ENDF/B PROCESSING CODES FOR THE RESONANCE REGION

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NATIONAL NEUTRON CROSS SECTION CENTER

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Availability of Computer Programs

The computer programs described in this report have been sent to the Argonne Code Center for distribution. For further information write or call

> Argonne Code Center, Building 203 Room C-230 Argonne National Laboratory 9700 South Cass Avenue Argonne, Illinois 60439 Phone: Area 312 739-7711 Extension 4366

Introduction

In this report we describe some six programs written for calculating point-wise cross-sections in the resolved and unresolved resonance region. These programs have been written specifically to read in the resonance parameters in the ENDF/B files. However, the smooth cross-sections from File 3 have to be added to the output of these programs to obtain the final cross-section.

Out of the six codes described in this report, the first four calculate the cross-sections in the resolved resonance region and the last two in the unresolved resonance region. The first program SIGPLOT calculates crosssections for scattering, capture and fission using the single level Breit-Wigner parameters of ENDF/B Version I data. It also calculates multilevel scattering cross-sections. The cross-sections may be Doppler broadened if necessary. The second program SIGMA2 is essentially a modified version of SIGPLOT written for ENDF/B Version II data. The third program RAMP1 calculates scattering, capture and fission cross-sections using the Reich-Moore approximation, with or without Doppler broadening. The next program ADLER calculates cross-sections from the Adler-Adler parameters. Doppler broadening is done using the ψ and χ functions. AVRAGE3 and AVRAGE4 calculate cross-sections in the unresolved region using energy independent parameters and energy dependent parameters of ENDF/B Version II respectively. Width-fluctuation corrections are applied by numerical integration. Also, there is no provision made for allowing any inelastic effects in AVRAGE3 whereas they are taken into account in the latter program. After describing the programs, we have given the program listings with sample input data and

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results of the test problems.

The main purpose of writing these codes has been to have a set of codes which (i) would serve as a standard reference set against which the results of other codes could be compared and (ii) could be used in neutron crosssections evaluation and (iii) from which automated plots of cross-sections could be obtained for author proofs. As such, every effort has been made to obtain accurate results from the codes avoiding the usual computer timesaving approximations such as taking only a small number of resonances in a particular energy region. Also, these codes have been checked against existing codes to trace down any errors of programming. However, the author would appreciate it if the users could communicate any errors they might find in using these codes.

My grateful thanks are due to D. E. Cullen for writing the subroutines used in calculating the Doppler broadened cross sections by the trapezoidal rule I have also benefited from useful discussions with M. S. Moore.

Copies of these programs have been sent to the Argonne Code Center. (See Availability of Computer Codes)

Any further details regarding these programs may be obtained from the author at the National Neutron Cross Section Center.

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Description of the Programs

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PROGRAM SIGPLOT

This is a program to calculate scattering, capture, fission, and total cross sections from resonance parameters of Version I data from File 2 of ENDF/B. Provision is also made to allow for level-level interference effects in the scattering cross section. The formulae used are essentially the same as given in the report of Gregson, <u>et al.</u>,⁽¹⁾ but are modified to include fission. Modified versions of the three subroutines, ORDER, FACTS, and SIGMA, described in this report are used in the current program. Further details of thes formulae are given in the Data Formats and Procedures Manual⁽²⁾.

Formulae:

1. Elastic Scattering

$$\sigma_{nn}^{\ell}(m) = (2\ell+1) \frac{4\pi}{k_{m}^{2}} \sin^{2}\varphi_{\ell} + \frac{\pi}{k_{m}^{2}} \sum_{J} g_{J} \sum_{r=1}^{N} \sum_{r=1}^{res} \frac{\Gamma_{nr}^{2} \cos 2\varphi - 2\Gamma_{nr}(\Gamma_{yr}^{}+\Gamma_{r}^{}) \sin^{2}\varphi_{\ell}}{(E-E_{r}^{'})^{2} + (\frac{\Gamma_{r}^{}}{2})^{2}} + \frac{2(E-E_{r}^{'}) \Gamma_{nr}^{} \sin 2\varphi_{\ell}}{(E-E_{r}^{'})^{2} + (\frac{\Gamma_{r}}{2})^{2}}$$
(1)

2. Capture

$$\sigma_{n\gamma}^{\ell}(m) = \frac{\pi}{k_{m}^{2}} \sum_{J} g_{J} \sum_{r=1}^{N_{res}(\ell,J)} \frac{\Gamma_{nr}\Gamma_{\gamma r}}{(E-E_{r}')^{2} + (\frac{\Gamma_{r}}{2})^{2}} . \qquad (2)$$

