Oz-2091

ORNL/TM-5223

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SUR, A Program to Generate Error Covariance Files

F. C. Difilippo

OAK RIDGE NATIONAL LABORATORY

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Printed in the United States of America. Available from
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road, Springfield, Virginia 22161
Price: Printed Copy $4.50; Microfiche $2.25

ORNL/TM-5223
UC-79d

Contract No. W-7405-eng-26

Neutron Physics Division

SUR, A PROGRAM TO GENERATE ERROR COVARIANCE FILES

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MARCH 1976

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ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

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Acknowledgments

The author is indebted to R. Gwin and L. W. Weston for providing the literature search for the plutonium isotopes cross sections. F. G. Perey, C. R. Weisbin, G. de Saussure, R. W. Peelle, and R. B. Perez have participated in many discussions regarding the present work. Thanks are also due J. D. Drischler for the correlation matrix plot. The convenient output presented in Appendix B was programmed by R. W. Peelle.

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Abstract

Covariance matrices were calculated for the ^{238}U, ^{241}Pu, and ^{239}Pu fission cross sections and for the ^{238}U, ^{240}Pu, ^{241}Pu, and ^{239}Pu capture cross sections. A computer program was written which uses the evaluated ENDF/B data files and the measured or evaluated (from other evaluations) cross sections for the calculation of the uncertainty files. An effort has been made to make the output of the program consistent with the ENDF/B error files format. A user's manual for the present code and references utilized in the covariance matrix calculations are given.

I. INTRODUCTION

The economic impact of nuclear data uncertainties in fast breeder as well as in thermal reactors has been the subject of many studies.[1-5] To evaluate the effect of group cross-section uncertainties in sensitivity calculations, the correlation both within the group structure and among different isotopes has to be calculated. Extensive discussions of this procedure are given in refs. 6-8.

II. CALCULATION OF RELATIVE COVARIANCE MATRICES

The relative covariance matrix elements are defined here as:

$$\mathrm{COV}(I,J) = \left\langle \left(\frac{X_i^\ell - X_i}{X_i} \right) \left(\frac{X_j^\ell - X_j}{X_j} \right) \right\rangle , \qquad (1)$$

where X_i^ℓ and X_j^ℓ are the group average cross sections for the i^{th} and j^{th} energy groups, respectively, for the ℓ^{th} data set. The cross sections X_i and X_j are the reference ("true") values, which by convention are taken to be the corresponding ENDF/B values. The bracket denotes a weighted average over the ensemble of data sets, having common data in the i^{th} and j^{th} groups, where weights, W_ℓ, have been assigned to each data set.

The ENDF/B-IV files, used as the reference data, were energy-weighted by a flat weighting function in producing the group-average cross sections. Details of calculations are given in Sect. III.

The present study of the error covariance matrix implies an "external" analysis of the data. Each data set, whether the results of a measurement or of an evaluation, is assigned an arbitrary weight and is compared with a reference line taken to be the ENDF/B-IV evaluation.

III. BRIEF DESCRIPTION OF THE PROGRAM

The calculations were done by the code SUR, which, in its present form, only handles error correlation for a given cross-section data set within a given energy range. A description of the main steps in the program follows.

Step 1: The program sets the energy limits of the group structure for several options: (1) constant lethargy interval, (2) decimal interval, or (3) a mixture of the first two.

Step 2: For the ratio measurements, the standard reference cross section was always the ENDF/B-IV evaluation.

Step 3: The measurements corresponding to the data set ℓ, inside a group j, are reduced to the mean energy of the group. This is implemented by approximating the shape of the cross section with a parabola determined by the evaluated cross sections in groups j - 1, j, j + 1. Then, all the measurements corresponding to the data set ℓ, inside group j, are averaged.

Step 4: Whenever there are not measurements in the ℓ^{th} set of data, inside group j, the program makes a linear interpolation of data set, ℓ, values corresponding to the neighboring groups. Before implementing the interpolation, the program searches whether or not the data points for the interpolation procedure are within energy limits preset by the user. If not, the interpolation is not made.

Step 5: Calculation of COV(I,J) is made. This is done by the formula

$$COV(I,J) = \frac{1}{RR} \sum_{K=1}^{NA} \left[\frac{\sigma(K,I) - \sigma(I)}{\sigma(I)} \right] \left[\frac{\sigma(K,J) - \sigma(J)}{\sigma(J)} \right] W(K) , \qquad (2)$$

where

$$RR = \sum_{K=1}^{NA'} W(K) , \qquad (3)$$

$\sigma(K,I)$, $\sigma(K,J)$ = measured or interpolated cross sections of data set K, in groups I and J,

$\sigma(I)$, $\sigma(J)$ = evaluated cross sections of groups I and J,

W(K) = weight of data set K,

NA = number of data sets with common, given or interpolated, measurement in groups I and J,

NA' = number of data sets with measured or interpolated cross sections in group I or J, whichever is greater.

If there are not common data sets in groups I and J, the covariance is set to zero. If there are not data inside a group, the standard deviation for that group is set to the average of the corresponding values in neighboring groups.

Step 6: The program also calculates the correlation matrix [COR(I,J)] according to the formula

$$COR(I,J) = \frac{COV(I,J)}{\sqrt{COV(I,I)\ COV(J,J)}} . \quad (4)$$

IV. DESCRIPTION OF THE INPUT-OUTPUT SPECIFICATIONS

A. Input

Card 1: NG,NAS,NAR,NL,IØP,MAT,MT,IP,IPØ,EMA,RLER,RLET,DELT,ECA,ID

[FORMAT(9I4,5E7.0,I1)]

NG: number of group;

NAS: number of cross-section data sets included in the error file evaluation;

NAR: number of ratio data sets included in the error file evaluation;

NL: number of energy limits preset to make linear interpolation between measurements in a given data set;

IØP: option

= 0, the word FISSION is printed;

= 1, the word CAPTURE is printed;

= 3, the word ALFA is printed;

MAT: material number according to ENDF/B specifications;

MT: reaction-type number according to ENDF/B specifications;

IP: option

= 0, part of the input is a cross-section ratio;

≠ 0, otherwise;

IPØ: = 1, the output includes punched cards of the covariance matrix according to ENDF/B format;

≠ 1, otherwise;

EMA: higher energy limit corresponding to group 1 (MeV) (group 1 is the highest energy group);

RLER: lethargy corresponding to the lower limit of group 1 (it is assumed that lethargy zero corresponds to 10 MeV);

RLET: group lethargy interval;

DELT: (MeV) increment corresponding to the first energy decade in the decimal group structure;

ECA: (MeV) higher energy limit of the decimal group structure; if all the groups are decimal, ECA must be greater than EMA; if all the groups are of constant lethargy ECA must be lower than the lower limit of the last group;

ID: ≠ 0, the output includes punched cards of the correlation matrix;

= 0, otherwise.

Cards 2: NPE(ℓ), ℓ = 1,NA; NA = NAS+NAR [FORMAT (14I5)]

Number of experimental points of set ℓ.

Cards 3: FORMAT (7E10.0)

Cross sections corresponding to the data set ℓ.

Cards 4: FØRMAT (7E10.0) (MeV)

Energies corresponding to the previous data set.

Cards 3 and Cards 4 must be repeated in a sequential order from $\ell = 1$ to ℓ = NAS. Following these cards, one has to place a set of cards in the same format but now for the ratio measurements (only present if IP = 0).

Cards 5: ENDF/B evaluated cross section for group J (J = 1,NG) [FØRMAT(6E12.0)]

Cards 6: (Only present if IP = 0.) FORMAT (6E12.0), ENDF/B evaluated cross sections for group J (J = 1,NG) of the reference standard cross section corresponding to the ratio measurement. (It is assumed that all ratio measurements in the input are relative to the same cross section.)

Cards 7: FORMAT (7E10.0)

Weight corresponding to each data set ℓ, (ℓ = 1,NA).

Cards 8: FØRMAT (7E10.0). Energy limits for the interpolation procedure (see step 4 in Sect. III). These limits are preset by the user, based on his judgment on the validity of the interpolation scheme. The limits must be given in MeV and in decreasing order [EL(J),J = 1,NL].

B. Output

Printed output:

(1) All the measured cross sections are ordered and displayed according to authors and group limits.

(2) The evaluated and the measured cross sections (now reduced to the mean energy of the group interval) are ordered and displayed according to authors and group limits.

(3) The covariance matrix.

(4) The relative standard deviation.

(5) The information contained in each punched card corresponding to the covariance matrix in the ENDF/B format.

(6) The information contained in each punched card corresponding to the correlation matrix. The formats are the following:
First NG cards (three values in each card):
Lower energy limit (MeV) in group I, and the corresponding relative standard deviation in percent and reference cross sections (1X,E11.4,11X,E11.4,F11.4)
The rest of the cards:
COR(I,J), for each I, J varies from 1 to NG format 7E10.4.
These cards are suitable for a three-dimensional plot of the correlation matrix.

(7) The correlation matrix is printed as can be seen in Appendix B.

Punched card:

With the option (IPO = 1), the covariance matrix is punched out according to the ENDF/B format.

The correlation matrix output is punched out, under option.

V. LISTING OF THE PROGRAM AND SAMPLE PROBLEM

Data for the sample problem: [COV(I,J) for the ^{240}Pu capture cross section].

NG = 45; NAS = 4; NAR = 0; NL = 2; IOP = 1; MAT = 1265; MT = 102;

IP = 1; IPO = 1; EMA = 10.; RLER = 0.; RLET = 0.; DELT = 1.

ECA = 11.; ID = 1

NPE(ℓ = 1,4) : 29;6;36;36

EL(J = 1,2) = 11., .0001

```
**FTN,L,G,E,Y.
C   ********LISTING OF THE PROGRAM SUR***********
C
C THIS PROGRAM CALCULATES THE COVARIANCE AND CORRELATION MATRICES OF
C CROSS SECTIONS.THE COVARIANCE MATRIX FILE IS PUNCHED ACCORDING TO THE
CENDF/B FORMAT. THE CORRELATION MATRIX IN A FORMAT SUITABLE FOR 3-D PLOT
C
      DIMENSION SFE28(120),SFE25(120),SFM28(35,150),E(35,150),ER(35),NPE
     1(35),EV(120),SFM(35,120),NM(120),COV(120,120),NMAR(35,120),EL(12),
     2W(35),AUX(120,120),TITLE(18),STA(100)
      DIMENSION LABEL(120)
      DIMENSION NDER(28)
  857 DC 125 I=1,35
      DC 125 J=1,150
  125 SFM28(I,J)=C.
C DATA INPUT
      READ 1,NG,NAS,NAR,NL,IOP,MAT,MT,IF,IPC,EMA,RLER,RLET,DELT,ECA,ID
    1 FORMAT(9I4,5E7.0,I1)
      IF(NG.EQ.0) CALL EXIT
      NA=NAS+NAR
      READ 2,(NPE(I),I=1,NA)
    2 FCRMAT(14I5)
      CO 3 I=1,NA
      JM=NPE(I)
      READ 4,(SFM28(I,J),J=1,JM)
    3 READ 4,(E(I,J),J=1,JM)
    4 FORMAT(10E8.0)
      READ 6,(SFE28(I),I=1,NG)
    6 FORMAT(10E8.0)
      IF(IP.NE.0) GO TO 253
      READ 6,(SFE25(I),I=1,NG)
  253 READ 4,(W(I),I=1,NA)
      READ 4,(EL(I),I=1,NL)
      READ 400,(TITLE(I),I=1,18)
  400 FCRMAT(18A4)
C RATIO MEASUREMENT ARE REDUCED TO ABSCLUTE ONES, AND LOCATED IN THE SAME
C LCCATICN, THEN WE LOCSE THE RATIOS.  EV(I) ARE THE LIMITS OF GROUP I.
      EV(1)=EMA
      CEL=DELT
      NE=NG+1
      CO 243 I=2,NE
      IF(ECA.GT.EMA) GO TO 245
      EV(I)=10.*EXP(-RLER)
      IF(EV(I).GT.ECA) GO TO 244
      EV(K)=ECA-DEL
      IF(I.EQ.K) GC TO 243
  245 CONTINUE
      IF(ABS(EV(I-2)/EV(I-1)-2.).LT.1.E-03) DELT=DELT*.1
      EV(I)=EV(I-1)-DELT
      GC TO 243
  244 RLER=RLER+RLET
      K=I+1
  243 CONTINUE
      IF(IP.NE.0) GC TC 254
      NR=NAS+1
      DC 8 I=NR,NA
      JM=NPE(I)
      CO 8  J=1,JM
      K=1
    9 CCNTINUE
      IF(E(I,J).LE.EV(K).AND.E(I,J).GT.EV(K+1))  GO TC 10
      K=K+1
      IF(K.EQ.NE) GC TO 8
      GO TO9
   10 IF(K.EQ.1) GC TO 845
      IF(K.EQ.NG) GO TO 846
      EK1=(EV(K+1)+EV(K+2))/2.
      EK2=(EV(K)+EV(K+1))/2.
      EK3=(EV(K)+EV(K-1))/2.
      AC=(SFE25(K+1)-SFE25(K))/((EK1-EK2)*(EK2-EK3))-(SFE25(K+1)-SFE25(K
     1-1))/((EK1-EK3)*(EK2-EK3))
      BC=(SFE25(K+1)-SFE25(K))/(EK1-EK2)-AC*(EK1+EK2)
      CC=SFE25(K+1)-AC*EK1*EK1-BC*EK1
      SF25=AC*E(I,J)**2+BC*E(I,J)+CC
      GO TO 87
  846 EK=(EV(K)+EV(K+1))/2.
      EKM1=(EV(K-1)+EV(K))/2.
      SF25=SFE25(K)+(SFE25(K-1)-SFE25(K))/(EKM1-EK)*(E(I,J)-EK)
      GO TC 87
  845 E1=(EV(1)+EV(2))/2.
      E2=(EV(2)+EV(3))/2.
      PE=(SFE25(1)-SFE25(2))/(E1-E2)
      SF25=SFE25(2)+PE*(E(I,J)-E2)
   87 SFM28(I,J)=SFM28(I,J)*SF25
    8 CCNTINUE
C OUTPUT OF MEASURED DATA
  254 PRINT 11
   11 FORMAT(1H1,6H GROUP,3X,20H ENERGY LIMITS (MEV),8X,16H MEASURED VAL
     1UES//)
      DC 12 J=1,NG
      IF(IOP.EQ.0) PRINT 13,J,EV(J),EV(J+1)
      IF(IOP.EQ.1) PRINT 53,J,EV(J),EV(J+1)
      IF(IOP.EQ.3) PRINT 325,J,EV(J),EV(J+1)
```

```
 13 FORMAT(I6,3X,1PE11.4,3X,1PE11.4,3X,7H AUTHOR,3X,7H ENERGY,7X,11H S
   1IGFISSION,7H WEIGHT)
 53 FORMAT(I6,3X,1PE11.4,3X,1PE11.4,3X,7H AUTHOR,3X,7H ENERGY,7X,11H S
   1IGCAPTURE,7H WEIGHT)
325 FORMAT(I6,3X,1PE11.4,3X,1PE11.4,3X,7H AUTHOR,3X,7H ENERGY,7X,11H
   1      ALFA,7H WEIGHT)
    L=0
    DO 14 I=1,NA
    KM=NFE(I)
    DO 14 K=1,KM
    IF(E(I,K).GT.EV(J).OR.E(I,K).LE.EV(J+1))  GO  TO  14
    PRINT 16,I,E(I,K),SFM28(I,K),W(I)
 16 FORMAT(43X,I2,3X,1PE11.4,3X,1PE11.4,2X,F5.2)
    L=1
 14 CONTINUE
    IF(L.EQ.0)  PRINT 17
 17 FORMAT(43X,15H NO MEASUREMENT)
 12 CONTINUE
C THE MEASUREMRNT CF AUTHOR I INSIDE GROUP J IS RECUCED TO THE MEAN ENERGY OF
C THE GROUP AND THEN AVERAGED. THE RESULS ARE LOCATED IN SFM(I,J)
    DO 18 J=1,12C
    NM(J)=0
    DO 18 I=1,35
 18 SFM(I,J)=0.
    DO 19 I=1,NA
    KM=NFE(I)
    DO 19 J=1,NG
    RR=0.
    DO 20 K=1,KM
    IF(E(I,K).GT.EV(J).OR.E(I,K).LE.EV(J+1))    GO  TO 20
    IF(J.EQ.1) GO TO 354
    IF(J.EQ.NG) GO TO 355
    EJ1=(EV(J+1)+EV(J+2))/2.
    EJ2=(EV(J)+EV(J+1))/2.
    EJ3=(EV(J)+EV(J-1))/2.
    AC=(SFE28(J+1)-SFE28(J))/((EJ1-EJ2)*(EJ2-EJ3))-(SFE28(J+1)-SFE28(J
   1-1))/((EJ1-EJ3)*(EJ2-EJ3))
    BC=(SFE28(J+1)-SFE28(J))/(EJ1-EJ2)-AC*(EJ1+EJ2)
    CC=SFE28(J+1)-AC*EJ1*EJ1-BC*EJ1
    RK=SFM28(I,K)/(AC*E(I,K)**2+BC*E(I,K)+CC)
    AC=RK*AC
    BC=RK*BC
    CC=RK*CC
    SFM(I,J)=SFM(I,J)+AC*EJ2**2+BC*EJ2+CC
    RR=RR+1.
    GO TO 20
355 EJ=(EV(J+1)+EV(J))/2.
    EJM1=(EV(J)+EV(J-1))/2.
    PE=(SFE28(J-1)-SFE28(J))/(EJM1-EJ)
    SFM(I,J)=SFM(I,J)+ SFM28(I,K)-PE*(E(I,K)-EJ)
    RR=RR+1.
    GO TO 20
354 E1=(EV(1)+EV(2))/2.
    E2=(EV(2)+EV(3))/2.
    PE=(SFE28(1)-SFE28(2))/(E1-E2)
    SFM(I,1)=SFM(I,1)+SFM28(I,K)-PE*(E(I,K)-E1)
    RR=RR+1.
 20 CONTINUE
    IF(RR.GT.0.)    SFM(I,J)=SFM(I,J)/RR
 19 CONTINUE
C NUMBER OF REAL MEASUREMENTS NM(J) INTC EACH GROUP
    DO 21 J=1,NG
    DO 21 I=1,NA
    NMAR(I,J)=1
    IF(SFM(I,J).GT.0.)   NM(J)=NM(J)+1
 21 CONTINUE
C THOSE GROUP AND ALTHORS IN WHICH THERE ARE NO MEASUREMENT ARE MARKED
    DO 457 J=1,NG
    DO 457  I=1,NA
    IF(SFM(I,J).EQ.0.)   NMAR(I,J)=0
457 CONTINUE
C ASIGNATION OF AUTHOR I MEASURENENT IN GROUP J BY INTERPOLATION
C      (IF POSSIBLE)
    DO  110 J=1,NG
    IF(J.EQ.1.OR.J.EQ.NG)  GO TO 110
    DO  110  I=1,NA
    IF(SFM(I,J).NE.0.)  GO TO 110
    L=1
111 CONTINUE
    IF(EV(J).LE.EL(L).AND.EV(J).GT.EL(L+1))  GO TO 112
    L=L+1
    GO TO 111
112 KAR=J-1
113 CONTINUE
    IF(SFM(I,KAR).NE.0.)   GO TO 114
    KAR=KAR-1
    IF(KAR.EQ.0) GO TO 110
    IF(EV(KAR).LE.EL(L))  GC TO 113
114 IF(EV(KAR).GT.EL(L)) GO TO 110
    KAB=J+1
115 CONTINUE
    IF(SFM(I,KAB).NE.0.) GO TO 116
    KAB=KAB+1
    IF(KAB.GT.NG) GO TO 110
    IF(EV(KAB).GT.EL(L+1)) GO TO 115
```

```
  116 IF(EV(KAB+1).LT.EL(L+1))  GO TC 110
      EAR=(EV(KAR)+EV(KAR+1))/2.
      EAB=(EV(KAB)+EV(KAB+1))/2.
      EJ=(EV(J)+EV(J+1))/2.
      IF(SFM(I,KAR).EQ.0..OR.SFM(I,KAB).EQ.0.)  GO TO 110
      SFM(I,J)=SFM(I,KAB)+(SFM(I,KAR)-SFM(I,KAB))/(EAR-EAB)*(EJ-EAB)
      NM(J)=NM(J)+1
  110 CONTINUE
C CALCULATION CF THE DIAGONAL TERMS OF COV(I,J)
      DC 22 I=1,NG
      DO 22 J=1,NG
   22 COV(I,J)=0.
      DC 23  J=1,NG
      IF(NM(J).EQ.0)  GO TO 23
      RR=0.
      DC 25 I=1,NA
      IF(SFM(I,J).EC.0.) GO TC 25
      COV(J,J)=CCV(J,J)+(SFM(I,J)-SFE28(J))**2*W(I)
      RR=RR+W(I)
   25 CONTINUE
      COV(J,J)=CCV(J,J)/RR
   23 CCNTINUE
      DO 28 J=1,NG
      IF(COV(J,J).NE.0.) GO TC 28
      KAB=J+1
   29 CONTINUE
      IF(COV(KAB,KAB).EQ.0.) GO TO 30
      GC TO 31
   30 KAB=KAB+1
      GO TO 29
   31 KAR=J-1
   32 CONTINUE
      IF(COV(KAR,KAR).EQ.0.)  GO TO 33
      GC TO 34
   33 KAR=KAR-1
      GO TO 32
   34 COV(J,J)=(CCV(KAB,KAB)+COV(KAR,KAR))/2.
   28 CCNTINUE
C OUTPUT OF DATA
      PRINT 35
   35 FORMAT(1H1,6H GROUP,3X,10H EVALUATED,3X,60H MEASURES AND INTERPOLA
     1TED VALUES REDUCED TO THE MESN ENERGY//)
      DO 36 J=1,NG
      IF(IOP.EC.0) PRINT 37,J,SFE28(J)
      IF(IOP.EC.1) PRINT 54,J,SFE28(J)
      IF(IOP.EQ.3) PRINT 326,J,SFE28(J)
   37 FORMAT(I6,3X,1PE11.4,3X,5H SIGF,8X,7H AUTHOR,18X,7H WEIGHT/)
  326 FORMAT(I6,3X,1PE11.4,3X,5H ALFA,8X,7H AUTHOR,18X,7H WEIGHT/)
   54 FORMAT(I6,3X,1PE11.4,3X,5H SIGC,8X,7H AUTHOR,18X,7H WEIGHT/)
      IF(NM(J).EQ.C) PRINT 38
   38 FORMAT(23X,38H NEITHER MEASUREMENT NOR INTERPOLATION/)
      DO 36 I=1,NA
      IF(SFM(I,J).EC.0.) GO TC 36
      IF(NMAR(I,J).EQ.0) PRINT 39,SFM(I,J),I,W(I)
      IF(NMAR(I,J).NE.0) PRINT 40,SFM(I,J),I,W(I)
   39 FORMAT(23X,1PE11.4,5X,I4,3X,13H INTERPOLATED,2X,F5.2)
   40 FORMAT(23X,1PE11.4,5X,I4,3X,9H MEASURED,6X,F5.2)
   36 CONTINUE
C CALCULATION OF CCV(I,J) WITH I.NE.J
      CO 41 I=1,NG
      CO 41 J=1,NG
      RRI=0.
      RRJ=0.
      IF(I.EQ.J) GO TO 41
      DO 42 K=1,NA
      IF(SFM(K,I).EC.0..OR.SFM(K,J).EQ.0.) GO TO 142
      COV(I,J)= COV(I,J)+(SFM(K,I)-SFE28(I))*(SFM(K,J)-SFE28(J))*W(K)
  142 IF(SFM(K,I).NE.0.) RRI=RRI+W(K)
      IF(SFM(K,J).NE.0.) RRJ=RRJ+W(K)
   42 CONTINUE
      IF(RRI.GE.RRJ) RR=RRI
      IF(RRI.LE.RRJ) RR=RRJ
      IF(RR.NE.0.) COV(I,J)=CCV(I,J)/RR
   41 CCNTINUE
C OUTPUT OF DATA
      PRINT 499
  499 FORMAT(1H1)
      DO 357 I=1,NG
      CO 357 J=1,NG
  357 COV(I,J)=CCV(I,J)/(SFE28(I)*SFE28(J))
      DO 43 I=1,NG
      PRINT 44,I,NG
   44 FORMAT(9H COV(I,J),4X,3H I=,I3,4X,12H J FROM 1 TO,I3//)
      PRINT 45,(CCV(I,J),J=1,NG)
   45 FCRMAT(1P10E12.4)
   43 CCNTINUE
      NG1=NG+1
      DO 210 I=1,NG1
  210 EV(I)=1000000.*EV(I)
      E0=.00001
      EM=20000000.
      MI=0
      RI=0.
      MIA=33
      RIA=1.
      MT1=MT
C THE CRDER IN THE GROUPS ARE INVERTED
```

```
      NX=NG1/2
      DO 212 I=1,NX
         EVT=EV(I)
       EV(I)=EV(NG1+1-I)
212      EV(NG1+1-I) =EVT
      MX=NG/2
      DO 213 I=1,MX
        SFT=SFE28(I)
        SFE28(I)=SFE28(NG+1-I)
213      SFE28(NG+1-I)=SFT
      EV(NG1+1)=20000000.
      IF(EV(NG1).EQ.EV(NG1+1))  EV(NG1)=EV(NG1)-.001*EV(NG1)
      DO 214 I=1,NG
      DO 214 J=1,NG
  214 AUX(NG+1-I,NG+1-J)=COV(I,J)
      DO 215 J=1,NG
      AUX(NG+1,J)=0.
  215 AUX(NG+2,J)=0.
      PRINT 46,NG
   46 FORMAT(1H1,21H RELATIVE ERROR FROM GROUP 1 TO,I3)
      DO 47 I=1,NG
      COV(I,I)=SQRT(COV(I,I))
   47 CONTINUE
      PRINT 48,(COV(I,I),I=1,NG)
   48 FORMAT(10F10.5)
      PRINT 211
  211 FORMAT(1H1,63H CARDS OUTPUT, WARNING THE ORDER IN THE GROUPS ARE NOW
     1OW INVERTED//35H COV(I,J) CARDS IN THE ENDF/B FORMAT//)
      N3=NG+3
      LB=3
      N14=2*NG+14
      N7=NG+7
      DO 216 J=1,NG
      IF(J.EQ.1) PRINT 217,MI,MT1,MI,NG,MAT,MIA,MT
      IF(J.EQ.1.AND.IPO.EQ.1) PUNCH 217,MI,MT1,MI,NG,MAT,MIA,MT
      IF(J.GT.1) PRINT 217,N3,LB,N14,N7,MAT,MIA,MT
      IF(J.GT.1.AND.IPO.EQ.1) PUNCH 217,N3,LB,N14,N7,MAT,MIA,MT
  217 FORMAT(22X,4I11,I4,I2,I3)
      PRINT 218,E0,RI,EV(J),RIA,EV(J+1),RI,MAT,MIA,MT
      IF(IPO.EQ.1) PUNCH 218,E0,RI,EV(J),RIA,EV(J+1),RI,MAT,MIA,MT
  218 FORMAT(6E11.4,I4,I2,I3)
      PRINT 219,EM,RI,E0,RI,EV(1),AUX(1,J),MAT,MIA,MT
      IF(IPO.EQ.1) PUNCH 219,EM,RI,E0,RI,EV(1),AUX(1,J),MAT,MIA,MT
  219 FORMAT(6E11.4,I4,I2,I3)
      NG2=NG+2
      I=2
  221 CONTINUE
      PRINT 220,EV(I),AUX(I,J),EV(I+1),AUX(I+1,J),EV(I+2),AUX(I+2,J),MAT
     1,MIA,MT
      IF(IPO.EQ.1) PUNCH 220,EV(I),AUX(I,J),EV(I+1),AUX(I+1,J),EV(I+2),A
     1UX(I+2,J),MAT,MIA,MT
  220 FORMAT(6E11.4,I4,I2,I3)
      I=I+3
      IF((NG2-I).GE.2) GO TO 221
      IF((NG2-I).EQ.1) GO TO 222
      IF((NG2-I).EQ.0) GO TO 223
      GO TO 230
  222 PRINT 224,EV(I),AUX(I,J),EV(I+1),AUX(I+1,J),MAT,MIA,MT
      IF(IPO.EQ.1) PUNCH 224,EV(I),AUX(I,J),EV(I+1),AUX(I+1,J),MAT,MIA,M
     1T
  224 FORMAT(4E11.4,22X,I4,I2,I3)
      GO TO 230
  223 PRINT 225,EV(I),AUX(I,J),MAT,MIA,MT
      IF(IPO.EQ.1) PUNCH 225,EV(I),AUX(I,J),MAT,MIA,MT
  225 FORMAT(2E11.4,44X,I4,I2,I3)
  230 CONTINUE
  216 CONTINUE
      IF(ID.NE.0) PUNCH 309, TITLE,NG
  309 FORMAT(18A4/I5)
      PRINT 310
  310 FORMAT(1H1,41H CORRELATION MATRIX CARDS FOR THE DRAWING//)
      DO 300 I=1,NG
      ST=100.*SQRT(AUX(I,I))
      ENE=.000001*EV(I)
      PRINT 301,ENE,ST
      IF(ID.NE.0) PUNCH 301,ENE,ST,SFE28(I)
  301 FORMAT(1X,E11.4,11X,E11.4,F11.4)
  300 CONTINUE
      ENE=EV(NE)/10**6
      IF(ID.NE.0) PUNCH 301,ENE
      DO 311 I=1,NG
      DO 311 J=1,NG
  311 COV(I,J)=AUX(I,J)/SQRT(AUX(I,I)*AUX(J,J))
      DO 302 I=1,NG
      PRINT 305,(COV(I,J),J=1,NG)
      IF(ID.NE.0) PUNCH 303,(COV(I,J),J=1,NG)
  303 FORMAT(8F9.5)
  305 FORMAT(1X,7E10.4)
  302 CONTINUE
      DO 391 I=1,NG
  391 STA(I)=100.*SQRT(AUX(I,I))
      PRINT 402,TITLE
  402  FORMAT(1H1,18A4)
      DO 399 N=2,28
  399   NDER(N)=4H
      DO 400 L=1,NG
```

```
400 LABEL(L)=L
     L1=1
401 LM=L1+27
     IF(LM.GT.NG) LM=NG
     PRINT 405,(LABEL(L),L=L1,LM)
405 FORMAT(29H0 I ELC(KEV)  RSD     CORR*100 /14X3HPCT,1X10I4,1X10I4,
   1  1X8I4)
     PRINT 430
430  FORMAT( 1H )
    DO 421 I=L1,NG
     ENE=EV(I)/1000.
      DO 409 L=L1,LM
     TEMP=              COV(I,L)*100.
409   LABEL(L)=TEMP
410 PRINT 406 , I,ENE,STA(I),(LABEL(L),L=L1,LM)
    IL=I+1-L1
    IF(IL.GT.28) GO TO 421
    NDER(IL)=4H ___
    PRINT 420, NDER
420 FORMAT(1H+,17X10A4,1X10A4,1X8A4)
    NDER(IL)=4H
421  CONTINUE
    ENE= EV(NE)/1000.
    PRINT 406, NE, ENE
     L1=LM+1
     IF(L1.LE.NG) GO TO 401
406 FORMAT(1H I3,F8.2,F5.1,1X10I4,1X10I4,1X8I4)
408 CONTINUE
    GO TO 897
    END
```

