	0.552300E-01	0.269888E-01	0.157557E-02	0.149059E-02
0.260000E 02	C.585799E-01	0.553599E-01	0.271964E-01	0.159316E-02	0.150559E-02
0.258000E 02	C.587834E-01	0.554898E-01	0.274072E-01	0.161109E-02	0.152082E-02
0.256000E 02	C.589892E-01	0.556197E-01	0.276214E-01	0.162936E-02	0.153629E-02
0.254000E 02	C.591972E-01	0.557496E-01	0.278388E-01	0.164798E-02	0.155200E-02
0.252000E 02	C.594075E-01	0.558793E-01	0.280598E-01	0.166696E-02	0.156796E-02
0.250000E 02	C.596202E-01	0.560088E-01	0.282843E-01	0.168632E-02	0.158417E-02
0.248000E 02	C.598354E-01	0.561382E-01	0.285124E-01	0.170605E-02	0.160063E-02
0.246000E 02	C.600529E-01	0.562670E-01	0.287442E-01	0.172617E-02	0.161735E-02
0.244000E 02	C.602730E-01	0.563957E-01	0.289798E-01	0.174670E-02	0.163434E-02
0.242000E 02	C.604956E-01	0.565240E-01	0.292193E-01	0.176764E-02	0.165159E-02
0.240000E 02	C.607208E-01	0.566519E-01	0.294628E-01	0.178901E-02	0.166912E-02
0.238000E 02	C.609487E-01	0.567791E-01	0.297104E-01	0.181081E-02	0.168693E-02
0.236000E 02	C.611793E-01	0.569058E-01	0.299621E-01	0.183306E-02	0.170502E-02
0.234000E 02	C.614126E-01	0.570317E-01	0.302182E-01	0.185578E-02	0.172340E-02
0.232000E 02	C.616487E-01	0.571568E-01	0.304787E-01	0.187897E-02	0.174207E-02
0.230000E 02	C.618878E-01	0.572810E-01	0.307438E-01	0.190266E-02	0.176104E-02
0.228000E 02	C.621297E-01	0.574043E-01	0.310134E-01	0.192685E-02	0.178030E-02
0.226000E 02	C.623747E-01	0.575265E-01	0.312879E-01	0.195157E-02	0.179988E-02
0.224000E 02	C.626227E-01	0.576474E-01	0.315673E-01	0.197683E-02	0.181977E-02

0.22200CE 02	C.628738E-C1	0.57767CE-01	0.318517E-01	0.2C0264E-02	0.183998E-02
0.220C0CE 02	C.631281E-01	0.578652E-01	0.321413E-01	0.2C2902E-02	0.18605CE-02
0.218C0CE 02	C.633857E-01	0.580C17E-01	0.324362E-01	0.2C5599E-02	0.188135E-02
0.21600CE 02	C.636466E-C1	0.581165E-01	0.327365E-01	0.2C8357E-02	0.190253E-02
0.214C0CE 02	C.6391C9E-01	0.582295E-01	0.330425E-01	0.211178E-02	0.192405E-02
0.21200CE 02	C.641787E-01	0.583403E-01	0.333542E-01	0.214063E-C2	0.194589E-02
0.21000CE 02	C.644501E-01	0.584490E-01	0.336719E-C1	0.217016E-02	0.1968C9E-02
0.208C0CE 02	C.647251E-01	0.585552E-01	0.339957E-01	0.220037E-02	0.199062E-02
0.20600CE 02	C.650038E-C1	0.586588E-01	0.343259E-C1	0.223131E-02	0.201352E-02
0.204C0CE 02	C.652863E-C1	0.587596E-01	0.346624E-C1	0.226298E-C2	0.203675E-02
0.20200CE 02	C.655728E-01	0.588573E-01	0.350057E-01	0.229542E-02	0.206034E-02
0.20000CE 02	C.658632E-01	0.589518E-01	0.353558E-01	0.232865E-02	0.208429E-02
0.198C0CE 02	C.661577E-01	0.590427E-01	0.357130E-C1	0.236269E-02	0.21C859E-02
0.19600CE 02	C.664564E-01	0.591298E-01	0.360776E-C1	0.239759E-C2	0.213326E-02
0.194C0CE 02	C.667594E-01	0.592129E-01	0.364496E-C1	0.243335E-02	0.215829E-02
0.19200CE 02	C.670668E-01	0.592915E-01	0.368295E-01	0.247004E-02	0.218368E-02
0.19000CE 02	C.673787E-01	0.593654E-01	0.372173E-01	0.250765E-02	0.220942E-02
0.188C0CE 02	C.676952E-01	0.594343E-01	0.376135E-C1	0.254625E-02	0.223553E-02
0.18600CE 02	C.680164E-01	0.594977E-01	0.380183E-01	0.258587E-02	0.226200E-02
0.184C0CE 02	C.683425E-01	0.595552E-01	0.384318E-C1	0.262652E-02	0.228881E-02
0.18200CE 02	C.686736E-C1	0.596C65E-01	0.388546E-01	0.266828E-02	0.231599E-02
0.18000CE 02	C.690097E-01	0.596511E-01	0.392868E-C1	0.271117E-02	0.234350E-02
0.178C0CE 02	C.693511E-01	0.596884E-01	0.397288E-C1	0.275524E-02	0.237135E-02
0.17600CE 02	C.696980E-01	0.597181E-01	0.401810E-C1	0.280053E-C2	0.239953E-02
0.174C0CE 02	C.700503E-01	0.597503E-01	0.406437E-01	0.284710E-02	0.242803E-02
0.17200CE 02	C.704083E-01	0.597520E-01	0.411174E-C1	0.289501E-02	0.245685E-02
0.17000CE 02	C.707721E-01	0.597551E-01	0.416024E-01	0.294429E-02	0.248596E-02
0.168C0CE 02	C.711420E-01	0.597480E-01	0.420993E-C1	0.299503E-C2	0.251535E-02
0.16600CE 02	C.715180E-01	0.597301E-01	0.426084E-C1	0.304727E-02	0.254500E-02
0.164C0CE 02	C.719004E-01	0.597C05E-01	0.431302E-01	0.310108E-02	0.257490E-02
0.16200CE 02	C.722894E-01	0.596585E-01	0.436653E-01	0.315654E-02	0.260501E-02
0.16000CE 02	C.726850E-01	0.596C32E-01	0.442144E-01	0.321372E-02	0.263532E-02
0.158C0CE 02	C.730876E-01	0.595335E-01	0.447781E-01	0.327272E-02	0.266580E-02
0.15600CE 02	C.734973E-01	0.594487E-01	0.453569E-01	0.333361E-02	0.269641E-02
0.154C0CE 02	C.739143E-01	0.593474E-01	0.459516E-01	0.339648E-02	0.272711E-02
0.15200CE 02	C.743390E-01	0.592287E-01	0.465631E-01	0.346145E-C2	0.275787E-02
0.150C0CE 02	C.747714E-01	0.590512E-01	0.471922E-01	0.352863E-02	0.278864E-02
0.148C0CE 02	C.752118E-01	0.589338E-01	0.478398E-01	0.359812E-02	0.281938E-02
0.14600CE 02	C.756607E-01	0.587549E-01	0.485071E-01	0.367008E-02	0.285003E-02
0.144C0CE 02	C.761181E-01	0.585530E-01	0.491952E-01	0.374464E-02	0.288052E-02
0.14200CE 02	C.765844E-01	0.583264E-01	0.499053E-01	0.382197E-C2	0.291080E-02
0.14000CE 02	C.770599E-01	0.580736E-01	0.506390E-01	0.390224E-02	0.294079E-02
0.13800CE 02	C.775449E-01	0.577526E-01	0.513977E-01	0.398563E-02	0.297041E-02
0.13600CE 02	C.780396E-01	0.574815E-01	0.521835E-01	0.407238E-02	0.299958E-02
0.134C0CE 02	C.785446E-01	0.571380E-01	0.529982E-01	0.416272E-02	0.302821E-02
0.13200CE 02	C.790600E-01	0.567601E-01	0.538442E-01	0.425692E-02	0.305620E-02
0.13000CE 02	C.795864E-01	0.563452E-01	0.547244E-01	0.435532E-02	0.308346E-02
0.128C0CE 02	C.801240E-01	0.558508E-01	0.556414E-01	0.445821E-02	0.31C984E-02
0.12600CE 02	C.806734E-01	0.553541E-01	0.565989E-01	0.456602E-02	0.313524E-02
0.12400CE 02	C.812348E-01	0.548522E-01	0.576010E-01	0.467921E-02	0.315954E-02
0.12200CE 02	C.818089E-01	0.542638E-01	0.586520E-01	0.479826E-02	0.318268E-02
0.12000CE 02	C.823961E-01	0.536224E-01	0.597574E-01	0.492378E-02	0.320434E-02
0.118C0CE 02	C.829970E-01	0.529262E-01	0.609234E-01	0.505646E-02	0.322444E-02
0.11600CE 02	C.836120E-01	0.521713E-01	0.621572E-01	0.519708E-02	0.324282E-02
0.11400CE 02	C.842417E-01	0.513541E-01	0.634669E-01	0.534656E-02	0.325929E-02
0.11200CE 02	C.848868E-C1	0.5047C6E-01	0.648625E-01	0.550597E-02	0.327365E-02
0.11000CE 02	C.855479E-01	0.495166E-01	0.663553E-01	0.567655E-02	0.328569E-02
0.10800CE 02	C.862257E-01	0.48488CE-01	0.679588E-01	0.585979E-02	0.329518E-02
0.10600CE 02	C.869208E-01	0.473785E-01	0.696882E-01	0.605736E-02	0.330172E-02
0.104C0CE 02	C.876343E-01	0.461669E-01	0.715622E-01	0.627130E-02	0.330523E-02
0.10200CE 02	C.883667E-01	0.449C74E-01	0.736022E-01	0.650398E-02	0.330528E-02
0.10000CE 02	C.891191E-01	0.435358E-01	0.758335E-01	0.675821E-02	0.330147E-02

0.990000E 01	0.895030E-01	0.428143E-01	0.770299E-01	0.689441E-02	0.329798E-02
0.980000E 01	0.898923E-01	0.420685E-01	0.782857E-01	0.703728E-02	0.329336E-02
0.970000E 01	0.902870E-01	0.412577E-01	0.796053E-01	0.718733E-02	0.328752E-02
0.960000E 01	0.906874E-01	0.404964E-01	0.809937E-01	0.734511E-02	0.327995E-02
0.950000E 01	0.910934E-01	0.396736E-01	0.824561E-01	0.751121E-02	0.327133E-02
0.940000E 01	0.915054E-01	0.388247E-01	0.839984E-01	0.768630E-02	0.326121E-02
0.930000E 01	0.919233E-01	0.379494E-01	0.856270E-01	0.787112E-02	0.324946E-02
0.920000E 01	0.923474E-01	0.370474E-01	0.873484E-01	0.806640E-02	0.323603E-02
0.910000E 01	0.927779E-01	0.361186E-01	0.891701E-01	0.827301E-02	0.322070E-02
0.900000E 01	0.932148E-01	0.351629E-01	0.911002E-01	0.849189E-02	0.320335E-02
0.890000E 01	0.936584E-01	0.341863E-01	0.931471E-01	0.872401E-02	0.318436E-02
0.880000E 01	0.941088E-01	0.331789E-01	0.953204E-01	0.897049E-02	0.316262E-02
0.870000E 01	0.945663E-01	0.321454E-01	0.976301E-01	0.923252E-02	0.313835E-02
0.860000E 01	0.950309E-01	0.310863E-01	0.100087E-00	0.951136E-02	0.311133E-02
0.850000E 01	0.955030E-01	0.300022E-01	0.102704E-00	0.980854E-02	0.308135E-02
0.840000E 01	0.959826E-01	0.288940E-01	0.105493E-00	0.101255E-01	0.304812E-02
0.830000E 01	0.964701E-01	0.277753E-01	0.108469E-00	0.104640E-01	0.301276E-02
0.820000E 01	0.969656E-01	0.266264E-01	0.111645E-00	0.108257E-01	0.297271E-02
0.810000E 01	0.974694E-01	0.254587E-01	0.115040E-00	0.112129E-01	0.292877E-02
0.800000E 01	0.979817E-01	0.242641E-01	0.118671E-00	0.116276E-01	0.287945E-02
0.790000E 01	0.985027E-01	0.230612E-01	0.122556E-00	0.120721E-01	0.282629E-02
0.780000E 01	0.990327E-01	0.218456E-01	0.126317E-00	0.125491E-01	0.276821E-02
0.770000E 01	0.995721E-01	0.206205E-01	0.131176E-00	0.130615E-01	0.270492E-02
0.760000E 01	0.100121E-00	0.193736E-01	0.135957E-00	0.136121E-01	0.263396E-02
0.750000E 01	0.100680E-00	0.181328E-01	0.141088E-00	0.142047E-01	0.255832E-02
0.740000E 01	0.101249E-00	0.169037E-01	0.146594E-00	0.148424E-01	0.247799E-02
0.730000E 01	0.101828E-00	0.156718E-01	0.152509E-00	0.155297E-01	0.239009E-02
0.720000E 01	0.102418E-00	0.144499E-01	0.158864E-00	0.162705E-01	0.229557E-02
0.710000E 01	0.103019E-00	0.132433E-01	0.165696E-00	0.170699E-01	0.219437E-02
0.700000E 01	0.103632E-00	0.120578E-01	0.173041E-00	0.179326E-01	0.208650E-02
0.690000E 01	0.104257E-00	0.108993E-01	0.180943E-00	0.188646E-01	0.197216E-02
0.680000E 01	0.104894E-00	0.977413E-02	0.189446E-00	0.198718E-01	0.185167E-02
0.670000E 01	0.105544E-00	0.868870E-02	0.198597E-00	0.209607E-01	0.172555E-02
0.660000E 01	0.106207E-00	0.764554E-02	0.208448E-00	0.221386E-01	0.159453E-02
0.650000E 01	0.106884E-00	0.666309E-02	0.219055E-00	0.234134E-01	0.145956E-02
0.640000E 01	0.107574E-00	0.573556E-02	0.230476E-00	0.247933E-01	0.132191E-02
0.630000E 01	0.108280E-00	0.487272E-02	0.242778E-00	0.262880E-01	0.118299E-02
0.620000E 01	0.109001E-00	0.407562E-02	0.256027E-00	0.279071E-01	0.104449E-02
0.610000E 01	0.109737E-00	0.336046E-02	0.270298E-00	0.296617E-01	0.908326E-03
0.600000E 01	0.110490E-00	0.271822E-02	0.285669E-00	0.315634E-01	0.776510E-03
0.590000E 01	0.111259E-00	0.215447E-02	0.302225E-00	0.336253E-01	0.651134E-03
0.580000E 01	0.112047E-00	0.166920E-02	0.320056E-00	0.358612E-01	0.534237E-03
0.570000E 01	0.112852E-00	0.126063E-02	0.339258E-00	0.382860E-01	0.427679E-03
0.560000E 01	0.113677E-00	0.925162E-03	0.359934E-00	0.409162E-01	0.332997E-03
0.550000E 01	0.114522E-00	0.657442E-03	0.382193E-00	0.437694E-01	0.251270E-03
0.540000E 01	0.115387E-00	0.450589E-03	0.406152E-00	0.468647E-01	0.183008E-03
0.530000E 01	0.116274E-00	0.296527E-03	0.431933E-00	0.502226E-01	0.128080E-03
0.520000E 01	0.117184E-00	0.186452E-03	0.459670E-00	0.538658E-01	0.857064E-04
0.510000E 01	0.118117E-00	0.111419E-03	0.489499E-00	0.578180E-01	0.545396E-04
0.500000E 01	0.119074E-00	0.629149E-04	0.521569E 00	0.621056E-01	0.328144E-04
0.495000E 01	0.119563E-00	0.461986E-04	0.395642E-00	0.473041E-01	0.182781E-04
0.490000E 01	0.120058E-00	0.333730E-04	0.411726E-00	0.494310E-01	0.137405E-04
0.485000E 01	0.120560E-00	0.236988E-04	0.428419E-00	0.516501E-01	0.101530E-04
0.480000E 01	0.121068E-00	0.165325E-04	0.445741E-00	0.539651E-01	0.736921E-05
0.475000E 01	0.121584E-00	0.113226E-04	0.463714E-00	0.563803E-01	0.525045E-05
0.470000E 01	0.122107E-00	0.760873E-05	0.482357E-00	0.588992E-01	0.367012E-05
0.465000E 01	0.122638E-00	0.501426E-05	0.501694E 00	0.615265E-01	0.251562E-05
0.460000E 01	0.123175E-00	0.324027E-05	0.521745E 00	0.642662E-01	0.169060E-05
0.455000E 01	0.123721E-00	0.205253E-05	0.542533E 00	0.671229E-01	0.111356E-05
0.450000E 01	0.124275E-00	0.127477E-05	0.564082E 00	0.701013E-01	0.719073E-06
0.445000E 01	0.124837E-00	0.776545E-06	0.586414E 00	0.732061E-01	0.455377E-06
0.440000E 01	0.125407E-00	0.464293E-06	0.609553E 00	0.764424E-01	0.283011E-06