3. Fission

$$\sigma_{nf}^{\ell}(m) = \frac{\pi}{k_{m}^{2}} \sum_{J} g_{J} \sum_{r=1}^{N_{res}^{(\ell,J)}} \frac{\Gamma_{nr}\Gamma_{fr}}{(E-E_{r}')^{2} + (\frac{\Gamma_{r}}{2})^{2}} .$$
(3)

4. Elastic Scattering with Level-Level Interference

In addition to the expression given in Eq. (1), we have the following level-level interference term:

$$\frac{\pi}{k_{m}^{2}} \sum_{J} g_{J} \sum_{r=2}^{N} \sum_{s=1}^{res} \sum_{s=1}^{(l,J)} \sum_{s=1}^{r-1} \frac{2\Gamma_{nr}\Gamma_{ns}\left[(E-E_{r}')(E-E_{s}') + \frac{\Gamma_{p}\Gamma_{s}}{4}\right]}{\left[(E-E_{r}')^{2} + \left(\frac{\Gamma_{r}}{2}\right)^{2}\right]\left[(E-E_{s}')^{2} + \left(\frac{\Gamma_{s}}{2}\right)^{2}\right]},$$
(4)

where m is the mth isotope,

 $N_{res}(l, J)$ are the number of resonances for a given l and J,

$$\begin{split} \Gamma_{nr}(E) &= \frac{P_{\ell}(E)\Gamma_{nr}(|E_{r}|)}{P_{\ell}(|E_{r}|)}, \\ \Gamma_{r} &= \Gamma_{nr}(E) + \Gamma_{\gamma r} + \Gamma_{rr}, \\ E_{r}' &= E_{r} + \left[\frac{S_{\ell}(|E_{r}|) - S_{\ell}(E)}{2P_{\ell}(|E_{r}|)}\right] \Gamma_{nr}(|E_{r}|) \quad (E \text{ in eV}), \\ k_{m} = 2.196771 \times 10^{-3} \left(\frac{AWR}{AWR + 1.0}\right) \sqrt{E(eV)} \quad (barns)^{-1}/_{2}, \end{split}$$

AWR = mass of the element in units of the neutron mass,

- E = neutron energy in eV in the Laboratory System,
- S_{ℓ} = shift factor,
- P_{ℓ} = penetration factor,
- φ = phase shift,
- $\rho = ka$,
- a = channel radius.

Storage Capacity of the Program

- 1. Maximum number of isotopes: 10.
- 2. Maximum number of ℓ values per isotope per energy range: 5.
- Maximum number of resonances over all isotope energy ranges and *l* values: 500.
- 4. Total memory for the program: 37K octal.

- 5. Time: approximately 14 secs C.P. time/ 25 res/ isotope on the CDC-6600.
- 6. This program assumes that the resolved resonance parameters are given for one energy range which is the same for all isotopes.

Procedure:

1. After all the data for one element are read in, the resonance energies over all isotopes are arranged in increasing order.

2. For each pair of levels which lie within the limits of the energy range in the input data, a variable number (8 = 4 MM as it stands now) of energy points which lie between these two levels are generated, and the scattering, capture, fission, and total cross section are calculated and printed out for all the resonances of a given isotope as well as for all the isotopes of a given element. A finer mesh may be obtained by setting MM (card SIGP246) to a higher value.

3. To avoid having huge core storage, the cross sections are not stored in memory but are printed out as they are generated.

4. The resonances in each isotope are arranged in increasing order of l and for a given increasing order of J before the cross sections are calculated.

5. For a given isotope, the measured resonance spins are, for example, 3 and 4. In File 2 the spins of some low energy resonances where they have been experimentally measured will have one of these two values. For the rest of the resonances where this data is lacking, the

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spins would be given as 3.5. In such a case, in calculating the cross section with level-level interference, we let spin-3 resonances interfere with one another. Similarly, spin-4 resonances that interfere with each other are treated as a group. The rest of the resonances (spin 3.5) do not interfere among themselves unless this is indicated on the title card in Col. 65 (see p. 8).