GROUP	ENERGY LIMITS (MEV)		MEASURED VALUES			
1	1.0000E 01	9.0000E 00	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			3	9.5000E 00	4.7000E-03	1.00
			4	9.5000E 00	4.7000E-03	1.00
2	9.0000E 00	8.0000E 00	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			3	8.5000E 00	5.7000E-03	1.00
			4	8.5000E 00	5.3000E-03	1.00
3	8.0000E 00	7.0000E 00	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			3	7.5000E 00	7.0000E-03	1.00
			4	7.5000E 00	6.0000E-03	1.00
4	7.0000E 00	6.0000E 00	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			3	6.5000E 00	8.3000E-03	1.00
			4	6.5000E 00	7.1000E-03	1.00
5	6.0000E 00	5.0000E 00	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			3	5.5000E 00	1.1000E-02	1.00
			4	5.5000E 00	8.5000E-03	1.00
6	5.0000E 00	4.0000E 00	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			3	4.5000E 00	1.6000E-02	1.00
			4	4.5000E 00	1.1000E-02	1.00
7	4.0000E 00	3.0000E 00	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			3	3.5000E 00	2.4000E-02	1.00
			4	3.5000E 00	1.7000E-02	1.00
8	3.0000E 00	2.0000E 00	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			3	2.5000E 00	4.4000E-02	1.00
			4	2.5000E 00	3.3000E-02	1.00
9	2.0000E 00	1.0000E 00	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			3	1.5000E 00	7.3000E-02	1.00
			4	1.5000E 00	6.4000E-02	1.00
10	1.0000E 00	9.0000E-01	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			3	9.5000E-01	1.1000E-01	1.00
			4	9.5000E-01	1.1000E-01	1.00
11	9.0000E-01	8.0000E-01	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			3	8.5000E-01	1.2000E-01	1.00
			4	8.5000E-01	1.2000E-01	1.00
12	8.0000E-01	7.0000E-01	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			3	7.5000E-01	1.3000E-01	1.00
			4	7.5000E-01	1.5000E-01	1.00
13	7.0000E-01	6.0000E-01	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			3	6.5000E-01	1.4000E-01	1.00
			4	6.5000E-01	1.9000E-01	1.00
14	6.0000E-01	5.0000E-01	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			3	5.5000E-01	1.5000E-01	1.00
			4	5.5000E-01	2.1000E-01	1.00
15	5.0000E-01	4.0000E-01	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			3	4.5000E-01	1.6000E-01	1.00
			4	4.5000E-01	2.3000E-01	1.00
16	4.0000E-01	3.0000E-01	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			3	3.5000E-01	1.6000E-01	1.00
			4	3.5000E-01	2.5000E-01	1.00
17	3.0000E-01	2.0000E-01	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	2.5000E-01	2.0200E-01	9.00
			3	2.5000E-01	1.8000E-01	1.00
			4	2.5000E-01	2.8000E-01	1.00
18	2.0000E-01	1.0000E-01	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	1.5000E-01	2.9400E-01	9.00
			3	1.5000E-01	2.2000E-01	1.00
			4	1.5000E-01	3.5000E-01	1.00
19	1.0000E-01	9.0000E-02	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	9.5000E-02	3.4600E-01	9.00
			3	9.5000E-02	2.7000E-01	1.00
			4	9.5000E-02	4.6000E-01	1.00
20	9.0000E-02	8.0000E-02	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	8.5000E-02	3.8200E-01	9.00
			3	8.5000E-02	2.8000E-01	1.00
			4	8.5000E-02	4.9000E-01	1.00
21	8.0000E-02	7.0000E-02	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	7.5000E-02	4.2000E-01	9.00
			3	7.5000E-02	3.0000E-01	1.00
			4	7.5000E-02	5.2000E-01	1.00
22	7.0000E-02	6.0000E-02	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	6.5000E-02	4.6800E-01	9.00
			3	6.5000E-02	3.3000E-01	1.00
			4	6.5000E-02	5.7000E-01	1.00
23	6.0000E-02	5.0000E-02	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	5.5000E-02	5.8300E-01	9.00
			3	5.5000E-02	3.7000E-01	1.00
			4	5.5000E-02	6.3000E-01	1.00
24	5.0000E-02	4.0000E-02	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	4.5000E-02	5.9200E-01	9.00
			3	4.5000E-02	4.2000E-01	1.00
			4	4.5000E-02	6.7000E-01	1.00
25	4.0000E-02	3.0000E-02	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	3.5000E-02	6.9100E-01	9.00
			3	3.5000E-02	4.7000E-01	1.00
			4	3.5000E-02	8.0000E-01	1.00
26	3.0000E-02	2.0000E-02	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	2.5000E-02	7.9000E-01	9.00
			2	2.5000E-02	8.9600E-01	9.00
			3	2.5000E-02	5.5000E-01	1.00
			4	2.5000E-02	9.5000E-01	1.00

27	2.0000E-02	1.0000E-02	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	1.5000E-02	1.0000E 00	9.00
			2	1.5000E-02	1.1200E 00	9.00
			3	1.5000E-02	7.3000E-01	1.00
			4	1.5000E-02	1.2500E 00	1.00
28	1.0000E-02	9.0004E-03	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	9.5000E-03	1.2800E 00	9.00
			2	9.5000E-03	1.3600E 00	9.00
			3	9.5000E-03	9.2000E-01	1.00
			4	9.5000E-03	1.5000E 00	1.00
29	9.0004E-03	8.0004E-03	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	8.5000E-03	1.3200E 00	9.00
			2	8.5000E-03	1.3600E 00	9.00
			3	8.5000E-03	9.7000E-01	1.00
			4	8.5000E-03	1.6000E 00	1.00
30	8.0004E-03	7.0004E-03	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	7.5000E-03	1.3600E 00	9.00
			2	7.5000E-03	1.3900E 00	9.00
			3	7.5000E-03	1.0300E 00	1.00
			4	7.5000E-03	1.7000E 00	1.00
31	7.0004E-03	6.0004E-03	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	6.5000E-03	1.3800E 00	9.00
			2	6.5000E-03	1.3900E 00	9.00
			3	6.5000E-03	1.1200E 00	1.00
			4	6.5000E-03	1.8000E 00	1.00
32	6.0004E-03	5.0004E-03	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	5.5000E-03	1.5500E 00	9.00
			3	5.5000E-03	1.2100E 00	1.00
			4	5.5000E-03	2.0000E 00	1.00
33	5.0004E-03	4.0004E-03	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	4.5000E-03	1.6700E 00	9.00
			3	4.5000E-03	1.3500E 00	1.00
			4	4.5000E-03	2.2000E 00	1.00
34	4.0004E-03	3.0004E-03	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	3.5000E-03	1.8900E 00	9.00
			3	3.5000E-03	1.5200E 00	1.00
			4	3.5000E-03	2.5000E 00	1.00
35	3.0004E-03	2.0004E-03	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	2.5000E-03	2.4100E 00	9.00
			3	2.5000E-03	1.8500E 00	1.00
			4	2.5000E-03	3.1000E 00	1.00
36	2.0004E-03	1.0004E-03	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	1.5000E-03	3.2200E 00	9.00
			3	1.5000E-03	2.4000E 00	1.00
			4	1.5000E-03	4.4000E 00	1.00
37	1.0004E-03	9.0040E-04	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	9.5000E-04	5.3200E 00	9.00
38	9.0040E-04	8.0040E-04	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	8.5000E-04	6.4600E 00	9.00
39	8.0040E-04	7.0040E-04	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	7.5000E-04	2.6000E 00	9.00
40	7.0040E-04	6.0040E-04	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	6.5000E-04	5.0300E 00	9.00
41	6.0040E-04	5.0040E-04	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	5.5000E-04	7.0300E 00	9.00
42	5.0040E-04	4.0040E-04	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	4.5000E-04	6.4400E 00	9.00
43	4.0040E-04	3.0040E-04	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	3.5000E-04	9.8900E 00	9.00
44	3.0040E-04	2.0040E-04	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	2.5000E-04	8.2900E 00	9.00
45	2.0040E-04	1.0040E-04	AUTHOR	ENERGY	SIGCAPTURE	WEIGHT
			1	1.5000E-04	2.7300E 01	9.00

GROUP	EVALUATED	MEASURES AND INTERPOLATED VALUES REDUCED TO THE MESN ENERGY			
1	5.1000E-03	SIGC	AUTHOR		WEIGHT
		4.7000E-03	3	MEASURED	1.00
		4.7000E-03	4	MEASURED	1.00
2	5.8000E-03	SIGC	AUTHOR		WEIGHT
		5.7000E-03	3	MEASURED	1.00
		5.3000E-03	4	MEASURED	1.00
3	6.9000E-03	SIGC	AUTHOR		WEIGHT
		7.0000E-03	3	MEASURED	1.00
		6.0000E-03	4	MEASURED	1.00
4	8.5000E-03	SIGC	AUTHOR		WEIGHT
		8.3000E-03	3	MEASURED	1.00
		7.1000E-03	4	MEASURED	1.00
5	1.1000E-02	SIGC	AUTHOR		WEIGHT
		1.1000E-02	3	MEASURED	1.00
		8.5000E-03	4	MEASURED	1.00
6	1.5000E-02	SIGC	AUTHOR		WEIGHT
		1.6000E-02	3	MEASURED	1.00
		1.1000E-02	4	MEASURED	1.00
7	2.4000E-02	SIGC	AUTHOR		WEIGHT
		2.4000E-02	3	MEASURED	1.00
		1.7000E-02	4	MEASURED	1.00
8	4.0000E-02	SIGC	AUTHOR		WEIGHT
		4.4000E-02	3	MEASURED	1.00
		3.3000E-02	4	MEASURED	1.00
9	7.5000E-02	SIGC	AUTHOR		WEIGHT
		7.3000E-02	3	MEASURED	1.00
		6.4000E-02	4	MEASURED	1.00
10	1.1200E-01	SIGC	AUTHOR		WEIGHT
		1.1000E-01	3	MEASURED	1.00
		1.1000E-01	4	MEASURED	1.00
11	1.2300E-01	SIGC	AUTHOR		WEIGHT
		1.2000E-01	3	MEASURED	1.00
		1.2000E-01	4	MEASURED	1.00
12	1.3300E-01	SIGC	AUTHOR		WEIGHT
		1.3000E-01	3	MEASURED	1.00
		1.5000E-01	4	MEASURED	1.00
13	1.4400E-01	SIGC	AUTHOR		WEIGHT
		1.4000E-01	3	MEASURED	1.00
		1.9000E-01	4	MEASURED	1.00
14	1.5300E-01	SIGC	AUTHOR		WEIGHT
		1.5000E-01	3	MEASURED	1.00
		2.1000E-01	4	MEASURED	1.00
15	1.6100E-01	SIGC	AUTHOR		WEIGHT
		1.6000E-01	3	MEASURED	1.00
		2.3000E-01	4	MEASURED	1.00
16	1.6500E-01	SIGC	AUTHOR		WEIGHT
		1.6000E-01	3	MEASURED	1.00
		2.5000E-01	4	MEASURED	1.00
17	1.8200E-01	SIGC	AUTHOR		WEIGHT
		2.0200E-01	1	MEASURED	9.00
		1.8000E-01	3	MEASURED	1.00
		2.8000E-01	4	MEASURED	1.00
18	2.2200E-01	SIGC	AUTHOR		WEIGHT
		2.9400E-01	1	MEASURED	9.00
		2.2000E-01	3	MEASURED	1.00
		3.5000E-01	4	MEASURED	1.00
19	2.7200E-01	SIGC	AUTHOR		WEIGHT
		3.4600E-01	1	MEASURED	9.00
		2.7000E-01	3	MEASURED	1.00
		4.6000E-01	4	MEASURED	1.00
20	2.8800E-01	SIGC	AUTHOR		WEIGHT
		3.8200E-01	1	MEASURED	9.00
		2.8000E-01	3	MEASURED	1.00
		4.9000E-01	4	MEASURED	1.00
21	3.1000E-01	SIGC	AUTHOR		WEIGHT
		4.2000E-01	1	MEASURED	9.00
		3.0000E-01	3	MEASURED	1.00
		5.2000E-01	4	MEASURED	1.00
22	3.4100E-01	SIGC	AUTHOR		WEIGHT
		4.6800E-01	1	MEASURED	9.00
		3.3000E-01	3	MEASURED	1.00
		5.7000E-01	4	MEASURED	1.00