0.435000E 01	C.125986E-00	0.272787E-06	0.633524E 00	0.798152E-01	0.172817E-06
0.430000E 01	C.126574E-00	0.157748E-06	0.658350E 00	0.833299E-01	0.103853E-06
0.425000E 01	C.127171E-00	0.899831E-07	0.684057E 00	0.869920E-01	0.615536E-07
0.420000E 01	C.127777E-00	0.507684E-07	0.710669E 00	0.908071E-01	0.360796E-07
0.415000E 01	C.128393E-00	0.284297E-07	0.738211E 00	0.947808E-01	0.209871E-07
0.410000E 01	C.129018E-00	0.158669E-07	0.766710E 00	0.989195E-01	0.121653E-07
0.405000E 01	C.129654E-00	0.886763E-08	0.796191E 00	0.103229E-00	0.706033E-08
0.400000E 01	C.130300E-00	0.499128E-08	0.826679E 00	0.107716E-00	0.412619E-08
0.395000E 01	C.130956E-00	0.284678E-08	0.858200E 00	0.112387E-00	0.244310E-08
0.390000E 01	C.131624E-00	0.165625E-08	0.890781E 00	0.117248E-00	0.147535E-08
0.385000E 01	C.132303E-00	0.990219E-09	0.924446E 00	0.122307E-00	0.915404E-09
0.380000E 01	C.132994E-00	0.612722E-09	0.959222E 00	0.127570E-00	0.587737E-09
0.375000E 01	C.133696E-00	0.395364E-09	0.995134E 00	0.133046E-00	0.393440E-09
0.370000E 01	C.134411E-00	0.267891E-09	0.103221E 01	0.138741E-00	0.276519E-09
0.365000E 01	C.135139E-00	0.191841E-09	0.107047E 01	0.144662E-00	0.205360E-09
0.360000E 01	C.135880E-00	0.146036E-09	0.110993E 01	0.150817E-00	0.162090E-09
0.355000E 01	C.136634E-00	0.118659E-09	0.115064E 01	0.157217E-00	0.136534E-09
0.350000E 01	C.137402E-00	0.103270E-09	0.119259E 01	0.163865E-00	0.123159E-09
0.345000E 01	C.138185E-00	0.963922E-10	0.123583E 01	0.170773E-00	0.119124E-09
0.340000E 01	C.138983E-00	0.965192E-10	0.128036E 01	0.177948E-00	0.123579E-09
0.335000E 01	C.139796E-00	0.103506E-09	0.132621E 01	0.185399E-00	0.137270E-09
0.330000E 01	C.140625E-00	0.118545E-09	0.137340E 01	0.193134E-00	0.162810E-09
0.325000E 01	C.141470E-00	0.144373E-09	0.142194E 01	0.201162E-00	0.205289E-09
0.320000E 01	C.142333E-00	0.186013E-09	0.147185E 01	0.209492E-00	0.273783E-09
0.315000E 01	C.143213E-00	0.252022E-09	0.152313E 01	0.218132E-00	0.383863E-09
0.310000E 01	C.144111E-00	0.356760E-09	0.157581E 01	0.227092E-00	0.562186E-09
0.305000E 01	C.145028E-00	0.524664E-09	0.162988E 01	0.236379E-00	0.854162E-09
0.300000E 01	C.145965E-00	0.793783E-09	0.168536E 01	0.246004E-00	0.133781E-08
0.295000E 01	C.146923E-00	0.123096E-08	0.174224E 01	0.255974E-00	0.214462E-08
0.290000E 01	C.147901E-00	0.194431E-08	0.180052E 01	0.266299E-00	0.350078E-08
0.285000E 01	C.148901E-00	0.310804E-08	0.186020E 01	0.276986E-00	0.578158E-08
0.280000E 01	C.149924E-00	0.500395E-08	0.192127E 01	0.288045E-00	0.961395E-08
0.275000E 01	C.150971E-00	0.807785E-08	0.198371E 01	0.299483E-00	0.160241E-07
0.270000E 01	C.152043E-00	0.130244E-07	0.204750E 01	0.311308E-00	0.266675E-07
0.265000E 01	C.153140E-00	0.209058E-07	0.211262E 01	0.323527E-00	0.441659E-07
0.260000E 01	C.154264E-00	0.333117E-07	0.217903E 01	0.336147E-00	0.725872E-07
0.255000E 01	C.155417E-00	0.525795E-07	0.224670E 01	0.349175E-00	0.118130E-06
0.250000E 01	C.156598E-00	0.820589E-07	0.231557E 01	0.362614E-00	0.190013E-06
0.245000E 01	C.157810E-00	0.126460E-06	0.238561E 01	0.376473E-00	0.301684E-06
0.240000E 01	C.159054E-00	0.192242E-06	0.245674E 01	0.390754E-00	0.472289E-06
0.235000E 01	C.160331E-00	0.288060E-06	0.252889E 01	0.405459E-00	0.728471E-06
0.230000E 01	C.161643E-00	0.425272E-06	0.260199E 01	0.420593E-00	0.110655E-05
0.225000E 01	C.162992E-00	0.618420E-06	0.267593E 01	0.436155E-00	0.165485E-05
0.220000E 01	C.164379E-00	0.885741E-06	0.275061E 01	0.452143E-00	0.243633E-05
0.215000E 01	C.165807E-00	0.124948E-05	0.282592E 01	0.468557E-00	0.353093E-05
0.210000E 01	C.167277E-00	0.173647E-05	0.290172E 01	0.485391E-00	0.503876E-05
0.205000E 01	C.168792E-00	0.237787E-05	0.297787E 01	0.502641E 00	0.708099E-05
0.200000E 01	C.170354E-00	0.320961E-05	0.305419E 01	0.520294E 00	0.980277E-05
0.195000E 01	C.171966E-00	0.427182E-05	0.313051E 01	0.538342E 00	0.133730E-04
0.190000E 01	C.173631E-00	0.560837E-05	0.320663E 01	0.556770E 00	0.179840E-04
0.185000E 01	C.175351E-00	0.726599E-05	0.328233E 01	0.575560E 00	0.238494E-04
0.180000E 01	C.177130E-00	0.929201E-05	0.335736E 01	0.594691E 00	0.312000E-04
0.175000E 01	C.178972E-00	0.117387E-04	0.343145E 01	0.614135E 00	0.402807E-04
0.170000E 01	C.180881E-00	0.146503E-04	0.350432E 01	0.633865E 00	0.513354E-04
0.165000E 01	C.182862E-00	0.180720E-04	0.357563E 01	0.653847E 00	0.646187E-04
0.160000E 01	C.184917E-00	0.220420E-04	0.364505E 01	0.674033E 00	0.803440E-04
0.155000E 01	C.187053E-00	0.265911E-04	0.371219E 01	0.694377E 00	0.987113E-04
0.150000E 01	C.189276E-00	0.317392E-04	0.377663E 01	0.714824E 00	0.119867E-03
0.145000E 01	C.191591E-00	0.374925E-04	0.383792E 01	0.735310E 00	0.143893E-03
0.140000E 01	C.194006E-00	0.438421E-04	0.389557E 01	0.755763E 00	0.170790E-03
0.135000E 01	C.196528E-00	0.507596E-04	0.394904E 01	0.776098E 00	0.200452E-03
0.130000E 01	C.199167E-00	0.581964E-04	0.399775E 01	0.796220E 00	0.232655E-03

0.125000E 01	0.201932E-00	0.660797E-04	0.404108E 01	0.816023E 00	0.267033E-03
0.120000E 01	0.204833E-00	0.743121E-04	0.407833E 01	0.835378E 00	0.303069E-03
0.115000E 01	0.207884E-00	0.827676E-04	0.410879E 01	0.854152E 00	0.340075E-03
0.110000E 01	0.211098E-00	0.912519E-04	0.413165E 01	0.872183E 00	0.377186E-03
0.105000E 01	0.214491E-00	0.997013E-04	0.414606E 01	0.889293E 00	0.413367E-03
0.100000E 01	0.218082E-00	0.107783E-03	0.415107E 01	0.905272E 00	0.447413E-03
0.950000E 00	0.221891E-00	0.115295E-03	0.414571E 01	0.919895E 00	0.477978E-03
0.900000E 00	0.225943E-00	0.121969E-03	0.412888E 01	0.932892E 00	0.503595E-03
0.850000E 00	0.230267E-00	0.127514E-03	0.409943E 01	0.943965E 00	0.522736E-03
0.800000E 00	0.234897E-00	0.131623E-03	0.405611E 01	0.952770E 00	0.533879E-03
0.750000E 00	0.239874E-00	0.133981E-03	0.399756E 01	0.958910E 00	0.535596E-03
0.700000E 00	0.245245E-00	0.134275E-03	0.392236E 01	0.961940E 00	0.526675E-03
0.650000E 00	0.251071E-00	0.132215E-03	0.382893E 01	0.961332E 00	0.506243E-03
0.600000E 00	0.257423E-00	0.127555E-03	0.371561E 01	0.956484E 00	0.473946E-03
0.550000E 00	0.264394E-00	0.120124E-03	0.358060E 01	0.946688E 00	0.430117E-03
0.500000E 00	0.272098E-00	0.109867E-03	0.342198E 01	0.931116E 00	0.375964E-03
0.450000E-00	0.280681E-00	0.968576E-04	0.323769E 01	0.908758E 00	0.313724E-03
0.400000E-00	0.290352E-00	0.815635E-04	0.302550E 01	0.878459E 00	0.246770E-03
0.350000E-00	0.301379E-00	0.645222E-04	0.278304E 01	0.838749E 00	0.179568E-03
0.300000E-00	0.314147E-00	0.468152E-04	0.250777E 01	0.787807E 00	0.117402E-03
0.250000E-00	0.329224E-00	0.299048E-04	0.219696E 01	0.723291E 00	0.656996E-04
0.200000E-00	0.347508E-00	0.155951E-04	0.184768E 01	0.642084E 00	0.288148E-04
0.150000E-00	0.370483E-00	0.566474E-05	0.145681E 01	0.539724E 00	0.825246E-05
0.100000E-00	0.400932E-00	0.947575E-06	0.102100E 01	0.409352E-00	0.967474E-06
0.500001E-01	0.444782E-00	0.139711E-07	0.536674E 00	0.238703E-00	0.749792E-08
0.	0.	0.	0.	0.	0.

APPENDIX C

Fortran Listing and Input and Output Sheets for
Beam-flux Case with Analytical Flux

704 INPUT DATA

FORM I

COST CODE _____

PROGRAM B512/RP

PROBLEM Beam-Analytical

ORIGIN AT OR

DATE _____

PAGE 1 OF 1

[illegible]

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C      BEAM FLUX PROGRAM WITH ANALYTICAL FLUX
      DIMENSION X(2510),P(2510),Q(2510),FLUXM(2510),FLUXE(2510),
      XXINTE1(2510),XXINTE2(2510),XXINTE3(2510),XXINTE4(2510),XTCP(105),
      XN(105),TOTAL1(105),TOTAL2(105),TOTAL3(105),TOTAL4(105),ALPA(100),
      XBETA(100),XRESA(100),ERESA(100),ALPC(100),BETC(100),XRESC(100),
      AERESC(100),F(10),G(10),XN(105),DELTAX(105)
C      READ INPUT AND WRITE INPUT DATA
      3 FORMAT(6I1,4I3/6E12.6/2E12.6/(6E12.6))
      4 FORMAT(18I4)
      5 FORMAT(6E12.6)
      6 FORMAT(E12.6,I2)
      10 READ INPUT TAPE7,3,KRCNA,KRONF,KRUNT,KRONM,NE,NP,M,NA,NF,
      XNPROB,GA,TA,SIGA0,GF,TF,SIGF0,EMAXW,RAT,(XTUP(J),J=1,M)
      READ INPUT TAPE7,4,(N(J),J=1,M)
      IF(NA)14,14,12
      12 READ INPUT TAPE7,5,(ALPA(J),BETA(J),ERESA(J),J=1,NA)
      14 IF(NF)18,18,16
      16 READ INPUT TAPE7,5,(ALPC(J),BETC(J),ERESC(J),J=1,NF)
      18 GO TO(20,22,24,26,28),NE
      20 READ INPUT TAPE7,30,XMU
      GO TO40
      22 READ INPUT TAPE7,6,XML,NTRAN
      GO TO40
      24 READ INPUT TAPE7,5,XONE,XTWO,(F(J),J=1,10)
      GO TO40
      26 READ INPUT TAPE7,32,XONE,XTWO
      GO TO40
      28 READ INPUT TAPE7,5,XONE,XTWO,(G(J),J=1,10)
      30 FORMAT(E12.6)
      32 FORMAT(2E12.6)
      40 WRITE OUTPUT TAPE6,42,NPROB,GA,TA,SIGA0,GF,TF,SIGF0,EMAXW,RAT
      42 FORMAT(34H1BEAM FLUX PROGRAM PROBLEM NUMBER 13/55H0
      X                               INPUT DATA/99H0      GA      T
      X      SIGMA A 0      GF      LO      SIGMA F 0      EM
      X      R/1H 8E13.6)
      44 FORMAT(36H0      FOIL RESONANCE PARAMETERS/42H      ALPHA
      X      BETA      FRES/(1H 3E15.6))
      46 FORMAT(36H0      COVER RESONANCE PARAMETERS/42H      ALPHA
      X      BETA      ERES/(1H 3E15.6))
      48 FORMAT(71H0 SUBINTEGRAL UPPER LIMITS AND NUMBER OF MESH INTERVALS
      XPER SUBINTEGRAL/(1H E15.6,15))
      50 FORMAT(36H0 EPITHERMAL FLUX PARAMETERS OPTION 11)
      52 FORMAT(11H      MU/1H E15.6)
      54 FORMAT(18H      MU      N/1H E15.6,13)
      56 FORMAT(25H      A      B/1H 2E15.6/71H      F1
      X      F2      F3      F4      F5/1H 5E15.6/7
      X2H      F6      F7      F8      F9
      X      F10/1H 5E15.6)
      58 FORMAT(25H      A      H/1H 2E15.6)
      60 FORMAT(25H      A      B/1H 2E15.6/71H      G1
      X      G2      G3      G4      G5/1H 5E15.6/7
      X2H      G6      G7      G8      G9
      X      G10/1H 5E15.6)
      IF(NA)68,68,66
      66 WRITE OUTPUT TAPE6,44,(ALPA(J),BETA(J),ERESA(J),J=1,NA)
      68 IF(NF)72,72,70
      70 WRITE OUTPUT TAPE6,46,(ALPC(J),BETC(J),ERESC(J),J=1,NF)
      72 WRITE OUTPUT TAPE6,48,(XTUP(J),N(J),J=1,M)
      WRITE OUTPUT TAPE6,50,NF
      GOTO(74,76,78,80,82),NE
      74 WRITE OUTPUT TAPE6,52,XMU
      GO TO90

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76 WRITE OUTPUT TAPE6,54,XMU,NTRAN
   GO TO90
78 WRITE OUTPUT TAPE6,56,XONE,XTWO,(F(J),J=1,10)
   GO TO90
80 WRITE OUTPUT TAPE6,58,XONE,XTWO
   GO TO90
82 WRITE OUTPUT TAPE6,60,XONE,XTWO,(G(J),J=1,10)
C  CALCULATE VARIOUS CONSTANTS
90 CONST1=1.0/(SQRTF(EMAXW))
   CONST3=(EMAXW)*2.
   XZERO=0.0253/EMAXW
   CONST5=SQRTF(XZERO)
   IF(KRONA-1)94,92,94
92 CONST2=0.15906*SICAC
94 IF(KRONF-1)98,96,98
96 CONST4=0.15906*SICFO
98 IF(NA)102,102,100
100 DO101J=1,NA
101 XRESA(J)=(ERESA(J))/EMAXW
102 IF(NF)110,110,104
104 DO105J=1,NF
105 XRESC(J)=(ERESC(J))/EMAXW
110 IF(NE-2)114,112,114
112 XNTRAN=NTRAN
   D=18.4207/XNTRAN
   XONE=XMU*(EXP(-D))
   XTWO=XMU*(EXP(D))
114 IF(NE-4)118,116,118
116 CONST6=1.0/((XONE-1.0)*XTWO)
C  CALCULATE X AND DELTAX
118 XTOP(M+1)=0.0
   N(M+1)=1
   I1=1
   I2=N(1)
   DO122J=1,M
   XN(J)=N(J)
   DELTAX(J)=(XTOP(J)-XTOP(J+1))/XN(J)
   X(I1)=XTOP(J)
   DO120I=I1,I2
120 X(I+1)=X(I)-DELTAX(J)
   I1=I1+N(J)
122 I2=I2+N(J+1)
   X(I2)=0.0
   L=I2-1
C  CALCULATION OF FUNCTIONS AT EACH MESH POINT
   DO300I=1,L
C  FULL CROSS SECTION FUNCTIONS
   IF(KRONA-1)126,124,126
124 SIGA=GA*CONST2*A
   GO TO128
126 SIGA=0.0
128 IF(NA)134,134,130
130 DO132J=1,NA
132 SIGA=SIGA+(GA*A*ALPHA(J))/(CONST3*((X(I)-XRESA(J))*2.)+BETA(J))
134 IF(KRONF-1)138,138,136
136 SICATA=TA*SIGA
   P(1)=1.-EXP(-SICATA)
   GO TO140
138 W(I)=SIGA
C  COVER CROSS SECTION FUNCTIONS
140 IF(KRONF-1)144,142,144

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142 SIGF=GF*CONST4*4
    GO 10146
144 SIGF=0.0
146 IF(NF)152,152,146
148 DO150J=1,NF
150 SIGF=SIGF+(GF*A*ALPC(J))/(CONST3*((X(I)-XRESC(J))*2.)+BETC(J))
152 SIGFTF=1F*SIGF
    G(I)=EXP(-SIGFTF)
C      MAXWELLIAN FLUX CALCULATION
    IF(KRUNM-1)156,154,154
154 FLUXM(I)=(1.1283791)*RAT*X(I)*EXP(-X(I))
    GO 10160
156 FLUXM(I)=0.0
C      EPITHERMAL FLUX CALCULATION
160 GO TO(170,190,210,230,250),I.E
C      OPTION 1 FOR DELTA
170 IF(X(I)-XMU)180,175,175
175 DELTA=1.0
    GO 10270
180 DELTA=0.0
    GO 10270
C      OPTION 2 FOR DELTA
190 IF(X(I)-XTWO)200,195,195
195 DELTA=1.0
    GO 10270
200 IF(X(I)-XONE)207,205,205
205 DELTA=1./(1.+(XMU/X(I))*XNTRAN)
    GO 10270
207 DELTA=0.0
    GO 10270
C      OPTION 3 FOR DELTA
210 IF(X(I)-XTWO)214,212,212
212 DELTA=1.0
    GO 10270
214 IF(X(I)-XONE)220,216,216
216 DELTA=0.0
    DO218J=1,10
    K=11-J
218 DELTA=F(K)+X(I)*DELTA
    GO 10270
220 DELTA=0.0
    GO 10270
C      OPTION 4 FOR DELTA
230 IF(X(I)-XTWO)234,232,232
232 DELTA=1.0
    GO 10270
234 IF(X(I)-XONE)238,236,236
236 DELTA=X(I)/XTWO
    GO 10270
238 IF(X(I)-1.0)242,240,240
240 DELTA=CONST6*X(I)*(X(I)-1.)
    GO 10270
242 DELTA=0.0
    GO 10270
C      OPTION 5 FOR DELTA
250 IF(X(I)-XTWO)254,252,252
252 DELTA=1.0
    GO 10270
254 IF(X(I)-XONE)260,256,256
256 DELTA=0.0
    DO258J=1,10
    K=11-J

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258 DELTA=G(K)+(LOGF(X(1)))*DELTA
GO TO 270
260 DELTA=0.0
270 FLUXE(1)=CONST5*DELTA/X(1)
C   CALCULATE INTEGRANDS
    IF(KRONM)280,280,290
280 XINTE1(1)=0.0
    XINTE3(1)=0.0
    GO TO 295
290 XINTE1(1)=FLUXM(1)*P(1)
    XINTE3(1)=XINTE1(1)*G(1)
295 XINTE2(1)=FLUXE(1)*P(1)
300 XINTE4(1)=XINTE2(1)*w(1)
C   CALCULATE SUBINTEGRALS
    XINTE1(12)=0.0
    XINTE2(12)=0.0
    XINTE3(12)=0.0
    XINTE4(12)=0.0
    LI=1
    L2=N(1)-1
    DO340J=1,M
    TOTAL1(J)=0.0
    TOTAL2(J)=0.0
    TOTAL3(J)=0.0
    TOTAL4(J)=0.0
    DO330I=L1,L2,2
    IF(KRONM)315,315,310
310 SUM1=(XINTE1(I)+4.*XINTE1(I+1)+XINTE1(I+2))*(DELTAX(J))/3.
    TOTAL1(J)=TOTAL1(J)+SUM1
    SUM3=(XINTE3(I)+4.*XINTE3(I+1)+XINTE3(I+2))*(DELTAX(J))/3.
    TOTAL3(J)=TOTAL3(J)+SUM3
315 IF(NE-1)316,316,320
316 IF(XTOP(J)-XMU-0.001)330,330,320
320 SUM2=(XINTE2(I)+4.*XINTE2(I+1)+XINTE2(I+2))*(DELTAX(J))/3.
    TOTAL2(J)=TOTAL2(J)+SUM2
    SUM4=(XINTE4(I)+4.*XINTE4(I+1)+XINTE4(I+2))*(DELTAX(J))/3.
    TOTAL4(J)=TOTAL4(J)+SUM4
330 CONTINUE
    LI=LI+N(J)
340 L2=L2+N(J+1)
C   CALCULATE RIGHT INTEGRALS XTOP TO ZERO
    RIGHT1=0.0
    IF(KRONM)360,360,350
350 DO355J=1,M
355 RIGHT1=RIGHT1+TOTAL3(J)
360 RIGHT4=0.0
    DO365J=1,M
365 RIGHT4=RIGHT4+TOTAL4(J)
    RIGHT7=RIGHT1+RIGHT4
C   CALCULATE LEFT INTEGRALS XTOP TO XCUT
    J=1
    XLEFT3=0.0
    XLEFT6=0.0
370 XLEFT3=XLEFT3+TOTAL1(J)
    XLEFT6=XLEFT6+TOTAL2(J)
    XLEFT9=XLEFT3+XLEFT6
    IF(XLEFT9-RIGHT7)380,390,390
380 J=J+1
    GO TO 370
390 XLEFT3=XLEFT3-TOTAL1(J)
    XLEFT6=XLEFT6-TOTAL2(J)
    XLEFT9=XLEFT3+XLEFT6