6. To Doppler-broaden cross sections, we write the Dopplerbroadened cross section as

$$\sigma_{\Delta}(\mathbf{E}') = \frac{1}{\Delta\sqrt{\pi}} \int_{0}^{\infty} \sigma(\mathbf{E}'') e^{-\left[\left(\mathbf{E}'-\mathbf{E}''\right)/\Delta\right]^{2}} d\mathbf{E}'' , \qquad (5)$$

where

$$\Delta (eV) = 0.3177 \left(\frac{T_{eff}^{\circ}}{293.0}\right)^{1/2} \left(\frac{E'(eV)}{AWR}\right)^{1/2}$$

$$T_{eff}^{\circ} = effective \ temperature \ in \ degrees \ Kelvin.$$

$$AWR = nuclear \ mass$$

The above expression is obtained as a good approximation for the more accurate expression for Doppler-broadened cross section (see Solbrig⁽³⁾) when $E/\Delta >> 1$. It is known that this approximation is good except at very low energies where the more accurate expression has to be used. Therefore, in this program Doppler-broadening of the cross section is by-passed for neutron energies less than 0.025 eV. The above expression can be written as

$$\sigma_{\Delta}(\mathbf{E}') = \frac{1}{\sqrt{\pi}} \int_{-\mathbf{E}'/\Delta}^{\infty} \sigma(\mathbf{E}' + \mathbf{x} \cdot \Delta) e^{-\mathbf{x}^2} d\mathbf{x} , \qquad (6)$$

where since E $^{\prime}/\Delta$ is large, the integral is written as

$$\sigma_{\Delta}(\mathbf{E}') = \frac{1}{\sqrt{\pi}} \int_{-\infty}^{+\infty} \sigma(\mathbf{E}' + \mathbf{x} \cdot \Delta) e^{-\mathbf{x}^2} d\mathbf{x} .$$
 (7)

A. Gauss-Hermite Quadrature

This integral can be evaluated using a 9-point Gauss-Hermite quadrature formula, provided the structure in the cross section is not small compared with the Doppler width Λ . Comparison of a test case which is Doppler broadened using ψ and χ functions, the trapezoidal rule, and Gauss-Hermite quadrature formula gives accurate results, provided the width of the resonances $\Gamma \geq 5\Delta$. If this condition is not satisfied, we have recourse to using the trapezoidal rule for evaluating the integral as described below. In most of the cases we use the quadrature formula for calculating the integral, as it has been found that the trapezoidal rule method requires a large amount of computer time. However, the trapezoidal method should be used if the resonances are very narrow and/or are very closely spaced. This may be done by setting all FLAG(I) = 1 in the subroutine SIEVE.

B. Trapezoidal Method

The above integrals can also be evaluated numerically by using the

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trapezoidal rule. To start with, a certain number of pivot points (NTAB which is an odd integer) equal to, say, 11 are specified at each energy E' where we wish to evaluate the Doppler-broadened cross section. Pivot points are then specified at eleven energy values given by $\textbf{E}^{\,\prime\prime}$ = $\textbf{E}^{\,\prime}$ and $E'' = E' \pm \Delta \dots E' \pm 5\Delta$. The cross section to be Doppler-broadened is explicitly evaluated at each pivot point at every iteration. The integral will give negligible contribution beyond this energy interval due to the $e^{-(E'-E'')^2/\Delta^2}$ factor. If, however, E' is very small so that the energy at one of the above pivot points is less than or equal to zero, we set $E'' = 10^{-3}$ eV as the lowest energy and set the energy of the pivot points at E'' = $10^{-3} + \Delta \dots$, $10^{-3} + 10\Delta$. In addition, we have to specify an ERRØR (say of the order of 10^{-4}). The above integral is then evaluated at these points, and if the relative value in each subinterval is less than ERRØR/(NTAB-1), the program assumes that the integral has converged in that interval; if not, at every iteration the number of steps is doubled until the integral converges. This method has been checked against results obtained by using ψ and χ functions in test cases and found to converge rapidly.

Use of these two numerical methods to evaluate the Doppler-broadened cross sections enables us to treat resonances due to higher ℓ -values where expressions for the Doppler-broadened cross sections in terms of the ψ and χ functions become very involved. The first card of the input is a TITLE card with the format (7A4, 2X, I5, F5.1, 2I5, E10.4, I5). One can punch an appropriate title in Cols. 1-28. If Doppler-broadened cross sections are desired, punch 1 in Col. 35, or else punch 0. In Cols. 36-40 give the effective temperature T_{eff} in degrees Kelvin, and in Cols. 41-45 punch NTAB, which is eual to the odd number of pivot points for the integration for Doppler-broadening; NTAB > 13 seems highly unlikely. In Cols. 46-50 punch an integer between 1 and 6 which specifies the particular cross section to be Doppler-broadened. The following list indicates these:

- 1 scattering cross section with no level-level
 interference
- 2 capture cross section with no level-level interference
- 3 fission cross section with no level-level interference
- 4 sum of the above three
- 5 scattering cross section with level-level interference
- 6 sum of 5, 2, and 3.

In Cols. 51-60 punch ERROR, which has been described above. If level-level interference in the scattering cross sections among those resonances which are assigned an average spin is desired, punch 1 in Col. 65, or else punch 0. The rest of the data cards are from ENDF/B File 2 beginning with the HEAD Card and these give the resonance parameters. These are described in the Data Formats and Procedures Manual⁽²⁾.