23	3.9000E-01	SIGC	AUTHOR		WEIGHT
		5.8300E-01	1	MEASURED	9.00
		3.7000E-01	3	MEASURED	1.00
		6.3000E-01	4	MEASURED	1.00
24	4.6100E-01	SIGC	AUTHOR		WEIGHT
		5.9200E-01	1	MEASURED	9.00
		4.2000E-01	3	MEASURED	1.00
		6.7000E-01	4	MEASURED	1.00
25	5.8300E-01	SIGC	AUTHOR		WEIGHT
		6.9099E-01	1	MEASURED	9.00
		4.7000E-01	3	MEASURED	1.00
		7.9999E-01	4	MEASURED	1.00
26	7.9500E-01	SIGC	AUTHOR		WEIGHT
		7.8999E-01	1	MEASURED	9.00
		8.9599E-01	2	MEASURED	9.00
		5.4999E-01	3	MEASURED	1.00
		9.4999E-01	4	MEASURED	1.00
27	1.0500E 00	SIGC	AUTHOR		WEIGHT
		9.9999E-01	1	MEASURED	9.00
		1.1200E 00	2	MEASURED	9.00
		7.2999E-01	3	MEASURED	1.00
		1.2500E 00	4	MEASURED	1.00
28	1.2400E 00	SIGC	AUTHOR		WEIGHT
		1.2800E 00	1	MEASURED	9.00
		1.3600E 00	2	MEASURED	9.00
		9.1999E-01	3	MEASURED	1.00
		1.5000E 00	4	MEASURED	1.00
29	1.2900E 00	SIGC	AUTHOR		WEIGHT
		1.3200E 00	1	MEASURED	9.00
		1.3600E 00	2	MEASURED	9.00
		9.6998E-01	3	MEASURED	1.00
		1.6000E 00	4	MEASURED	1.00
30	1.3600E 00	SIGC	AUTHOR		WEIGHT
		1.3600E 00	1	MEASURED	9.00
		1.3900E 00	2	MEASURED	9.00
		1.0300E 00	3	MEASURED	1.00
		1.7000E 00	4	MEASURED	1.00
31	1.4400E 00	SIGC	AUTHOR		WEIGHT
		1.3800E 00	1	MEASURED	9.00
		1.3900E 00	2	MEASURED	9.00
		1.1200E 00	3	MEASURED	1.00
		1.8000E 00	4	MEASURED	1.00
32	1.5500E 00	SIGC	AUTHOR		WEIGHT
		1.5499E 00	1	MEASURED	9.00
		1.2100E 00	3	MEASURED	1.00
		1.9999E 00	4	MEASURED	1.00
33	1.7000E 00	SIGC	AUTHOR		WEIGHT
		1.6700E 00	1	MEASURED	9.00
		1.3500E 00	3	MEASURED	1.00
		2.2000E 00	4	MEASURED	1.00
34	1.6400E 00	SIGC	AUTHOR		WEIGHT
		1.8898E 00	1	MEASURED	9.00
		1.5198E 00	3	MEASURED	1.00
		2.4998E 00	4	MEASURED	1.00
35	2.5400E 00	SIGC	AUTHOR		WEIGHT
		2.4097E 00	1	MEASURED	9.00
		1.8498E 00	3	MEASURED	1.00
		3.0996E 00	4	MEASURED	1.00
36	3.2300E 00	SIGC	AUTHOR		WEIGHT
		3.2184E 00	1	MEASURED	9.00
		2.3988E 00	3	MEASURED	1.00
		4.3978E 00	4	MEASURED	1.00
37	6.4100E 00	SIGC	AUTHOR		WEIGHT
		5.3203E 00	1	MEASURED	9.00
38	6.2100E 00	SIGC	AUTHOR		WEIGHT
		6.4668E 00	1	MEASURED	9.00
39	3.1400E 00	SIGC	AUTHOR		WEIGHT
		2.6017E 00	1	MEASURED	9.00
40	5.1000E 00	SIGC	AUTHOR		WEIGHT
		5.0232E 00	1	MEASURED	9.00
41	6.5900E 00	SIGC	AUTHOR		WEIGHT
		7.0268E 00	1	MEASURED	9.00
42	6.6000E 00	SIGC	AUTHOR		WEIGHT
		6.4370E 00	1	MEASURED	9.00
43	8.1600E 00	SIGC	AUTHOR		WEIGHT
		9.8869E 00	1	MEASURED	9.00
44	7.8600E 00	SIGC	AUTHOR		WEIGHT
		8.2543E 00	1	MEASURED	9.00
45	2.5040E 01	SIGC	AUTHOR		WEIGHT
		2.7231E 01	1	MEASURED	9.00

```
COV(I,J)      I=  1      J FROM 1 TO 45

 6.1515E-03  4.0567E-03  4.5467E-03  7.3818E-03  8.9128E-03  7.8432E-03  1.1438E-02  2.9411E-03  6.7974E-0
 1.9130E-03 -4.1280E-03 -1.1438E-02 -1.3841E-02 -1.6563E-02 -1.9014E-02 -3.7609E-03 -4.0468E-03 -4.8757E-0
-4.6000E-03 -4.5582E-03 -4.0221E-03 -2.5983E-03 -1.2718E-03  4.4404E-04  4.4826E-04  1.8987E-04  3.0552E-0
-1.0871E-04 -5.0551E-04 -6.2898E-04 -3.2155E-03  3.6666E-04 -7.4317E-04  0.0         0.0         0.0
 0.0         0.0         0.0         0.0         0.0
COV(I,J)      I=  2      J FROM 1 TO 45

 4.0567E-03  3.8642E-03  5.4970E-03  7.3020E-03  9.7961E-03  1.0919E-02  1.2572E-02  6.6808E-03  6.5516E-0
 1.2615E-03 -5.3149E-03 -1.3529E-02 -1.5889E-02 -1.8419E-02 -2.1943E-02 -4.2026E-03 -4.5044E-03 -5.4050E-0
-5.2582E-03 -5.2122E-03 -4.7422E-03 -3.4134E-03 -2.6130E-03 -5.7463E-04 -5.5821E-04 -6.8120E-04 -8.2183E-0
-8.8582E-04 -1.9310E-03 -1.9821E-03 -3.9935E-03 -1.3007E-03 -2.4301E-03  0.0         0.0         0.0
 0.0         0.0         0.0         0.0         0.0
COV(I,J)      I=  3      J FROM 1 TO 45
 4.5467E-03  5.4970E-03  8.6114E-03  1.0571E-02  1.4822E-02  1.7874E-02  1.9022E-02  1.2137E-02  9.3719E-0
 1.4139E-03 -8.4994E-03 -2.1034E-02 -2.4438E-02 -2.7995E-02 -3.3816E-02 -6.3993E-03 -6.8486E-03 -8.2053E-0
-8.0750E-03 -8.0054E-03 -7.3645E-03 -5.4928E-03 -4.6687E-03 -1.4947E-03 -1.4630E-03 -1.5543E-03 -1.7468E-0
-1.7912E-03 -3.7310E-03 -3.7586E-03 -6.3128E-03 -2.9705E-03 -4.6262E-03  0.0         0.0         0.0
 0.0         0.0         0.0         0.0         0.0
COV(I,J)      I=  4      J FROM 1 TO 45

 7.3818E-03  7.3020E-03  1.0571E-02  1.3841E-02  1.8717E-02  2.1177E-02  2.4020E-02  1.3235E-02  1.2392E-0
 2.2956E-03 -1.0261E-02 -2.5980E-02 -3.0450E-02 -3.5221E-02 -4.2068E-02 -8.0390E-03 -8.6139E-03 -1.0333E-0
-1.0074E-02 -9.9863E-03 -9.1045E-03 -6.5979E-03 -5.1584E-03 -1.2430E-03 -1.2100E-03 -1.4230E-03 -1.6870E-0
-1.7971E-03 -3.8772E-03 -3.9633E-03 -7.6929E-03 -2.7177E-03 -4.8633E-03  0.0         0.0         0.0
 0.0         0.0         0.0         0.0         0.0
COV(I,J)      I=  5      J FROM 1 TO 45
 8.9128E-03  9.7961E-03  1.4822E-02  1.8717E-02  2.5827E-02  3.0303E-02  3.3144E-02  1.9887E-02  1.6667E-0
 2.7717E-03 -1.4525E-02 -3.6301E-02 -4.2336E-02 -4.8702E-02 -5.8541E-02 -1.1125E-02 -1.1913E-02 -1.4281E-0
-1.3996E-02 -1.3875E-02 -1.2715E-02 -9.3669E-03 -7.6901E-03 -2.2154E-03 -2.1643E-03 -2.3825E-03 -2.7305E-0
-2.8405E-03 -5.9975E-03 -6.0766E-03 -1.0832E-02 -4.5521E-03 -7.4703E-03  0.0         0.0         0.0
 0.0         0.0         0.0         0.0         0.0
COV(I,J)      I=  6      J FROM 1 TO 45

 7.8432E-03  1.0919E-02  1.7874E-02  2.1177E-02  3.0303E-02  3.7778E-02  3.8889E-02  2.6667E-02  1.8667E-0
 2.4391E-03 -1.7795E-02 -4.3519E-02 -5.0327E-02 -5.7350E-02 -6.9697E-02 -1.3120E-02 -1.4032E-02 -1.6800E-0
-1.6618E-02 -1.6476E-02 -1.5229E-02 -1.1529E-02 -1.0198E-02 -3.6267E-03 -3.5554E-03 -3.6557E-03 -4.0307E-0
-4.0737E-03 -8.3666E-03 -8.3776E-03 -1.3153E-02 -6.9880E-03 -1.0325E-02  0.0         0.0         0.0
 0.0         0.0         0.0         0.0         0.0
COV(I,J)      I=  7      J FROM 1 TO 45
 1.1438E-02  1.2572E-02  1.9022E-02  2.4020E-02  3.3144E-02  3.8889E-02  4.2535E-02  2.5521E-02  2.1389E-0
 3.5570E-03 -1.8640E-02 -4.6586E-02 -5.4330E-02 -6.2500E-02 -7.5126E-02 -1.4277E-02 -1.5288E-02 -1.8327E-0
-1.7962E-02 -1.7806E-02 -1.6317E-02 -1.2021E-02 -9.8689E-03 -2.8431E-03 -2.7776E-03 -3.0575E-03 -3.5042E-0
-3.6454E-03 -7.6968E-03 -7.7982E-03 -1.3900E-02 -5.8418E-03 -9.5869E-03  0.0         0.0         0.0
 0.0         0.0         0.0         0.0         0.0
COV(I,J)      I=  8      J FROM 1 TO 45

 2.9411E-03  6.6808E-03  1.2137E-02  1.3235E-02  1.9887E-02  2.6667E-02  2.5521E-02  2.0313E-02  1.1500E-0
 9.1463E-04 -1.2312E-02 -2.9340E-02 -3.3578E-02 -3.7811E-02 -4.6591E-02 -8.6663E-03 -9.2547E-03 -1.1063E-0
-1.1070E-02 -1.0977E-02 -1.0256E-02 -8.0210E-03 -7.6834E-03 -3.2468E-03 -3.1904E-03 -3.1249E-03 -3.3429E-0
-3.2984E-03 -6.6125E-03 -6.5507E-03 -9.0063E-03 -5.9755E-03 -8.0915E-03  0.0         0.0         0.0

RELATIVE ERROR FROM GROUP 1 TO 45
 0.07843   0.06216   0.09280   0.11765   0.16071   0.19437   0.20624   0.14252   0.10541   0.01786
 0.02439   0.09178   0.22673   0.26380   0.30308   0.36490   0.19039   0.34101   0.32248   0.36325
 0.38056   0.39316   0.48480   0.29235   0.20996   0.11802   0.09736   0.10104   0.08678   0.07929
 0.08318   0.10971   0.10942   0.21085   0.11523   0.13385   0.17000   0.04135   0.17142   0.01506
 0.06628   0.02470   0.21163   0.05016   0.08750
```

CARDS OUTPUT, WARNING THE ORDER IN THE GROUPS ARE NOW INVERTED

COV(I,J) CARDS IN THE ENDF/B FORMA

```
                                0        102          0         45126533102
 0.1000E-04 0.0        0.1004E 03 0.1000E 01 0.2004E 03 0.0       126533102
 0.2000E 08 0.0        0.1000E-04 0.0        0.1004E 03 0.7656E-02126533102
 0.2004E 03 0.4389E-02 0.3004E 03 0.1852E-01 0.4004E 03-0.2162E-02126533102
 0.5004E 03 0.5800E-02 0.6004E 03-0.1318E-02 0.7004E 03-0.1500E-01126533102
 0.8004E 03 0.3619E-02 0.9004E 03-0.1488E-01 0.1000E 04-0.2567E-03126533102
 0.2000E 04-0.3673E-02 0.3000E 04 0.1091E-01 0.4000E 04-0.1264E-02126533102
 0.5000E 04-0.2423E-05 0.6000E 04-0.1642E-02 0.7000E 04-0.9112E-06126533102
 0.8000E 04 0.9149E-03 0.9000E 04 0.1270E-02 0.1000E 05-0.1875E-02126533102
 0.2000E 05-0.2481E-03 0.3000E 05 0.1326E-01 0.4000E 05 0.2034E-01126533102
 0.5000E 05 0.3543E-01 0.6000E 05 0.2666E-01 0.7000E 05 0.2540E-01126533102
 0.8000E 05 0.2337E-01 0.9000E 05 0.1948E-01 0.1000E 06 0.2322E-01126533102
 0.2000E 06 0.7867E-02 0.3000E 06 0.0        0.4000E 06 0.0       126533102
 0.5000E 06 0.0        0.6000E 06 0.0        0.7000E 06 0.0       126533102
 0.8000E 06 0.0        0.9000E 06 0.0        0.1000E 07 0.0       126533102
 0.2000E 07 0.0        0.3000E 07 0.0        0.4000E 07 0.0       126533102
 0.5000E 07 0.0        0.6000E 07 0.0        0.7000E 07 0.0       126533102
 0.8000E 07 0.0        0.9000E 07 0.0        0.1000E 08 0.0       126533102
 0.2000E 08 0.0                                                   126533102
                               48          3        104         52126533102
 0.1000E-04 0.0        0.2004E 03 0.1000E 01 0.3004E 03 0.0       126533102
 0.2000E 08 0.0        0.1000E-04 0.0        0.1004E 03 0.4389E-02126533102
 0.2004E 03 0.2516E-02 0.3004E 03 0.1062E-01 0.4004E 03-0.1239E-02126533102
 0.5004E 03 0.3325E-02 0.6004E 03-0.7554E-03 0.7004E 03-0.8598E-02126533102
 0.8004E 03 0.2074E-02 0.9004E 03-0.8527E-02 0.1000E 04-0.1471E-03126533102
 0.2000E 04-0.2105E-02 0.3000E 04 0.6252E-02 0.4000E 04-0.7247E-03126533102
 0.5000E 04-0.1389E-05 0.6000E 04-0.9411E-03 0.7000E 04-0.5223E-06126533102
 0.8000E 04 0.5245E-03 0.9000E 04 0.7277E-03 0.1000E 05-0.1075E-02126533102
 0.2000E 05-0.1422E-03 0.3000E 05 0.7602E-02 0.4000E 05 0.1166E-01126533102
 0.5000E 05 0.2031E-01 0.6000E 05 0.1528E-01 0.7000E 05 0.1456E-01126533102
 0.8000E 05 0.1339E-01 0.9000E 05 0.1117E-01 0.1000E 06 0.1331E-01126533102
 0.2000E 06 0.4510E-02 0.3000E 06 0.0        0.4000E 06 0.0       126533102
 0.5000E 06 0.0        0.6000E 06 0.0        0.7000E 06 0.0       126533102
 0.8000E 06 0.0        0.9000E 06 0.0        0.1000E 07 0.0       126533102
 0.2000E 07 0.0        0.3000E 07 0.0        0.4000E 07 0.0       126533102
 0.5000E 07 0.0        0.6000E 07 0.0        0.7000E 07 0.0       126533102
 0.8000E 07 0.0        0.9000E 07 0.0        0.1000E 08 0.0       126533102
 0.2000E 08 0.0                                                   126533102
                               48          3        104         52126533102
 0.1000E-04 0.0        0.3004E 03 0.1000E 01 0.4004E 03 0.0       126533102
 0.2000E 08 0.0        0.1000E-04 0.0        0.1004E 03 0.1852E-01126533102
 0.2004E 03 0.1062E-01 0.3004E 03 0.4479E-01 0.4004E 03-0.5228E-02126533102
 0.5004E 03 0.1403E-01 0.6004E 03-0.3187E-02 0.7004E 03-0.3628E-01126533102
 0.8004E 03 0.8752E-02 0.9004E 03-0.3598E-01 0.1000E 04-0.6208E-03126533102
 0.2000E 04-0.8883E-02 0.3000E 04 0.2638E-01 0.4000E 04-0.3057E-02126533102
 0.5000E 04-0.5860E-05 0.6000E 04-0.3971E-02 0.7000E 04-0.2204E-05126533102
 0.8000E 04 0.2213E-02 0.9000E 04 0.3070E-02 0.1000E 05-0.4536E-02126533102
 0.2000E 05-0.6001E-03 0.3000E 05 0.3207E-01 0.4000E 05 0.4920E-01126533102
 0.5000E 05 0.8569E-01 0.6000E 05 0.6449E-01 0.7000E 05 0.6144E-01126533102
 0.8000E 05 0.5652E-01 0.9000E 05 0.4711E-01 0.1000E 06 0.5616E-01126533102
 0.2000E 06 0.1903E-01 0.3000E 06 0.0        0.4000E 06 0.0       126533102
 0.5000E 06 0.0        0.6000E 06 0.0        0.7000E 06 0.0       126533102
 0.8000E 06 0.0        0.9000E 06 0.0        0.1000E 07 0.0       126533102
 0.2000E 07 0.0        0.3000E 07 0.0        0.4000E 07 0.0       126533102
 0.5000E 07 0.0        0.6000E 07 0.0        0.7000E 07 0.0       126533102
 0.8000E 07 0.0        0.9000E 07 0.0        0.1000E 08 0.0       126533102
 0.2000E 08 0.0                                                   126533102
                               48          3        104         52126533102
 0.1000E-04 0.0        0.4004E 03 0.1000E 01 0.5004E 03 0.0       126533102
```

CORRELATION MATRIX CARDS FOR THE DRAWING

```
  0.1004E-03              0.8750E 01
  0.2004E-03              0.5016E 01
  0.3004E-03              0.2116E 02
  0.4004E-03              0.2470E 01
  0.5004E-03              0.6628E 01
  0.6004E-03              0.1506E 01
  0.7004E-03              0.1714E 02
  0.8004E-03              0.4135E 01
  0.9004E-03              0.1700E 02
  0.1000E-02              0.1338E 02
  0.2000E-02              0.1152E 02
  0.3000E-02              0.2108E 02
  0.4000E-02              0.1094E 02
  0.5000E-02              0.1097E 02
  0.6000E-02              0.8318E 01
  0.7000E-02              0.7929E 01
  0.8000E-02              0.8678E 01
  0.9000E-02              0.1010E 02
  0.1000E-01              0.9736E 01
  0.2000E-01              0.1180E 02
  0.3000E-01              0.2100E 02
  0.4000E-01              0.2923E 02
  0.5000E-01              0.4848E 02
  0.6000E-01              0.3932E 02
  0.7000E-01              0.3806E 02
  0.8000E-01              0.3633E 02
  0.9000E-01              0.3225E 02
  0.1000E 00              0.3410E 02
  0.2000E 00              0.1904E 02
  0.3000E 00              0.3649E 02
  0.4000E 00              0.3031E 02
  0.5000E 00              0.2638E 02
  0.6000E 00              0.2267E 02
  0.7000E 00              0.9178E 01
  0.8000E 00              0.2439E 01
  0.9000E 00              0.1786E 01
  0.1000E 01              0.1054E 02
  0.2000E 01              0.1425E 02
  0.3000E 01              0.2062E 02
  0.4000E 01              0.1944E 02
  0.5000E 01              0.1607E 02
  0.6000E 01              0.1176E 02
  0.7000E 01              0.9280E 01
  0.8000E 01              0.6216E 01
  0.9000E 01              0.7843E 01
0.1000E 010.1000E 010.1000E 01-.1000E 010.1000E 01-.1000E 01-.1000E 01
0.1000E 01-.1000E 01-.2192E-01-.3642E 000.5911E 00-.1320E 00-.2524E-03
-.2255E 00-.1313E-030.1205E 000.1436E 00-.2202E 00-.2403E-010.7218E 00
0.7953E 000.8352E 000.7750E 000.7629E 000.7351E 000.6903E 000.7781E 00
0.4722E 000.0         0.0         0.0         0.0         0.0         0.0
0.0         0.0         0.0         0.0         0.0         0.0         0.0
0.0         0.0         0.0
0.1000E 010.1000E 010.1000E 01-.1000E 010.1000E 01-.1000E 01-.1000E 01
0.1000E 01-.1000E 01-.2192E-01-.3642E 000.5911E 00-.1320E 00-.2524E-03
-.2255E 00-.1313E-030.1205E 000.1436E 00-.2202E 00-.2403E-010.7218E 00
0.7953E 000.8352E 000.7750E 000.7629E 000.7351E 000.6903E 000.7781E 00
0.4722E 000.0         0.0         0.0         0.0         0.0         0.0
0.0         0.0         0.0         0.0         0.0         0.0         0.0
0.0         0.0         0.0
0.1000E 010.1000E 010.1000E 01-.1000E 010.1000E 01-.1000E 01-.1000E 01
0.1000E 01-.1000E 01-.2192E-01-.3642E 000.5911E 00-.1320E 00-.2524E-03
```

VI. THE THREE-DIMENSIONAL CORRELATION MATRIX PLOT

As noted, part of the card output of the program can be used to generate a three-dimensional plot of the correlation matrix. This can be seen in Fig. 1, where this plot is shown for the ^{238}U fission cross section.