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      LJC=J
      LJCM=LJC-1
      I=1
      IF(LJCM)405,405,395
395  DO400K=1,LJCM
400  I=I+N(K)
405  LIC=I
      IF(NE-1)406,406,410
406  IF(XTOP(LJC)-XMO-0.001)407,407,410
407  XINTE2(LIC)=0.0
      XINTE4(LIC)=0.0
410  XSUM1=(XINTE1(I)+4.*XINTE1(I+1)+XINTE1(I+2))*(DELTAX(LJC))/3.
      XSUM2=(XINTE2(I)+4.*XINTE2(I+1)+XINTE2(I+2))*(DELTAX(LJC))/3.
      XLEFT3=XLEFT3+XSUM1
      XLEFT6=XLEFT6+XSUM2
      XLEFT9=XLEFT3+XLEFT6
      IF(XLEFT9-RIGHT7)420,430,430
420  I=I+2
      GO TO410
430  XLEFT3=XLEFT3-XSUM1
      XLEFT6=XLEFT6-XSUM2
      XLEFT9=XLEFT3+XLEFT6
440  T1=(XINTE1(I)+XINTE1(I+1))*(DELTAX(LJC))/2.
      T2=(XINTE2(I)+XINTE2(I+1))*(DELTAX(LJC))/2.
      XLEFT3=XLEFT3+T1
      XLEFT6=XLEFT6+T2
      XLEFT9=XLEFT3+XLEFT6
      IF(XLEFT9-RIGHT7)450,460,460
450  I=I+1
      GO TO440
460  XLEFT3=XLEFT3-T1
      XLEFT6=XLEFT6-T2
      XLEFT9=XLEFT3+XLEFT6
      LCUT=1
C      CALCULATE XCUT AND ECUT
470  XMESH=(RIGHT7-XLEFT9)*(DELTAX(LJC))/(T1+T2)
      XCUT=X(I)-XMESH
      ECUT=XCUT*EMAXW
      XLEFT3=XLEFT3+T1*XMESH/(DELTAX(LJC))
      XLEFT6=XLEFT6+T2*XMESH/(DELTAX(LJC))
      XLEFT9=XLEFT3+XLEFT6
C      CALCULATE LEFT INTEGRALS XTOP TO ZERO
      XLEFT11=0.0
      IF(KRONM)485,485,475
475  DO480J=1,M
480  XLEFT1=XLEFT1+TOTAL1(J)
485  XLEFT4=0.0
      DO490J=1,M
490  XLEFT4=XLEFT4+TOTAL2(J)
      XLEFT7=XLEFT1+XLEFT4
C      CALCULATE LEFT INTEGRALS XCUT TO ZERO
      XLEFT2=XLEFT1-XLEFT3
      XLEFT5=XLEFT4-XLEFT6
      XLEFT8=XLEFT7-XLEFT9
C      CALCULATE RIGHT INTEGRALS XTOP TO XCUT
      RIGHT3=0.0
      IF(KRONM)515,515,500
500  IF(LJCM)515,515,505
505  DO510J=1,LJCM
510  RIGHT3=RIGHT3+TOTAL3(J)
515  RIGHT6=0.0
      IF(LJCM)530,530,520

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520 D0525J=1,LJCM
525 RIGHT6=RIGHT6+TOTAL4(J)
530 IF(LCUT-LIC-2)550,535,535
535 LSTOP=LCUT-2
    D0540I=LIC,LSTOP,2
    XSUM3=(XINTE3(1)+4.*XINTE3(I+1)+XINTE3(I+2))*(DELTAX(LJC))/3.
    XSUM4=(XINTE4(1)+4.*XINTE4(I+1)+XINTE4(I+2))*(DELTAX(LJC))/3.
    RIGHT3=RIGHT3+XSUM3
540 RIGHT6=RIGHT6+XSUM4
550 LV=LIC
555 IF(LCUT-LV)580,565,560
560 LV=LV+2
    GO T0555
565 I=LCUT
570 RIGHT3=RIGHT3+(XMESH)*(XINTE3(I)+XINTE3(I+1))/2.
    RIGHT6=RIGHT6+(XMESH)*(XINTE4(I)+XINTE4(I+1))/2.
    RIGHT9=RIGHT3+RIGHT6
    GO T0590
580 I=LCUT-1
    RIGHT3=RIGHT3+(XINTE3(I)+XINTE3(I+1))*(DELTAX(LJC))/2.
    RIGHT6=RIGHT6+(XINTE4(I)+XINTE4(I+1))*(DELTAX(LJC))/2.
    I=I+1
    GO T0570
C   CALCULATE RIGHT INTEGRALS XCUT TO ZERO
590 RIGHT2=RIGHT1-RIGHT3
    RIGHT5=RIGHT4-RIGHT6
    RIGHT8=RIGHT7-RIGHT9
C   WRITE STANDARD OUTPUT DATA
    WRITE OUTPUT TAPE6,600,XCUT,ECUT,(TOTAL1(J),TOTAL2(J),
    XTOTAL3(J),TOTAL4(J),J=1,M)
    WRITE OUTPUT TAPE6,610,XLEFT2,XLEFT3,XLEFT1,XLEFT5,
    XXLEFT6,XLEFT4,XLEFT8,XLEFT9,XLEFT7,RIGHT2,RIGHT3,
    XRIGHT1,RIGHT5,RIGHT6,RIGHT4,RIGHT8,RIGHT9,RIGHT7
600 FORMAT(55H0                                OUTPUT DATA/
    X3IH0          XCUT          CUTOFF ENERGY/1H 2E15.6/38H0
    X              SUBINTEGRALS/58H          TOTAL 1          TOTAL 2          TOTAL
    X3              TOTAL 4/(1H 4E15.6))
610 FORMAT(71H0                                INTEGRAL
    XS FOR BARE FOIL/1COH                      MAXWELLIAN
    X              EPITHERMAL                      SUM/116H    0 TO
    X XCUT          XCUT TO XTOP    0 TO XTOP    0 TO XCUT    XCUT TO XTOP    0 TO
    XXTOP          0 TO XCUT    XCUT TO XTOP    0 TO XTOP/1H 9E13.6/73H0
    X              INTEGRALS FOR COVERED FOIL/1
    X00H                      MAXWELLIAN                      EPITHERM
    XAL                      SUM/116H    0 TO XCUT    XCUT TO X
    XTOP    0 TO XTOP    0 TO XCUT    XCUT TO XTOP    0 TO XTOP    0 TO XCUT
    X    XCUT TO XTOP    0 TO XTOP/1H 9E13.6)
C   WRITE OPTIONAL OUTPUT DATA
    IF(NP)630,630,620
620 WRITE OUTPUT TAPE6,625,(X(I),P(I),Q(I),FLUXM(I),FLUXE(I),
    XXINTE1(I),XINTE2(I),XINTE3(I),XINTE4(I),I=1,12)
625 FORMAT(78H0                                VALUES OF FUNCTI
    XONS AT EACH MESH POINT/117H
    X              FLUXES                      BARE FOIL INTEGRANDS          COVERED FOI
    XL INTEGRANDS/117H          X              P              2              MAXWELL
    XIAN EPITHERMAL MAXWELLIAN EPITHERMAL MAXWELLIAN EPITHERM
    XAL/(1H 9E13.6))
630 GO TO 10
    END ( 1 , 1 , 0 , 1 , 0 )

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BEAM FLUX PROGRAM PROBLEM NUMBER 2

INPUT DATA

GA T SIGMA A Q GF LO SIGMA F Q EM R
0.153035E-03 0.100000E 03 0.314320E 02 0.118040E-03 0.200000E 02 0. 0.506000E-01 0.100000E 02

COVER RESONANCE PARAMETERS

ALPHA RLTA ERES
0.109000E 02 0.336000E-02 0.178000E-00

SUBINTEGRAL UPPER LIMITS AND NUMBER OF MESH INTERVALS PER SUBINTEGRAL

0.100000E 07 50
0.100000E 06 50
0.100000E 05 50
0.100000E 04 50
0.250000E 03 50
0.800000E 02 100
0.300000E 02 100
0.100000E 02 50
0.500000E 01 40
0.300000E 01 30
0.150000E 01 30

EPITHERMAL FLUX PARAMETERS OPTION 1

MU
0.500000E 01

OUTPUT DATA

XCUT CUTOFF ENERGY
0.782361E 01 0.395875E-00

SUBINTEGRALS			
TOTAL 1	TOTAL 2	TOTAL 3	TOTAL 4
0.	0.103977E-02	0.	0.103977E-02
0.	0.328556E-02	0.	0.328556E-02
0.	0.103648E-01	0.	0.103648E-01
0.	0.150892E-01	0.	0.150890E-01
0.784540E-33	0.230131E-01	0.783878E-33	0.230060E-01
0.194014E-11	0.332044E-01	0.191959E-11	0.330568E-01
0.548703E-03	0.616404E-01	0.430313E-03	0.559468E-01
0.584010E-01	0.590895E-01	0.721126E-02	0.174977E-01
0.289973E-00	0.	0.325991E-04	0.
0.847803E 00	0.	0.240053E-03	0.
0.165265E 01	0.	0.351154E-02	0.

INTEGRALS FOR BARE FOIL								
MAXWELLIAN				EPITHERMAL		SUM		
0 TO XCUR	XCUT TO XTOP	0 TO XTOP	0 TO XCUR	XCUT TO XTOP	0 TO XTOP	0 TO XCUR	XCUT TO XTOP	0 TO XTOP
0.284506E 01	0.430786E-02	0.284937E 01	0.403225E-01	0.166404E-00	0.206727E-00	0.288539E 01	0.170712E-00	0.305610E 01

INTEGRALS FOR COVERED FOIL								
MAXWELLIAN				EPITHERMAL		SUM		
0 TO XCUR	XCUT TO XTOP	0 TO XTOP	0 TO XCUR	XCUT TO XTOP	0 TO XTOP	0 TO XCUR	XCUT TO XTOP	0 TO XTOP
0.890024E-02	0.252553E-02	0.114258E-01	0.635114E-02	0.152935E-00	0.159286E-00	0.152514E-01	0.155461E-00	0.170712E-00

VALUES OF FUNCTIONS AT EACH MESH POINT								
FLUXES			BARE FOIL		COVERED FOIL		INTEGRANDS	
X	P	Q	MAXWELLIAN	EPITHERMAL	MAXWELLIAN	EPITHERMAL	MAXWELLIAN	EPITHERMAL
0.100000E 07	0.340059E-03	0.100000E 01	0.	0.707107E-06	0.	0.240458E-09	0.	0.240458E-09
0.982000E 06	0.343181E-03	0.100000E 01	0.	0.720068E-06	0.	0.247114E-09	0.	0.247114E-09

0.964000E	06	0.346363E-03	0.100000E	01	0.	0.733513E-06	0.	0.254062E-09	0.	0.254062E-09
0.946000E	06	0.349641E-03	0.100000E	01	0.	0.747470E-06	0.	0.261346E-09	0.	0.261346E-09
0.928000E	06	0.353009E-03	0.100000E	01	0.	0.761969E-06	0.	0.268981E-09	0.	0.268981E-09
0.910000E	06	0.356495E-03	0.100000E	01	0.	0.777040E-06	0.	0.277011E-09	0.	0.277011E-09
0.892000E	06	0.360072E-03	0.100000E	01	0.	0.792721E-06	0.	0.285436E-09	0.	0.285436E-09
0.874000E	06	0.363745E-03	0.100000E	01	0.	0.809047E-06	0.	0.294287E-09	0.	0.294287E-09
0.856000E	06	0.367552E-03	0.100000E	01	0.	0.826059E-06	0.	0.303620E-09	0.	0.303620E-09
0.838000E	06	0.371478E-03	0.100000E	01	0.	0.843803E-06	0.	0.313455E-09	0.	0.313455E-09
0.820000E	06	0.375539E-03	0.100000E	01	0.	0.862325E-06	0.	0.323837E-09	0.	0.323837E-09
0.802000E	06	0.379734E-03	0.100000E	01	0.	0.881679E-06	0.	0.334803E-09	0.	0.334803E-09
0.784000E	06	0.384063E-03	0.100000E	01	0.	0.901922E-06	0.	0.346394E-09	0.	0.346394E-09
0.766000E	06	0.388548E-03	0.100000E	01	0.	0.923116E-06	0.	0.358675E-09	0.	0.358675E-09
0.748000E	06	0.393197E-03	0.100000E	01	0.	0.945330E-06	0.	0.371701E-09	0.	0.371701E-09
0.730000E	06	0.398003E-03	0.100000E	01	0.	0.968639E-06	0.	0.385521E-09	0.	0.385521E-09
0.712000E	06	0.403009E-03	0.100000E	01	0.	0.993127E-06	0.	0.400240E-09	0.	0.400240E-09
0.694000E	06	0.408188E-03	0.100000E	01	0.	0.101889E-05	0.	0.415896E-09	0.	0.415896E-09
0.676000E	06	0.413604E-03	0.100000E	01	0.	0.104602E-05	0.	0.432636E-09	0.	0.432636E-09
0.658000E	06	0.419214E-03	0.100000E	01	0.	0.107463E-05	0.	0.450500E-09	0.	0.450500E-09
0.640000E	06	0.425071E-03	0.100000E	01	0.	0.110485E-05	0.	0.469641E-09	0.	0.469641E-09
0.622000E	06	0.431180E-03	0.100000E	01	0.	0.113683E-05	0.	0.490177E-09	0.	0.490177E-09
0.604000E	06	0.43758E-03	0.100000E	01	0.	0.117071E-05	0.	0.512252E-09	0.	0.512252E-09
0.586000E	06	0.444226E-03	0.100000E	01	0.	0.120667E-05	0.	0.536033E-09	0.	0.536033E-09
0.568000E	06	0.451200E-03	0.100000E	01	0.	0.124491E-05	0.	0.561701E-09	0.	0.561701E-09
0.550000E	06	0.458524E-03	0.100000E	01	0.	0.128565E-05	0.	0.589500E-09	0.	0.589500E-09
0.532000E	06	0.466213E-03	0.100000E	01	0.	0.132915E-05	0.	0.619666E-09	0.	0.619666E-09
0.514000E	06	0.474311E-03	0.100000E	01	0.	0.137569E-05	0.	0.652507E-09	0.	0.652507E-09
0.496000E	06	0.482835E-03	0.100000E	01	0.	0.142562E-05	0.	0.688338E-09	0.	0.688338E-09
0.478000E	06	0.491835E-03	0.100000E	01	0.	0.147930E-05	0.	0.727573E-09	0.	0.727573E-09
0.460000E	06	0.501364E-03	0.100000E	01	0.	0.153719E-05	0.	0.770692E-09	0.	0.770692E-09
0.442000E	06	0.511467E-03	0.100000E	01	0.	0.159979E-05	0.	0.818240E-09	0.	0.818240E-09
0.424000E	06	0.522211E-03	0.100000E	01	0.	0.166770E-05	0.	0.870894E-09	0.	0.870894E-09
0.406000E	06	0.533655E-03	0.100000E	01	0.	0.174164E-05	0.	0.929437E-09	0.	0.929437E-09
0.388000E	06	0.545889E-03	0.100000E	01	0.	0.182244E-05	0.	0.994850E-09	0.	0.994850E-09
0.370000E	06	0.559010E-03	0.100000E	01	0.	0.191110E-05	0.	0.106832E-08	0.	0.106832E-08
0.352000E	06	0.573121E-03	0.100000E	01	0.	0.200883E-05	0.	0.115130E-08	0.	0.115130E-08
0.334000E	06	0.588365E-03	0.100000E	01	0.	0.211709E-05	0.	0.124562E-08	0.	0.124562E-08
0.316000E	06	0.604875E-03	0.100000E	01	0.	0.223768E-05	0.	0.135352E-08	0.	0.135352E-08
0.298000E	06	0.622861E-03	0.100000E	01	0.	0.237284E-05	0.	0.147795E-08	0.	0.147795E-08
0.280000E	06	0.642575E-03	0.100000E	01	0.	0.252538E-05	0.	0.162275E-08	0.	0.162275E-08
0.262000E	06	0.664286E-03	0.100000E	01	0.	0.269888E-05	0.	0.179283E-08	0.	0.179283E-08
0.244000E	06	0.688329E-03	0.100000E	01	0.	0.289798E-05	0.	0.199476E-08	0.	0.199476E-08
0.226000E	06	0.715211E-03	0.100000E	01	0.	0.312879E-05	0.	0.223775E-08	0.	0.223775E-08
0.208000E	06	0.745505E-03	0.100000E	01	0.	0.339955E-05	0.	0.253438E-08	0.	0.253438E-08
0.190000E	06	0.780016E-03	0.100000E	01	0.	0.372161E-05	0.	0.290292E-08	0.	0.290292E-08
0.172000E	06	0.819795E-03	0.100000E	01	0.	0.411109E-05	0.	0.337025E-08	0.	0.337025E-08
0.154000E	06	0.866346E-03	0.100000E	01	0.	0.459160E-05	0.	0.397792E-08	0.	0.397792E-08
0.136000E	06	0.921875E-03	0.100000E	01	0.	0.519931E-05	0.	0.479312E-08	0.	0.479312E-08
0.118000E	06	0.989668E-03	0.100000E	01	0.	0.599243E-05	0.	0.593052E-08	0.	0.593052E-08
0.100000E	06	0.107500E-02	0.100000E	01	0.	0.707107E-05	0.	0.760139E-08	0.	0.760139E-08
0.982000E	05	0.108481E-02	0.100000E	01	0.	0.720068E-05	0.	0.781138E-08	0.	0.781138E-08
0.964000E	05	0.109489E-02	0.100000E	01	0.	0.733513E-05	0.	0.803113E-08	0.	0.803113E-08
0.946000E	05	0.110524E-02	0.100000E	01	0.	0.747470E-05	0.	0.826135E-08	0.	0.826135E-08
0.928000E	05	0.111590E-02	0.100000E	01	0.	0.761969E-05	0.	0.850283E-08	0.	0.850283E-08
0.910000E	05	0.112689E-02	0.100000E	01	0.	0.777040E-05	0.	0.875635E-08	0.	0.875635E-08
0.892000E	05	0.113819E-02	0.100000E	01	0.	0.792721E-05	0.	0.902265E-08	0.	0.902265E-08
0.874000E	05	0.114984E-02	0.100000E	01	0.	0.809047E-05	0.	0.930275E-08	0.	0.930275E-08
0.856000E	05	0.116187E-02	0.100000E	01	0.	0.826059E-05	0.	0.959770E-08	0.	0.959770E-08
0.838000E	05	0.117427E-02	0.100000E	01	0.	0.843803E-05	0.	0.990853E-08	0.	0.990853E-08
0.820000E	05	0.118708E-02	0.100000E	01	0.	0.862325E-05	0.	0.102365E-07	0.	0.102365E-07
0.802000E	05	0.120033E-02	0.100000E	01	0.	0.881679E-05	0.	0.105830E-07	0.	0.105830E-07
0.784000E	05	0.121422E-02	0.100000E	01	0.	0.901922E-05	0.	0.109495E-07	0.	0.109495E-07
0.766000E	05	0.122818E-02	0.100000E	01	0.	0.923116E-05	0.	0.113376E-07	0.	0.113376E-07