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- 1. Name of Code: SIGPLØT.
- 2. Computer for which Code is designed: CDC-6600.
- 3. <u>Nature of problem solved</u>: This code calculates the scattering, capture, fission, and total cross sections from resolved resonance parameter data. Scattering cross sections may be calculated with or without level-level interference. Provision is also made to numerically Doppler-broaden any of the cross sections.
- 4. <u>Method of solution</u>: Multi-level Breit-Wigner formula. Details of formulae to be found in Gregson, <u>et al</u>.⁽¹⁾
- 5. <u>Restrictions on the complexity of the problem</u>: This program can handle resonance data up to a maximum of 10 different isotopes with a total number of 500 resonances and an *l* value not exceeding 5. It further assumes that the resolved resonance parameters are given for one energy range which is the same for all the isotopes of an element. The mesh points at which the cross sections are calculated can be varied. Since the calculated data are not stored, an increase in the number of mesh points does not conflict with any storage requirements.
- <u>Typical running time</u>: Calculations of the cross sections of monoisotopic manganese from its resonance data with 27 resonances, with 20 mesh points between the positive energy resonance, takes 14 secs of central processor time on the CDC-6600.
- 7. Unusual features of the program:
 - a) In calculating scattering cross sections with level-level interference, resonances are grouped according to their spins for the same l value. Thus for s-wave resonances, for example, the spins are 3 and 4. It is possible that there are a number of resonances whose spins have not been measured, and these are

given an average spin of 3.5. The program normally calculates scattering cross sections with level-level interference among the spin-3 group and the spin-4 group. Contributions of the spin-3.5 resonances are calculated as a sum of single-level Breit-Wigner terms. If, however, it is desired to include the level-level interference terms among these resonances, this may be indicated on the control card.

- b) The method of numerical integration used to Doppler-broaden cross sections is very general and is designed to take care of situations where the fine structure of the cross section is rapidly varying.
- 8. <u>Related auxiliary programs</u>: This program has been patterned after the MLBW program⁽¹⁾ with certain corrections and changes in the subroutines ORDER, FACTS, and SIGMA.
- <u>References</u>: K. Gregson, M. F. James, and D. S. Norton, "MLBW A Multi-level Breit-Wigner Computer Program," U.K. Atomic Energy Establishment Report AEEW-M517 (1965).
- 10. Machine requirements: This needs a 37k octal memory.
- 11. Programming language: FORTRAN IV.
- 12. <u>Operating system or monitor</u>: Brookhaven National Laboratory version of CDC Scope 2.0 operating system.
- 13. Other programming or operating information: None.
- 14. <u>Name and establishment</u>: M. R. Bhat and D. Cullen, National Neutron Cross Section Center, Brookhaven National Laboratory, Upton, N.Y.
- 15. Material available: Fortran deck with sample output.
- 16. Category:

PROGRAM SIGMA2

This program is a modified version of SIGPLOT described in the preceding pages. The modifications enable it to handle ENDF/B Version II data. These modifications are described in the Data Formats and Procedures Manual⁽²⁾ in great detail and are briefly the following:

(1) provision is made to give the individual isotopic masses AWRI

(2) channel radius "a" (in units of 10^{-12} cm) and defined by

a =
$$\left[1.23(AWRI * 1.008665)^{1/3} + 0.8\right] \times 10^{-1}$$

is used to calculate the penetrabilities P_{ℓ} (ka) and the shift factors S_{ℓ} (ka) whereas the effective scattering radius \hat{a} is used to calculate φ_{ℓ} (k \hat{a}), the phase shift.

For details regarding the input data, Doppler broadening and other details of the program please see the write-up on SIGPLOT (p. 12) as they are common to the two programs.

PROGRAM RAMP1

Program RAMP1 (Reich And Moore Program Version 1) calculates scattering, capture, fission and total cross sections in the resolved resonance region using the Reich-Moore formalism⁽⁴⁾. The resonance parameters are assumed to be in the ENDF/B Version-II data format⁽²⁾. The cross sections may also be Doppler broadened if so desired. Formulae:

The cross section for a neutron reaction with the exit channel c is:

$$\sigma_{nc} = \pi \lambda_n^2 \sum_{J} g_{J} \left| \delta_{nc} - U_{nc}^{J} \right|^2$$
(1)

where χ_n is the reduced neutron wave length; g_J is the statistical weight factor for resonances of spin J and U_{nc}^J is the collision matrix.