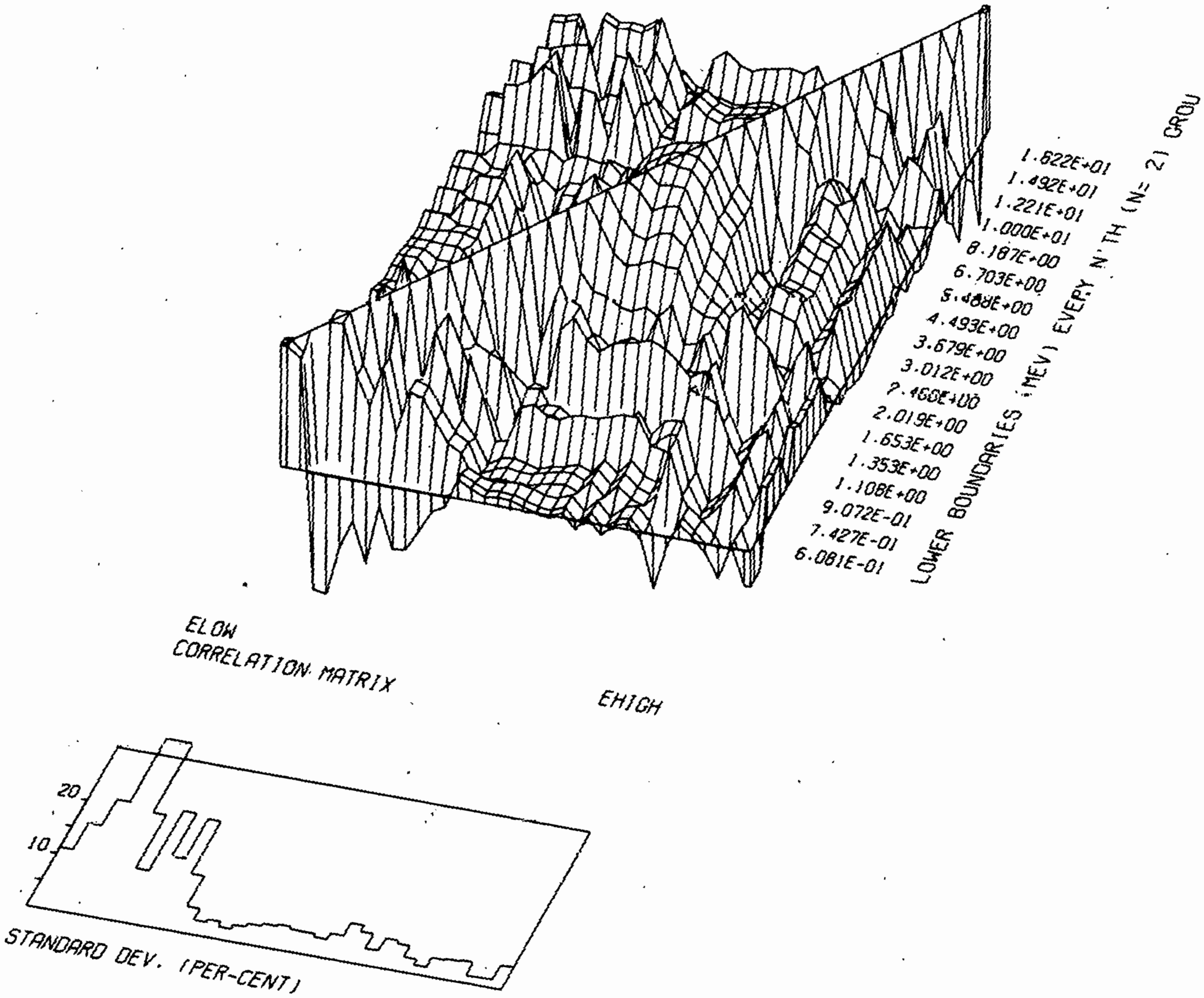
Several conclusions can be deduced from this plot:

(1) A lot of structure can be seen. This corresponds to the fact that the cross section was analyzed with very much detail.

(2) The standard deviation shows large uncertainties in the low-energy region. This reflects the lack of data in this region.

(3) Positive correlation corresponds to differences in magnitude but not in shape; negative correlation corresponds to differences in shape. Then, differences in shape in the low-energy range can be detected. This reflects the fact that in this zone the cross section rises so fast that differences in cross-section values correspond to a large difference in shape.

(4) The recent measurement of Behrens et al. correlates all the analyzed energy intervals.[9]



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2. Barré, Y., et al., "Roles Respectifs des Evaluations et des Experiences Integrales pour la Physique des Reacteurs Rapides," *Applications of Nuclear Data in Science and Technology,* Symp., Paris, 1973.

3. Usachev, L. N., et al., "Nuclear Data Sources and Their Implications on the Design of Fast Reactors," *Applications of Nuclear Data in Science and Technology,* Symp., Paris, 1973.

4. Hummel, H., et al., FRA-TM-54, ANL (1973).

5. Votinen, V. O., et al., "The Light-Water Industry. Nuclear Data Needs," Conf. on Nuclear Cross Sections and Technology, Washington, D.C., March 1975.

6. Minutes of the spring and fall 1973 meeting of the cross-section evaluation group and F. G. Perey. "Format and procedures for ENDF/B data covariance files."

7. Perey, F. G., et al., "Estimated Data Covariance Files of Evaluated Cross Section — Examples for U-235 and U-238," paper presented at ANS meeting, Atlanta, September 1974.

8. Perey, F. G., "Estimated Uncertainties in Nuclear Data. An Approach," Conf. on Nuclear Cross Sections and Technology, Washington, D.C., March 1975.

9. Behrens, J. W., et al., *Conf. of Nuclear Cross Sections and Technology,* paper GB-14, Washington, D.C., March 1975.

APPENDIX A. LIST OF REFERENCES USED IN THE CALCULATION OF THE COVARIANCE MATRICES

<u>^{238}U Fission</u>: In this case the covariance [COV(I,J)] was calculated for 36 groups from 20 MeV to 550.24 keV in a 0.1 lethergy unit interval. The following set of references was used:

1. Nyer, W., Report LA-719 (1948).

   One measurement at 14 MeV. Original data.

2. Uttley, C. A., et al., Report AERE NP/R 1996 (1956).

   Two measurements at 14.1 and 15 MeV. Original data.

3. Smith, R. K., et al., *Bull. Am. Phys. Soc.* 2: 196 (1957).

   Thirty seven measurements at 1-20 MeV. Results from Sowerby, M. G., et al., Report AERE-R7273 (1973).

4. Billand, P., et al., *Geneva Conf.* 16: 106 (1958).

   One measurement at 13.6 MeV. Original data.

5. Flerov, N. N., et al., *J. Nucl. Energy* 11: 173 (1959).

   One measurement at 14.6 MeV. Original data.

6. Mangialajo, M., et al., *Nucl. Phys.* 43: 124 (1963).

   Eight measurements at 13.74-14.75 MeV. Original data.

7. Barral, R. C., et al., Report AFWL-TR-68-134 (1969).

   One measurement at 14.6 MeV. Original data.

8. Henkel, R. L., et al., Report LA-1495 (1952) and Report LA-2122 (1957).

   Thirty eight measurements at 1.3-6.92 MeV. Data renormalized to 0.5176b at 4.50 MeV.

9. Sailor, V. L., Report WASH-745, p. 31 (1958).
Four measurements at 8.8-13.86 MeV. Renormalized to 1.109 b at 13.86 MeV.

10. Adams, B., et al., *J. Nucl. Energy* 14: 85 (1961).
Fourteen measurements at 12.7-19.4 MeV. Renormalized to 1.125 b at 14 MeV.

11. Pankratov, V. M., et al., *J. Nucl. Energy* 16: 494 (1962).
Fifteen measurements at 10.6-20.4 MeV. Renormalized to 1.125 b at 14 MeV.

12. Pankratov, V. M., *At. Energ.* 14: 167 (1963).
Thirty six measurements at 5.1-22.5 MeV. Renormalized to 1.125 b at 14 MeV.

13. Emma, V., et al., *Nucl. Phys.* 63: 641 (1965).

The following are ratio measurements relative to the ^{235}U fission cross section. They were reduced to ^{238}U fission data utilizing the ^{235}U fission cross-section ENDF/B-IV evaluation.

14. Nyer, W., Report LA-938 (1950).
One measurement at 14 MeV.

15. Jarvis, G. A., et al., Report LA-1571 (1953).
One measurement at 2.5 MeV.

16. Lamphere, R. W., *Phys. Rev.* 104: 1654 (1956).
Eighty eight measurements at 0.573-2.995 MeV, measurement multiplied by 0.95.

17. Uttley, C. A., et al., Report AERE NP/R 1996 (1956).

One measurement at 14.1 MeV.

18. Kalinin, S. P., et al., *Geneva Conf.* 16: 136 (1958).

Twenty measurements at 2.95-8.30 MeV.

19. Berezin, A. A., et al., *J. Nucl. Energy* 11: 175 (1960).

One measurement at 14.6 MeV.

20. Smirenkin, G. N., et al., *At. Energ.* 13: 974 (1962).

One measurement at 2.5 MeV.

21. Stein, W. E., et al., p. 627 in *Proc. Conf. Neutron Cross Sections and Technology*, vol. I, Washington, D.C., 1968.

Fourteen measurements at 1.5-5 MeV.

22. White, P. H., et al., *J. Nucl. Energy* 21: 671 (1967).

Three measurements at 2.25-14.1 MeV.

23. Grundl, J. A., *Nucl. Sci. Eng.* 30: 39 (1967).

Sixteen measurements at 1.68-8.07 MeV.

24. Poenitz, W. P., et al., *J. Nucl. Energy* 26: 483 (1972).

Three measurements at 2-3 MeV.

25. Meadows, J. W., *Nucl. Sci. Eng.* 49: 310 (1972).

Twenty one measurements at 0.898-5.33 MeV.

26. Behrens, J. W., et al., *Conf. of Nuclear Cross Sections and Technology*, paper GB-14, Washington, D.C., March 1975.

White source, 30.23-0.1077 MeV.

^{238}U Capture. In this case the covariance [COV(I,J)] was calculated for 91 groups for energies ranging from 10 MeV to 100 eV. From 10 MeV down to 4.095 keV, 0.1 lethargy unit intervals were used. The energy range between 4.095 keV and 100 eV was divided in decimal intervals. The following set of references was used:

1. Rose, B., Report AERE NP/R 1743 (1955). See also *J. Nucl. Energy* 8: 197 (1959).
   Eleven measurements at 29-840 keV. Original data.
2. Broda, E., et al., Report BR-754. Reported by Rose in ref. 1.
   Seven measurements at 400 keV-4.05 MeV. Data revised by Davey in ref. 19.
3. English and Gueron, National Research Council of Canada, Montreal Laboratory Report MC-69. Reported by Rose in ref. 1.
   Two measurements at 220-850 keV. Original data.
4. Macklin, R. L., et al., *Phys. Rev.* 107: 504 (1957).
   One measurement at 25 keV. Original data.
5. Lyon, W. S., et al., *Phys. Rev.* 114: 1619 (1959).
   One measurement at 195 keV. Original data.
6. Bilpuch, E. G., *Ann. Phys.* 10: 455 (1960).
   Thirteen measurements at 2.55-217 keV. Data revised by Davey in ref. 19.
7. Given, B. G., et al., *Phys. Rev.* 120: 556 (1960).
   Seven measurements at 0.175-1 MeV. Data revised by Davey in ref. 19.
8. Gibbons, J. H., et al., *Phys, Rev.* 122: 182 (1961).
   Two measurements at 30-65 keV. Original data.

9. Berginst, I., *Ark. Fys.* 23: 425 (1963).
Eight measurements at 18-300 keV. Data revised by Davey in ref. 19.

10. de Saussure, G., et al., Report ORNL-3360 (1963).
Two measurements at 30-64 keV. Data revised by Davey in ref. 19.

11. Macklin, R. L., et al., Report WASH-1046, p. 88 (1963).
Sixteen measurements at 8.8-54.7 keV. Data according to a recent evaluation of σ (Ta) in ref. 19.

12. Tolstikov, V. A., et al., *J. Nucl. Energy* 18: 599 (1964).
Eleven measurements at 15-180 keV. Corrected by non-1/v ^{10}B behavior and normalized to the Belanova (ref. 13) value. Data from Sowerby (ref. 20).

13. Belanova, T. A., et al., *J. Nucl. Energy* 20: 411 (1966).
One measurement at 22.8 keV as corrected by Miller et al. in *Nucl. Sci. Eng.* 35: 295 (1969).

14. Menlove, H. O., et al., *Nucl. Sci. Eng.* 33: 24 (1968).
Nine measurements at 24-503 kev. Original data.

15. Moxon, M. C., Report AERE-R6074 (1969).
White source, time of flight; 0.50-100 keV. Results average in decimal intervals. Date revised in 1970 (ref. 20).

16. Fricke, M. P., et al., IAEA Conf., Helsinki (1970).
White source, time of flight; 1-100 keV. Results average in decimal intervals, 100-752 keV point results. Original data.

17. de Saussure, G., et al., *Nucl. Sci. Eng.* 51: 385 (1973).
White source, time of flight; 0.100-100 keV. Results average over decimal intervals. Original data.

18. Langner, I., et al., Report KFK-880 (1968).

Evaluation.

19. Davey, W. G., *Nucl. Sci. Eng.* 39: 337 (1970).

Evaluation.

20. Sowerby, M. G., et al., Report AERE-R7273 (1973).

Evaluation.

21. Ponitkin, Y. G., et al., Report IAEA-CN-26, Helsinki (1970).

Ten measurements at 24-145 keV. Original data.

22. Ponitkin, Y. G., et al., *At. Energ.* 33: 782 (1972).

Two measurements at 132-160 keV. Original data.

23. Block, R. C., et al., Conf-720901, vol. II, p. 1107 (1972).

One measurement at 24 keV. Original data.

24. Chelnokov, V. B., et al., "Neutron cross section for radioactive capture," preprint USSR Institute of Physics and Power Engineering (1973).

Ten measurements at 3.3-35 keV. Original data.

25. Ryves, T. B., et al., *J. Nucl. Energy* 27: 519 (1973).

Four measurements at 157-624 keV. Original data.

26. Pearlstein, S., et al., UKAEA Progress Report (1973).

Eleven measurements at 200-1750 keV. Original data.

27. Spencer, R. R., et al., private communication, 1975.

The following are ratio measurements relative to the ^{235}U fission cross section. They were reduced to ^{238}U capture data utilizing the ^{235}U fission cross-section ENDF/B-IV evaluation.

28. Linemberg, G. A., et al., Report LA-467 (1946).

Thirteen measurements at 0.005-5.9 MeV. Original data.

29. Barry, J. F., et al., *J. Nucl. Energy* 18: 481 (1964).

Thirteen measurements at 0.127-7.6 MeV. Original data.

30. Weston, L. W., et al., Report EANDC 330, p. 64 (1963).

See also ref. 10.

Two measurements at 30-64 keV. Original data.

31. Poenitz, W. P., *Nucl. Sci. Eng.* 49: 383 (1970) and *Trans. Am. Nucl. Soc.* 12: 279 (1968).

Thirteen measurements at 30 keV-1.4 MeV. Original data.

32. Sowerby, M. G., et al., Report AERE-R7273 (1973).

Evaluation.

<u>^{239}Pu Capture</u>: In this case the covariance [COV(I,J)] was calculated for 36 groups for energies ranging from 1 MeV to 100 eV. The energy range was divided in decimal intervals. The following set of references was used:

1. Sowerby, M. G., et al., *At. Energy Rev.* 10(4): 453 (1972). IAEA.

2. Gwin, R., et al., *Nucl. Sci. Eng.* 45: 25 (1971).

3. Schomberg, M. G., et al., p. 315 in *Proc. Conf. Nuclear Data for Reactors*, vol. I, IAEA, Helsinki, 1970.

4. Czirr, J. R., et al., p. 331 in *Proc. Conf. Nuclear Data for Reactors*, vol. I, IAEA, Helsinki, 1970.

5. Belyaer, F. N., et al., p. 336 in *Proc. Conf. Nuclear Data for Reactors*, vol. I, IAEA, Helsinki, 1970.

6. Farrell, J. A., et al., p. 543 in *Proc. Conf. Nuclear Data for Reactors*, vol. I, IAEA, Helsinki, 1970.

7. Kononov, V. N., et al., p. 345 in *Proc. Conf. Nuclear Data for Reactors*, vol. I, IAEA, Helsinki, 1970.

8. Ryabov, Yu. V., et al., p. 345 in *Proc. Conf. Nuclear Data for Reactors*, vol. I, IAEA, Helsinki, 1970.

9. Weston, L. W., et al., memorandum to R. E. Chrien, 1972.

10. Gwin, R., et al., to be published in *Nuclear Science Engineering*.

<u>^{239}Pu Fission</u>: In this case the covariance [COV(I,J)] was calculated for 45 groups for energies ranging from 10 MeV to 100 eV. The energy range was divided in decimal intervals. The following set of references was used:

1. Sowerby, M. G., et al., Report AERE-R-7273, UKAEA (1973).

2. Hunter, R. E., et al., Report LA-5172 (1973).

3. Gwin, R., to be published in *Nuclear Science Engineering*.

4. Weston, L. W., memorandum to R. E. Chrien, 1972.

5. James, G. D., p. 267 in *Proc. Conf. Nuclear Data for Reactors*, vol. I, IAEA, Helsinki, 1970.

6. Gwin, R., et al., *Nucl. Sci. Eng.* 45: 25 (1971).

7. Shunk, E. R., et al., p. 979 in *Proc. Conf. Neutron Cross Section Technology*, vol. II, CONF-660303, 1966.

8. Blons, J., *Nucl. Sci. Eng.* 51: 95 (1973).

9. Schomberg, M. G., et al., p. 315 in *Proc. Conf. Nuclear Data for Reactors*, vol. I, IAEA, Helsinki, 1970.

^{240}Pu and ^{241}Pu Capture. ^{241}Pu Fission: In this case the covariance was calculated for 45 groups for energies ranging from 10 MeV to 100 eV. The following sets of references were used:

^{240}Pu Capture Cross Section

1. Weston, L. W., and Todd, J. H., "Measurement of the Neutron Capture Cross Sections of the Actinides," Proceedings of the Conference on Nuclear Cross Sections and Technology, Washington, D.C., 1975, to be published.

   100 eV to 300 keV with weight of 9 on the variance.
2. Hockenbury, R. W., Moyer, W. R., and Block, R. C., *Nucl. Sci. Eng.* 49: 153-161 (1972).

   6 to 30 keV with weight of 9 on the variance.
3. Prince, A., *Conf. Nucl. Data for Reactors*, CN-26/91, Helsinki, 1970.

   1 keV to 10 MeV with weight of 1 on the variance (model calculation).
4. Yiftah, S., Schmidt, J. J., Caner, M., and Segev, M., p. 123 in *Fast Reactor Physics*, vol. I, IAEA, Vienna, 1968.

   1 keV to 10 MeV with weight of 1 on the variance (model calculation).

^{241}Pu Capture Cross Section

1. Weston, L. W., and Todd, J. H., "Neutron Fission and Absorption Cross Sections for ^{239}Pu and ^{241}Pu," *Trans. Am. Nucl. Soc.* 15(1): 480 (1972).

   100 eV to 200 keV with weight of 9 on the variance.

2. Caner, M., and Yiftah, S., p. 735 in *Conf. Nucl. Data for Reactors*, vol. II, IAEA, Vienna, 1970.

   100 eV to 10 MeV with weight of 1 on the variance (model calculation).

3. Prince, A., *Conf. Nucl. Data for Reactors*, CN-26/91, Helsinki, 1970.

   80 keV to 10 MeV with weight of 1 on the variance (model calculation).

^{241}Pu Fission Cross Section (all references with weight of 1 on the variance)

1. Weston, L. W., and Todd, J. H., same reference as with ^{241}Pu capture.

   100 eV to 200 keV.

2. Simpson, O. D., et al., p. 910 in *Proc. Conf. on Neutron Cross Section and Technology*, vol. II, Washington, D.C., 1966.

   100 eV to 10 keV.

3. Blons, J., et al., p. 469 in *Conf. Nucl. Data for Reactors*, vol. I, Vienna, 1970.

4. Migneco, E., Theohald, J. P., and Wartena, J. A., p. 437 in *Conf. Nuclear Data for Reactors*, vol. I, Vienna, 1970.

   100 eV to 2 keV.

5. Smith, H. L., Smith, R. K., and Henkel, R. L., *Phys. Rev.* 125: 1329 (1962).

200 keV to 10 MeV.

6. Zabo, I., et al., *Neutron Standards and Flux Normalization*, p. 256, Argonne National Laboratory (1970).

20 keV to 1 MeV.

7. White, P. H., and Warner, G. P., *J. Nucl. Energy* 21: 671 (1967).

40 keV to 6 MeV.

8. Butler, D. K., and Sjoblom, R. L., *Phys. Rev.* 124: 1129 (1961).

300 keV to 2 MeV.