0.748000E	05	0.124286E-02	0.100000E	01	C.	0.945330E-05	0.	0.117491E-07	0.	0.117491E-07
0.730000E	05	0.125809E-02	0.100000E	01	C.	0.968639E-05	0.	0.121864E-07	0.	0.121864E-07
0.712000E	05	0.127388E-02	0.100000E	01	C.	0.973127E-05	0.	0.126512E-07	0.	0.126512E-07
0.694000E	05	0.129030E-02	0.100000E	01	C.	0.101889E-04	0.	0.131467E-07	0.	0.131467E-07
0.676000E	05	0.130735E-02	0.100000E	01	C.	0.104602E-04	0.	0.136751E-07	0.	0.136751E-07
0.658000E	05	0.132509E-02	0.100000E	01	C.	0.107463E-04	0.	0.142399E-07	0.	0.142399E-07
0.640000E	05	0.134358E-02	0.100000E	01	C.	0.110485E-04	0.	0.148446E-07	0.	0.148446E-07
0.622000E	05	0.136287E-02	0.100000E	01	C.	0.113683E-04	0.	0.154935E-07	0.	0.154935E-07
0.604000E	05	0.138301E-02	0.100000E	01	C.	0.117071E-04	0.	0.161910E-07	0.	0.161910E-07
0.586000E	05	0.140408E-02	0.100000E	01	C.	0.120667E-04	0.	0.169426E-07	0.	0.169426E-07
0.568000E	05	0.142614E-02	0.100000E	01	C.	0.124491E-04	0.	0.177541E-07	0.	0.177541E-07
0.550000E	05	0.144928E-02	0.100000E	01	C.	0.128565E-04	0.	0.186326E-07	0.	0.186326E-07
0.532000E	05	0.147357E-02	0.100000E	01	C.	0.132915E-04	0.	0.195859E-07	0.	0.195859E-07
0.514000E	05	0.149913E-02	0.100000E	01	C.	0.137569E-04	0.	0.206235E-07	0.	0.206235E-07
0.496000E	05	0.152607E-02	0.100000E	01	C.	0.142562E-04	0.	0.217559E-07	0.	0.217559E-07
0.478000E	05	0.155451E-02	0.100000E	01	C.	0.147930E-04	0.	0.229959E-07	0.	0.229959E-07
0.460000E	05	0.158462E-02	0.100000E	01	C.	0.153719E-04	0.	0.243586E-07	0.	0.243586E-07
0.442000E	05	0.161652E-02	0.100000E	01	C.	0.159979E-04	0.	0.258610E-07	0.	0.258610E-07
0.424000E	05	0.165046E-02	0.100000E	01	C.	0.166770E-04	0.	0.275248E-07	0.	0.275248E-07
0.406000E	05	0.168662E-02	0.100000E	01	C.	0.174164E-04	0.	0.293748E-07	0.	0.293748E-07
0.388000E	05	0.172527E-02	0.100000E	01	C.	0.182244E-04	0.	0.314420E-07	0.	0.314420E-07
0.370000E	05	0.176670E-02	0.100000E	01	C.	0.191110E-04	0.	0.337635E-07	0.	0.337635E-07
0.352000E	05	0.181127E-02	0.100000E	01	C.	0.200883E-04	0.	0.363852E-07	0.	0.363852E-07
0.334000E	05	0.185937E-02	0.100000E	01	C.	0.211709E-04	0.	0.393646E-07	0.	0.393646E-07
0.316000E	05	0.191155E-02	0.100000E	01	C.	0.223768E-04	0.	0.427744E-07	0.	0.427744E-07
0.298000E	05	0.196839E-02	0.100000E	01	C.	0.237284E-04	0.	0.467068E-07	0.	0.467068E-07
0.280000E	05	0.203060E-02	0.100000E	01	C.	0.252538E-04	0.	0.512805E-07	0.	0.512805E-07
0.262000E	05	0.209913E-02	0.100000E	01	C.	0.269888E-04	0.	0.566531E-07	0.	0.566531E-07
0.244000E	05	0.217512E-02	0.100000E	01	C.	0.289798E-04	0.	0.630344E-07	0.	0.630344E-07
0.226000E	05	0.225995E-02	0.100000E	01	C.	0.312879E-04	0.	0.707093E-07	0.	0.707093E-07
0.208000E	05	0.235561E-02	0.100000E	01	C.	0.339955E-04	0.	0.800803E-07	0.	0.800803E-07
0.190000E	05	0.246453E-02	0.100000E	01	C.	0.372161E-04	0.	0.917204E-07	0.	0.917204E-07
0.172000E	05	0.259013E-02	0.100000E	01	C.	0.411109E-04	0.	0.106483E-06	0.	0.106483E-06
0.154000E	05	0.273711E-02	0.100000E	01	C.	0.459160E-04	0.	0.125677E-06	0.	0.125677E-06
0.136000E	05	0.291236E-02	0.100000E	01	C.	0.519931E-04	0.	0.151423E-06	0.	0.151423E-06
0.118000E	05	0.312626E-02	0.100000E	01	C.	0.599243E-04	0.	0.187339E-06	0.	0.187339E-06
0.100000E	05	0.339554E-02	0.100000E	01	C.	0.707107E-04	0.	0.240101E-06	0.	0.240101E-06
0.982000E	04	0.342646E-02	0.100000E	01	C.	0.720068E-04	0.	0.246729E-06	0.	0.246729E-06
0.964000E	04	0.345826E-02	0.100000E	01	C.	0.733513E-04	0.	0.253668E-06	0.	0.253668E-06
0.946000E	04	0.349094E-02	0.100000E	01	C.	0.747470E-04	0.	0.260937E-06	0.	0.260937E-06
0.928000E	04	0.352458E-02	0.100000E	01	C.	0.761969E-04	0.	0.268562E-06	0.	0.268562E-06
0.910000E	04	0.355920E-02	0.100000E	01	C.	0.777040E-04	0.	0.276564E-06	0.	0.276564E-06
0.892000E	04	0.359487E-02	0.100000E	01	C.	0.792721E-04	0.	0.284973E-06	0.	0.284973E-06
0.874000E	04	0.363163E-02	0.100000E	01	C.	0.809047E-04	0.	0.293816E-06	0.	0.293816E-06
0.856000E	04	0.366955E-02	0.100000E	01	C.	0.826059E-04	0.	0.303127E-06	0.	0.303127E-06
0.838000E	04	0.370868E-02	0.100000E	01	C.	0.843803E-04	0.	0.312940E-06	0.	0.312940E-06
0.820000E	04	0.374909E-02	0.100000E	01	C.	0.862325E-04	0.	0.323294E-06	0.	0.323294E-06
0.802000E	04	0.379085E-02	0.100000E	01	C.	0.881679E-04	0.	0.334231E-06	0.	0.334231E-06
0.784000E	04	0.383403E-02	0.100000E	01	C.	0.901922E-04	0.	0.345800E-06	0.	0.345800E-06
0.766000E	04	0.387872E-02	0.100000E	01	C.	0.923116E-04	0.	0.358051E-06	0.	0.358051E-06
0.748000E	04	0.392503E-02	0.100000E	01	C.	0.945330E-04	0.	0.371045E-06	0.	0.371045E-06
0.730000E	04	0.397303E-02	0.100000E	01	C.	0.968639E-04	0.	0.384843E-06	0.	0.384843E-06
0.712000E	04	0.402284E-02	0.100000E	01	C.	0.993127E-04	0.	0.399520E-06	0.	0.399520E-06
0.694000E	04	0.407457E-02	0.100000E	01	C.	0.101889E-03	0.	0.415152E-06	0.	0.415152E-06
0.676000E	04	0.412835E-02	0.100000E	01	C.	0.104602E-03	0.	0.431832E-06	0.	0.431832E-06
0.658000E	04	0.418432E-02	0.100000E	01	C.	0.107463E-03	0.	0.449660E-06	0.	0.449660E-06
0.640000E	04	0.424264E-02	0.100000E	01	C.	0.110485E-03	0.	0.468750E-06	0.	0.468750E-06
0.622000E	04	0.430345E-02	0.100000E	01	C.	0.113683E-03	0.	0.489228E-06	0.	0.489228E-06
0.604000E	04	0.436697E-02	1.000000E	00	0.	0.117071E-03	0.	0.511244E-06	0.	0.511244E-06
0.586000E	04	0.443338E-02	1.000000E	00	0.	0.120667E-03	0.	0.534961E-06	0.	0.534961E-06
0.568000E	04	0.450292E-02	1.000000E	00	0.	0.124491E-03	0.	0.560572E-06	0.	0.560572E-06
0.550000E	04	0.457584E-02	1.000000E	00	0.	0.128565E-03	0.	0.588292E-06	0.	0.588292E-06

0.532000E	04	0.465243E-02	1.000000E	00	0.	0.132915E-03	0.	0.618377E-06	0.	0.618377E-06
0.514000E	04	0.473300E-02	1.000000E	00	0.	0.137569E-03	0.	0.651115E-06	0.	0.651115E-06
0.496000E	04	0.481792E-02	1.000000E	00	0.	0.142562E-03	0.	0.686851E-06	0.	0.686851E-06
0.478000E	04	0.490757E-02	1.000000E	00	0.	0.147930E-03	0.	0.725978E-06	0.	0.725978E-06
0.460000E	04	0.500242E-02	1.000000E	00	0.	0.153719E-03	0.	0.768966E-06	0.	0.768966E-06
0.442000E	04	0.511301E-02	1.000000E	00	0.	0.159979E-03	0.	0.816375E-06	0.	0.816375E-06
0.424000E	04	0.520993E-02	1.000000E	00	0.	0.166770E-03	0.	0.868862E-06	0.	0.868862E-06
0.406000E	04	0.532386E-02	1.000000E	00	0.	0.174164E-03	0.	0.927225E-06	0.	0.927225E-06
0.388000E	04	0.544562E-02	1.000000E	00	0.	0.182244E-03	0.	0.992432E-06	0.	0.992432E-06
0.370000E	04	0.557613E-02	1.000000E	00	0.	0.191110E-03	0.	0.106565E-05	0.	0.106565E-05
0.352000E	04	0.571653E-02	1.000000E	00	0.	0.200883E-03	0.	0.114835E-05	0.	0.114835E-05
0.334000E	04	0.586809E-02	1.000000E	00	0.	0.211709E-03	0.	0.124233E-05	0.	0.124233E-05
0.316000E	04	0.603241E-02	1.000000E	00	0.	0.223768E-03	0.	0.134986E-05	0.	0.134986E-05
0.298000E	04	0.621138E-02	1.000000E	00	0.	0.237284E-03	0.	0.147386E-05	0.	0.147386E-05
0.280000E	04	0.647728E-02	1.000000E	00	0.	0.252538E-03	0.	0.161808E-05	0.	0.161808E-05
0.262000E	04	0.662301E-02	1.000000E	00	0.	0.269888E-03	0.	0.178747E-05	0.	0.178747E-05
0.244000E	04	0.686213E-02	1.000000E	00	0.	0.289798E-03	0.	0.198863E-05	0.	0.198863E-05
0.226000E	04	0.712920E-02	1.000000E	00	0.	0.312879E-03	0.	0.223058E-05	0.	0.223058E-05
0.208000E	04	0.743015E-02	1.000000E	00	0.	0.339955E-03	0.	0.252592E-05	0.	0.252592E-05
0.190000E	04	0.777281E-02	1.000000E	00	0.	0.372161E-03	0.	0.289274E-05	0.	0.289274E-05
0.172000E	04	0.816777E-02	1.000000E	00	0.	0.411109E-03	0.	0.335784E-05	0.	0.335784E-05
0.154000E	04	0.862993E-02	1.000000E	00	0.	0.459160E-03	0.	0.396252E-05	0.	0.396252E-05
0.136000E	04	0.918073E-02	0.999999E	00	0.	0.519931E-03	0.	0.477335E-05	0.	0.477335E-05
0.118000E	04	0.985279E-02	0.999999E	00	0.	0.599243E-03	0.	0.590422E-05	0.	0.590422E-05
0.100000E	04	0.106983E-01	0.999999E	00	0.	0.707107E-03	0.	0.756484E-05	0.	0.756484E-05
0.985000E	03	0.107790E-01	0.999999E	00	0.	0.717875E-03	0.	0.773797E-05	0.	0.773797E-05
0.970000E	03	0.108616E-01	0.999998E	00	0.	0.728976E-03	0.	0.791784E-05	0.	0.791784E-05
0.955000E	03	0.109461E-01	0.999998E	00	0.	0.740426E-03	0.	0.810476E-05	0.	0.810476E-05
0.940000E	03	0.111326E-01	0.999998E	00	0.	0.752241E-03	0.	0.829917E-05	0.	0.829917E-05
0.925000E	03	0.111212E-01	0.999998E	00	0.	0.764440E-03	0.	0.850147E-05	0.	0.850147E-05
0.910000E	03	0.112120E-01	0.999998E	00	0.	0.777040E-03	0.	0.871215E-05	0.	0.871215E-05
0.895000E	03	0.113050E-01	0.999998E	00	0.	0.790063E-03	0.	0.893166E-05	0.	0.893166E-05
0.880000E	03	0.114004E-01	0.999998E	00	0.	0.803530E-03	0.	0.916055E-05	0.	0.916055E-05
0.865000E	03	0.114982E-01	0.999998E	00	0.	0.817464E-03	0.	0.939940E-05	0.	0.939940E-05
0.850000E	03	0.115987E-01	0.999998E	00	0.	0.831890E-03	0.	0.964881E-05	0.	0.964881E-05
0.835000E	03	0.117018E-01	0.999998E	00	0.	0.846834E-03	0.	0.990946E-05	0.	0.990946E-05
0.820000E	03	0.118077E-01	0.999998E	00	0.	0.862325E-03	0.	0.101821E-04	0.	0.101821E-04
0.805000E	03	0.119165E-01	0.999998E	00	0.	0.878394E-03	0.	0.104674E-04	0.	0.104674E-04
0.790000E	03	0.120284E-01	0.999997E	00	0.	0.895072E-03	0.	0.107663E-04	0.	0.107663E-04
0.775000E	03	0.121436E-01	0.999997E	00	0.	0.912396E-03	0.	0.110798E-04	0.	0.110798E-04
0.760000E	03	0.122621E-01	0.999997E	00	0.	0.930404E-03	0.	0.114087E-04	0.	0.114087E-04
0.745000E	03	0.123842E-01	0.999997E	00	0.	0.949137E-03	0.	0.117543E-04	0.	0.117543E-04
0.730000E	03	0.125100E-01	0.999997E	00	0.	0.968639E-03	0.	0.121176E-04	0.	0.121176E-04
0.715000E	03	0.126337E-01	0.999997E	00	0.	0.988961E-03	0.	0.125001E-04	0.	0.125001E-04
0.700000E	03	0.127735E-01	0.999997E	00	0.	0.101015E-02	0.	0.129032E-04	0.	0.129032E-04
0.685000E	03	0.129117E-01	0.999996E	00	0.	0.103227E-02	0.	0.133284E-04	0.	0.133284E-04
0.670000E	03	0.130545E-01	0.999996E	00	0.	0.105538E-02	0.	0.137775E-04	0.	0.137775E-04
0.655000E	03	0.132022E-01	0.999996E	00	0.	0.107955E-02	0.	0.142524E-04	0.	0.142524E-04
0.640000E	03	0.133549E-01	0.999996E	00	0.	0.110485E-02	0.	0.147553E-04	0.	0.147553E-04
0.625000E	03	0.135132E-01	0.999995E	00	0.	0.113137E-02	0.	0.152884E-04	0.	0.152884E-04
0.610000E	03	0.136772E-01	0.999995E	00	0.	0.115919E-02	0.	0.158545E-04	0.	0.158545E-04
0.595000E	03	0.138473E-01	0.999995E	00	0.	0.118841E-02	0.	0.164563E-04	0.	0.164563E-04
0.580000E	03	0.140240E-01	0.999994E	00	0.	0.121915E-02	0.	0.170973E-04	0.	0.170973E-04
0.565000E	03	0.142076E-01	0.999994E	00	0.	0.125152E-02	0.	0.177810E-04	0.	0.177810E-04
0.550000E	03	0.143986E-01	0.999994E	00	0.	0.128565E-02	0.	0.185116E-04	0.	0.185116E-04
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0.172000E	02	C.787403E-01	0.944455E	00	C.657830E-05	0.411108E-01	0.517977E-06	0.323708E-02	J.489206E-06	0.305727E-02
0.170000E	02	C.791833E-01	0.942529E	00	C.794132E-05	0.415945E-01	0.628820E-06	0.329359E-02	J.592681E-06	0.310430E-02
0.168000E	02	C.796340E-01	0.940510E	00	C.958544E-05	0.420897E-01	0.763327E-06	0.335177E-02	J.717916E-06	0.315237E-02
0.166000E	02	C.80926E-01	0.938392E	00	C.115683E-04	0.425968E-01	0.926535E-06	0.341169E-02	J.869453E-06	0.320150E-02
0.164000E	02	C.805533E-01	0.936168E	00	C.139593E-04	0.431162E-01	0.112455E-05	0.347342E-02	J.105277E-05	0.325170E-02
0.162000E	02	C.810344E-01	0.933832E	00	C.168420E-04	0.436460E-01	0.136478E-05	0.353703E-02	J.127448E-05	0.330299E-02
0.160000E	02	C.815182E-01	0.931376E	00	C.203169E-04	0.441941E-01	0.165620E-05	0.360262E-02	J.154254E-05	0.335540E-02
0.158000E	02	C.82108E-01	0.928793E	00	C.245050E-04	0.447536E-01	0.200967E-05	0.367027E-02	J.186657E-05	0.340893E-02
0.156000E	02	C.825126F-01	0.92674E	00	C.295515E-04	0.453273E-01	0.243837E-05	0.374007E-02	J.225812E-05	0.346359E-02
0.154000E	02	C.83238E-01	0.923211E	00	C.356316E-04	0.459160E-01	0.295827E-05	0.381212E-02	J.271111E-05	0.351939E-02
0.152000E	02	C.835449E-01	0.920192E	00	C.423553E-04	0.465201E-01	0.358870E-05	0.388652E-02	J.33229E-05	0.357634E-02
0.150000E	02	C.84760E-01	0.91709E	00	C.517754E-04	0.471404E-01	0.435307E-05	0.396338F-02	J.391180E-05	0.363445E-02
0.148000E	02	C.846175E-01	0.913648E	00	C.623954F-04	0.477774E-01	0.527974E-05	0.404281E-02	J.482383E-05	0.369370E-02
0.146000E	02	C.851698F-01	0.910098E	00	C.751801E-04	0.484319E-01	0.64037E-05	0.412494E-02	J.587742E-05	0.375410E-02
0.144000E	02	C.857332E-01	0.906346E	00	C.905673E-04	0.491046E-01	0.776462E-05	0.420989E-02	J.703743E-05	0.381562E-02
0.142000E	02	C.863081E-01	0.902375E	00	C.109083E-03	0.497062E-01	0.941472E-05	0.429781E-02	J.849561E-05	0.387824E-02
0.140000E	02	C.863949E-01	0.898171E	00	C.131357E-03	0.505076E-01	0.114143E-04	0.438885E-02	J.102520E-04	0.394194E-02
0.138000E	02	C.874940E-01	0.893716E	00	C.158148E-03	0.512396E-01	0.138370E-04	0.448315E-02	J.123664E-04	0.400667E-02
0.136000E	02	C.881059E-01	0.888992E	00	C.190636E-03	0.519931E-01	0.167721E-04	0.458090F-02	J.149103E-04	0.407238E-02
0.134000E	02	C.887310E-01	0.883977E	00	C.229091E-03	0.527691E-01	0.203275E-04	0.468226E-02	J.179690E-04	0.413900E-02
0.132000E	02	C.893698E-01	0.878649E	00	C.275636E-03	0.535686E-01	0.246335E-04	0.478742E-02	J.216442E-04	0.420646E-02
0.130000E	02	C.90229E-01	0.872783E	00	C.331562E-03	0.543928E-01	0.298481E-04	0.489659E-02	J.26569E-04	0.427464E-02