In the Reich-Moore approximation, the collision matrix is expressed in terms of a matrix (I-K), with dimensions (m+1)x(m+1) where m is the number of fission channels, used in the cross section analysis; (m=2 in the ENDF/B format) and it is assumed that there is only one neutron channel (though there may be two channel spins for p-wave neutrons). Thus we define,

$$(I-K)_{cc'} = \delta_{cc'} - \frac{i}{2} \sum_{\lambda} \frac{\Gamma_{\lambda c}^{1/2} \Gamma_{\lambda c'}^{1/2}}{E_{\lambda}^{-E} - \frac{i}{2} \Gamma_{\lambda \gamma}}$$
(2)

where \mathbf{E}_{λ} is the resonance energy and $\mathbf{\Gamma}_{\lambda\gamma}$ the corresponding capture width of the λ -th resonance and $\mathbf{\Gamma}_{\lambda c}$ and $\mathbf{\Gamma}_{\lambda c}$ ' are the partial widths corresonding to the channels c and c'. Here it is also further assumed that the shift factor $\boldsymbol{\Delta}_{\lambda}$ is zero. The collision matrix \mathbf{U}_{nc}^{J} can be expressed in terms of the matrix defined in equation (2) as

$$U_{nc}^{J} = \bar{e}^{i}(\varphi_{n} + \varphi_{c}) \left[2(I - K)_{nc}^{-1} - \delta_{nc} \right]$$
(3)

where $\varphi_{\rm h}$ and $\varphi_{\rm c}$ are the hard-sphere phase-shifts. The different cross sections can now be written as

$$\sigma_{\text{Total}} = \sum_{J} \sigma_{nT}^{J} = 2\pi \chi_{n}^{2} \sum_{J} g_{J}^{Re} (1 - U_{nn}^{J})$$

$$= 2\pi \chi_{n}^{2} \sum_{J} g_{J} \left[(1 - \cos 2\varphi_{n}^{\ell}) + 2Re (e^{2i\varphi_{n}^{\ell}} \rho_{nn}) \right]$$
(4)

$$\sigma_{\text{Fission}} = \sum_{J} \sigma_{nf}^{J} = \pi \chi_{n}^{2} \sum_{J} g_{J} \left(\left| u_{nf_{1}}^{J} \right|^{2} + \left| u_{nf_{2}}^{J} \right|^{2} \right)$$

$$= 4 \pi \chi_{n}^{2} \sum_{J} g_{J} \left(\left| \rho_{nf_{1}}^{J} \right|^{2} + \left| \rho_{nf_{2}}^{J} \right|^{2} \right)$$
(5)

$$\sigma_{\text{Scattering}} = \sum_{J} \sigma_{nn}^{J} = \pi \chi_{n}^{2} \sum_{J} g_{J} \left| 1 - U_{nn}^{J} \right|^{2}$$
(6)
$$= \pi \chi_{n}^{2} \sum_{J} g_{J} \left[2(1 - \cos 2 \varphi_{n}^{\ell}) + 4\text{Re} \left(\bar{e}^{2i} \varphi_{n}^{\ell} \rho_{nn}^{J} \right) - 4\text{Re} \left(\rho_{nn}^{J} \right) + 4 \left| \rho_{nn}^{J} \right|^{2} \right]$$

$$\sigma_{\text{capture}} = 4\pi \, \lambda_n^2 \sum_{J} g_{J} \sum_{a,b} (I-K)_{na}^{-1} (I-K)_{nb}^{-1} \, \text{Re}\left[(I-K)_{ab}^{-1} \, \delta_{ab}\right]$$
(7)

where a, b = 1, 2, 3, and 1 = neutron channel and 2, 3 are

fission channels.

The total, fission and capture cross-sections are obtained by direct calculation and the scattering cross-section is obtained by subtraction form these. In the above expressions the matrix ρ_{nc} is defined as

$$\rho_{\rm nc} = \delta_{\rm nc} - (I - K)_{\rm nc}^{-1}$$

In addition we define the following:

$$\Gamma_{\lambda n}(E) = \frac{P_{\ell}(E) \Gamma_{\lambda n}(E)}{P_{\ell}(E_{\lambda})}$$

$$k_n = \frac{1}{\lambda_n} = 2.196771 \times 10^{-3} \left(\frac{AWRI}{AWRI+1.0}\right) \sqrt{E(eV)}$$

where AWRI is the isotopic mass of the I-th isotope in units of the neutron mass.

E = the neutron energy in eV in the laboratory system. P_{ℓ} = penetration factor for angular momentum ℓ . φ_{ℓ} = phase shift factor " " " ". where,

$$\varphi_{0} = ka$$

$$\varphi_{1} = k\hat{a} - tan^{-1} (k\hat{a})$$

$$\varphi_{2} = k\hat{a} - tan^{-1} \left(\frac{3k\hat{a}}{3 - k^{2}\hat{a}^{2}} \right) \quad \text{etc.}$$

 \hat{a} = effective scattering radius.