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APPENDIX B. STANDARD DEVIATION AND CORRELATION MATRICES CORRESPONDING TO DIFFERENT CROSS SECTIONS

U238 FISSION 36 GROUPS

I	ELO(KEV)	RSD PCT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	23
1	550.24	11.1	100	91	-95	-97	-57	-33	-66	-17	-51	-49	-32	-14	-8	15	10	4	6	6	3	0	0	3	-7	3	-8	1	4	-6
2	608.11	16.0	91	100	-99	-97	-58	-35	-68	-17	-53	-49	-32	-18	-11	11	5	3	4	6	3	0	0	3	-7	3	-7	1	4	-5
3	672.06	21.0	-95	-99	100	99	59	35	69	17	53	50	33	17	11	-12	-7	-3	-5	-6	-3	0	0	-3	7	-3	8	-1	-4	6
4	742.74	34.1	-97	-97	99	100	59	35	69	18	53	50	33	16	10	-13	-8	-4	-6	-6	-3	0	0	-3	7	-3	8	-1	-4	6
5	820.86	31.6	-57	-58	59	59	100	30	94	8	44	86	59	18	4	-15	-8	-6	-8	-12	-7	-6	-2	-6	5	-4	9	-1	-5	6
6	907.19	19.8	-33	-35	35	35	30	100	36	-39	28	26	-11	58	29	-6	-3	24	30	22	20	26	28	27	30	34	34	13	11	6
7	1002.60	9.8	-66	-68	69	69	94	36	100	17	63	81	54	22	10	-16	-9	-5	-8	-10	-6	-3	0	-5	8	-4	10	-1	-6	8
8	1108.04	21.0	-17	-17	17	18	8	-39	17	100	27	7	44	-50	-21	-36	-23	-46	-54	-44	-35	-29	-35	-39	-30	-41	-28	-33	-15	0
9	1224.57	12.9	-51	-53	53	53	44	28	63	27	100	63	39	33	29	-14	-18	-8	-8	-14	-20	-16	-13	-19	-1	-27	-13	-6	-5	7
10	1353.36	20.4	-49	-49	50	50	86	26	81	7	63	100	67	26	12	-15	-16	-10	-10	-19	-20	-20	-14	-17	-3	-20	-7	-4	-5	6
11	1495.69	10.6	-32	-32	33	33	59	-11	54	44	39	67	100	-14	-1	-10	-8	-29	-35	-38	-38	-40	-34	-39	-20	-44	-23	-16	-15	4
12	1653.00	4.7	-14	-18	17	16	18	58	22	-50	33	26	-14	100	52	-15	-18	30	43	27	18	27	31	32	36	31	23	11	18	7
13	1826.84	2.6	-8	-11	11	10	4	29	10	-21	29	12	-1	52	100	6	42	47	43	21	3	20	24	21	47	6	5	6	7	3
14	2018.97	3.1	15	11	-12	-13	-15	-6	-16	-36	-14	-15	-10	-15	6	100	47	24	13	10	1	-8	-2	-7	-2	-11	-2	26	-10	-2
15	2231.31	2.2	10	5	-7	-8	-8	-3	-9	-23	-18	-16	-8	-18	42	47	100	50	36	33	27	25	30	24	36	5	8	20	-5	-1
16	2465.97	3.1	4	3	-3	-4	-6	24	-5	-46	-8	-10	-29	30	47	24	50	100	80	59	50	53	58	56	56	27	21	21	6	1
17	2725.32	3.6	6	4	-5	-6	-8	30	-8	-54	-8	-10	-35	43	43	13	36	80	100	81	68	64	71	73	63	34	25	18	6	-2
18	3011.94	4.2	6	6	-6	-6	-12	22	-10	-44	-14	-19	-38	27	21	10	33	59	81	100	92	78	84	86	67	38	29	16	0	-6
19	3328.71	4.4	3	3	-3	-3	-7	20	-6	-35	-20	-20	-38	18	3	1	27	50	68	92	100	89	91	91	67	46	36	13	-1	-6
20	3678.79	410	0	0	0	0	-6	26	-3	-29	-16	-20	-40	27	20	-8	25	53	64	78	89	100	97	96	82	60	45	2	-6	-13
21	4065.70	4.0	0	0	0	0	-2	28	0	-35	-13	-14	-34	31	24	-2	30	58	71	84	91	97	100	97	86	58	45	3	-11	-16
22	4493.29	3.4	3	3	-3	-3	-6	27	-5	-39	-19	-17	-39	32	21	-7	24	56	73	86	91	96	97	100	83	60	44	2	-7	-15
23	4965.85	4.5	-7	-7	7	7	5	30	8	-30	-1	-3	-20	36	47	-2	36	56	63	67	67	82	86	83	100	60	46	-10	-26	-27
24	5488.12	6.9	3	3	-3	-3	-4	34	-4	-41	-27	-20	-44	31	6	-11	5	27	34	38	46	60	58	60	60	100	75	-15	-35	-44
25	6065.30	5.7	-8	-7	8	8	9	34	10	-28	-13	-7	-23	23	5	-2	8	21	25	29	36	45	45	44	46	75	100	22	-15	-17
26	6703.20	3.0	1	1	-1	-1	-1	13	-1	-33	-6	-4	-16	11	6	26	20	21	18	16	13	2	3	2	-10	-15	22	100	70	63
27	7408.18	5.3	4	4	-4	-4	-5	11	-6	-15	-5	-5	-15	18	7	-10	-5	6	6	0	-1	-6	-11	-7	-26	-35	-15	70	100	81
28	8187.31	4.8	-6	-5	6	6	6	6	8	0	7	6	4	7	3	-2	-1	1	-2	-6	-6	-13	-16	-15	-27	-44	-17	63	81	100
29	9048.38	2.6	-44	-43	44	45	50	65	59	-24	52	49	12	66	34	-14	-10	19	23	17	17	24	27	23	33	30	46	23	13	9
30	10000.00	1.6	-8	-8	8	8	9	61	11	-67	10	9	-32	77	38	-2	-2	37	47	37	32	39	41	42	40	51	56	46	33	17
31	11051.71	3.4	12	12	-12	-12	-14	57	-16	-65	-14	-13	-44	56	26	4	2	33	42	34	29	32	33	37	30	46	38	21	20	3
32	12214.03	3.7	3	3	-3	-3	-4	30	-4	-46	-4	-4	-31	47	24	1	1	29	37	29	25	29	30	32	24	30	44	52	31	4
33	13496.59	3.9	-7	-7	7	7	9	8	10	-1	9	8	5	11	7	-2	-4	3	6	4	3	3	4	4	8	3	7	5	2	9
34	14918.25	1.4	-27	-26	26	27	30	33	35	-10	31	30	13	40	21	-8	-7	10	11	8	9	13	15	12	23	15	0	-22	-12	-7
35	16487.21	1.5	1	1	-1	-1	-1	43	-1	-59	-1	-1	-35	58	28	0	0	31	39	31	27	31	33	35	33	41	19	3	9	-3
36	18221.17	4.2	-28	-28	28	29	32	3	38	32	33	32	39	0	1	-9	-8	-12	-16	-14	-10	-8	-7	-12	0	-14	-7	-15	-13	0
37	19980.00																													

I	ELO(KEV)	RSD PCT	29	30	31	32	33	34	35	36
29	9048.38	2.6	100	70	40	38	13	44	37	21
30	10000.00	1.6	70	100	69	66	10	22	58	-14
31	11051.71	3.4	40	69	100	39	2	1	51	-25
32	12214.03	3.7	38	66	39	100	10	20	54	-50
33	13496.59	3.9	13	10	2	10	100	17	14	-7
34	14918.25	1.4	44	22	1	20	17	100	71	-20
35	16487.21	1.5	37	58	51	54	14	71	100	-65
36	18221.17	4.2	21	-14	-25	-50	-7	-20	-65	100
37	19980.00									

U238 CAPTURE 91 GROUPS

I	ELO(KEV)	RSD PCT	CORR*100 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	25	27	28
1	0.10	4.9	100	99	99	100	70	69	49	45	28	33	22	18	0	5	11	15	18	15	10	2	3	6	9	10	10	13	13	12
2	0.20	9.7	99	100	100	100	70	69	49	45	28	33	22	18	0	5	11	15	18	15	10	2	3	6	9	10	10	13	13	12
3	0.30	11.9	99	100	100	100	70	69	49	45	28	33	22	18	0	5	11	15	18	15	10	2	3	6	9	10	10	13	13	12
4	0.40	20.9	100	100	100	100	70	69	49	45	28	33	22	18	0	5	11	15	18	15	10	2	3	6	9	10	10	13	13	12
5	0.50	6.0	70	70	70	70	100	97	69	63	39	47	31	26	0	7	16	21	25	22	14	3	5	9	12	14	14	18	18	17
6	0.60	6.7	69	69	69	69	97	100	82	78	20	51	34	27	-2	6	15	20	23	20	14	3	5	9	12	14	14	18	19	17
7	0.70	23.0	49	49	49	49	69	82	100	99	-38	50	34	24	-8	1	11	12	11	12	9	1	3	7	10	11	11	14	15	13
8	0.80	14.6	45	45	45	45	63	78	99	100	-45	48	33	23	-9	0	10	10	9	10	9	0	3	6	9	10	10	13	14	12
9	0.90	11.3	28	28	28	28	39	20	-38	-45	100	-3	-3	2	10	8	6	11	17	12	5	2	2	3	3	3	4	5	4	4
10	1.00	12.5	33	33	33	33	47	51	50	48	-3	100	77	67	0	16	32	34	36	34	29	10	8	18	21	25	24	28	27	23
11	2.00	12.4	22	22	22	22	31	34	34	33	-3	77	100	79	5	20	37	37	38	40	40	14	14	25	28	31	30	34	35	28
12	3.00	9.7	18	18	18	18	26	27	24	23	2	67	79	100	34	44	53	55	57	55	50	19	17	27	28	30	29	32	31	24
13	4.10	11.7	0	0	0	0	0	-2	-8	-9	10	0	5	34	100	88	74	75	75	77	78	34	32	40	40	38	32	36	27	17
14	4.53	11.7	5	5	5	5	7	6	1	0	8	16	20	44	88	100	91	91	89	91	91	37	39	51	52	49	43	50	42	29
15	5.00	11.7	11	11	11	11	16	15	11	10	6	32	37	53	74	91	100	98	96	97	96	38	42	56	58	55	48	56	48	36
16	5.53	12.2	15	15	15	15	21	20	12	10	11	34	37	55	75	91	98	100	98	99	95	38	40	55	57	55	48	56	49	37
17	6.11	13.3	18	18	18	18	25	23	11	9	17	36	38	57	75	89	96	98	100	98	93	37	38	53	55	54	48	56	48	37
18	6.76	12.6	15	15	15	15	22	20	12	10	12	34	40	55	77	91	97	99	98	100	97	38	41	56	58	57	50	58	51	38
19	7.47	12.9	10	10	10	10	14	14	9	9	5	29	40	50	78	91	96	95	93	97	100	40	44	58	61	59	51	59	51	38
20	8.25	28.4	2	2	2	2	3	3	1	0	2	10	14	19	34	37	38	38	37	38	40	100	98	85	81	83	82	77	76	53
21	9.12	21.1	3	3	3	3	5	5	3	3	2	8	14	17	32	39	42	40	38	41	44	98	100	88	85	86	83	80	79	56
22	10.08	13.1	6	6	6	6	9	9	7	6	3	18	25	27	40	51	56	55	53	56	58	85	88	100	99	98	94	91	88	66
23	11.14	13.5	9	9	9	9	12	12	10	9	3	21	28	28	40	52	58	57	55	58	61	81	85	99	100	99	94	92	89	68
24	12.31	14.5	10	10	10	10	14	14	11	10	3	25	31	30	38	49	55	55	54	57	59	83	86	98	99	100	95	94	91	68
25	13.60	14.7	10	10	10	10	14	14	11	10	4	24	30	29	32	43	48	48	48	50	51	82	83	94	94	95	100	96	94	71
26	15.03	12.9	13	13	13	13	18	18	14	13	5	28	34	32	36	50	56	56	56	58	59	77	80	91	92	94	96	100	96	71
27	16.62	13.4	13	13	13	13	18	19	15	14	4	27	35	31	27	42	48	49	48	51	51	76	79	88	89	91	94	96	100	74
28	18.36	14.3	12	12	12	12	17	17	13	12	4	23	28	24	17	29	36	37	37	38	38	53	56	66	68	68	71	71	74	100
29	20.29	12.2	14	14	14	14	19	19	15	13	6	27	34	29	21	35	43	44	44	46	46	47	52	65	68	69	70	72	75	98
30	22.43	10.0	12	12	12	12	16	16	11	10	7	25	33	28	19	32	40	40	40	42	42	45	49	61	62	63	64	66	69	80
31	24.79	11.9	9	9	9	9	13	12	6	5	8	17	23	21	7	16	22	23	24	23	22	34	36	42	43	44	46	45	49	62
32	27.40	9.8	10	10	10	10	15	14	7	6	9	17	22	19	10	18	24	25	26	27	26	35	38	46	47	48	48	49	52	64
33	30.28	11.3	13	13	13	13	19	17	8	7	13	21	28	23	7	17	24	26	28	28	26	37	40	51	53	54	54	54	58	75
34	33.46	11.3	14	14	14	14	20	18	6	5	17	23	31	25	5	15	22	25	28	27	25	34	37	47	49	50	50	51	55	70
35	36.98	10.3	15	15	15	15	21	19	8	6	16	23	31	24	3	13	20	23	26	25	23	34	36	45	47	49	48	49	54	72
36	40.87	7.7	15	15	15	15	22	19	8	6	18	22	28	24	9	15	20	24	28	26	23	13	15	26	30	31	30	33	35	69
37	45.17	5.6	18	18	18	18	26	22	7	5	23	19	27	22	5	11	13	19	24	22	17	-8	-5	1	5	7	7	17	18	38
38	49.92	7.5	9	9	9	9	12	10	1	0	15	8	18	14	6	9	8	11	14	14	13	11	13	18	20	21	30	32	32	29
39	55.17	5.0	0	0	0	0	0	0	0	0	0	25	69	53	27	30	34	32	31	36	43	18	18	28	28	28	27	28	27	13
40	60.97	7.0	7	7	7	7	10	8	0	-1	13	5	9	4	7	10	14	15	16	17	16	6	10	17	19	19	17	21	22	24
41	67.38	6.8	C	0	0	0	0	0	0	0	0	17	24	21	44	47	37	35	34	40	49	20	23	35	40	39	34	38	30	25
42	74.47	12.0	12	12	12	12	17	15	6	5	14	19	27	18	19	28	36	37	37	40	43	17	25	40	45	44	38	46	42	43
43	82.30	11.9	13	13	13	13	19	15	3	1	20	15	26	16	23	28	36	38	39	42	44	18	26	40	44	44	38	47	43	41
44	90.95	10.5	6	6	6	6	9	8	2	1	9	4	12	5	20	21	19	20	21	25	29	12	18	28	33	32	28	36	35	38
45	100.52	10.5	0	0	0	0	0	0	0	0	0	4	15	9	33	32	27	25	24	30	39	18	23	37	42	40	34	40	35	31
46	111.09	9.8	0	0	0	0	0	0	0	0	0	9	20	19	39	37	30	29	28	34	41	20	22	39	44	42	38	40	35	27
47	122.78	12.1	.0	0	0	0	0	0	0	0	0	4	13	8	17	17	14	13	12	16	22	10	13	23	26	24	22	24	23	18
48	135.69	12.1	0	0	0	0	0	0	0	0	0	6	15	13	23	22	18	18	17	21	26	12	14	24	27	26	24	25	24	19
49	149.96	11.6	C	0	0	0	0	0	0	0	0	5	16	12	16	16	14	13	13	16	22	10	12	22	25	24	22	24	23	18
50	165.73	11.7	C	0	0	0	0	0	0	0	0	4	16	10	15	16	15	13	12	17	22	10	13	23	26	24	19	21	22	19
51	183.16	9.8	0	0	0	0	0	0	0	0	0	7	18	19	29	30	26	26	25	28	32	15	16	27	29	28	27	29	28	19
52	202.42	13.5	C	0	0	0	0	0	0	0	0	6	14	16	24	24	21	21	20	22	25	12	12	21	22	21	21	21	21	17
53	223.71	14.8	C	0	0	0	0	0	0	0	0	10	23	22	25	25	26	25	24	28	32	15	16	29	31	29	28	27	29	28
54	247.24	17.8	0	0	0	0	0	0	0	0	0	9	22	21	24	24	26	25	24	27	31	15	16	29	32	30	28	27	29	26
55	273.24	19.2	C	0	0	0	0	0	0	0	0	9	22	21	24	24	25	24	23	26	31	15	15	28	30	28	28	26	27	24
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57	333.74	15.6	C	0	0	0	0	0	0	0	0	12	32	26	23	25	29	27	25	30	37	17	19	37	39	37	33	32	29	25
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59	407.63	14.7	0	0	0	0	0	0	0	0	0	20	51	38	34	37	41	38	36	42	51	20	23	39	43	39	36	34	30	27
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62	550.24	19.1	C	0	0	0	0	0	0	0	0	16	34	29	31	34	38	35	34	39	46	20	22	38	42	39	35	32	29	26
63	608.11	19.5	0	0	0	0	0	0	0	0	0	18	33	33	37	39	41	39	38	43	48	23	23	41	44	41	38	34	30	26
64	672.06	20.5	0	0	0	0	0	0	0	0	0	20	35	35	37	39	42	40	39	43	48	22	22	37	40	38	35	32	28	24
65	742.74	19.5	0	0	0	0	0	0	0	0	0	18	34	33	33	34	38	36	35	39	45	21	22	39	42	40	36	34	30	25
66	820.86	24.9	C	0	0	0	0	C	0	0	0	17	35	31	30	34	37	35	33	38	45	18	20	33	35	33	30	29	26	22
67	907.19	24.0	C	0	0	0	0	0	0	0	0	23	46	36	33	36	39	37	35	40	47	19	21	34	36	34	31	30	27	22
68	1002.60	27.7	C	0	0	0	0	C	0	0	0	23	48	38	36	39	42	40	38	43	51	21	23	38	40	38	34	33	29	25
69	1108.04	28.4	C	0	0	0	0	0	0	0	0	22	44	39	37	41	45	42	40	46	54	22	24	40	43	41	36	35	31	27
70	1224.57	29.8	C	0	0	0	0	C	0	0	0	21	42	36	37	43	47	44	42	48	56	23	25	42	45	42	38	36	32	28
71	1353.36	26.3	C	0	0	0	0	0	0	0	0	0	23	19	38	35	33	32	30	35	42	17	20	33	36	32	29	27	23	21
72	1495.69	18.9	0	0	0	0	0	0	0	0	0	0	13	13	27	20	19	19	18	22	27	11	13	22	25	22	20	17	15	14
73	1653.00	12.8	C	0	0	0	0	0	0	C	0	0	24	18	34	18	18	18	18	23	30	12	14	24	27	24	21	18	15	15

74	1826.84	12.8	0	0	0	0	0	0	0	0	0	0	4	3	18	-2	-1	0	0	3	7	3	3	8	10	8	7	3	1	3
75	2018.97	17.5	0	0	0	0	0	0	0	0	0	0	0	0	9	-11	-10	-9	-7	-5	-2	0	-1	2	4	2	2	-2	-4	0
76	2231.31	22.0	C	0	0	0	0	0	0	0	0	0	0	0	7	-14	-13	-11	-9	-8	-5	-1	-2	1	3	1	1	-4	-5	0
77	2465.97	24.3	C	0	0	0	0	0	0	0	0	0	3	2	9	-16	-14	-13	-10	-8	-5	-1	-3	0	1	0	0	-5	-6	-1
78	2725.32	26.4	C	0	0	0	0	0	0	0	0	0	3	2	13	-16	-14	-12	-10	-7	-3	0	-2	0	2	0	0	-4	-6	-2
79	3011.94	33.0	0	0	0	0	0	0	0	0	0	0	5	4	13	-15	-13	-11	-9	-6	-2	0	-1	0	1	0	-1	-4	-5	-2
80	3328.71	42.0	C	0	0	0	0	0	0	0	0	0	4	3	12	-14	-12	-10	-8	-6	-2	0	-1	0	1	0	0	-3	-4	-1
81	3678.79	49.5	C	0	0	0	0	0	0	0	0	0	5	4	14	-11	-10	-8	-6	-4	0	0	0	2	5	3	2	-2	-3	0
82	4065.70	58.4	C	0	0	0	0	0	0	0	0	0	5	3	13	-10	-9	-7	-5	-3	0	0	0	3	6	4	3	-1	-2	0
83	4493.29	56.0	0	0	0	0	0	0	0	0	0	0	5	3	14	-10	-9	-7	-5	-3	1	0	0	3	5	3	2	-1	-2	0
84	4965.85	50.6	C	0	0	0	0	0	0	0	0	0	7	5	18	-6	-5	-4	-2	0	5	2	2	6	9	7	5	1	0	2
85	5488.11	47.0	C	0	0	0	0	0	0	0	0	0	11	8	27	6	6	7	8	12	18	7	8	15	17	15	12	9	7	8
86	6065.30	72.5	0	0	0	0	0	0	0	0	0	0	13	10	27	26	24	24	22	26	30	12	14	27	31	27	25	20	17	18
87	6703.20	90.9	0	0	0	0	0	0	0	0	0	0	12	9	25	24	23	22	20	24	28	11	13	27	30	26	24	19	16	17
88	7408.18	91.8	0	0	0	0	C	0	0	0	0	0	14	11	29	27	26	25	23	27	32	13	15	28	32	27	25	21	18	18
89	8187.30	122.0	C	0	0	0	0	0	0	0	0	0	15	11	28	27	26	25	23	27	32	13	15	27	30	26	24	21	18	18
90	9048.37	137.2	0	0	0	0	0	0	0	0	0	0	16	12	31	29	28	27	25	29	34	14	16	28	31	27	25	22	19	18
91	10000.00	127.8	0	0	0	0	0	0	0	0	0	0	21	16	41	39	37	36	33	39	46	18	22	32	35	31	27	28	24	20
92	11052.00																													