0.128000E	02	0.96937F-01	0.866954E	00	0.398740E-03	0.552427E-01	0.361620E-04	0.500999E-02	0.313508E-04	0.434343E-02
0.126000E	02	0.913738F-01	0.860532E	00	0.479412E-03	0.561195E-01	0.438057E-04	0.512785E-02	0.376962E-04	0.441268E-02
0.124000E	02	0.92729E-01	0.853684E	00	0.576261E-03	0.570247E-01	0.530580E-04	0.525043E-02	0.452948E-04	0.448220E-02
0.122000E	02	0.927835E-01	0.846377E	00	0.692494E-03	0.579595E-01	0.642555E-04	0.537797E-02	0.543844E-04	0.455179E-02
0.120000E	02	0.935214E-01	0.838572E	00	0.831949E-03	0.589255E-01	0.77805CE-04	0.551079E-02	0.652451E-04	0.462119E-02
0.118000E	02	0.942722F-01	0.830227E	00	0.999209E-03	0.599242E-01	0.941976E-04	0.564919E-02	0.782054E-04	0.469011E-02
0.116000E	02	0.953416F-01	0.821297E	00	0.119975E-02	0.6.9574F-01	0.114026E-03	0.579349E-02	0.936495E-04	0.475818E-02
0.114000E	02	0.9583.6E-01	0.811733E	00	0.144011E-02	0.620268E-01	0.138007E-03	0.594407E-02	0.112025E-03	0.482500E-02
0.112000E	02	0.966399F-01	0.801479E	00	0.172810E-02	0.631344E-01	0.167003E-03	0.610131E-02	0.133850E-03	0.489007E-02
0.110000E	02	0.974734E-01	0.790477E	00	0.207301E-02	0.642823E-01	0.202058F-03	0.626563E-02	0.159722E-03	0.495283E-02
0.108000E	02	0.983231E-01	0.778661E	00	0.248595E-02	0.654728E-01	0.244426E-03	0.643748E-02	0.190325E-03	0.501262E-02
0.106000E	02	0.991990E-01	0.765961E	00	0.298012E-02	0.667081E-01	0.295625E-03	0.661737E-02	0.226437E-03	0.506865E-02
0.104000E	02	0.100099E-00	0.752300E	00	0.357125E-02	0.679909E-01	0.357478E-03	0.680583E-02	0.268931E-03	0.512003F-02
0.102000E	02	0.101025F-00	0.737596E	00	0.427805E-02	0.693241E-01	0.432188E-03	0.700344E-02	0.318780E-03	0.516571E-02
0.100000E	02	0.101977E-00	0.721757E	00	0.512283E-02	0.707107E-01	0.52241CE-03	0.721085E-02	0.377053E-03	0.520448E-02
0.990000E	01	0.102463E-00	0.713383E	00	0.560499E-02	0.714249E-01	0.574306E-03	0.731843E-02	0.409700E-03	0.522085E-02
0.980000E	01	0.102957F-00	0.704690E	00	0.613190E-02	0.721538E-01	0.631322E-03	0.742873E-02	0.444886E-03	0.523495E-02
0.970000E	01	0.103458E-00	0.695664E	00	0.670765E-02	0.728976E-01	0.693959E-03	0.754183E-02	0.482762E-03	0.524658E-02
0.960000E	01	0.103966E-00	0.686291E	00	0.733667E-02	0.736570E-01	0.762767E-03	0.765785E-02	0.523481E-03	0.525551F-02
0.950000E	01	0.104483E-00	0.67659E	00	0.802381E-02	0.744323E-01	0.838349E-03	0.777688E-02	0.567193E-03	0.526152E-02
0.940000E	01	0.105007E-00	0.666453E	00	0.877434E-02	0.752241E-01	0.921365E-03	0.789904E-02	0.614046E-03	0.526434E-02
0.930000E	01	0.105539E-00	0.655959E	00	0.959398E-02	0.760330E-01	0.101254E-02	0.802444E-02	0.664184E-03	0.526370E-02
0.920000E	01	0.106080E-00	0.645C63E	00	0.104890E-01	0.768594E-01	0.111267E-02	0.815321E-02	0.717740E-03	0.525933E-02
0.910000E	01	0.106629E-00	0.633750E	00	0.114661E-01	0.777040E-01	0.122262E-02	0.828547E-02	0.774833E-03	0.525092E-02
0.900000E	01	0.107187E-00	0.622006E	00	0.125328E-01	0.785674E-01	0.134334E-02	0.842137E-02	0.835568E-03	0.523814E-02
0.890000E	01	0.107753E-00	0.609817E	00	0.136969E-01	0.794502E-01	0.147589E-02	0.856103E-02	0.900255E-03	0.522066E-02
0.880000E	01	0.108330E-00	0.597169E	00	0.149674E-01	0.803530E-01	0.162141E-02	0.870461E-02	0.968256E-03	0.519812E-02
0.870000E	01	0.108915E-00	0.584048E	00	0.163535E-01	0.812766E-01	0.178115E-02	0.885227E-02	0.104028E-02	0.517015E-02
0.860000E	01	0.109511F-00	0.570441E	00	0.178657E-01	0.822217E-01	0.195649E-02	0.900416E-02	0.111606E-02	0.513634E-02
0.850000E	01	0.110116E-00	0.556336E	00	0.195151E-01	0.831890E-01	0.214893E-02	0.916047E-02	0.119553E-02	0.509630E-02
0.840000E	01	0.110732E-00	0.541723E	00	0.213138E-01	0.841794E-01	0.236012E-02	0.932137E-02	0.127853E-02	0.504960F-02
0.830000E	01	0.111359E-00	0.526593E	00	0.232749E-01	0.851936E-01	0.259187E-02	0.948706E-02	0.136486E-02	0.499582E-02
0.820000E	01	0.111996F-00	0.510937E	00	0.254129E-01	0.862325E-01	0.284615E-02	0.965773E-02	0.145420E-02	0.493450E-02
0.810000E	01	0.112645E-00	0.494752E-00	0.277430E-01	0.872971E-01	0.312512E-02	0.983361E-02	0.154616E-02	0.154616E-02	0.486520E-02
0.800000E	01	0.113396E-00	0.478035E-00	0.302823E-01	0.883883E-01	0.343116E-02	0.100149E-01	0.164021E-02	0.164021E-02	0.478748E-02
0.790000E	01	0.113978E-00	0.460787E-00	0.330487E-01	0.895072E-01	0.376684E-02	0.102019E-01	0.173571E-02	0.173571E-02	0.470089E-02
0.780000E	01	0.114663E-00	0.443014E-00	0.360622E-01	0.906547E-01	0.413500E-02	0.103947E-01	0.183186E-02	0.183186E-02	0.460502E-02
0.770000E	01	0.115361E-00	0.424726E-00	0.393439E-01	0.918320E-01	0.453874E-02	0.105938E-01	0.192772E-02	0.192772E-02	0.449947E-02
0.760000E	01	0.116071E-00	0.405940E-00	0.429170E-01	0.930403E-01	0.498144E-02	0.107993E-01	0.202217E-02	0.202217E-02	0.438388E-02
0.750000E	01	0.116796E-00	0.386677E-00	0.468066E-01	0.942809E-01	0.546681E-02	0.110116E-01	0.211389E-02	0.211389E-02	0.425794E-02
0.740000E	01	0.117534F-00	0.366968E-00	0.510395E-01	0.955549E-01	0.599889E-02	0.112310E-01	0.220140F-02	0.220140F-02	0.412141E-02
0.730000E	01	0.118287E-00	0.346852E-00	0.556452E-01	0.968639E-01	0.658210E-02	0.114577E-01	0.228302E-02	0.228302E-02	0.397414E-02
0.720000E	01	0.119055E-00	0.326377E-00	0.606550E-01	0.982092E-01	0.722127E-02	0.116923E-01	0.235686E-02	0.235686E-02	0.381610E-02
0.710000E	01	0.119838F-00	0.305603E-00	0.661031E-01	0.995925E-01	0.792167E-02	0.119350E-01	0.242089E-02	0.242089E-02	0.364737E-02
0.700000E	01	0.120638E-00	0.284600E-00	0.720263E-01	0.101015E-00	0.868907E-02	0.121862E-01	0.247291E-02	0.247291E-02	0.346820E-02
0.690000E	01	0.121453E-00	0.263453E-00	0.784642E-01	0.102479E-00	0.952974E-02	0.124464E-01	0.251064E-02	0.251064E-02	0.327905E-02
0.680000E	01	0.122286E-00	0.242259E-00	0.854595E-01	0.103986E-00	0.104505E-01	0.127161E-01	0.253174E-02	0.253174E-02	0.308059E-02
0.670000E	01	0.123137E-00	0.221130E-00	0.930585E-01	0.105538E-00	0.114590E-01	0.129957E-01	0.253392E-02	0.253392E-02	0.287373E-02
0.660000E	01	0.124006E-00	0.200191E-00	0.101311E-00	0.107137E-00	0.125631E-01	0.132857E-01	0.251503E-02	0.251503E-02	0.265968E-02
0.650000E	01	0.124895E-00	0.179583E-00	0.110269E-00	0.108786E-00	0.137720E-01	0.135867E-01	0.247322E-02	0.247322E-02	0.243995E-02
0.640000E	01	0.125803E-00	0.159457E-00	0.119991E-00	0.110485E-00	0.150952E-01	0.138994E-01	0.24705E-02	0.24705E-02	0.221636E-02
0.630000E	01	0.126731E-00	0.139977E-00	0.130539E-00	0.112239E-00	0.165434E-01	0.142242E-01	0.231569E-02	0.231569E-02	0.199107E-02
0.620000E	01	0.127681E-00	0.121312E-00	0.141978E-00	0.114049E-00	0.181279E-01	0.145620E-01	0.219912E-02	0.219912E-02	0.176654E-02
0.610000E	01	0.128654F-00	0.103633E-00	0.154379E-00	0.115919E-00	0.198614E-01	0.149134E-01	0.205829E-02	0.205829E-02	0.154551E-02
0.600000E	01	0.129649E-00	0.871082E-01	0.167818E-00	0.117851E-00	0.217574E-01	0.152793E-01	0.189525E-02	0.189525E-02	0.133095E-02
0.590000E	01	0.130668E-00	0.718952E-01	0.182376E-00	0.119849E-00	0.238308E-01	0.156604E-01	0.171332E-02	0.171332E-02	0.112591E-02
0.580000E	01	0.131713E-00	0.581303E-01	0.198141E-00	0.121915E-00	0.260976E-01	0.160577E-01	0.151706E-02	0.151706E-02	0.933440E-03
0.570000E	01	0.132783E-00	0.459205E-01	0.215204E-00	0.124054E-00	0.285754E-01	0.164722E-01	0.131220E-02	0.131220E-02	0.756412E-03
0.560000E	01	0.133880F-00	0.353338E-01	0.233665E-00	0.126269E-00	0.312831E-01	0.169049E-01	0.110535E-02	0.110535E-02	0.597317E-03
0.550000E	01	0.135006E-00	0.263910E-01	0.253628E-00	0.128565E-00	0.342414E-01	0.173571E-01	0.903662E-03	0.903662E-03	0.458069E-03
0.540000E	01	0.136162E-00	0.190591E-01	0.275206E-00	0.130946E-00	0.374725E-01	0.178298E-01	0.714192E-03	0.714192E-03	0.339820E-03
0.530000E	01	0.137348E-00	0.132503E-01	0.298517E-00	0.133416E-00	0.410008E-01	0.183245E-01	0.543271E-03	0.543271E-03	0.242804E-03

0.520000E	01	0.138567E-00	0.882466E-02	0.323688E-00	0.135982E-00	0.448524E-01	0.188426E-01	0.395807E-03	0.166280E-03
0.510000E	01	0.139820E-00	0.560804E-02	0.350851E-00	0.138648E-00	0.490558E-01	0.193858E-01	0.274715E-03	0.108561E-03
0.500000E	01	0.141108E-00	0.336655E-02	0.380148E-00	0.141421E-00	0.536419E-01	0.199557E-01	0.180588E-03	0.671817E-04
0.495000E	01	0.141766E-00	0.255303E-02	0.395642E-00	0.	0.560885E-01	0.	0.143196E-03	0.
0.490000E	01	0.142433E-00	0.190575E-02	0.411726E-00	0.	0.586435E-01	0.	0.111760E-03	0.
0.485000E	01	0.143111E-00	0.139923E-02	0.428419E-00	0.	0.613112E-01	0.	0.857884E-04	0.
0.480000E	01	0.143798E-00	0.100973E-02	0.445741E-00	0.	0.640966E-01	0.	0.647205E-04	0.
0.475000E	01	0.144495E-00	0.715694E-03	0.463714E-00	0.	0.670044E-01	0.	0.479547E-04	0.
0.470000E	01	0.145203E-00	0.497948E-03	0.482357E-00	0.	0.700398E-01	0.	0.348762E-04	0.
0.465000E	01	0.145922E-00	0.339903E-03	0.501694E-00	0.	0.732081E-01	0.	0.248837E-04	0.
0.460000E	01	0.146652E-00	0.227549E-03	0.521745E-00	0.	0.765149E-01	0.	0.174109E-04	0.
0.455000E	01	0.147393E-00	0.149367E-03	0.542533E-00	0.	0.799657E-01	0.	0.119442E-04	0.
0.450000E	01	0.148146E-00	0.961383E-04	0.564082E-00	0.	0.835665E-01	0.	0.803394E-05	0.
0.445000E	01	0.148911E-00	0.606912E-04	0.586414E-00	0.	0.873234E-01	0.	0.529977E-05	0.
0.440000E	01	0.149668E-00	0.376017E-04	0.609553E-00	0.	0.912428E-01	0.	0.343089E-05	0.
0.435000E	01	0.150478E-00	0.228865E-04	0.633524E-00	0.	0.953313E-01	0.	0.218180E-05	0.
0.430000E	01	0.151281E-00	0.137050E-04	0.658350E-00	0.	0.995956E-01	0.	0.136496E-05	0.
0.425000E	01	0.152097E-00	0.809044E-05	0.684057E-00	0.	0.104043E-00	0.	0.841751E-06	0.
0.420000E	01	0.152926E-00	0.472041E-05	0.710669E-00	0.	0.108680E-00	0.	0.513015E-06	0.
0.415000E	01	0.153770E-00	0.273090E-05	0.738211E-00	0.	0.113515E-00	0.	0.309998E-06	0.
0.410000E	01	0.154629E-00	0.157272E-05	0.766710E-00	0.	0.118556E-00	0.	0.186455E-06	0.
0.405000E	01	0.155502E-00	0.905780E-06	0.796191E-00	0.	0.123810E-00	0.	0.112144E-06	0.
0.400000E	01	0.156391E-00	0.524480E-06	0.826679E-00	0.	0.129285E-00	0.	0.678075E-07	0.
0.395000E	01	0.157296E-00	0.307154E-06	0.858200E-00	0.	0.134991E-00	0.	0.414631E-07	0.
0.390000E	01	0.158217E-00	0.183119E-06	0.890781E-00	0.	0.140937E-00	0.	0.258082E-07	0.
0.385000E	01	0.159155E-00	0.111910E-06	0.924446E-00	0.	0.147130E-00	0.	0.164653E-07	0.
0.380000E	01	0.160110E-00	0.706099E-07	0.959222E-00	0.	0.153581E-00	0.	0.108443E-07	0.
0.375000E	01	0.161083E-00	0.463259E-07	0.995134E-00	0.	0.160299E-00	0.	0.742602E-08	0.
0.370000E	01	0.162075E-00	0.318219E-07	0.103221E-01	0.	0.167295E-00	0.	0.532364E-08	0.
0.365000E	01	0.163086E-00	0.230307E-07	0.107047E-01	0.	0.174578E-00	0.	0.402065E-08	0.
0.360000E	01	0.164116E-00	0.176580E-07	0.110993E-01	0.	0.182158E-00	0.	0.321656E-08	0.
0.355000E	01	0.165167E-00	0.144053E-07	0.115064E-01	0.	0.190047E-00	0.	0.273768E-08	0.
0.350000E	01	0.166239E-00	0.125421E-07	0.119259E-01	0.	0.198255E-00	0.	0.248654E-08	0.
0.345000E	01	0.167333E-00	0.116728E-07	0.123583E-01	0.	0.206795E-00	0.	0.241387E-08	0.
0.340000E	01	0.168449E-00	0.116136E-07	0.128036E-01	0.	0.215676E-00	0.	0.250477E-08	0.
0.335000E	01	0.169589E-00	0.123345E-07	0.132621E-01	0.	0.224911E-00	0.	0.277415E-08	0.
0.330000E	01	0.170753E-00	0.139447E-07	0.137340E-01	0.	0.234512E-00	0.	0.327019E-08	0.
0.325000E	01	0.171942E-00	0.167136E-07	0.142194E-01	0.	0.244491E-00	0.	0.408632E-08	0.
0.320000E	01	0.173157E-00	0.211306E-07	0.147185E-01	0.	0.254860E-00	0.	0.538534E-08	0.
0.315000E	01	0.174398E-00	0.280169E-07	0.152313E-01	0.	0.265632E-00	0.	0.744219E-08	0.
0.310000E	01	0.175668E-00	0.387147E-07	0.157581E-01	0.	0.276820E-00	0.	0.107170E-07	0.
0.305000E	01	0.176967E-00	0.553945E-07	0.162988E-01	0.	0.288436E-00	0.	0.159778E-07	0.
0.300000E	01	0.178297E-00	0.815439E-07	0.168536E-01	0.	0.300494E-00	0.	0.245034E-07	0.
0.295000E	01	0.179657E-00	0.122724E-06	0.174224E-01	0.	0.313006E-00	0.	0.384132E-07	0.
0.290000E	01	0.181050E-00	0.187726E-06	0.180052E-01	0.	0.325986E-00	0.	0.611961E-07	0.
0.285000E	01	0.182478E-00	0.290290E-06	0.186020E-01	0.	0.339446E-00	0.	0.985379E-07	0.
0.280000E	01	0.183941E-00	0.451585E-06	0.192127E-01	0.	0.353400E-00	0.	0.159590E-06	0.
0.275000E	01	0.185440E-00	0.703693E-06	0.198371E-01	0.	0.367860E-00	0.	0.258860E-06	0.
0.270000E	01	0.186979E-00	0.109436E-05	0.204750E-01	0.	0.382839E-00	0.	0.418962E-06	0.
0.265000E	01	0.188598E-00	0.169319E-05	0.211262E-01	0.	0.398350E-00	0.	0.674483E-06	0.
0.260000E	01	0.190178E-00	0.259957E-05	0.217903E-01	0.	0.414404E-00	0.	0.107727E-05	0.
0.255000E	01	0.191843E-00	0.395214E-05	0.224670E-01	0.	0.431014E-00	0.	0.170343E-05	0.
0.250000E	01	0.193554E-00	0.593990E-05	0.231557E-01	0.	0.448190E-00	0.	0.266220E-05	0.
0.245000E	01	0.195314E-00	0.881440E-05	0.238561E-01	0.	0.465943E-00	0.	0.410700E-05	0.
0.240000E	01	0.197124E-00	0.129024E-04	0.245674E-01	0.	0.484282E-00	0.	0.624840E-05	0.
0.235000E	01	0.198987E-00	0.186181E-04	0.252889E-01	0.	0.503217E-00	0.	0.936895E-05	0.
0.230000E	01	0.200906E-00	0.264738E-04	0.261199E-01	0.	0.522756E-00	0.	0.138393E-04	0.
0.225000E	01	0.202884E-00	0.370875E-04	0.267593E-01	0.	0.542904E-00	0.	0.201349E-04	0.
0.220000E	01	0.204924E-00	0.511868E-04	0.275061E-01	0.	0.563667E-00	0.	0.288523E-04	0.
0.215000E	01	0.207029E-00	0.696064E-04	0.282592E-01	0.	0.585048E-00	0.	0.407231E-04	0.
0.210000E	01	0.209203E-00	0.932801E-04	0.290172E-01	0.	0.607049E-00	0.	0.566256E-04	0.
0.205000E	01	0.211450E-00	0.123225E-03	0.297787E-01	0.	0.629669E-00	0.	0.775912E-04	0.