We use a channel radius $a = (1.23(AWRI * 1.008665)^{1/3} + 0.8) \times 10^{-1}$ in units of 10^{-12} cm to calculate the penetration factor and the effective scattering radius "â" as determined from a fit of experimental data to calculate the scattering cross section.

Storage Capacity of the Program

- 1. Maximum number of isotopes: 10.
- 2. Maximum number of ℓ values per isotope per energy range: 5.
- 3. Maximum number of resonances over all isotope energy ranges and ℓ values: 500.
- 4. Total memory for the program: 40 K octal.
- 5. Time: approximately 11 secs/100 energy points for a nucleus with 4 isotopes and 294 s- and p-wave resonances.
- 6. This program assumes that the resolved resonance parameters are given for one energy range which is the same for all isotopes.

Procedure:

1. After all the data for one element are read in, the resonance energies over all isotopes are arranged in increasing order.

2. For each pair of levels which lie within the limits of the energy range in the input data, a variable number of energy points (4 MM = 8 as it stands now) which lie between these two levels are generated, and the scattering, capture, fission, and total cross section are calculated and printed out for all the resonances of a given isotope as well as for all the isotopes of a given element. One can get a finer mesh by setting MM (card RMP1228) to a higher value.

3. To avoid having huge core storage, the cross sections are not stored in memory but are printed out as they are generated.

4. The resonances in each isotope are arranged in increasing order of land for a given increasing order of J before the cross sections are calculated.

5. To Doppler-broaden cross sections, the same procedure using Grauss-Hermite Quadrature or the Trapezoidal Method as described in SIGPLOT (p.10) is used.

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Input Data

The first card of the input is a TITLE card with the format (7A4, 2X, 15, F.1, 2I5, E10.4, I5). One can punch an appropriate title in Cols. 1-28. If Doppler-broadened cross sections are desired, punch 1 in Col. 35, or else punch 0. In Cols. 36-40 give the effective temperature T_{eff} in degrees Kelvin, and in Cols. 41-45 punch NTAB, which is equal to the odd number of pivot points for the integration for Doppler-broadeneing; NTAB > 13 seems highly unlikely. In Cols. 46-50 punch an integer between 1 and 4 which specifies the particular cross section to be Doppler-broadened. The following list indicates these:

- 1 scattering cross section
- 2 capture cross section
- 3 fission cross section
- 4 total cross section.

In Cols. 51-60 punch ERROR, which has been described above. The rest of the data cards are from ENDF/B File 2 beginning with the HEAD Card and these give the resonance parameters⁽²⁾.

REACTOR CODE ABSTRACT

- 1. Name of Code: RAMP1
- 2. Computer for which code is designed: CDC-6600
- 3. <u>Nature of problem solved</u>: This code calculates scattering, capture, fission and total cross sections from Reich-Moore resolved resonance parameters. Cross sections may be Doppler broadened if so desired.
- Method of solution: Reich-Moore approximation. Details may be found in the reference given.
- 5. <u>Restrictions on the complexity of the problem</u>: This program can handle resonance data up to a maximum of 10 different isotopes with a total number of 500 resonances and an *l* value not exceeding 5. The mesh points at which the cross sections are calculated can be varied. Further, since the calculated data are not stored, an increase in the number of mesh points does not conflict with any storage requirements.
- <u>Typical running time</u>: Calculations of 4 isotopes involving a total of 294 s and p-wave resonances took 11 sec. of central processor time per 100 energy points on the CDC-6600.
- 7. <u>Unusual features of the program</u>: The Doppler broadening is done using numerical methods and can handle p-wave and resonances corresponding to higher partial waves.
- 8. Related auxiliary programs: None
- 9. References: C. W. Reich and M. S. Moore, Phys. Rev. 111, 929, 1958.
- 10. Machine Requirements: This program needs 40K octal memory.
- 11. Programming language: FORTRAN IV

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- Operating System or monitor: Brookhaven National Laboratory version of CDC Scope 3.0 operating system.
- 14. <u>Name and establishment</u>: M. R. Bhat, National Neutron Cross Section Center, Brookhaven National Laboratory, Upton, N. Y. 11973.
- 15. Material available: FORTRAN deck with sample output.
- 16. <u>Category</u>:

PROGRAM ADLER

This is a program to calculate total, capture or fission crosssections according to the Adler-Adler formalism using the corresponding parameters from File 2 of ENDF/B Version II data.