I	ELO(KEV)	RSD PCT	CORR*100 29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56
29	20.29	12.2	100	83	61	64	77	73	73	72	44	33	18	30	32	51	50	46	38	35	24	25	24	24	25	21	34	32	30	31
30	22.43	10.0	83	100	72	79	84	80	76	69	43	34	21	43	29	53	52	50	40	37	29	28	26	26	26	22	31	29	28	32
31	24.79	11.9	61	72	100	63	71	68	66	59	37	27	14	34	13	36	36	33	24	22	17	16	15	16	14	13	20	19	19	22
32	27.40	9.8	64	79	63	100	78	75	72	65	42	28	14	55	19	45	44	42	30	27	20	18	17	20	13	11	18	16	17	21
33	30.28	11.3	77	84	71	78	100	96	93	85	55	34	18	50	22	55	54	52	37	34	27	24	22	28	17	15	25	23	22	33
34	33.46	11.3	73	80	68	75	96	100	96	87	62	34	20	51	21	56	58	54	36	33	27	23	21	30	16	13	24	22	21	32
35	36.98	10.3	73	76	66	72	93	96	100	91	65	30	18	47	18	53	55	52	33	30	24	21	18	28	13	11	22	20	20	30
36	40.87	7.7	72	69	59	65	85	87	91	100	73	29	13	43	19	50	52	49	31	29	20	19	16	23	13	12	22	20	20	28
37	45.17	5.6	44	43	37	42	55	62	65	73	100	56	14	46	11	63	67	58	31	25	17	14	11	15	8	5	8	8	7	11
38	49.92	7.5	33	34	27	28	34	34	30	29	56	100	21	43	19	57	58	56	40	38	26	23	19	2	16	10	15	14	13	18
39	55.17	5.0	18	21	14	14	18	20	18	13	14	21	100	9	30	22	24	17	26	33	22	24	27	27	29	22	33	33	33	46
40	60.97	7.0	30	43	34	55	50	51	47	43	46	43	9	100	15	55	55	64	47	42	33	27	21	23	18	16	25	25	26	19
41	67.38	6.8	32	29	13	19	22	21	18	19	11	19	30	15	100	38	37	42	59	59	35	35	32	30	30	21	26	27	25	35
42	74.47	12.0	51	53	36	45	55	56	53	50	63	57	22	55	38	100	97	74	69	60	36	30	24	26	19	13	23	24	22	33
43	82.30	11.9	50	52	36	44	54	58	55	52	67	58	24	55	37	97	100	75	67	57	35	30	25	27	19	13	23	24	22	33
44	90.95	10.5	46	50	33	42	52	54	52	49	58	56	17	64	42	74	75	100	83	75	56	50	42	46	38	30	44	44	45	32
45	100.52	10.5	38	40	24	30	37	36	33	31	31	40	26	47	59	69	67	83	100	96	57	53	46	48	45	37	52	57	60	47
46	111.09	9.8	35	37	22	27	34	33	30	29	25	38	33	42	59	60	57	75	96	100	57	56	48	49	51	43	59	63	67	53
47	122.78	12.1	24	29	17	20	27	27	24	20	17	26	22	33	35	36	35	56	57	57	100	98	92	86	81	55	71	68	64	65
48	135.69	12.1	25	28	16	18	24	23	21	19	14	23	24	27	35	30	30	50	53	56	98	100	94	87	86	61	76	72	67	67
49	149.96	11.6	24	26	15	17	22	21	18	16	11	19	27	21	32	24	25	42	46	48	92	94	100	87	85	61	74	70	65	65
50	165.73	11.7	24	26	16	20	28	30	28	23	15	2	27	23	30	26	27	46	48	49	86	87	87	100	87	62	78	74	69	68
51	183.16	9.8	25	26	14	13	17	16	13	13	8	16	29	18	30	19	19	38	45	51	81	86	85	87	100	73	86	81	74	69
52	202.42	13.5	21	22	13	11	15	13	11	12	5	10	22	16	21	13	13	30	37	43	55	61	61	62	73	100	70	66	61	50
53	223.71	14.8	34	31	20	18	25	24	22	22	8	15	33	25	26	23	23	44	52	59	71	76	74	78	86	70	100	94	88	72
54	247.24	17.8	32	29	19	16	23	22	20	20	8	14	33	25	27	24	24	44	57	63	68	72	70	74	81	66	94	100	95	73
55	273.24	19.2	30	28	19	17	22	21	20	20	7	13	33	26	25	22	22	45	60	67	64	67	65	69	74	61	88	95	100	70
56	301.98	15.5	31	32	22	21	33	32	30	28	11	18	46	19	35	33	33	32	47	53	65	67	65	68	69	50	72	73	70	100
57	333.74	15.6	31	33	23	23	35	34	32	30	12	19	46	21	34	34	34	33	46	51	65	66	64	68	67	49	71	72	69	99
58	368.84	14.7	31	32	23	24	34	32	30	29	9	17	43	19	32	28	28	29	43	51	62	65	62	65	69	51	72	72	70	93
59	407.63	14.7	33	30	19	23	30	28	25	23	10	18	81	15	58	34	33	28	42	48	30	31	32	33	33	26	39	40	39	53
60	450.50	14.4	34	30	19	24	31	29	26	23	11	19	76	18	60	38	38	32	45	48	32	31	33	34	31	23	37	38	37	52
61	497.88	13.9	35	32	20	21	31	28	25	24	8	17	43	16	40	35	34	31	48	54	68	71	70	70	72	52	73	73	67	90
62	550.24	19.1	32	29	18	21	28	26	23	22	6	15	48	14	47	33	31	27	42	48	41	44	46	50	54	43	59	58	52	73
63	608.11	19.5	32	29	18	20	26	24	21	21	4	13	45	12	45	31	28	23	41	49	41	45	46	51	58	46	62	61	54	75
64	672.06	20.5	30	27	17	14	24	22	20	19	5	12	45	11	45	29	26	23	40	48	39	44	43	49	57	46	62	60	54	75
65	742.74	19.5	31	29	18	15	26	24	22	21	7	14	44	12	40	32	30	26	42	50	54	58	56	61	67	50	70	70	64	89
66	820.86	24.9	27	25	16	13	23	22	20	18	8	13	47	12	42	29	28	24	37	42	33	35	35	41	45	56	51	51	46	64
67	907.19	24.0	28	26	16	19	23	22	20	18	8	14	65	12	51	30	29	24	36	40	25	26	26	31	34	27	39	40	37	51
68	1002.60	27.7	31	28	17	21	26	25	22	20	8	15	70	14	57	33	31	26	40	45	46	47	45	43	42	29	44	45	45	62
69	1108.04	28.4	33	31	19	22	28	27	23	22	8	15	60	15	59	35	34	28	43	48	54	56	54	53	53	37	54	55	52	73
70	1224.57	29.8	34	32	20	23	29	28	24	23	8	16	57	15	54	36	34	28	44	50	56	58	56	55	55	39	57	58	55	76
71	1353.36	26.3	25	21	13	17	23	18	16	17	6	15	53	12	45	25	25	25	36	41	48	49	48	47	46	33	47	49	47	63
72	1495.69	18.9	17	14	9	12	16	13	12	13	3	11	44	9	34	18	18	18	28	32	41	41	40	37	37	25	38	41	37	50
73	1653.00	12.8	18	15	9	14	19	15	14	16	5	14	56	11	40	22	24	24	36	41	35	36	35	34	32	24	35	37	37	50
74	1826.84	12.8	5	3	1	5	8	6	5	7	-1	4	17	6	28	13	15	16	24	26	35	34	32	29	24	16	24	27	27	37
75	2018.97	17.5	C	0	0	2	5	3	3	5	-3	2	8	4	20	8	9	11	17	20	33	32	29	26	20	13	21	23	24	32
76	2231.31	22.0	C	0	0	2	5	4	3	5	-4	2	7	4	20	7	7	10	17	21	31	30	28	25	19	13	21	23	23	32
77	2465.97	24.3	-1	-1	-1	1	4	3	3	5	-1	3	13	4	17	7	9	11	17	20	28	28	26	23	17	12	19	21	22	30
78	2725.32	26.4	-1	-1	-2	1	4	3	3	5	-1	3	12	5	21	10	12	14	21	23	23	23	21	18	13	10	16	18	18	25
79	3011.94	33.0	-1	-1	-2	0	3	2	2	5	0	3	15	4	18	9	12	13	19	21	27	27	25	22	16	11	18	20	21	28
80	3328.71	42.0	-1	-1	-1	1	3	3	3	5	0	3	14	4	18	9	11	13	18	21	29	29	27	24	18	12	19	21	22	30
81	3678.79	49.5	1	0	0	3	6	4	4	6	0	4	17	5	22	10	12	14	21	24	32	32	30	27	21	14	23	25	25	34
82	4065.70	58.4	2	1	0	3	6	5	4	7	-1	4	16	5	22	10	11	13	20	24	31	30	28	25	20	14	22	24	24	33
83	4493.29	56.0	1	0	0	3	6	5	4	4	0	4	16	5	22	10	12	14	21	24	29	29	27	24	19	13	21	23	23	31
84	4965.85	50.6	4	3	0	4	8	6	5	8	0	5	22	6	27	13	15	17	25	28	25	25	24	22	17	13	21	22	22	30

85	5488.11	47.0	10	8	3	8	11	9	8	10	1	8	31	8	35	18	20	21	30	33	35	35	33	31	27	19	28	30	30	41
86	6065.30	72.5	21	16	10	15	20	15	13	14	0	9	38	10	42	20	18	19	30	36	35	35	34	33	31	22	33	35	35	46
87	6703.20	90.9	20	15	10	15	20	15	12	14	-1	9	37	10	40	19	16	18	29	35	34	34	33	32	31	22	32	34	34	46
88	7408.18	91.8	21	17	10	15	20	15	13	14	0	10	40	10	42	21	19	20	31	36	36	37	35	34	33	23	34	36	36	48
89	8187.30	122.0	21	16	10	14	19	15	12	13	1	10	40	10	40	20	19	19	30	34	21	21	21	21	22	18	25	26	26	34
90	9048.37	137.2	21	17	10	15	19	15	13	14	2	11	42	10	41	21	20	20	31	35	21	22	22	22	23	18	26	27	26	35
91	10000.00	127.8	24	21	11	16	18	15	14	14	6	12	50	11	45	26	27	25	35	37	23	24	23	24	25	19	27	28	27	36
92	11052.00																													

CORR*100

I	ELO(KEV)	RSD PCT	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84
57	333.74	15.6	100	93	53	52	90	74	75	74	87	63	50	61	72	75	61	49	48	35	31	30	28	23	27	28	33	31	30	29
58	368.84	14.7	93	100	50	48	88	75	74	72	83	59	48	57	68	71	58	46	45	32	22	24	21	21	22	21	30	29	27	27
59	407.63	14.7	53	50	100	98	56	65	60	59	54	58	79	87	76	72	73	63	77	38	29	31	29	30	26	26	35	35	33	42
60	450.50	14.4	52	48	98	100	54	63	57	56	51	56	77	86	75	71	72	61	75	38	28	30	29	30	26	26	34	35	33	41
61	497.88	13.9	90	88	56	54	100	75	78	74	84	59	45	63	77	80	66	53	50	37	32	32	29	24	26	28	33	33	30	30
62	550.24	19.1	74	75	65	63	75	100	92	93	82	76	63	58	73	75	57	41	50	28	17	20	18	22	18	16	26	26	24	30
63	608.11	19.5	75	74	60	57	78	92	100	93	87	75	62	55	70	72	54	41	46	25	20	21	19	20	17	17	23	23	22	27
64	672.06	20.5	74	72	59	56	74	93	93	100	88	82	63	54	69	71	52	38	44	24	19	20	19	20	17	17	22	22	21	26
65	742.74	19.5	87	83	54	51	84	82	87	88	100	75	60	59	72	75	58	46	45	32	27	27	25	23	24	25	29	29	27	28
66	820.86	24.9	63	59	58	56	59	76	75	82	75	100	65	52	63	67	50	39	42	21	15	16	15	16	14	14	19	19	18	23
67	907.19	24.0	50	48	79	77	45	63	62	63	60	65	100	71	63	61	59	60	63	32	23	24	23	24	22	22	28	28	27	34
68	1002.60	27.7	61	57	87	86	63	58	55	54	59	52	71	100	87	83	83	77	76	55	48	47	43	36	39	42	50	48	45	45
69	1108.04	28.4	72	68	76	75	77	73	70	69	72	63	63	87	100	94	82	66	65	48	42	42	37	32	34	37	43	42	40	40
70	1224.57	29.8	75	71	72	71	80	75	72	71	75	67	61	83	94	100	81	67	62	46	40	40	35	29	32	34	41	40	37	37
71	1353.36	26.3	61	58	73	72	66	57	54	52	58	50	59	83	82	81	100	86	78	57	51	51	46	39	42	45	53	52	48	48
72	1495.69	18.9	49	46	63	61	53	41	41	38	46	39	60	77	66	67	86	100	83	69	64	65	60	52	56	59	67	64	61	59
73	1653.00	12.8	48	45	77	75	50	50	46	44	45	42	63	76	65	62	78	83	100	77	69	72	72	73	71	71	78	75	74	79
74	1826.84	12.8	35	32	38	38	37	28	25	24	32	21	32	55	48	46	57	69	77	100	86	88	87	86	88	87	92	98	97	94
75	2018.97	17.5	31	22	29	28	32	17	20	19	27	15	23	48	42	40	51	64	69	86	100	99	97	86	90	96	90	86	85	80
76	2231.31	22.0	30	24	31	30	32	20	21	20	27	16	24	47	42	40	51	65	72	88	99	100	98	89	91	95	93	89	87	83
77	2465.97	24.3	28	21	29	29	29	18	19	19	25	15	23	43	37	35	46	60	72	87	97	98	100	93	96	99	94	89	89	86
78	2725.32	26.4	23	21	30	30	24	22	20	20	23	16	24	36	32	29	39	52	73	86	86	89	93	100	97	94	96	90	91	92
79	3011.94	33.0	27	22	26	26	26	18	17	17	24	14	22	39	34	32	42	56	71	88	90	91	96	97	100	98	97	90	92	89
80	3328.71	42.0	28	21	26	26	28	16	17	17	25	14	22	42	37	34	45	59	71	87	96	95	99	94	98	100	95	89	90	86
81	3676.79	49.5	33	30	35	34	33	26	23	22	29	19	28	50	43	41	53	67	78	92	90	93	94	96	97	95	100	93	93	90
82	4065.70	58.4	31	29	35	35	33	26	23	22	29	19	28	48	42	40	52	64	75	98	86	89	89	90	90	89	93	100	99	96
83	4493.29	56.0	30	27	33	33	30	24	22	21	27	18	27	45	40	37	48	61	74	97	85	87	89	91	92	90	93	99	100	97
84	4965.85	50.6	29	27	42	41	30	30	27	26	28	23	34	45	40	37	48	59	79	94	80	83	86	92	89	86	90	96	97	100
85	5488.11	47.0	39	36	52	51	41	36	32	31	37	29	44	62	54	51	64	73	86	97	81	83	83	84	85	84	89	96	95	95
86	6065.30	72.5	45	43	70	69	51	47	44	41	43	38	56	75	65	63	77	79	79	66	54	56	48	41	39	43	54	60	55	58
87	6703.20	90.9	44	43	69	68	50	47	43	41	42	37	56	73	64	62	76	78	78	66	54	56	48	41	39	42	53	60	55	57
88	7408.18	91.8	46	45	71	69	51	47	44	41	43	38	57	76	66	64	78	80	80	67	54	56	48	41	40	44	54	61	56	58
89	8187.30	122.0	33	33	67	66	38	44	41	39	34	37	55	57	50	47	58	56	67	42	31	34	29	30	24	25	34	39	36	45
90	9048.37	137.2	34	34	68	67	39	45	41	39	34	37	56	58	50	48	59	56	67	42	30	32	29	29	24	25	33	39	36	45
91	10000.00	127.8	35	34	67	67	38	43	40	38	35	38	58	59	51	48	57	53	65	37	23	23	23	25	23	23	29	33	32	40
92	11052.00																													

CORR*100

I	ELO(KEV)	RSD PCT	85	86	87	88	89	90	91
85	5488.11	47.0	100	72	72	74	53	54	52
86	6065.30	72.5	72	100	99	99	78	77	67
87	6703.20	90.9	72	99	100	99	78	77	66
88	7408.18	91.8	74	99	99	100	77	77	69
89	8187.30	122.0	53	78	78	77	100	99	90
90	9048.37	137.2	54	77	77	77	99	100	93
91	10000.00	127.8	52	67	66	69	90	93	100
92	11052.00								

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I	ELO(KEV)	RSD PCT	CORR*100 1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	0.10	6.2	100	86	98	30	54	15	63	-7	-59	-25	-5	-46	20	-1
2	0.20	5.3	86	100	87	-4	24	-11	19	-36	-77	-50	-38	-70	6	25
3	0.30	7.5	98	87	100	35	57	22	59	-2	-60	-19	-1	-40	30	11
4	0.40	3.4	30	-4	35	100	89	84	68	85	12	78	84	67	82	-2
5	0.50	4.1	54	24	57	89	100	70	63	70	-27	61	72	40	83	2
6	0.60	6.3	15	-11	22	84	70	100	52	88	7	82	87	71	67	-17
7	0.70	4.4	63	19	59	68	63	52	100	39	13	25	44	17	29	-33
8	0.80	6.6	-7	-36	-2	85	70	68	39	100	17	97	98	88	69	-24
9	0.90	4.3	-59	-77	-60	12	-27	7	13	17	100	26	17	51	-10	-10
10	1.00	7.9	-25	-50	-19	78	61	82	25	97	26	100	95	94	70	-15
11	2.00	8.6	-5	-38	-1	84	72	67	44	98	17	95	100	88	65	-30
12	3.00	6.0	-46	-70	-40	67	40	71	17	88	51	94	88	100	52	-15
13	4.00	5.2	20	6	30	82	83	67	29	69	-10	70	65	52	100	43
14	5.00	8.7	-1	25	11	-2	2	-17	-33	-24	-10	-15	-30	-15	43	100
15	6.00	5.0	-53	-43	-43	21	8	7	-37	21	36	38	17	46	54	70
16	7.00	3.8	33	58	42	7	22	-8	-22	-16	-46	-20	-22	-24	36	72
17	8.00	6.4	1	20	11	-30	-41	-22	-8	-47	17	-44	-50	-31	-16	56
18	9.00	6.9	-37	-30	-24	24	3	12	-18	14	45	25	10	40	46	75
19	10.00	3.7	-34	-46	-33	12	9	1	-1	13	33	26	18	31	23	20
20	20.00	3.3	-3	-19	-6	21	22	1	19	8	20	14	14	17	19	11
21	30.00	0.4	-8	-6	-8	14	14	9	0	14	1	18	14	18	19	13
22	40.00	2.6	9	-6	5	26	17	8	27	10	26	9	9	10	13	-3
23	50.00	2.9	-7	7	-3	-28	-19	-9	-27	-13	-26	-12	-12	-13	-16	1
24	60.00	0.9	1	9	3	-27	-22	-12	-15	-18	-16	-20	-17	-21	-23	-9
25	70.00	0.9	-12	-1	-9	-3	2	3	-16	5	-13	9	6	9	7	13
26	80.00	2.4	12	-2	8	16	8	2	24	2	22	0	1	0	3	-9
27	90.00	1.6	10	-4	6	22	13	5	27	7	25	4	6	5	8	-6
28	100.00	4.0	-13	3	-9	-22	-12	-4	-30	-5	-27	-2	-4	-3	-6	9
29	200.00	2.1	-6	-5	-6	11	11	7	0	11	1	14	11	14	15	11
30	300.00	2.6	-7	-5	-6	11	12	8	0	11	1	15	11	15	15	11
31	400.00	4.5	-5	-4	-5	9	9	6	0	9	1	11	9	11	12	8
32	500.00	3.0	-7	-5	-6	11	12	8	0	11	1	15	11	15	15	11
33	600.00	2.3	-6	-5	-6	11	11	7	0	11	1	14	11	14	15	11
34	700.00	1.5	-6	-4	-5	10	10	7	0	10	1	13	10	13	14	10
35	800.00	0.4	-6	-4	-6	10	11	7	0	10	1	13	10	13	14	10
36	900.00	0.5	-6	-5	-6	11	11	7	0	11	1	14	11	14	15	10
37	1000.00	2.2	5	4	5	-9	-9	-6	0	-9	-1	-12	-9	-11	-12	-8
38	2000.00	0.6	-6	-4	-6	10	11	7	0	10	1	13	10	13	14	10
39	3000.00	0.5	-7	-5	-6	11	12	8	0	11	1	15	11	15	15	11
40	4000.00	1.0	-4	-3	-4	7	7	4	0	7	1	9	7	9	9	7
41	5000.00	2.2	3	2	2	-5	-5	-3	0	-5	0	-6	-5	-6	-6	-4
42	6000.00	1.5	-5	-4	-5	10	10	6	0	10	1	12	10	12	13	9
43	7000.00	5.2	-6	-4	-5	10	10	7	0	10	1	13	10	13	13	10
44	8000.00	4.4	-6	-4	-6	10	11	7	0	11	1	13	10	13	14	10
45	9000.00	3.0	-7	-5	-6	11	12	7	0	11	1	15	11	14	15	11
46	10000.00															