0.200000E 01 0.213773E-03 0.160519E-03 0.305419E 01 0.
 0.195000E 01 0.216179E-03 0.206270E-03 0.313051E 01 0.
 0.190000E 01 0.218670E-03 0.261576E-03 0.320663E 01 0.
 0.185000E 01 0.221254E-03 0.327488E-03 0.328233E 01 0.
 0.180000E 01 0.223936E-03 0.404958E-03 0.335736E 01 0.
 0.175000E 01 0.226722E-03 0.494789E-03 0.343145E 01 0.
 0.170000E 01 0.229619E-03 0.597586E-03 0.350432E 01 0.
 0.165000E 01 0.232635E-03 0.713703E-03 0.357563E 01 0.
 0.160000E 01 0.235779E-03 0.843195E-03 0.364505E 01 0.
 0.155000E 01 0.239060E-03 0.985775E-03 0.371219E 01 0.
 0.150000E 01 0.242489E-03 0.114077E-02 0.377663E 01 0.
 0.145000E 01 0.246077E-03 0.130710E-02 0.383792E 01 0.
 0.140000E 01 0.249837E-03 0.148322E-02 0.389557E 01 0.
 0.135000E 01 0.253784E-03 0.166716E-02 0.394904E 01 0.
 0.130000E 01 0.257933E-03 0.185646E-02 0.399775E 01 0.
 0.125000E 01 0.262304E-03 0.204819E-02 0.404108E 01 0.
 0.120000E 01 0.266918E-03 0.223899E-02 0.407833E 01 0.
 0.115000E 01 0.271797E-03 0.242504E-02 0.410879E 01 0.
 0.110000E 01 0.276969E-03 0.260213E-02 0.413165E 01 0.
 0.105000E 01 0.282466E-03 0.276572E-02 0.414606E 01 0.
 0.100000E 01 0.288324E-03 0.291094E-02 0.415107E 01 0.
 0.950000E 00 0.294585E-03 0.303276E-02 0.414571E 01 0.
 0.900000E 00 0.301298E-03 0.312599E-02 0.412888E 01 0.
 0.850000E 00 0.308523E-03 0.318550E-02 0.409943E 01 0.
 0.800000E 00 0.316330E-03 0.320631E-02 0.405611E 01 0.
 0.750000E 00 0.324803E-03 0.318382E-02 0.399756E 01 0.
 0.700000E 00 0.334047E-03 0.311405E-02 0.392236E 01 0.
 0.650000E 00 0.344189E-03 0.299395E-02 0.382893E 01 0.
 0.600000E 00 0.355390E-03 0.282180E-02 0.371561E 01 0.
 0.550000E 00 0.367854E-03 0.259773E-02 0.358060E 01 0.
 0.500000E 00 0.381848E-03 0.232429E-02 0.342198E 01 0.
 0.450000E 00 0.397724E-03 0.200724E-02 0.323769E 01 0.
 0.400000E 00 0.415967E-03 0.165644E-02 0.302550E 01 0.
 0.350000E 00 0.437255E-03 0.128680E-02 0.278304E 01 0.
 0.300000E 00 0.462590E-03 0.919088E-03 0.250777E 01 0.
 0.250000E 00 0.493517E-03 0.580077E-03 0.219696E 01 0.
 0.200000E 00 0.532595E 00 0.300732E-03 0.184768E 01 0.
 0.150000E 00 0.584478E 00 0.109845E-03 0.145681E 01 0.
 0.100000E 00 0.658905E 00 0.189487E-04 0.102100E 01 0.
 0.500001E-01 0.781533E 00 0.311800E-06 0.536674E 00 0.
 0. 0. 0. 0.

* * ALL DATA PROCESSED.

0.652904E 00 0. 0.104804E-03 0.
 0.67675CE 00 0. 0.139593E-03 0.
 0.701119E 00 0. 0.183416E-03 0.
 0.726229E 00 0. 0.237831E-03 0.
 0.751832E 00 0. 0.304460E-03 0.
 0.777984E 00 0. 0.384938E-03 0.
 0.804657E 00 0. 0.480851E-03 0.
 0.831818E 00 0. 0.593671E-03 0.
 0.859428E 00 0. 0.724665E-03 0.
 0.887437E 00 0. 0.874813E-03 0.
 0.915792E 00 0. 0.104471E-02 0.
 0.944424E 00 0. 0.123445E-02 0.
 0.973257E 00 0. 0.144356E-02 0.
 0.100220E 01 0. 0.167083E-02 0.
 0.103115E 01 0. 0.191429E-02 0.
 0.105999E 01 0. 0.217107E-02 0.
 0.108858E 01 0. 0.243732E-02 0.
 0.111676E 01 0. 0.270818E-02 0.
 0.114434E 01 0. 0.297773E-02 0.
 0.117112E 01 0. 0.323899E-02 0.
 0.119686E 01 0. 0.348398E-02 0.
 0.122126E 01 0. 0.370380E-02 0.
 0.124403E 01 0. 0.388882E-02 0.
 0.126477E 01 0. 0.402893E-02 0.
 0.128307E 01 0. 0.411392E-02 0.
 0.129842E 01 0. 0.413395E-02 0.
 0.131025E 01 0. 0.408019E-02 0.
 0.131787E 01 0. 0.394565E-02 0.
 0.132049E 01 0. 0.372616E-02 0.
 0.131714E 01 0. 0.342157E-02 0.
 0.130668E 01 0. 0.303709E-02 0.
 0.128771E 01 0. 0.258473E-02 0.
 0.125851E 01 0. 0.208464E-02 0.
 0.121690E 01 0. 0.156591E-02 0.
 0.116007E 01 0. 0.106621E-02 0.
 0.108424E 01 0. 0.628941E-03 0.
 0.984065E 00 0. 0.295940E-03 0.
 0.851472E 00 0. 0.935295E-04 0.
 0.672742E 00 0. 0.127476E-04 0.
 0.419429E-00 0. 0.139778E-06 0.
 0. 0. 0. 0.

APPENDIX D

Fortran Listing and Input and Output Sheets for
Beam-flux Case with Input Flux

704 INPUT DATA

FORM I

COST CODE _____

PROGRAM B512/RP

PROBLEM Beam-Input

ORIGIN AT OR

DATE _____

PAGE 1

OF 1

[illegible]

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C   BEAM FLUX PROGRAM WITH INPUT FLUX
      DIMENSION X(2510),P(2510),Q(2510),FLUX(2510),XINTE1(2510),
      XXINTE3(2510),XTOP(105),N(105),XN(105),DELTAX(105),TOTAL1(105),
      XTOTAL3(105),ALPA(100),BETA(100),XRESA(100),ERESA(100),ALPC(100),
      XBEIC(100),XRESC(100),FRESC(100)
C   READ INPUT AND WRITE INPUT DATA
      3 READ INPUT TAPE7,6,NFLUX,M,L,EMAXW,(XTOP(J),J=1,M)
      READ INPUT TAPE7,4,(N(J),J=1,M)
      READ INPUT TAPE7,5,(FLUX(I),I=1,L)
      4 FORMAT(18I4)
      5 FORMAT(6E12.6)
      6 FORMAT(3I4,E12.6/(6E12.6))
      7 FORMAT(4I1,3I4/6E12.6)
      10 READ INPUT TAPE7,7,KRONA,KRONF,KHUNT,NF,NA,NF,NPRCB,GA,TA,
      XSIGAO,GF,TF,SIGFU
      IF(NA)14,14,12
      12 READ INPUT TAPE7,5,(ALPA(J),BETA(J),ERESA(J),J=1,NA)
      14 IF(NF)40,40,16
      16 READ INPUT TAPE7,5,(ALPC(J),BETC(J),ERESC(J),J=1,NF)
      40 WRITE OUTPUT TAPE6,42,NPROH,GA,TA,SIGAO,GF,TF,SIGFU,EMAXW
      42 FORMAT(34H1BEAM FLUX PROGRAM PROELFM NUMBER 13/55H0
      X                               INPUT DATA/67H0          GA          T
      X      SIGMA A 0          GF          LO          SIGMA F 0          EM/I
      XH 7E13.6)
      44 FORMAT(36H0          FULL RESONANCE PARAMETERS/42H          ALPHA
      X      BETA          ERES/(1H 3E15.6))
      46 FORMAT(36H0          COVER RESONANCE PARAMETERS/42H          ALPHA
      X      BETA          ERES/(1H 3E15.6))
      48 FORMAT(71H0 SUBINTEGRAL UPPER LIMITS AND NUMBER OF MESH INTERVALS
      XPER SUBINTEGRAL/(1H E15.6/15))
      IF(NA)66,68,66
      66 WRITE OUTPUT TAPE6,44,(ALPA(J),BETA(J),ERESA(J),J=1,NA)
      68 IF(NF)72,72,70
      70 WRITE OUTPUT TAPE6,46,(ALPC(J),BETC(J),ERESC(J),J=1,NF)
      72 WRITE OUTPUT TAPE6,48,(XTOP(J),N(J),J=1,M)
C   CALCULATE VARIOUS CONSTANTS
      90 CONST1=1./(SQRTF(EMAXW))
      CONST3=(EMAXW)**2.
      IF(KRONA-1)94,92,94
      92 CONST2=0.15906*SIGAO
      94 IF(KRONF-1)98,96,98
      96 CONST4=0.15906*SIGFU
      98 IF(NA)102,102,100
      100 DO101J=1,NA
      101 XRESA(J)=(ERESA(J))/EMAXW
      102 IF(NF)118,118,104
      104 DO105J=1,NF
      105 XRESC(J)=(ERESC(J))/EMAXW
C   CALCULATE X AND DELTAX
      118 XTOP(M+1)=0.0
      N(M+1)=1
      I1=1
      I2=N(1)
      DO122J=1,M
      XN(J)=N(J)
      DELTAX(J)=(XTOP(J)-XTOP(J+1))/XN(J)
      X(I1)=XTOP(J)
      DO120I=1,I2
      120 X(I+1)=X(I)-DELTAX(J)
      I1=I1+N(J)
      122 I2=I2+N(J+1)
      X(I2)=0.0

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C      CALCULATION OF FUNCTIONS AT EACH MESH POINT
      DO300I=1,L
      A=CONST1/(SQRT(X(I)))
C      FULL CROSS SECTION FUNCTIONS
      IF(KRONA=1)126,124,126
124 SIGA=GA*CONST2*A
      GO TO128
126 SIGA=0.0
128 IF(NA)134,134,130
130 DO132J=1,NA
132 SIGA=SIGA+(GA*A*ALPHA(J))/(CONST3*((X(I)-XRESA(J))**2.))+BETA(J))
134 IF(KRONT)138,138,136
136 SIGATA=1A*SIGA
      P(I)=1.-EXP(-SIGATA)
      GO TO140
138 P(I)=SIGA
C      COVER CROSS SECTION FUNCTIONS
140 IF(KRUNF=1)144,142,144
142 SIGF=GF*CONST4*A
      GO TO146
144 SIGF=0.0
146 IF(NF)152,152,148
148 DO150J=1,NF
150 SIGF=SIGF+(GF*A*ALPHA(J))/(CONST3*((X(I)-XRESG(J))**2.))+BETA(J))
152 SIGFIF=1F*SIGF
      Q(I)=EXP(-SIGFIF)
C      CALCULATE INTEGRANDS
290 XINTE1(I)=FLUX(I)*P(I)
300 XINTE3(I)=XINTE1(I)*Q(I)
C      CALCULATE SUBINTEGRALS
      XINTE1(12)=0.0
      XINTE3(12)=0.0
      L1=1
      L2=N(I)-1
      DO340J=1,M
      TOTAL1(J)=0.0
      TOTAL3(J)=0.0
      DO330I=L1,L2,2
310 SUM1=(XINTE1(I)+4.*XINTE1(I+1)+XINTE1(I+2))*(DELTA(X(J)))/3.
      TOTAL1(J)=TOTAL1(J)+SUM1
      SUM3=(XINTE3(I)+4.*XINTE3(I+1)+XINTE3(I+2))*(DELTA(X(J)))/3.
330 TOTAL3(J)=TOTAL3(J)+SUM3
      L1=L1+N(J)
      L2=L2+N(J)+1
C      CALCULATE RIGHT INTEGRAL XTOP TO ZERO
      RIGHT1=0.0
      DO355J=1,M
355 RIGHT1=RIGHT1+TOTAL3(J)
C      CALCULATE LEFT INTEGRAL XTOP TO XCUT
      J=1
      XLEFT3=0.0
370 XLEFT3=XLEFT3+TOTAL1(J)
      IF(XLEFT3-RIGHT1)380,390,390
380 J=J+1
      GO TO370
390 XLEFT3=XLEFT3-TOTAL1(J)
      LJC=J
      LJCM=LJC-1
      I=1
      IF(LJCM)405,405,395
395 DO400K=1,LJCM
400 I=I+N(K)

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405 LIC=I
410 XSUM1=(XINTE1(I)+4.*XINTE1(I+1)+XINTE1(I+2))*(DELTAX(LJC))/3.
    XLEFT3=XLEFT3+XSUM1
    IF(XLEFT3-RIGHT1)420,430,430
420 I=I+2
    GO TO410
430 XLEFT3=XLEFT3-XSUM1
440 T1=(XINTE1(I)+XINTE1(I+1))*(DELTAX(LJC))/2.
    XLEFT3=XLEFT3+T1
    IF(XLEFT3-RIGHT1)450,460,460
450 I=I+1
    GO TO440
460 XLEFT3=XLEFT3-T1
    LCUT=I
C   CALCULATE XCUT AND ECUT
470 XMESH=(RIGHT1-XLEFT3)*(DELTAX(LJC))/T1
    XCUT=X(I)-XMESH
    ECUT=XCUT*EMAXW
    XLEFT3=XLEFT3+T1*XMESH/(DELTAX(LJC))
C   CALCULATE LEFT INTEGRAL XTUP TO ZERO
    XLEFT1=0.0
475 DO480J=1,M
480 XLEFT1=XLEFT1+TOTAL1(J)
C   CALCULATE LEFT INTEGRAL XCUT TO ZERO
    XLEFT2=XLEFT1-XLEFT3
C   CALCULATE RIGHT INTEGRAL XTUP TO XCUT
    RIGHT3=0.0
500 IF(LJCM)530,530,505
505 DO510J=1,LJCM
510 RIGHT3=RIGHT3+TOTAL3(J)
530 IF(LCUT-LIC-2)550,535,535
535 LSTOP=LCUT-2
    DO540I=LIC,LSTOP,2
    XSUM3=(XINTE3(I)+4.*XINTE3(I+1)+XINTE3(I+2))*(DELTAX(LJC))/3.
540 RIGHT3=RIGHT3+XSUM3
550 LV=LIC
555 IF(LCUT-LV)580,565,560
560 LV=LV+2
    GO TO555
565 I=LCUT
570 RIGHT3=RIGHT3+(XMESH)*(XINTE3(I)+XINTE3(I+1))/2.
    GO TO590
560 I=LCUT-1
    RIGHT3=RIGHT3+(XINTE3(I)+XINTE3(I+1))*(DELTAX(LJC))/2.
    I=I+1
    GO TO570
C   CALCULATE RIGHT INTEGRAL XCUT TO ZERO
590 RIGHT2=RIGHT1-RIGHT3
C   WRITE STANDARD OUTPUT DATA
    WRITE OUTPUT TAPE6,600,XCUT,ECUT,(TOTAL1(J),TOTAL3(J),J=1,M)
    WRITE OUTPUT TAPE6,610,XLEFT2,XLEFT3,XLEFT1,RIGHT2,
        XRIGHT3,RIGHT1
600 FORMAT(55H0                                OUTPUT DATA/
    X31H0      XCUT      CUTOFF ENERGY/1H 2E15.6/23H0      SUBINTE
    X6RALS/28H      TOTAL 1      TOTAL 2/(1H 2E15.6))
610 FORMAT(36H0      INTEGRALS FOR BARE FOIL/44H      0 TO XCUT
    X      XCUT TO XTOP      0 TO XTOP/1H 3E15.6/38H0      INTEGRALS FO
    XH COVERED FOIL/44H      0 TO XCUT      XCUT TO XTOP      0 TO XTOP/1H
    X3E15.6)
C   WRITE OPTIONAL OUTPUT DATA
    IF(NP)630,630,620
620 WRITE OUTPUT TAPE6,625,(X(I),P(I),U(I),FLUX(I),XINTE1(I),

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      XXINTE3(I),I=1,I2)
625  FORMAT(65H0
      XESH POINT/82H
      X
      X      Q      INTEGRANDS/91H      X      P
      X      FLUX      BARE FOIL      COVERED FOIL/CM BEI
      X5.6))
630  NFLUX=NFLUX-1
      IF(NFLUX)3,3,10
      END ( 1 , 1 , 0 , 1 , 0 )

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ANL-30

BEAM FLUX PROGRAM PROBLEM_NUMBER 1

INPUT DATA

GA	T	SIGMA A U	GF	LO	SIGMA F U	EM
0.153035E-03	0.100000E 03	0.314320E 02	0.118040E-03	0.200000E 02	0.	0.506000E-01

COVER RESONANCE PARAMETERS

ALPHA	BETA	ERFS
0.109000E 02	0.336000E-02	0.178000E-00

SUBINTEGRAL UPPER LIMITS AND NUMBER OF MESH INTERVALS PER SUBINTEGRAL

0.800000E 02	100
0.300000E 02	100
0.100000E 02	50
0.500000E 01	40
0.300000E 01	30
0.150000E 01	30

OUTPUT DATA

XCUT	CUTOFF ENERGY
0.782302E 01	0.395845E-00

SUBINTEGRALS

TOTAL 1	TOTAL 2
0.332043E-01	0.330568E-01
0.621891E-01	0.563772E-01
0.117491E-00	0.247089E-01
0.290306E-00	0.337188E-04
0.847802E 00	0.240053E-03
0.165265E 01	0.351154E-02

INTEGRALS FOR BARE FOIL

0 TO XCUR	XCUT TO XTOP	0 TO XTOP
0.288571E 01	0.117928E-00	0.300364E 01

INTEGRALS FOR COVERED FOIL

0 TO XCUR	XCUT TO XTOP	0 TO XTOP
0.152487E-01	0.102679E-00	0.117928E-00

VALUES OF FUNCTIONS AT EACH MESH POINT

X	P	Q	FLUX	INTEGRANDS	
				BARE FOIL	COVERED FOIL
0.800000E 02	0.373140E-01	0.999147E 00	0.883883E-02	0.329812E-03	0.329531E-03
0.795000E 02	0.374289E-01	0.999133E 00	0.889442E-02	0.332909E-03	0.332620E-03
0.790000E 02	0.375450E-01	0.999118E 00	0.895072E-02	0.336054E-03	0.335758E-03
0.785000E 02	0.376621E-01	0.999104E 00	0.900773E-02	0.339250E-03	0.338946E-03
0.780000E 02	0.377803E-01	0.999089E 00	0.906547E-02	0.342496E-03	0.342184E-03
0.775000E 02	0.378996E-01	0.999073E 00	0.912396E-02	0.345795E-03	0.345474E-03
0.770000E 02	0.380201E-01	0.999058E 00	0.918320E-02	0.349146E-03	0.348817E-03
0.765000E 02	0.381417E-01	0.999042E 00	0.924323E-02	0.352553E-03	0.352215E-03
0.760000E 02	0.382646E-01	0.999025E 00	0.930404E-02	0.356015E-03	0.355668E-03
0.755000E 02	0.383886E-01	0.999008E 00	0.936565E-02	0.359534E-03	0.359178E-03
0.750000E 02	0.385139E-01	0.998991E 00	0.942809E-02	0.363112E-03	0.362746E-03
0.745000E 02	0.386404E-01	0.998973E 00	0.949137E-02	0.366750E-03	0.366374E-03
0.740000E 02	0.387681E-01	0.998955E 00	0.955550E-02	0.370449E-03	0.370062E-03
0.735000E 02	0.388972E-01	0.998937E 00	0.962050E-02	0.374210E-03	0.373812E-03
0.730000E 02	0.390275E-01	0.998918E 00	0.968639E-02	0.378036E-03	0.377627E-03
0.725000E 02	0.391592E-01	0.998898E 00	0.975320E-02	0.381928E-03	0.381507E-03
0.720000E 02	0.392922E-01	0.998878E 00	0.982093E-02	0.385886E-03	0.385453E-03
0.715000E 02	0.394267E-01	0.998858E 00	0.988961E-02	0.389914E-03	0.389469E-03