Formulae

The Adler-Adler formulae have been discussed in the reports given in the references (5,6). The formulae are:

$$\sigma^{(\mathbf{x})}(\mathbf{E}) = \frac{2C}{E} (1 - \cos \omega) + \frac{C}{\sqrt{E}} \sum_{k} \frac{\nu_{k} (G_{k}^{(\mathbf{x})} \cos \omega + H_{k}^{(\mathbf{x})} \sin \omega) + (\mu_{k} - \mathbf{E}) (H_{k}^{(\mathbf{x})} \cos \omega - G_{k}^{(\mathbf{x})} \sin \omega)}{(\mu_{k} - \mathbf{E})^{2} + \nu_{k}^{2}} + \frac{C}{\sqrt{E}} (A_{1}^{(\mathbf{x})} + \frac{A_{2}^{(\mathbf{x})}}{E} + \frac{A_{3}^{(\mathbf{x})}}{E^{2}} + \frac{A_{4}^{(\mathbf{x})}}{E^{3}} + B_{1}^{(\mathbf{x})} \mathbf{E} + B_{2}^{(\mathbf{x})} \mathbf{E}^{2})$$
(1)

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and B.G =
$$\frac{C}{\sqrt{E}} (A_1^{(X)} + \frac{A_2^{(X)}}{E} + \frac{A_3^{(X)}}{E^2} + \frac{A_4^{(X)}}{E^3} + \frac{A_4^{(X)}}{E^3} + \frac{B_1^{(X)}E}{E^3} + \frac{B_2^{(X)}E^2}{E^2};$$

where $\frac{C}{E} = \pi \lambda^2$; where $\frac{1}{\lambda} = k = 2.196771 \times 10^{-3} \times \left(\frac{AWRI}{AWRI+1.0}\right) \sqrt{E(eV)}$
where k is the wave number of the incident neutron in the center-of-mass
system and AWRI is the isotopic mass in units of the neutron mass.

$$\frac{2C}{E}$$
 (1-cos ω) = potential scattering cross section; this term is non-
zero only for scattering and total cross sections.

Procedure (con't)

(3) Cross-sections are not stored in memory so that an increase in mesh points does not conflict with any memory requirements.

(4) Only s-wave resonances are handled by the program.

(5) The Doppler broadened cross-section is written as:

$$\sigma_{\Delta}(E) = \frac{1}{\Delta\sqrt{\pi}} \int_{0}^{\infty} \sigma(E') e^{-\frac{(E-E')^2}{\Delta^2}} dE'$$
(2)

where $\underline{\Lambda}(eV) = 0.3177 \left(\frac{T_{eff}^{\circ}}{293.0}\right)^{\frac{1}{2}} \left(\frac{\underline{E}(eV)}{AWRI}\right)^{\frac{1}{2}}$

where T_{eff}° = effective temperature in degrees Kelvin

AWRI = mass of the isotope. This expression is quite good except for resonances of very small energies.⁽⁷⁾ We use the real and imaginary parts of the complex probability integral which are proportional to the Ψ and Φ functions to obtain expressions for Doppler broadened cross-sections.

We define.

$$U = \operatorname{Im}\left(\frac{i}{\pi}\int_{-\infty}^{+\infty}\frac{e^{-t^{2}}}{z-t} dt\right) ; \quad V = \operatorname{Re}\left(\frac{i}{\pi}\int_{-\infty}^{+\infty}\frac{e^{-t^{2}}}{z-t} dt\right) \quad (3)$$

where $z = \xi + i \eta$, ξ and η real. Further,

$$\Psi(s,\theta) = \frac{1}{2}\sqrt{\frac{\pi}{\theta}} U(\xi,\eta) = \frac{1}{(4\pi\theta)^{\frac{1}{2}}} \int_{-\infty}^{+\infty} \frac{e^{-(s-r)^2/4\theta}}{1+r^2} dr$$

and $\Phi(s,\theta) = \frac{1}{2}\sqrt{\frac{\pi}{\theta}} V(\xi,\eta) = \frac{1}{(4\pi\theta)^{\frac{1}{2}}} \int_{-\infty}^{+\infty} \frac{e^{-(s-r)^2/4\theta}}{1+r^2} r dr$
where $\eta = \frac{1}{2\sqrt{\theta}}$ and $\xi = s\eta$. If we further set $\xi = \frac{\mu-E}{\Delta}$ and $\eta = \frac{\nu}{\Delta}$,

$$\mathcal{L}_{\omega} = 2\mathbf{k}\hat{\mathbf{a}} \qquad \text{Where } \hat{\mathbf{a}} \text{ corresponds to the effective scattering radius in units of 10-12 cm;}$$
$$= 2WN \sqrt{E(eV)} \qquad \text{and } WN = 2.196771 \left(\frac{AWRI}{AWRI + 1.0}\right) \times 10^{-3} \times \hat{\mathbf{a}},$$

$$A_{1}^{(x)}, A_{2}^{(x)}, A_{3}^{(x)}, A_{4}^{(x)}$$

and $B_{1}^{(x)}, B_{2}^{(x)}$

are background parameters which give contributions due to "tails" of resonances lying outside of the energy range under consideration. They are associated with the type of reaction "x".