I	ELO(KEV)	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	0.10	-53	33	1	-37	-34	-3	-8	9	-7	1	-12	12	10	-13
2	0.20	-43	58	20	-30	-46	-19	-6	-6	7	9	-1	-2	-4	3
3	0.30	-43	42	11	-24	-33	-6	-8	5	-3	3	-9	8	6	-9
4	0.40	21	7	-30	24	12	21	14	26	-28	-27	-3	16	22	-22
5	0.50	8	22	-41	2	9	22	14	17	-19	-22	2	8	13	-12
6	0.60	7	-8	-22	12	1	1	9	8	-9	-12	3	2	5	-4
7	0.70	-37	-22	-8	-18	-1	19	0	27	-27	-15	-16	24	27	-30
8	0.80	21	-16	-47	14	13	8	14	10	-13	-18	5	2	7	-5
9	0.90	36	-46	17	45	33	20	1	26	-26	-16	-13	22	25	-27
10	1.00	38	-20	-44	25	26	14	18	9	-12	-20	9	0	4	-2
11	2.00	17	-22	-50	10	18	14	14	9	-12	-17	6	1	6	-4
12	3.00	46	-24	-31	40	31	17	18	10	-13	-21	9	0	5	-3
13	4.00	54	36	-16	46	23	19	19	13	-16	-23	7	3	8	-6
14	5.00	70	72	56	75	20	11	13	-3	1	-9	13	-9	-6	9
15	6.00	100	35	12	87	48	26	21	9	-13	-23	12	-1	4	0
16	7.00	35	100	22	43	-20	-3	8	0	-1	-7	7	-4	-1	3
17	8.00	12	22	100	47	-1	-8	-3	-13	14	11	5	-10	-12	13
18	9.00	87	43	47	100	36	20	14	9	-11	-16	6	1	5	-3
19	10.00	48	-20	-1	36	100	64	21	6	-9	-21	14	-4	0	2
20	20.00	26	-3	-6	20	64	100	47	33	-41	-58	19	7	21	-15
21	30.00	21	8	-3	14	21	47	100	0	-17	-81	81	-46	-22	31
22	40.00	9	0	-13	5	6	33	0	100	-98	-57	-57	88	97	-80
23	50.00	-13	-1	14	-11	-9	-41	-17	-98	100	71	42	-78	-91	73
24	60.00	-23	-7	11	-16	-21	-58	-81	-57	71	100	-33	-12	-37	20
25	70.00	12	7	5	6	14	19	81	-57	42	-33	100	-89	-74	72
26	80.00	-1	-4	-10	1	-4	7	-46	88	-78	-12	-89	100	96	-85
27	90.00	4	-1	-12	5	0	21	-22	97	-91	-37	-74	96	100	-85
28	100.00	0	3	13	-3	2	-15	31	-80	73	20	72	-85	-85	100
29	200.00	17	6	-2	11	17	38	80	0	-13	-65	65	-37	-18	26
30	300.00	17	7	-3	11	17	39	81	0	-14	-66	66	-38	-18	25
31	400.00	13	5	-2	8	13	30	64	0	-11	-52	52	-30	-14	18
32	500.00	17	7	-3	11	17	39	81	0	-14	-66	66	-38	-18	26
33	600.00	17	6	-2	11	17	38	80	0	-13	-65	65	-37	-18	24
34	700.00	15	6	-2	10	15	35	73	0	-12	-59	59	-34	-16	21
35	800.00	16	6	-2	10	16	35	74	0	-12	-60	60	-34	-17	25
36	900.00	17	6	-2	11	16	37	78	0	-13	-64	64	-36	-18	26
37	1000.00	-13	-5	2	-9	-13	-31	-64	0	11	52	-52	30	14	-23
38	2000.00	16	6	-2	10	16	35	74	0	-13	-61	61	-35	-17	22
39	3000.00	17	7	-3	11	17	39	81	0	-14	-66	66	-38	-18	26
40	4000.00	10	4	-1	7	10	24	50	0	-8	-41	41	-23	-11	19
41	5000.00	-7	-3	1	-4	-7	-16	-35	0	6	28	-28	16	8	-7
42	6000.00	14	5	-2	9	14	32	68	0	-11	-56	56	-32	-15	19
43	7000.00	15	6	-2	10	15	34	72	0	-12	-58	58	-33	-16	21
44	8000.00	16	6	-2	10	16	36	75	0	-13	-61	61	-35	-17	22
45	9000.00	17	6	-2	11	17	38	81	0	-14	-66	66	-37	-18	25
46	10000.00														

I	ELO(KEV)	RSD PCT	CORR*100 29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
29	200.00	2.1	100	97	66	98	93	80	97	99	-88	82	98	75	-26	73	78	83	95
30	300.00	2.6	97	100	80	99	98	91	89	95	-77	92	99	59	-46	86	90	93	99
31	400.00	4.5	66	80	100	76	88	97	46	59	-24	96	78	0	-89	99	98	96	85
32	500.00	3.0	98	99	76	100	97	88	92	97	-81	90	99	64	-40	82	87	91	98
33	600.00	2.3	93	98	88	97	100	96	82	89	-66	97	98	46	-59	92	95	97	99
34	700.00	1.5	80	91	97	88	96	100	64	75	-44	99	89	21	-78	99	99	99	94
35	800.00	0.4	97	89	46	92	82	64	100	98	-97	67	91	88	-2	55	61	68	85
36	900.00	0.5	99	95	59	97	89	75	98	100	-92	77	96	80	-17	67	73	78	92
37	1000.00	2.2	-88	-77	-24	-81	-66	-44	-97	-92	100	-48	-79	-96	-20	-34	-41	-49	-71
38	2000.00	0.6	82	92	96	90	97	99	67	77	-48	100	91	25	-75	98	99	99	95
39	3000.00	0.5	98	99	78	99	98	89	91	96	-79	91	100	61	-43	84	88	92	99
40	4000.00	1.0	75	59	0	64	46	21	88	80	-96	25	61	100	43	9	18	27	52
41	5000.00	2.2	-26	-46	-89	-40	-59	-78	-2	-17	-20	-75	-43	43	100	-84	-80	-74	-53
42	6000.00	1.5	73	86	99	82	92	99	55	67	-34	98	84	9	-84	100	99	98	90
43	7000.00	5.2	78	90	98	87	95	99	61	73	-41	99	88	18	-80	99	100	99	93
44	8000.00	4.4	83	93	96	91	97	99	68	78	-49	99	92	27	-74	98	99	100	96
45	9000.00	3.0	95	99	85	98	99	94	85	92	-71	95	99	52	-53	90	93	96	100
46	10000.00																		

PU 239 CAPTURE 36 GROUPS

I	ELO(KEV)	RSD PCT	CORR*100 1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	0.10	9.2	100	51	-21	-24	45	-21	-10	28	-10	-42	-30	-31	31	-10
2	0.20	11.5	51	100	30	-5	73	-29	20	52	19	-11	-9	-7	47	19
3	0.30	11.3	-21	30	100	-11	-10	26	25	-16	-11	-8	-3	30	-24	-37
4	0.40	22.6	-24	-5	-11	100	33	5	87	41	87	53	29	52	-32	-9
5	0.50	7.2	45	73	-10	33	100	-13	44	88	62	20	2	4	41	13
6	0.60	11.5	-21	-29	26	5	-13	100	15	2	18	54	51	73	-28	-22
7	0.70	11.1	-10	20	25	87	44	15	100	45	84	34	11	53	-37	-25
8	0.80	18.0	28	52	-16	41	88	2	45	100	67	35	9	15	55	32
9	0.90	19.3	-10	19	-11	87	62	18	84	67	100	56	27	57	-13	1
10	1.00	11.7	-42	-11	-8	53	20	54	34	35	56	100	91	75	-1	22
11	2.00	8.8	-30	-9	-3	29	2	51	11	9	27	91	100	69	-2	19
12	3.00	12.4	-31	-7	30	52	4	73	53	15	57	75	69	100	-38	-17
13	4.00	7.8	31	47	-24	-32	41	-28	-37	55	-13	-1	-2	-38	100	74
14	5.00	6.9	-10	19	-37	-9	13	-22	-25	32	1	22	19	-17	74	100
15	6.00	6.5	-36	19	27	-12	-6	17	-7	21	2	23	16	22	49	67
16	7.00	5.7	33	13	-24	-22	33	53	-25	48	6	42	43	25	53	27
17	8.00	6.7	-44	-52	23	2	-58	65	6	-31	-6	25	26	45	-29	5
18	9.00	10.5	0	-49	-17	-40	-57	40	-57	-38	-48	12	32	15	4	3
19	10.00	8.8	6	10	-24	12	35	-4	-7	49	10	43	41	1	53	24
20	20.00	9.7	-29	-38	2	26	-31	47	9	3	9	51	51	53	1	10
21	30.00	8.7	12	13	-5	5	1	6	6	11	2	10	14	4	24	36
22	40.00	7.9	36	23	-20	4	11	-13	-4	14	4	0	8	4	26	18
23	50.00	11.6	31	18	-21	-1	14	-24	-13	11	0	-9	-5	-6	19	-2
24	60.00	9.8	24	18	-20	-2	13	-21	-11	14	-2	-7	-5	-14	28	10
25	70.00	11.5	23	13	-19	-4	14	-27	-16	8	-2	-12	-12	-14	15	-9
26	80.00	10.5	17	15	-16	-3	10	-15	-9	14	-3	-4	-4	-16	29	17
27	90.00	10.6	13	13	-3	7	0	10	10	10	4	13	19	12	20	36
28	100.00	14.3	-37	-22	20	-3	-12	17	6	-12	-4	2	-5	-4	-21	-9
29	200.00	3.2	6	5	-7	-2	5	-10	-6	5	-2	-4	-6	-9	10	0
30	300.00	9.6	6	5	-7	-2	5	-10	-6	5	-2	-4	-6	-9	10	0
31	400.00	4.1	6	5	-7	-2	5	-10	-6	5	-2	-4	-6	-9	10	0
32	500.00	27.4	-6	-5	7	2	-5	10	6	-5	2	4	6	9	-10	0
33	600.00	47.6	-6	-5	7	2	-5	10	6	-5	2	4	6	9	-10	0
34	700.00	81.2	-6	-5	7	2	-5	10	6	-5	2	4	6	9	-10	0
35	800.00	133.1	-6	-5	7	2	-5	10	6	-5	2	4	6	9	-10	0
36	900.00	174.6	-6	-5	7	2	-5	10	6	-5	2	4	6	9	-10	0
37	1000.00															

I	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	-36	33	-44	0	6	-29	12	36	31	24	23	17	13	-37
2	19	13	-52	-49	10	-38	13	23	18	18	13	15	13	-22
3	27	-24	23	-17	-24	2	-5	-20	-21	-20	-19	-16	-3	20
4	-12	-22	2	-40	12	26	5	4	-1	-2	-4	-3	7	-3
5	-6	33	-58	-57	35	-31	1	11	14	13	14	10	0	-12
6	17	53	65	40	-4	47	6	-13	-24	-21	-27	-15	10	17
7	-7	-25	6	-57	-7	9	6	-4	-13	-11	-16	-9	10	6
8	21	48	-31	-38	49	3	11	14	11	14	8	14	10	-12
9	2	6	-6	-48	10	9	2	4	0	-2	-2	-3	4	-4
10	23	42	25	12	43	51	10	0	-9	-7	-12	-4	13	2
11	16	43	26	32	41	51	14	8	-5	-5	-12	-4	19	-5
12	22	25	45	15	1	53	4	4	-6	-14	-14	-16	12	-4
13	49	53	-29	4	53	1	24	26	19	28	15	29	20	-21
14	67	27	5	3	24	10	36	18	-2	10	-9	17	36	-9
15	100	24	39	10	2	34	28	11	-6	4	-11	10	29	-3
16	24	100	7	44	47	32	19	23	15	20	11	20	18	-20
17	39	7	100	47	-32	60	26	-13	-39	-27	-46	-16	32	23
18	10	44	47	100	16	59	5	16	10	1	2	-3	10	-18
19	2	47	-32	16	100	37	0	16	22	20	22	17	-2	-17
20	34	32	60	59	37	100	26	21	3	5	-6	7	30	-17
21	28	19	26	5	0	26	100	56	3	42	-13	60	96	-31
22	11	23	-13	16	16	21	56	100	80	79	61	67	53	-96
23	-6	15	-39	10	22	3	3	80	100	84	95	62	-4	-89
24	4	20	-27	1	20	5	42	79	84	100	82	94	23	-73
25	-11	11	-46	2	22	-6	-13	61	95	82	100	62	-27	-72
26	10	20	-16	-3	17	7	60	67	62	94	62	100	39	-54
27	29	18	32	10	-2	30	96	53	-4	23	-27	39	100	-31
28	-3	-20	23	-18	-17	-17	-31	-96	-89	-73	-72	-54	-31	100
29	0	6	-15	-2	9	-2	8	24	34	42	38	40	-1	-23
30	0	6	-15	-2	9	-2	8	24	34	42	38	40	-1	-23
31	0	6	-15	-2	9	-2	8	24	34	42	38	40	-1	-23
32	0	-6	15	2	-9	2	-8	-24	-34	-42	-38	-40	1	23
33	0	-6	15	2	-9	2	-8	-24	-34	-42	-38	-40	1	23
34	0	-6	15	2	-9	2	-8	-24	-34	-42	-38	-40	1	23
35	0	-6	15	2	-9	2	-8	-24	-34	-42	-38	-40	1	23
36	0	-6	15	2	-9	2	-8	-24	-34	-42	-38	-40	1	23
37														

I	ELO(KEV)	RSD PCT	CORR*100 29	30	31	32	33	34	35	36
29	200.00	3.2	100	100	100	-100	-100	-99	-100	-99
30	300.00	9.6	100	100	100	-99	-100	-100	-100	-100
31	400.00	4.1	100	100	100	-100	-100	-100	-100	-100
32	500.00	27.4	-100	-99	-100	100	100	100	100	100
33	600.00	47.6	-100	-100	-100	100	100	100	100	99
34	700.00	81.2	-99	-100	-100	100	100	100	100	99
35	800.00	133.1	-100	-100	-100	100	100	100	100	100
36	900.00	174.6	-99	-100	-100	100	99	99	100	100
37	1000.00									

PU 240 CAPTURE 45 GROUPS

I	ELO(KEV)	RSD PCT	CORR*100 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	0.10	8.8	100	100	100	-100	100	-100	-99	100	-100	-2	-36	59	-13	0	-22	0	12	14	-22	-2	72	79	83	77	76	73	69	77
2	0.20	5.0	100	100	100	-99	100	-100	-100	100	-100	-2	-36	59	-13	0	-22	0	12	14	-22	-2	72	79	83	77	76	73	69	77
3	0.30	21.2	100	100	100	-100	100	-100	-100	100	-100	-2	-36	59	-13	0	-22	0	12	14	-22	-2	72	79	83	77	76	73	69	77
4	0.40	2.5	-100	-99	-100	100	-99	100	100	-100	100	2	36	-59	13	0	22	0	-12	-14	22	2	-72	-79	-83	-77	-76	-73	-69	-77
5	0.50	6.6	100	100	100	-99	100	-100	-100	100	-100	-2	-36	59	-13	0	-22	0	12	14	-22	-2	72	79	83	77	76	73	69	77
6	0.60	1.5	-100	-100	-100	100	-100	100	100	-100	99	2	36	-59	13	0	22	0	-12	-14	22	2	-72	-79	-83	-77	-76	-73	-69	-77
7	0.70	17.1	-99	-100	-100	100	-100	100	100	-100	100	2	36	-59	13	0	22	0	-12	-14	22	2	-72	-79	-83	-77	-76	-73	-69	-77
8	0.80	4.1	100	100	100	-100	100	-100	-100	100	-100	-2	-36	59	-13	0	-22	0	12	14	-22	-2	72	79	83	77	76	73	69	77
9	0.90	17.0	-100	-100	-100	100	-100	99	100	-100	100	2	36	-59	13	0	22	0	-12	-14	22	2	-72	-79	-83	-77	-76	-73	-69	-77
10	1.00	13.4	-2	-2	-2	2	-2	2	2	-2	2	100	89	65	99	99	66	72	64	52	57	47	57	41	30	41	43	46	51	39
11	2.00	11.5	-36	-36	-36	36	-36	36	36	-36	36	89	100	24	92	88	70	66	54	43	65	47	18	-1	-12	-3	-1	2	7	-4
12	3.00	21.1	59	59	59	-59	59	-59	-59	59	-59	65	24	100	57	66	25	44	48	40	13	23	95	93	89	94	95	96	98	94
13	4.00	10.9	-13	-13	-13	13	-13	13	13	-13	13	99	92	57	100	98	69	71	62	49	59	47	47	30	19	30	32	36	41	29
14	5.00	11.0	0	0	0	0	0	0	0	0	0	99	88	66	98	100	66	72	65	52	57	47	59	42	32	42	44	47	51	41
15	6.00	8.3	-22	-22	-22	22	-22	22	22	-22	22	66	70	25	69	66	100	83	62	40	69	40	19	5	-2	5	6	9	13	4
16	7.00	7.9	0	0	0	0	0	0	0	0	0	72	66	44	71	72	83	100	95	83	87	79	42	29	21	28	29	31	34	27
17	8.00	8.7	12	12	12	-12	12	-12	-12	12	-12	64	54	48	62	65	62	95	100	96	85	89	48	37	31	36	37	38	40	35
18	9.00	10.1	14	14	14	-14	14	-14	-14	14	-14	52	43	40	49	52	40	83	96	100	82	96	42	33	29	32	32	33	34	31
19	10.00	9.7	-22	-22	-22	22	-22	22	22	-22	22	57	65	13	59	57	69	87	85	82	100	91	12	-1	-8	-2	-1	0	2	-3
20	20.00	11.8	-2	-2	-2	2	-2	2	2	-2	2	47	47	23	47	47	40	79	89	96	91	100	24	14	9	12	13	14	15	12
21	30.00	21.0	72	72	72	-72	72	-72	-72	72	-72	57	18	95	47	59	19	42	48	42	12	24	100	97	95	96	96	96	95	96
22	40.00	29.2	79	79	79	-79	79	-79	-79	79	-79	41	-1	93	30	42	5	29	37	33	-1	14	97	100	99	99	99	98	97	99
23	50.00	48.5	83	83	83	-83	83	-83	-83	83	-83	30	-12	89	19	32	-2	21	31	29	-8	9	95	99	100	98	98	97	95	98
24	60.00	39.3	77	77	77	-77	77	-77	-77	77	-77	41	-3	94	30	42	5	28	36	32	-2	12	96	99	98	100	99	99	98	99
25	70.00	38.1	76	76	76	-76	76	-76	-76	76	-76	43	-1	95	32	44	6	29	37	32	-1	13	96	99	98	99	100	99	99	99
26	80.00	36.3	73	73	73	-73	73	-73	-73	73	-73	46	2	96	36	47	9	31	38	33	0	14	96	98	97	99	99	100	99	99
27	90.00	32.2	69	69	69	-69	69	-69	-69	69	-69	51	7	98	41	51	13	34	40	34	2	15	95	97	95	98	99	99	100	98
28	100.00	34.1	77	77	77	-77	77	-77	-77	77	-77	39	-4	94	29	41	4	27	35	31	-3	12	96	99	98	99	99	99	98	100
29	200.00	19.0	47	47	47	-47	47	-47	-47	47	-47	69	29	98	62	69	30	45	46	38	15	22	87	85	80	88	89	92	94	88
30	300.00	36.5	0	0	0	0	0	0	0	0	0	36	26	32	35	35	22	23	20	15	15	12	23	20	16	21	22	24	27	21
31	400.00	30.3	0	0	0	0	0	0	0	0	0	35	25	32	34	34	21	22	19	14	14	11	22	19	16	21	22	24	27	21
32	500.00	26.4	0	0	0	0	0	0	0	0	0	35	26	32	35	35	22	23	20	15	14	12	23	20	16	21	22	24	27	21
33	600.00	22.7	0	0	0	0	0	0	0	0	0	36	27	32	36	36	22	24	21	16	15	13	23	20	16	21	22	24	27	21
34	700.00	9.2	0	0	0	0	C	0	0	0	0	38	29	32	38	37	24	25	22	17	17	14	24	20	16	21	22	24	27	21
35	800.00	2.4	0	0	0	0	0	0	0	0	0	-7	4	-19	-7	-5	-1	0	0	2	5	4	-7	-11	-10	-14	-15	-16	-19	-15
36	900.00	1.8	0	0	0	0	0	0	0	0	0	-7	4	-19	-7	-5	-1	0	0	2	5	4	-7	-11	-10	-14	-15	-16	-19	-15
37	1000.00	10.5	0	0	0	0	C	0	0	0	0	-29	-18	-30	-29	-28	-17	-18	-15	-11	-9	-8	-20	-18	-15	-21	-22	-24	-27	-21
38	2000.00	14.3	0	0	0	0	0	0	0	0	0	-42	-36	-29	-42	-42	-27	-30	-27	-21	-22	-19	-25	-19	-14	-19	-20	-22	-24	-19
39	3000.00	20.6	0	0	0	0	0	0	0	0	0	-34	-24	-31	-34	-34	-21	-22	-19	-14	-13	-11	-22	-19	-16	-21	-22	-24	-27	-21
40	4000.00	19.4	0	0	0	0	0	0	0	0	0	-39	-31	-32	-39	-39	-25	-26	-23	-18	-18	-15	-24	-20	-16	-21	-22	-24	-26	-21
41	5000.00	16.1	0	0	0	0	0	0	0	0	0	-34	-24	-31	-34	-34	-21	-22	-19	-14	-13	-11	-22	-19	-16	-21	-22	-24	-27	-21
42	6000.00	11.8	0	0	0	0	C	C	0	0	0	-30	-20	-31	-30	-30	-18	-19	-16	-11	-10	-8	-20	-19	-15	-21	-22	-24	-27	-21
43	7000.00	9.3	0	0	0	0	C	0	0	0	0	-37	-27	-32	-37	-36	-23	-24	-21	-16	-16	-13	-23	-20	-16	-21	-22	-24	-27	-21
44	8000.00	6.2	0	0	0	0	C	0	0	0	0	-29	-18	-30	-29	-28	-17	-17	-15	-10	-9	-7	-20	-18	-15	-21	-22	-24	-26	-21
45	9000.00	7.8	0	0	0	0	0	0	0	0	0	-7	4	-19	-7	-5	-1	0	0	2	5	4	-7	-11	-10	-14	-15	-16	-19	-15
46	10000.00																													