0.710000E 02	0.395625E-01	0.998837E 00	0.995025E-02	0.394012E-03	0.393554E-03
0.705000E 02	0.396997E-01	0.998815E 00	0.100299E-01	0.398184E-03	0.397712E-03
0.700000E 02	0.398384E-01	0.998793E 00	0.101151E-01	0.402427E-03	0.401941E-03
0.695000E 02	0.399785E-01	0.998771E 00	0.101742E-01	0.406749E-03	0.406249E-03
0.690000E 02	0.401202E-01	0.998747E 00	0.102479E-01	0.411147E-03	0.410632E-03
0.685000E 02	0.402633E-01	0.998723E 00	0.103227E-01	0.415626E-03	0.415096E-03
0.680000E 02	0.404081E-01	0.998698E 00	0.103986E-01	0.420187E-03	0.419640E-03
0.675000E 02	0.405544E-01	0.998673E 00	0.104757E-01	0.424636E-03	0.424272E-03
0.670000E 02	0.407023E-01	0.998647E 00	0.105538E-01	0.429564E-03	0.428983E-03
0.665000E 02	0.408519E-01	0.998620E 00	0.106332E-01	0.434386E-03	0.433787E-03
0.660000E 02	0.410031E-01	0.998593E 00	0.107137E-01	0.439295E-03	0.438677E-03
0.655000E 02	0.411561E-01	0.998565E 00	0.107955E-01	0.444300E-03	0.443662E-03
0.650000E 02	0.413107E-01	0.998536E 00	0.108786E-01	0.449403E-03	0.448745E-03
0.645000E 02	0.414672E-01	0.998506E 00	0.109629E-01	0.454601E-03	0.453921E-03
0.640000E 02	0.416254E-01	0.998475E 00	0.110485E-01	0.459899E-03	0.459197E-03
0.635000E 02	0.417855E-01	0.998443E 00	0.111355E-01	0.465303E-03	0.464578E-03
0.630000E 02	0.419475E-01	0.998411E 00	0.112239E-01	0.470815E-03	0.470066E-03
0.625000E 02	0.421114E-01	0.998377E 00	0.113137E-01	0.476436E-03	0.475662E-03
0.620000E 02	0.422772E-01	0.998343E 00	0.114049E-01	0.482167E-03	0.481368E-03
0.615000E 02	0.424450E-01	0.998307E 00	0.114977E-01	0.488020E-03	0.487194E-03
0.610000E 02	0.426149E-01	0.998271E 00	0.115919E-01	0.493987E-03	0.493133E-03
0.605000E 02	0.427868E-01	0.998233E 00	0.116877E-01	0.500079E-03	0.499195E-03
0.600000E 02	0.429608E-01	0.998194E 00	0.117851E-01	0.506298E-03	0.505383E-03
0.595000E 02	0.431370E-01	0.998154E 00	0.118841E-01	0.512644E-03	0.511698E-03
0.590000E 02	0.433154E-01	0.998113E 00	0.119849E-01	0.519131E-03	0.518151E-03
0.585000E 02	0.434960E-01	0.998070E 00	0.120873E-01	0.525750E-03	0.524735E-03
0.580000E 02	0.436790E-01	0.998026E 00	0.121915E-01	0.532512E-03	0.531461E-03
0.575000E 02	0.438642E-01	0.997981E 00	0.122975E-01	0.539421E-03	0.538331E-03
0.570000E 02	0.440519E-01	0.997934E 00	0.124054E-01	0.546482E-03	0.545353E-03
0.565000E 02	0.442420E-01	0.997886E 00	0.125152E-01	0.553698E-03	0.552527E-03
0.560000E 02	0.444347E-01	0.997836E 00	0.126269E-01	0.561072E-03	0.559858E-03
0.555000E 02	0.446298E-01	0.997784E 00	0.127407E-01	0.568616E-03	0.567355E-03
0.550000E 02	0.448277E-01	0.997731E 00	0.128565E-01	0.576327E-03	0.575019E-03
0.545000E 02	0.450261E-01	0.997675E 00	0.129744E-01	0.584213E-03	0.582855E-03
0.540000E 02	0.452313E-01	0.997618E 00	0.130946E-01	0.592286E-03	0.590876E-03
0.535000E 02	0.454374E-01	0.997559E 00	0.132169E-01	0.600541E-03	0.599075E-03
0.530000E 02	0.456462E-01	0.997498E 00	0.133416E-01	0.608993E-03	0.607470E-03
0.525000E 02	0.458580E-01	0.997435E 00	0.134687E-01	0.617648E-03	0.616063E-03
0.520000E 02	0.460728E-01	0.997369E 00	0.135982E-01	0.626507E-03	0.624859E-03
0.515000E 02	0.462907E-01	0.997301E 00	0.137302E-01	0.635580E-03	0.633865E-03
0.510000E 02	0.465117E-01	0.997230E 00	0.138648E-01	0.644875E-03	0.643089E-03
0.505000E 02	0.467359E-01	0.997157E 00	0.140021E-01	0.654401E-03	0.652541E-03
0.500000E 02	0.469635E-01	0.997082E 00	0.141421E-01	0.664162E-03	0.662224E-03
0.495000E 02	0.471944E-01	0.997003E 00	0.142850E-01	0.674172E-03	0.672151E-03
0.490000E 02	0.474288E-01	0.996921E 00	0.144308E-01	0.684435E-03	0.682328E-03
0.485000E 02	0.476667E-01	0.996836E 00	0.145795E-01	0.694957E-03	0.692758E-03
0.480000E 02	0.479083E-01	0.996748E 00	0.147314E-01	0.705757E-03	0.703462E-03
0.475000E 02	0.481536E-01	0.996657E 00	0.148865E-01	0.716839E-03	0.714442E-03
0.470000E 02	0.484028E-01	0.996561E 00	0.150448E-01	0.728211E-03	0.725707E-03
0.465000E 02	0.486559E-01	0.996462E 00	0.152066E-01	0.739891E-03	0.737274E-03
0.460000E 02	0.489131E-01	0.996359E 00	0.153719E-01	0.751887E-03	0.749150E-03
0.455000E 02	0.491744E-01	0.996252E 00	0.155408E-01	0.764210E-03	0.761345E-03
0.450000E 02	0.494400E-01	0.996140E 00	0.157135E-01	0.776875E-03	0.773876E-03
0.445000E 02	0.497100E-01	0.996023E 00	0.158900E-01	0.789892E-03	0.786750E-03
0.440000E 02	0.499845E-01	0.995902E 00	0.160706E-01	0.803280E-03	0.799988E-03
0.435000E 02	0.502636E-01	0.995775E 00	0.162553E-01	0.817049E-03	0.813597E-03
0.430000E 02	0.505475E-01	0.995642E 00	0.164443E-01	0.831218E-03	0.827596E-03
0.425000E 02	0.508363E-01	0.995504E 00	0.166378E-01	0.845804E-03	0.842001E-03
0.420000E 02	0.511301E-01	0.995359E 00	0.168359E-01	0.860822E-03	0.856827E-03
0.415000E 02	0.514292E-01	0.995208E 00	0.170387E-01	0.876287E-03	0.872088E-03
0.410000E 02	0.517336E-01	0.995050E 00	0.172465E-01	0.892224E-03	0.887807E-03
0.405000E 02	0.520435E-01	0.994885E 00	0.174594E-01	0.908649E-03	0.904001E-03

0.400000E-02	0.523592E-01	0.994711E-00	0.176777E-01	0.925589E-03	0.920694E-03
0.395000E-02	0.526807E-01	0.994530E-00	0.179014E-01	0.943357E-03	0.937899E-03
0.390000E-02	0.530082E-01	0.994339E-00	0.181309E-01	0.961086E-03	0.955646E-03
0.385000E-02	0.533420E-01	0.994139E-00	0.183664E-01	0.979700E-03	0.973958E-03
0.380000E-02	0.536822E-01	0.993929E-00	0.186081E-01	0.998923E-03	0.992859E-03
0.375000E-02	0.540291E-01	0.993709E-00	0.188562E-01	0.101878E-02	0.101237E-02
0.370000E-02	0.543828E-01	0.993477E-00	0.191110E-01	0.103931E-02	0.103253E-02
0.365000E-02	0.547437E-01	0.993233E-00	0.193728E-01	0.106054E-02	0.105336E-02
0.360000E-02	0.551119E-01	0.992976E-00	0.196419E-01	0.108250E-02	0.107490E-02
0.355000E-02	0.554878E-01	0.992705E-00	0.199185E-01	0.110523E-02	0.109717E-02
0.350000E-02	0.558714E-01	0.992419E-00	0.202031E-01	0.112878E-02	0.112022E-02
0.345000E-02	0.562633E-01	0.992118E-00	0.204958E-01	0.115316E-02	0.114407E-02
0.340000E-02	0.566636E-01	0.991799E-00	0.207973E-01	0.117845E-02	0.116878E-02
0.335000E-02	0.570726E-01	0.991462E-00	0.211077E-01	0.120467E-02	0.119439E-02
0.330000E-02	0.574907E-01	0.991105E-00	0.214275E-01	0.123188E-02	0.122097E-02
0.325000E-02	0.579183E-01	0.990727E-00	0.217571E-01	0.126013E-02	0.124845E-02
0.320000E-02	0.583556E-01	0.990327E-00	0.220971E-01	0.128949E-02	0.127702E-02
0.315000E-02	0.588030E-01	0.989901E-00	0.224478E-01	0.132000E-02	0.130667E-02
0.310000E-02	0.592611E-01	0.989450E-00	0.228099E-01	0.135174E-02	0.133748E-02
0.305000E-02	0.597301E-01	0.988969E-00	0.231838E-01	0.138477E-02	0.136950E-02
0.300000E-02	0.602106E-01	0.988457E-00	0.235702E-01	0.141918E-02	0.140279E-02
0.298000E-02	0.604061E-01	0.988243E-00	0.237284E-01	0.143334E-02	0.141649E-02
0.296000E-02	0.606035E-01	0.988024E-00	0.238887E-01	0.144774E-02	0.143040E-02
0.294000E-02	0.608029E-01	0.987798E-00	0.240512E-01	0.146238E-02	0.144454E-02
0.292000E-02	0.610043E-01	0.987567E-00	0.242160E-01	0.147728E-02	0.145891E-02
0.290000E-02	0.612077E-01	0.987330E-00	0.243830E-01	0.149243E-02	0.147352E-02
0.288000E-02	0.614132E-01	0.987086E-00	0.245523E-01	0.150784E-02	0.148836E-02
0.286000E-02	0.616209E-01	0.986835E-00	0.247240E-01	0.152351E-02	0.150346E-02
0.284000E-02	0.618306E-01	0.986578E-00	0.248981E-01	0.153947E-02	0.151880E-02
0.282000E-02	0.620426E-01	0.986313E-00	0.250747E-01	0.155570E-02	0.153441E-02
0.280000E-02	0.622567E-01	0.986042E-00	0.252538E-01	0.157222E-02	0.155027E-02
0.278000E-02	0.624731E-01	0.985762E-00	0.254355E-01	0.158903E-02	0.156641E-02
0.276000E-02	0.626918E-01	0.985475E-00	0.256198E-01	0.160615E-02	0.158282E-02
0.274000E-02	0.629129E-01	0.985180E-00	0.258068E-01	0.162358E-02	0.159952E-02
0.272000E-02	0.631363E-01	0.984876E-00	0.259966E-01	0.164133E-02	0.161651E-02
0.270000E-02	0.633622E-01	0.984564E-00	0.261891E-01	0.165940E-02	0.163378E-02
0.268000E-02	0.635905E-01	0.984242E-00	0.263846E-01	0.167781E-02	0.165137E-02
0.266000E-02	0.638213E-01	0.983911E-00	0.265830E-01	0.169656E-02	0.166927E-02
0.264000E-02	0.640547E-01	0.983570E-00	0.267843E-01	0.171566E-02	0.168747E-02
0.262000E-02	0.642907E-01	0.983219E-00	0.269888E-01	0.173513E-02	0.170601E-02
0.260000E-02	0.645294E-01	0.982858E-00	0.271964E-01	0.175497E-02	0.172488E-02
0.258000E-02	0.647707E-01	0.982485E-00	0.274072E-01	0.177518E-02	0.174409E-02
0.256000E-02	0.650149E-01	0.982101E-00	0.276214E-01	0.179580E-02	0.176366E-02
0.254000E-02	0.652618E-01	0.981706E-00	0.278388E-01	0.181681E-02	0.178357E-02
0.252000E-02	0.655116E-01	0.981298E-00	0.280598E-01	0.183824E-02	0.180386E-02
0.250000E-02	0.657643E-01	0.980877E-00	0.282843E-01	0.186010E-02	0.182453E-02
0.248000E-02	0.660200E-01	0.980443E-00	0.285124E-01	0.188239E-02	0.184557E-02
0.246000E-02	0.662788E-01	0.979995E-00	0.287442E-01	0.190513E-02	0.186702E-02
0.244000E-02	0.665406E-01	0.979532E-00	0.289798E-01	0.192833E-02	0.188887E-02
0.242000E-02	0.668057E-01	0.979055E-00	0.292193E-01	0.195201E-02	0.191113E-02
0.240000E-02	0.670739E-01	0.978561E-00	0.294628E-01	0.197618E-02	0.193382E-02
0.238000E-02	0.673454E-01	0.978052E-00	0.297104E-01	0.200086E-02	0.195695E-02
0.236000E-02	0.676204E-01	0.977525E-00	0.299621E-01	0.202605E-02	0.198051E-02
0.234000E-02	0.678987E-01	0.976981E-00	0.302182E-01	0.205178E-02	0.200455E-02
0.232000E-02	0.681806E-01	0.976418E-00	0.304787E-01	0.207805E-02	0.202905E-02
0.230000E-02	0.684660E-01	0.975836E-00	0.307438E-01	0.210490E-02	0.205404E-02
0.228000E-02	0.687551E-01	0.975234E-00	0.310134E-01	0.213233E-02	0.207952E-02
0.226000E-02	0.690479E-01	0.974610E-00	0.312879E-01	0.216036E-02	0.210551E-02
0.224000E-02	0.693446E-01	0.973964E-00	0.315673E-01	0.218902E-02	0.213203E-02
0.222000E-02	0.696451E-01	0.973296E-00	0.318517E-01	0.221831E-02	0.215908E-02
0.220000E-02	0.699496E-01	0.972603E-00	0.321413E-01	0.224827E-02	0.218668E-02
0.218000E-02	0.702583E-01	0.971885E-00	0.324362E-01	0.227891E-02	0.221484E-02

0.216000E 02	0.705711E-01	0.971140E 00	0.327365E-01	0.231025E-02	0.224358E-02
0.214000E 02	0.708881E-01	0.970308E 00	0.330425E-01	0.234232E-02	0.227291E- 2
0.212000E 02	0.712095E-01	0.969566E 00	0.333542E-01	0.237514E-02	0.230285E- 2
0.210000E 02	0.715354E-01	0.968734E 00	0.336719E-01	0.240873E-02	0.233342E-02
0.208000E 02	0.718659E-01	0.967871E 00	0.339957E-01	0.244313E-02	0.236463E- 02
0.206000E 02	0.722010E-01	0.966973E 00	0.343259E-01	0.247836E-02	0.239651E-02
0.204000E 02	0.725409E-01	0.966041E 00	0.346624E-01	0.251444E-02	0.242905E-02
0.202000E 02	0.728858E-01	0.965071E 00	0.350057E-01	0.255142E-02	0.246230E-02
0.200000E 02	0.732357E-01	0.964063E 00	0.353558E-01	0.258931E-02	0.249625E-02
0.198000E 02	0.735907E-01	0.963013E 00	0.357130E-01	0.262814E-02	0.253094E-02
0.196000E 02	0.739510E-01	0.961921E 00	0.360776E-01	0.266797E-02	0.256638E-02
0.194000E 02	0.743167E-01	0.960783E 00	0.364496E-01	0.270881E-02	0.260258E-02
0.192000E 02	0.746880E-01	0.959598E 00	0.368295E-01	0.275072E-02	0.263959E-02
0.190000E 02	0.750650E-01	0.958362E 00	0.372173E-01	0.279372E-02	0.267739E-02
0.188 00E 02	0.754478E-01	0.957073E 00	0.376135E-01	0.283786E-02	0.271603E-02
0.186000E 02	0.758366E-01	0.955728E 00	0.380183E-01	0.288318E-02	0.275553E- 02
0.184000E 02	0.762315E-01	0.954324E 00	0.384318E-01	0.292972E-02	0.279590E- 02
0.182000E 02	0.766328E-01	0.952858E 00	0.388546E-01	0.297754E-02	0.283717E- 2
0.180000E 02	0.770406E-01	0.951325E 00	0.392868E-01	0.302668E-02	0.287936E-02
0.178000E 02	0.774550E-01	0.949723E 00	0.397288E-01	0.307720E-02	0.292248E-02
0.176000E 02	0.778763E-01	0.948047E 00	0.401810E-01	0.312915E-02	0.296658E-02
0.174000E 02	0.783047E-01	0.946292E 00	0.406437E-01	0.318259E-02	0.301160E- 2
0.172000E 02	0.787403E-01	0.944455E 00	0.411174E-01	0.323759E-02	0.305776E-02
0.170000E 02	0.791833E-01	0.942529E 00	0.416024E-01	0.329421E-02	0.310489E- 02
0.168000E 02	0.796340E-01	0.940510E 00	0.420993E-01	0.335254E-02	0.315309E-02
0.166000E 02	0.800926E-01	0.938392E 00	0.426084E-01	0.341262E-02	0.320237E-02
0.164000E 02	0.805593E-01	0.936166E 00	0.431302E-01	0.347454E-02	0.325275E-02
0.162000E 02	0.810344E-01	0.933832E 00	0.436653E-01	0.353839E-02	0.330426E-02
0.160000E 02	0.815182E-01	0.931376E 00	0.442144E-01	0.360428E-02	0.335694E-02
0.158000E 02	0.820108E-01	0.928793E 00	0.447781E-01	0.367229E-02	0.341079E-02
0.156000E 02	0.825126E-01	0.926074E 00	0.453569E-01	0.374252E-02	0.346585E-02
0.154000E 02	0.830238E-01	0.923211E 00	0.459516E-01	0.381508E-02	0.352212E-02
0.152000E 02	0.835449E-01	0.920192E 00	0.465631E-01	0.389011E-02	0.357965E-02
0.150000E 02	0.840760E-01	0.917009E 00	0.471922E-01	0.396773E-02	0.363844E-02
0.148000E 02	0.846175E-01	0.913648E 00	0.478398E-01	0.404808E-02	0.369852E-02
0.146000E 02	0.851698E-01	0.910098E 00	0.485071E-01	0.413134E-02	0.375992E- 2
0.144000E 02	0.857332E-01	0.906346E 00	0.491952E-01	0.421766E-02	0.382266E-02
0.142000E 02	0.863081E-01	0.902375E 00	0.499053E-01	0.430723E-02	0.388674E-02
0.140000E 02	0.868949E-01	0.898171E 00	0.506390E-01	0.440027E-02	0.395220E-02
0.138000E 02	0.874940E-01	0.893716E 00	0.513977E-01	0.449699E-02	0.401903E-02
0.136000E 02	0.881059E-01	0.888992E 00	0.521835E-01	0.459767E-02	0.408729E-02
0.134000E 02	0.887310E-01	0.883977E 00	0.529982E-01	0.470258E-02	0.415697E-02
0.132000E 02	0.893698E-01	0.878649E 00	0.538442E-01	0.481205E-02	0.422810E-02
0.130000E 02	0.900229E-01	0.872983E 00	0.547244E-01	0.492645E-02	0.430071E-02
0.128000E 02	0.906907E-01	0.866954E 00	0.556414E-01	0.504616E-02	0.437479E-02
0.126000E 02	0.913738E-01	0.860532E 00	0.565989E-01	0.517166E-02	0.445037E-02
0.124000E 02	0.920729E-01	0.853684E 00	0.576101E-01	0.530349E-02	0.452750E-02
0.122000E 02	0.927885E-01	0.846377E 00	0.586520E-01	0.544223E-02	0.460618E-02
0.120000E 02	0.935214E-01	0.838572E 00	0.597574E-01	0.558859E-02	0.468644E-02
0.118000E 02	0.942722E-01	0.830227E 00	0.609234E-01	0.574338E-02	0.476831E-02
0.116000E 02	0.950416E-01	0.821297E 00	0.621572E-01	0.590752E-02	0.485183E-02
0.114000E 02	0.958306E-01	0.811733E 00	0.634669E-01	0.608207E-02	0.493702E-02
0.112000E 02	0.966399E-01	0.801479E 00	0.648625E-01	0.626831E-02	0.502392E-02
0.110000E 02	0.974704E-01	0.790477E 00	0.663553E-01	0.646768E-02	0.511255E-02
0.108000E 02	0.983231E-01	0.778661E 00	0.679588E-01	0.668192E-02	0.520295E-02
0.106000E 02	0.991990E-01	0.765916E 00	0.696882E-01	0.691300E-02	0.529508E-02
0.104000E 02	0.100099E-00	0.752300E 00	0.715622E-01	0.716331E-02	0.538896E-02
0.102000E 02	0.101025E-00	0.737596E 00	0.736022E-01	0.743563E-02	0.548449E-02
0.100000E 02	0.101977E-00	0.721757E 00	0.758335E-01	0.773326E-02	0.558153E-02
0.990000E 01	0.102463E-00	0.713383E 00	0.779299E-01	0.789274E-02	0.563055E-02
0.980000E 01	0.102957E-00	0.704690E 00	0.782857E-01	0.806006E-02	0.567984E-02
0.970000E 01	0.103458E-00	0.695664E 00	0.796053E-01	0.823580E-02	0.572935E-02