I	ELO(KEV)	RSD PCT	CORR*100 29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
29	200.00	19.0	100	36	36	36	36	35	-25	-25	-35	-31	-36	-35	-36	-35	-36	-35	-25
30	300.00	36.5	36	100	99	99	99	99	-66	-66	-97	-89	-99	-98	-99	-97	-99	-96	-66
31	400.00	30.3	36	99	100	99	99	98	-69	-69	-98	-87	-99	-97	-99	-98	-99	-97	-69
32	500.00	26.4	36	99	99	100	99	99	-66	-66	-97	-89	-99	-98	-99	-98	-99	-96	-66
33	600.00	22.7	36	99	99	99	100	99	-64	-64	-96	-90	-99	-98	-99	-97	-99	-95	-64
34	700.00	9.2	35	99	98	99	99	100	-57	-57	-93	-94	-98	-93	-98	-95	-99	-93	-57
35	800.00	2.4	-25	-66	-69	-66	-64	-57	100	99	82	26	70	51	70	79	62	83	99
36	900.00	1.8	-25	-66	-69	-66	-64	-57	99	100	82	26	70	51	70	79	62	83	100
37	1000.00	10.5	-35	-97	-98	-97	-96	-93	82	82	100	76	98	91	98	99	95	99	82
38	2000.00	14.3	-31	-89	-87	-89	-90	-94	26	26	76	100	86	96	86	78	91	75	26
39	3000.00	20.6	-36	-99	-99	-99	-99	-98	70	70	98	86	100	97	99	98	99	98	70
40	4000.00	19.4	-35	-98	-97	-98	-98	-99	51	51	91	96	97	100	97	92	99	90	51
41	5000.00	16.1	-36	-99	-99	-99	-99	-98	70	70	98	86	99	97	100	98	99	98	70
42	6000.00	11.8	-35	-97	-98	-98	-97	-95	79	79	99	78	98	92	98	100	96	99	79
43	7000.00	9.3	-36	-99	-99	-99	-99	-99	62	62	95	91	99	99	99	96	100	95	62
44	8000.00	6.2	-35	-96	-97	-96	-95	-93	83	83	99	75	98	90	98	99	95	100	83
45	9000.00	7.8	-25	-66	-69	-66	-64	-57	99	100	82	26	70	51	70	79	62	83	100
46	10000.00																		

PU 241 FISSION 42 GROUPS

I'	ELO(KEV)	RSD PCT	CORR*100 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	0.10	15.0	100	-25	62	35	24	73	71	66	62	54	29	38	27	23	-44	33	-29	17	-46	-40	-27	10	22	11	-16	-33	-24	-57
2	0.20	10.0	-25	100	33	57	59	-55	-61	-51	-53	-35	-64	-68	-68	-67	2	-69	-22	-65	63	12	8	-3	-6	-3	4	10	7	17
3	0.30	9.7	62	33	100	92	85	52	47	56	55	63	-11	-13	-16	-17	-10	-15	-15	-18	9	-6	-4	1	3	1	-2	-4	-3	-8
4	0.40	12.7	35	57	92	100	98	21	17	31	36	51	-31	-33	-31	-30	10	-33	-2	-28	33	13	8	-3	-7	-3	5	10	8	18
5	0.50	7.7	24	59	85	98	100	11	8	24	33	48	-37	-36	-31	-29	21	-34	8	-25	39	22	15	-5	-12	-6	9	18	13	32
6	0.60	24.7	73	-55	52	21	11	100	99	97	88	83	62	43	38	36	-20	41	-4	32	-44	-22	-15	5	12	6	-9	-18	-13	-31
7	0.70	23.0	71	-61	47	17	8	99	100	97	90	84	64	46	42	41	-17	45	0	37	-46	-20	-13	5	11	5	-8	-16	-12	-28
8	0.80	21.7	66	-51	56	31	24	97	97	100	95	93	60	38	37	36	-5	38	9	35	-36	-9	-6	2	5	2	-3	-8	-5	-13
9	0.90	10.3	62	-53	55	36	33	88	90	95	100	96	48	40	43	43	9	42	24	43	-34	1	0	0	0	0	0	0	0	1
10	1.00	11.8	54	-35	63	51	48	83	84	93	96	100	44	25	29	31	16	27	26	32	-18	9	6	-2	-5	-2	3	7	5	13
11	2.00	14.1	29	-64	-11	-31	-37	62	64	60	48	44	100	52	50	49	-10	51	9	46	-50	-15	-10	3	8	4	-6	-12	-9	-22
12	3.00	2.4	38	-68	-13	-33	-36	43	46	38	40	25	52	100	97	94	-18	99	18	89	-96	-29	-19	5	11	5	-7	-16	-11	-27
13	4.00	7.3	27	-68	-16	-31	-31	38	42	37	43	29	50	97	100	99	5	99	41	97	-86	-9	-6	1	3	1	-2	-5	-4	-9
14	5.00	10.0	23	-67	-17	-30	-29	36	41	36	43	31	49	94	99	100	14	97	50	99	-82	-2	-1	0	0	0	0	-1	0	-2
15	6.00	2.7	-44	2	-10	10	21	-20	-17	-5	9	16	-10	-18	5	14	100	-6	93	26	44	81	54	-13	-30	-15	21	44	32	77
16	7.00	8.5	33	-69	-15	-33	-34	41	45	38	42	27	51	99	99	97	-6	100	30	94	-92	-19	-13	3	7	3	-5	-10	-7	-18
17	8.00	5.5	-29	-22	-15	-2	8	-4	0	9	24	26	9	18	41	50	93	30	100	60	8	70	47	-12	-26	-13	18	38	28	66
18	9.00	9.8	17	-65	-18	-28	-25	32	37	35	43	32	46	89	97	99	26	94	60	100	-74	8	5	-1	-3	-1	2	4	3	7
19	10.00	7.7	-46	63	9	33	39	-44	-46	-36	-34	-18	-50	-96	-86	-82	44	-92	8	-74	100	49	33	-8	-18	-9	13	27	19	46
20	20.00	5.1	-40	12	-6	13	22	-22	-20	-9	1	9	-15	-29	-9	-2	81	-19	70	8	49	100	92	-14	-57	-52	-11	11	-14	72
21	30.00	3.0	-27	8	-4	8	15	-15	-13	-6	0	6	-10	-19	-6	-1	54	-13	47	5	33	92	100	-11	-64	-66	-30	-12	-42	54
22	40.00	4.0	10	-3	1	-3	-5	5	5	2	0	-2	3	5	1	0	-13	3	-12	-1	-8	-14	-11	100	70	55	70	54	14	4
23	50.00	3.1	22	-6	3	-7	-12	12	11	5	0	-5	8	11	3	0	-30	7	-26	-3	-18	-57	-64	70	100	95	77	54	56	-34
24	60.00	2.6	11	-3	1	-3	-6	6	5	2	0	-2	4	5	1	0	-15	3	-13	-1	-9	-52	-66	55	95	100	83	66	77	-22
25	70.00	2.8	-16	4	-2	5	9	-9	-8	-3	0	3	-6	-7	-2	0	21	-5	18	2	13	-11	-30	70	77	83	100	95	79	31
26	80.00	4.3	-33	10	-4	10	18	-18	-16	-8	0	7	-12	-16	-5	-1	44	-10	38	4	27	11	-12	54	54	66	95	100	82	57
27	90.00	3.2	-24	7	-3	8	13	-13	-12	-5	0	5	-9	-11	-4	0	32	-7	28	3	19	-14	-42	14	56	77	79	82	100	27
28	100.00	5.2	-57	17	-8	18	32	-31	-28	-13	1	13	-22	-27	-9	-2	77	-18	66	7	46	72	54	4	-34	-22	31	57	27	100
29	200.00	9.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-5	-7	18	18	17	19	17	12	2
30	300.00	8.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	-4	6	8	8	8	7	6	0
31	400.00	8.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-6	-9	-5	5	8	3	3	11	-3
32	500.00	7.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-12	-18	-17	6	13	3	3	20	-8
33	600.00	7.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	-2	-26	-13	-9	-16	-14	0	-6
34	700.00	6.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	-2	-4	0	1	0	0	3	-1
35	800.00	6.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5	7	0	-3	0	0	-6	3
36	900.00	5.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	1000.00	4.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-43	-27	-21	-32	-27	-7	-10
38	2000.00	2.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	31	24	36	31	8	11
39	3000.00	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	40	31	47	40	10	14
40	4000.00	5.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	27	21	32	27	7	10
41	5000.00	4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-8	-5	-4	-6	-5	-1	-2
42	6000.00	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	7000.00	3.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	8000.00	3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	9000.00	1.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	10000.00																													

I	ELO(KEV)	RSD PCT	CORR*100 29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
29	200.00	9.2	100	80	82	74	70	72	71	79	79	71	59	74	77	56	56	56	56
30	300.00	8.5	80	100	96	92	92	98	96	99	68	54	43	57	64	46	46	46	46
31	400.00	8.4	82	96	100	96	94	92	86	96	78	50	36	54	68	48	48	48	48
32	500.00	7.5	74	92	96	100	95	92	82	92	77	39	25	43	63	44	44	44	44
33	600.00	7.6	70	92	94	95	100	95	88	94	80	35	19	39	64	44	44	44	44
34	700.00	6.7	72	98	92	92	95	100	97	98	68	45	33	48	60	42	42	42	42
35	800.00	6.9	71	96	86	82	88	97	100	96	60	50	40	52	57	41	41	41	41
36	900.00	5.5	79	99	96	92	94	98	96	100	72	51	39	55	65	46	46	46	46
37	1000.00	4.5	79	68	78	77	80	68	60	72	100	34	14	40	76	51	51	51	51
38	2000.00	2.7	71	54	50	39	35	45	50	51	34	100	96	99	70	55	55	55	55
39	3000.00	4.6	59	43	36	25	19	33	40	39	14	96	100	94	50	42	42	42	42
40	4000.00	5.1	74	57	54	43	39	48	52	55	40	99	94	100	76	58	58	58	58
41	5000.00	4.2	77	64	68	63	64	60	57	65	76	70	50	76	100	70	70	70	70
42	6000.00	0.5	56	46	48	44	44	42	41	46	51	55	42	58	70	100	100	100	100
43	7000.00	3.3	56	46	48	44	44	42	41	46	51	55	42	58	70	100	100	100	100
44	8000.00	3.1	56	46	48	44	44	42	41	46	51	55	42	58	70	100	100	100	100
45	9000.00	1.7	56	46	48	44	44	42	41	46	51	55	42	58	70	100	100	100	100
46	10000.00																		

PU241 CAPTURE 45 GROUPS

I	ELO(KEV)	RSD PCT	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	0.10	17.7	100	31	-76	-96	-95	-59	90	97	-92	-99	49	2	11	-83
2	0.20	6.8	31	100	37	-6	0	57	69	50	6	-18	98	95	97	26
3	0.30	10.7	-76	37	100	90	92	97	-41	-61	95	84	18	62	54	99
4	0.40	25.0	-96	-6	90	100	99	77	-76	-89	99	99	-25	23	14	94
5	0.50	15.9	-95	0	92	99	100	81	-72	-86	99	98	-20	29	19	96
6	0.60	5.6	-59	57	97	77	81	100	-18	-41	85	69	40	79	73	93
7	0.70	7.5	90	69	-41	-76	-72	-18	100	97	-67	-83	82	44	53	-51
8	0.80	12.1	97	50	-61	-89	-86	-41	97	100	-82	-94	66	22	31	-70
9	0.90	7.6	-92	6	95	99	99	85	-67	-82	100	96	-12	36	26	98
10	1.00	19.2	-99	-18	84	99	98	69	-83	-94	96	100	-37	11	1	89
11	2.00	5.7	49	98	18	-25	-20	40	82	66	-12	-37	100	87	92	6
12	3.00	5.6	2	95	62	23	29	79	44	22	36	11	87	100	99	53
13	4.00	6.3	11	97	54	14	19	73	53	31	26	1	92	99	100	45
14	5.00	11.1	-83	26	99	94	96	93	-51	-70	98	89	6	53	45	100
15	6.00	6.9	59	94	6	-37	-31	29	88	74	-24	-48	99	81	86	-5
16	7.00	20.0	-95	-3	91	99	99	79	-74	-88	99	98	-23	26	16	95
17	8.00	9.1	-86	19	98	96	97	91	-56	-74	99	92	0	48	39	99
18	9.00	9.1	88	71	-37	-73	-69	-14	99	96	-64	-81	84	48	56	-47
19	10.00	21.6	-97	-8	89	99	99	76	-77	-90	98	99	-27	21	12	94
20	20.00	19.7	-94	0	92	99	99	81	-72	-86	99	98	-19	29	19	96
21	30.00	7.5	48	98	19	-23	-18	42	81	64	-11	-35	99	88	92	8
22	40.00	29.0	-94	0	92	99	99	81	-72	-86	99	98	-19	29	19	96
23	50.00	17.0	-82	27	99	94	95	94	-49	-69	97	89	8	55	46	99
24	60.00	16.5	-84	24	99	95	96	93	-52	-71	98	90	5	52	43	99
25	70.00	25.7	-94	1	93	99	99	82	-71	-85	99	98	-18	30	21	96
26	80.00	10.6	1	59	39	14	18	49	27	13	22	7	54	61	61	33
27	90.00	18.3	-77	19	88	86	87	82	-49	-66	89	82	1	44	36	89
28	100.00	30.2	-94	-15	81	94	94	67	-78	-89	92	95	-33	12	3	86
29	200.00	16.7	0	-11	-7	-2	-3	-9	-5	-2	-4	-1	-10	-11	-11	-6
30	300.00	20.8	0	-25	-16	-6	-7	-21	-11	-5	-9	-3	-23	-26	-26	-14
31	400.00	23.6	0	-25	-16	-6	-7	-21	-11	-5	-9	-3	-23	-26	-26	-14
32	500.00	20.6	0	-11	-7	-2	-3	-9	-5	-2	-4	-1	-10	-12	-12	-6
33	600.00	17.2	0	-13	-8	-3	-4	-11	-6	-3	-5	-1	-12	-14	-14	-7
34	700.00	13.6	0	-14	-9	-3	-4	-12	-6	-3	-5	-1	-13	-15	-15	-8
35	800.00	10.4	0	-7	-4	-1	-2	-6	-3	-1	-2	0	-6	-7	-7	-4
36	900.00	11.1	0	16	10	4	4	13	7	3	6	2	14	17	16	9
37	1000.00	38.7	0	42	27	10	12	35	19	9	16	5	38	44	43	23
38	2000.00	58.4	0	42	28	10	13	35	19	9	16	5	39	44	44	24
39	3000.00	60.3	0	42	27	10	12	35	19	9	16	5	38	44	43	23
40	4000.00	61.4	0	42	28	10	13	35	19	9	16	5	39	44	44	24
41	5000.00	61.0	0	42	28	10	13	35	19	9	16	5	39	44	44	24
42	6000.00	61.7	0	42	28	10	13	35	19	9	16	5	39	44	44	24
43	7000.00	63.2	0	42	28	10	13	35	19	9	16	5	39	44	44	24
44	8000.00	63.9	0	42	28	10	13	35	19	9	16	5	39	44	44	24
45	9000.00	64.7	0	42	28	10	13	35	19	9	16	5	39	44	44	24
46	10000.00															

I	ELO(KEV)	RSD PCT	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	0.10	17.7	59	-95	-86	88	-97	-94	48	-94	-82	-84	-94	1	-77	-94
2	0.20	6.8	94	-3	19	71	-8	0	98	0	27	24	1	59	19	-15
3	0.30	10.7	6	91	98	-37	89	92	19	92	99	99	93	39	88	81
4	0.40	25.0	-37	99	96	-73	99	99	-23	99	94	95	99	14	86	94
5	0.50	15.9	-31	99	97	-69	99	99	-18	99	95	96	99	18	87	94
6	0.60	5.6	29	79	91	-14	76	81	42	81	94	93	82	49	82	67
7	0.70	7.5	88	-74	-56	99	-77	-72	81	-72	-49	-52	-71	27	-49	-78
8	0.80	12.1	74	-88	-74	96	-90	-86	64	-86	-69	-71	-85	13	-66	-89
9	0.90	7.6	-24	99	99	-64	98	99	-11	99	97	98	99	22	89	92
10	1.00	19.2	-48	98	92	-81	99	98	-35	98	89	90	98	7	82	95
11	2.00	5.7	99	-23	0	84	-27	-19	99	-19	8	5	-18	54	1	-33
12	3.00	5.6	81	26	48	48	21	29	88	29	55	52	30	61	44	12
13	4.00	6.3	86	16	39	56	12	19	92	19	46	43	21	61	36	3
14	5.00	11.1	-5	95	99	-47	94	96	8	96	99	99	96	33	89	86
15	6.00	6.9	100	-34	-11	90	-38	-31	99	-31	-3	-7	-30	50	-8	-44
16	7.00	20.0	-34	100	97	-72	99	99	-21	99	94	95	99	16	87	94
17	8.00	9.1	-11	97	100	-53	96	97	2	97	99	99	98	29	90	88
18	9.00	9.1	90	-72	-53	100	-74	-69	83	-69	-46	-49	-68	29	-46	-76
19	10.00	21.6	-38	99	96	-74	100	99	-25	99	93	94	99	13	86	94
20	20.00	19.7	-31	99	97	-69	99	100	-17	99	96	96	99	18	87	94
21	30.00	7.5	99	-21	2	83	-25	-17	100	-18	10	6	-16	54	3	-32
22	40.00	29.0	-31	99	97	-69	99	99	-18	100	95	96	99	18	87	94
23	50.00	17.0	-3	94	99	-46	93	96	10	95	100	99	96	34	89	85
24	60.00	16.5	-7	95	99	-49	94	96	6	96	99	100	97	32	89	87
25	70.00	25.7	-30	99	98	-68	99	99	-16	99	96	97	100	19	88	93
26	80.00	10.6	50	16	29	29	13	18	54	18	34	32	19	100	55	6
27	90.00	18.3	-8	87	90	-46	86	87	3	87	89	89	88	55	100	86
28	100.00	30.2	-44	94	88	-76	94	94	-32	94	85	87	93	6	86	100
29	200.00	16.7	-9	-3	-5	-5	-2	-3	-10	-3	-6	-6	-3	-38	-18	0
30	300.00	20.8	-21	-7	-12	-12	-5	-7	-23	-7	-14	-14	-8	-42	-23	-2
31	400.00	23.6	-21	-7	-12	-12	-5	-7	-23	-7	-14	-14	-8	-42	-23	-2
32	500.00	20.6	-9	-3	-5	-5	-2	-3	-10	-3	-6	-6	-3	-38	-18	0
33	600.00	17.2	-11	-3	-6	-6	-3	-4	-12	-4	-7	-7	-4	-39	-19	0
34	700.00	13.6	-12	-4	-7	-7	-3	-4	-13	-4	-8	-7	-4	-39	-20	0
35	800.00	10.4	-6	-2	-3	-3	-1	-2	-6	-2	-4	-4	-2	-36	-17	0
36	900.00	11.1	13	4	8	8	3	5	15	5	9	8	5	-19	-5	3
37	1000.00	38.7	35	11	21	21	9	13	39	13	24	23	13	22	17	5
38	2000.00	58.4	36	11	21	21	9	13	39	13	24	23	13	26	19	5
39	3000.00	60.3	35	11	21	21	9	13	39	13	24	23	13	22	17	5
40	4000.00	61.4	36	11	21	21	9	13	39	13	24	23	13	26	19	5
41	5000.00	61.0	36	11	21	21	9	13	39	13	24	23	13	26	19	5
42	6000.00	61.7	36	11	21	21	9	13	39	13	24	23	13	25	19	5
43	7000.00	63.2	36	11	21	21	9	13	39	13	24	23	13	25	19	5
44	8000.00	63.9	36	11	21	21	9	13	39	13	24	23	13	26	19	5
45	9000.00	64.7	36	11	21	21	9	13	39	13	24	23	13	25	19	5
46	10000.00															

I	ELO(KEV)	RSD PCT	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
29	200.00	16.7	100	93	93	99	99	99	99	78	-11	-23	-11	-22	-22	-20	-20	-23	-21
30	300.00	20.8	93	100	100	93	94	95	89	51	-47	-57	-46	-56	-56	-55	-55	-57	-55
31	400.00	23.6	93	100	100	93	94	95	89	51	-47	-57	-46	-56	-56	-55	-55	-57	-55
32	500.00	20.6	99	93	93	100	99	99	99	78	-12	-23	-11	-22	-22	-21	-21	-24	-22
33	600.00	17.2	99	94	94	99	100	99	98	75	-16	-28	-16	-27	-27	-25	-25	-28	-26
34	700.00	13.6	99	95	95	99	99	100	98	73	-19	-30	-19	-29	-29	-28	-28	-31	-29
35	800.00	10.4	99	89	89	99	98	98	100	84	-2	-13	-1	-12	-12	-11	-11	-14	-12
36	900.00	11.1	78	51	51	78	75	73	84	100	51	41	52	42	42	43	43	40	42
37	1000.00	38.7	-11	-47	-47	-12	-16	-19	-2	51	100	99	99	99	99	99	99	99	99
38	2000.00	58.4	-23	-57	-57	-23	-28	-30	-13	41	99	100	99	99	99	99	99	99	99
39	3000.00	60.3	-11	-46	-46	-11	-16	-19	-1	52	99	99	100	99	99	99	99	99	99
40	4000.00	61.4	-22	-56	-56	-22	-27	-29	-12	42	99	99	99	100	99	99	99	99	99
41	5000.00	61.0	-22	-56	-56	-22	-27	-29	-12	42	99	99	99	99	100	99	99	99	99
42	6000.00	61.7	-20	-55	-55	-21	-25	-28	-11	43	99	99	99	99	99	100	99	99	99
43	7000.00	63.2	-20	-55	-55	-21	-25	-28	-11	43	99	99	99	99	99	99	100	99	99
44	8000.00	63.9	-23	-57	-57	-24	-28	-31	-14	40	99	99	99	99	99	99	99	100	99
45	9000.00	64.7	-21	-56	-55	-22	-26	-29	-12	42	99	99	99	99	99	99	99	99	100
46	10000.00																		

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