0.960000E 01	0.103966E-00	0.686291F 00	0.809937E-01	0.842062E-02	0.577900E-02
0.950000E 01	0.104483E-00	0.676559E 00	0.824561E-01	0.861523E-02	0.582871E-02
0.940000E 01	0.105007E-00	0.666453E 00	0.839984E-01	0.882040E-02	0.587838E-02
0.930000E 01	0.105539E-00	0.655959E 00	0.856270F-01	0.903698E-02	0.592789E-02
0.920000E 01	0.106080E-00	0.645063E 00	0.873484E-01	0.926588E-02	0.597707E-02
0.910000E 01	0.106629E-00	0.633750E 00	0.891701E-01	0.950808E-02	0.602575E-02
0.900000E 01	0.107187E-00	0.622006E 00	0.911002E-01	0.976471E-02	0.607371E-02
0.890000E 01	0.107753E-00	0.609817E 00	0.931471E-01	0.100369E-01	0.612069E-02
0.880000E 01	0.108330E-00	0.597169E 00	0.953204E-01	0.103260E-01	0.616638E-02
0.870000E 01	0.108915E-00	0.584048E 00	0.976301E-01	0.106334E-01	0.621042E-02
0.860000E 01	0.109511E-00	0.570441E 00	0.100087E-00	0.109606E-01	0.625238E-02
0.850000E 01	0.110116E-00	0.556336E 00	0.102704E-00	0.113094E-01	0.629182E-02
0.840000E 01	0.110732E-00	0.541723E 00	0.105493E-00	0.116815E-01	0.632813E-02
0.830000E 01	0.111359E-00	0.526593E 00	0.108469E-00	0.120790E-01	0.636071E-02
0.820000E 01	0.111996E-00	0.510937E 00	0.111645E-00	0.125038E-01	0.638868E-02
0.810000E 01	0.112645E-00	0.494752E-00	0.115040E-00	0.129587E-01	0.641135E-02
0.800000E 01	0.113306E-00	0.478035E-00	0.118671E-00	0.134461E-01	0.642771E-02
0.790000E 01	0.113978E-00	0.460787E-00	0.122556E-00	0.139687E-01	0.643661E-02
0.780000E 01	0.114663E-00	0.443014E-00	0.126717E-00	0.145298E-01	0.643689E-02
0.770000E 01	0.115361E-00	0.424726E-00	0.131176E-00	0.151326E-01	0.642719E-02
0.760000E 01	0.116071E-00	0.405940E-00	0.135957E-00	0.157807E-01	0.640602E-02
0.750000E 01	0.116796E-00	0.386677E-00	0.141088E-00	0.164785E-01	0.637185E-02
0.740000E 01	0.117534E-00	0.366968E-00	0.146594E-00	0.172298E-01	0.632279E-02
0.730000E 01	0.118287E-00	0.346852E-00	0.152509E-00	0.180398E-01	0.625716E-02
0.720000E 01	0.119055E-00	0.326377E-00	0.158864E-00	0.189135E-01	0.617295E-02
0.710000E 01	0.119838E-00	0.305603E-00	0.165696E-00	0.198567E-01	0.606827E-02
0.700000E 01	0.120638E-00	0.284600E-00	0.173041E-00	0.208752E-01	0.594110E-02
0.690000E 01	0.121453E-00	0.263453E-00	0.180943E-00	0.219761E-01	0.578968E-02
0.680000E 01	0.122286E-00	0.242259E-00	0.189446E-00	0.231667E-01	0.561233E-02
0.670000E 01	0.123137E-00	0.221130E-00	0.198597E-00	0.244547E-01	0.540765E-02
0.660000E 01	0.124006E-00	0.200191E-00	0.208448E-00	0.258489E-01	0.517472E-02
0.650000E 01	0.124895E-00	0.179583E-00	0.219055E-00	0.273588E-01	0.491317E-02
0.640000E 01	0.125803E-00	0.159457E-00	0.230476E-00	0.289945E-01	0.462337E-02
0.630000E 01	0.126731E-00	0.139977E-00	0.242778E-00	0.307676E-01	0.430676E-02
0.620000E 01	0.127681E-00	0.121312E-00	0.256027E-00	0.326899E-01	0.396566E-02
0.610000E 01	0.128654E-00	0.103633E-00	0.270298E-00	0.347748E-01	0.360380E-02
0.600000E 01	0.129649E-00	0.871082E-01	0.285669E-00	0.370367E-01	0.322620E-02
0.590000E 01	0.130668E-00	0.718952E-01	0.302225E-00	0.394912E-01	0.283923E-02
0.580000E 01	0.131713E-00	0.581303E-01	0.320056E-00	0.421554E-01	0.245050E-02
0.570000E 01	0.132783E-00	0.459205E-01	0.339258E-00	0.450477E-01	0.206861E-02
0.560000E 01	0.133880E-00	0.353338E-01	0.359934E-00	0.481881E-01	0.170267E-02
0.550000E 01	0.135006E-00	0.263910E-01	0.382193E-00	0.515985E-01	0.136173E-02
0.540000E 01	0.136162E-00	0.190591E-01	0.406152E-00	0.553024E-01	0.105401E-02
0.530000E 01	0.137348E-00	0.132503E-01	0.431933E-00	0.593252E-01	0.786074E-03
0.520000E 01	0.138567E-00	0.862466E-02	0.459670E-00	0.636951E-01	0.562088E-03
0.510000E 01	0.139820E-00	0.560004E-02	0.489499E-00	0.684416E-01	0.383276E-03
0.500000E 01	0.141108E-00	0.336655E-02	0.521569E-00	0.735975E-01	0.247770E-03
0.495000E 01	0.141766E-00	0.255303E-02	0.539564E-00	0.560885E-01	0.143196E-03
0.490000E 01	0.142433E-00	0.190575E-02	0.411726E-00	0.586435E-01	0.111760E-03
0.485000E 01	0.143111E-00	0.139923E-02	0.428419E-00	0.613113E-01	0.857884E-04
0.480000E 01	0.143798E-00	0.100973E-02	0.445741E-00	0.640966E-01	0.647205E-04
0.475000E 01	0.144495E-00	0.715694E-03	0.463714E-00	0.670045E-01	0.479547E-04
0.470000E 01	0.145203E-00	0.497948E-03	0.482357E-00	0.700398E-01	0.348762E-04
0.465000E 01	0.145922E-00	0.339903E-03	0.501634E-00	0.732082E-01	0.248837E-04
0.460000E 01	0.146652E-00	0.227549E-03	0.521745E-00	0.765149E-01	0.174109E-04
0.455000E 01	0.147393E-00	0.149367E-03	0.542533E-00	0.799656E-01	0.119442E-04
0.450000E 01	0.148146E-00	0.961383E-04	0.564382E-00	0.835665E-01	0.803394E-05
0.445000E 01	0.148911E-00	0.606912E-04	0.586414E-00	0.873234E-01	0.529976E-05
0.440000E 01	0.149688E-00	0.376017E-04	0.609553E-00	0.912428E-01	0.343089E-05
0.435000E 01	0.150478E-00	0.228865E-04	0.633524E-00	0.953313E-01	0.218180E-05
0.430000E 01	0.151281E-00	0.137055E-04	0.658350E-00	0.995555E-01	0.136496E-05
0.425000E 01	0.152097E-00	0.809044E-05	0.684057E-00	0.104043E-00	0.841752E-06

0.420000E 01	.152926E-00	0.472041E-05	0.710669E 00	0.108680E-00	0.513015E-06
0.415000E 01	.153771E-00	0.273090E-05	0.736211E 00	0.113515E-00	0.309998E-06
0.410000E 01	.154629E-00	0.157272E-05	0.766710E 00	0.118556E-00	0.186455E-06
0.405000E 01	.155502E-00	0.905780E-06	0.796191E 00	0.123810E-00	0.112144E-06
0.400000E 01	.156391E-00	0.524480E-06	0.826679E 00	0.129285E-00	0.678075E-07
0.395000E 01	.157296E-00	0.307154E-06	0.858200E 00	0.134991E-00	0.414631E-07
0.390000E 01	.158217E-00	0.183119E-06	0.890781E 00	0.140937E-00	0.258082E-07
0.385000E 01	.159155E-00	0.111910E-06	0.924446E 00	0.147130E-00	0.164653E-07
0.380000E 01	.160110E-00	0.706099E-07	0.959222E 00	0.153581E-00	0.108443E-07
0.375000E 01	.161083E-00	0.463259E-07	0.995134E 00	0.160299E-00	0.742602E-08
0.370000E 01	.162075E-00	0.318219E-07	0.103221E 01	0.167295E-00	0.532365E-08
0.365000E 01	.163086E-00	0.230307E-07	0.107047E 01	0.174578E-00	0.402067E-08
0.360000E 01	.164116E-00	0.176580E-07	0.110993E 01	0.182158E-00	0.321654E-08
0.355000E 01	.165167E-00	0.144053E-07	0.115064E 01	0.190048E-00	0.273770E-08
0.350000E 01	.166239E-00	0.125421E-07	0.119259E 01	0.198255E-00	0.248653E-08
0.345000E 01	.167333E-00	0.116726E-07	0.123583E 01	0.206795E-00	0.241388E-08
0.340000E 01	.168449E-00	0.116136E-07	0.128336E 01	0.215676E-00	0.250476E-08
0.335000E 01	.169589E-00	0.123345E-07	0.132621E 01	0.224910E-00	0.277415E-08
0.330000E 01	.170753E-00	0.139447E-07	0.137340E 01	0.234512E-00	0.327019E-08
0.325000E 01	.171942E-00	0.167136E-07	0.142194E 01	0.244491E-00	0.408632E-08
0.320000E 01	.173157E-00	0.211306E-07	0.147185E 01	0.254861E-00	0.538536E-08
0.315000E 01	.174398E-00	0.280169E-07	0.152313E 01	0.265632E-00	0.744218E-08
0.310000E 01	.175668E-00	0.387147E-07	0.157581E 01	0.276820E-00	0.107170E-07
0.305000E 01	.176967E-00	0.553945E-07	0.162988E 01	0.288436E-00	0.159777E-07
0.300000E 01	.178297E-00	0.815439E-07	0.168536E 01	0.300494E-00	0.245034E-07
0.295000E 01	.179657E-00	0.122724E-06	0.174224E 01	0.313006E-00	0.384132E-07
0.290000E 01	.181050E-00	0.187726E-06	0.180052E 01	0.325985E-00	0.611959E-07
0.285000E 01	.182478E-00	0.290290E-06	0.186020E 01	0.339445E-00	0.985377E-07
0.280000E 01	.183941E-00	0.451585E-06	0.192127E 01	0.353400E-00	0.159590E-06
0.275000E 01	.185440E-00	0.703693E-06	0.198371E 01	0.367860E-00	0.258861E-06
0.270000E 01	.186979E-00	0.19436E-05	0.204750E 01	0.382839E-00	0.418962E-06
0.265000E 01	.188558E-00	0.169319E-05	0.211262E 01	0.398351E-00	0.674485E-06
0.260000E 01	.190178E-00	0.259957E-05	0.217903E 01	0.414405E-00	0.107727E-05
0.255000E 01	.191843E-00	0.395214E-05	0.224670E 01	0.431014E-00	0.170343E-05
0.250000E 01	.193554E-00	0.593990E-05	0.231557E 01	0.448189E-00	0.266220E-05
0.245000E 01	.195314E-00	0.881440E-05	0.238561E 01	0.465942E-00	0.410700E-05
0.240000E 01	.197124E-00	0.129024E-04	0.245674E 01	0.484282E-00	0.624840E-05
0.235000E 01	.198987E-00	0.186181E-04	0.252889E 01	0.503216E 00	0.936893E-05
0.230000E 01	.200906E-00	0.264738E-04	0.260199E 01	0.522756E 00	0.138393E-04
0.225000E 01	.202884E-00	0.370875E-04	0.267593E 01	0.542904E 00	0.201349E-04
0.220000E 01	.204924E-00	0.511868E-04	0.275061E 01	0.563666E 00	0.288522E-04
0.215000E 01	.207029E-00	0.696064E-04	0.282592E 01	0.585047E 00	0.407230E-04
0.210000E 01	.209203E-00	0.932801E-04	0.290172E 01	0.607048E 00	0.566256E-04
0.205000E 01	.211450E-00	0.123225E-03	0.297787E 01	0.629670E 00	0.775913E-04
0.200000E 01	.213773E-00	0.160519E-03	0.305419E 01	0.652904E 00	0.104804E-03
0.195000E 01	.216179E-00	0.206270E-03	0.313051E 01	0.676749E 00	0.139593E-03
0.190000E 01	.218670E-00	0.261576E-03	0.320663E 01	0.701195E 00	0.183416E-03
0.185000E 01	.221254E-00	0.327488E-03	0.328233E 01	0.726229E 00	0.237832E-03
0.180000E 01	.223936E-00	0.404958E-03	0.335736E 01	0.751833E 00	0.304461E-03
0.175000E 01	.226722E-00	0.494789E-03	0.343145E 01	0.777984E 00	0.384938E-03
0.170000E 01	.229619E-00	0.597586E-03	0.350432E 01	0.804658E 00	0.480852E-03
0.165000E 01	.232635E-00	0.713703E-03	0.357563E 01	0.831817E 00	0.593670E-03
0.160000E 01	.235779E-00	0.843195E-03	0.364505E 01	0.859427E 00	0.724665E-03
0.155000E 01	.239060E-00	0.985775E-03	0.371219E 01	0.887437E 00	0.874813E-03
0.150000E 01	.242489E-00	0.114077E-02	0.377663E 01	0.915791E 00	0.104471E-02
0.145000E 01	.246077E-00	0.130710E-02	0.383792E 01	0.944423E 00	0.123445E-02
0.140000E 01	.249837E-00	0.148322E-02	0.389557E 01	0.973257E 00	0.144356E-02
0.135000E 01	.253784E-00	0.166716E-02	0.394904E 01	0.100220E 01	0.167083E-02
0.130000E 01	.257933E-00	0.185646E-02	0.399775E 01	0.103115E 01	0.191429E-02
0.125000E 01	.262304E-00	0.204819E-02	0.404108E 01	0.105999E 01	0.217107E-02
0.120000E 01	.266918E-00	0.223899E-02	0.407833E 01	0.108858E 01	0.243731E-02
0.115000E 01	.271797E-00	0.242504E-02	0.410879E 01	0.111676E 01	0.270818E-02

<u>0.110000E 01</u>	<u>0.276969E-00</u>	<u>0.260213E-02</u>	<u>0.413165E 01</u>	<u>0.114434E 01</u>	<u>0.297773E-02</u>
0.105000E 01	0.282466E-00	0.276572E-02	0.414606E 01	0.117112E 01	0.323899E-02
0.100000E 01	0.288324E-00	0.291094E-02	0.415107E 01	0.119685E 01	0.348397E-02
<u>0.950000E 00</u>	<u>0.294585E-00</u>	<u>0.303276E-02</u>	<u>0.414571E 01</u>	<u>0.122126E 01</u>	<u>0.370380E-02</u>
0.900000E 00	0.301298E-00	0.312599E-02	0.412888E 01	0.124402E 01	0.388881E-02
0.850000E 00	0.308523E-00	0.318550E-02	0.409943E 01	0.126477E 01	0.402893E-02
<u>0.800000E 00</u>	<u>0.316330E-00</u>	<u>0.320631E-02</u>	<u>0.405611E 01</u>	<u>0.128307E 01</u>	<u>0.411392E-02</u>
0.750000E 00	0.324803E-00	0.318382E-02	0.399756E 01	0.129842E 01	0.413394E-02
0.700000E 00	0.334047E-00	0.311405E-02	0.392236E 01	0.131025E 01	0.408019E-02
<u>0.650000E 00</u>	<u>0.344189E-00</u>	<u>0.299395E-02</u>	<u>0.382893E 01</u>	<u>0.131788E 01</u>	<u>0.394565E-02</u>
0.600000E 00	0.355390E-00	0.282180E-02	0.371561E 01	0.132049E 01	0.372616E-02
0.550000E 00	0.367854E-00	0.259773E-02	0.358060E 01	0.131714E 01	0.342157E-02
<u>0.500000E 00</u>	<u>0.381848E-00</u>	<u>0.232429E-02</u>	<u>0.342198E 01</u>	<u>0.130668E 01</u>	<u>0.303709E-02</u>
0.450000E-00	0.397724E-00	0.200724E-02	0.323769E 01	0.128771E 01	0.258473E-02
0.400000E-00	0.415967E-00	0.165644E-02	0.302550E 01	0.125851E 01	0.208464E-02
<u>0.350000E-00</u>	<u>0.437255E-00</u>	<u>0.128680E-02</u>	<u>0.278304E 01</u>	<u>0.121690E 01</u>	<u>0.156590E-02</u>
0.300000E-00	0.462590E-00	0.919088E-03	0.250777E 01	0.116007E 01	0.106621E-02
0.250000E-00	0.493517E-00	0.580077E-03	0.219696E 01	0.108424E 01	0.628942E-03
<u>0.200000E-00</u>	<u>0.532595E 00</u>	<u>0.300732E-03</u>	<u>0.184768E 01</u>	<u>0.984066E 00</u>	<u>0.295940E-03</u>
0.150000E-00	0.584478E 00	0.109845E-03	0.145681E 01	0.851473E 00	0.935296E-04
0.100000E-00	0.658905E 00	0.189487E-04	0.102100E 01	0.672742E 00	0.127476E-04
<u>0.500001E-01</u>	<u>0.781533E 00</u>	<u>0.311800E-06</u>	<u>0.536674E 00</u>	<u>0.419428E-00</u>	<u>0.130778E-06</u>
0.	0.	0.	0.	0.	0.