 $G_k^{(x)}$, $H_k^{(x)}$ Are Adler-Adler parameters, characteristic of the k-th resonance and the type of reaction indicated by "x".

Procedure

(1) After all the data for one element are read in, the resonance energies of all the isotopes are arranged in increasing order.

(2) For each pair of resonances which lie within the limits of the energy range in the input data, a variable number of energy points (20 = 4 MM as it stands now) which lie between these two resonances are generated, and the total, capture and fission cross sections are calculated and printed out. This is done for all the resonances in an element. A finer mesh may be obtained by setting MM (card ADLR278) to a higher value. we obtain the Doppler broadened cross section as

$$\sigma_{\Delta}^{(x)}(E) = \frac{2C}{E} (1 - \cos \omega) + \frac{C\sqrt{\pi}}{\Delta} \sum_{k} \frac{U_{k}^{(x)}}{E^{\frac{1}{2}}} (G_{k}^{(x)} \cos \omega + H_{k}^{(x)} \sin \omega)$$

$$+ \frac{C\sqrt{\pi}}{\Delta} \sum_{k} \frac{V_{k}^{(x)}}{E^{\frac{1}{2}}} (H_{k}^{(x)} \cos \omega - G_{k}^{(x)} \sin \omega)$$

$$(4)$$

The potential scattering term (non-zero only for scattering and total cross-sections) and the background terms are not Doppler broadened, as they are slowly varying and not affected by Doppler broadening. The functions $U_k^{(x)}$ and $V_k^{(x)}$ are characteristic of the k-th resonance of the type of cross-section "x", and its parameters are evaluated using a subroutine-PFCN⁽⁸⁾.

Input Data

First Data Card: Format (7A4,2X, I5, F5.1)
Reads in TITLE(1),, TITLE(7), IDPL, TEFF
TITLE(1),, TITLE(7), = any suitable title for the program.
IDPL = 1 if Doppler broadened cross-sections are desired or else = 0
TEFF = Effective temperature of the sample in degrees kelvin.
Rest of the Data Cards: Follow the ENDF/B File 2 format for AdlerAdler parameters. This is described in detail in Reference 2.

REACTOR CODE ABSTRACT

- 1. Name of Code: ADLER
- 2. Computer for which code is designed: CDC-6600
- 3. <u>Nature of problem solved</u>: This code calculates total, capture and fission cross-sections from the corresponding Adler-Adler parameters in the ENDF/B File 2 and also Doppler broadens cross-sections.
- 4. <u>Method of solution</u>: Adler-Adler formalism. Details of formulae are to be found in the report given in references.
- 5. <u>Restrictions on the complexity of the problem</u>: This program can handle resonance data up to a maximum of 10 isotopes with a total number of 500 resonances. It further assumes that the resolved resonance parameters are given for one energy range which is the same for all the isotopes of an element. The mesh points at which the cross-sections are calculated can be varied. Since the calculated data are not stored, an increase in the number of mesh points does not conflict with any storage requirement.
- 6. <u>Typical running time</u>: Calculations of cross-sections of one isotope with 37 resonances and 20 mesh points between resonances takes:
 - (a) without Doppler broadening, 21 secs
 - (b) with Doppler broadening, 209 secs.
- 7. Unusual features of the program: None
- 8. Related auxiliary program: None
- 9. <u>References</u>: D. B. Adler and F. T. Adler, Analysis of Neutron Resonances in Fissile Elements: Programs CØDILLI, CURVEPLØT and SIGMA, Report COO-1546-3 (Sept. 1966), Dept. of Physics, University of Illinois, Urbana, Illinois.
- 10. Machine requirements: This needs a 37K octal memory.
- 11. Programming language: FORTRAN IV
- 12. <u>Operating system or monitor</u>: Brookhaven National Laboratory version of CDC Scope 3 operating system.
13. Other programming or operating information: None

- 14. <u>Name and establishment</u>: M. R. Bhat, National Neutron Cross-Section Center, Brookhaven National Laboratory, Upton, New York.
- 15. <u>Material available</u>: FORTRAN Deck with sample output.
- 16. <u>Category</u>:

PROGRAM AVRAGE3

This is a program to calculate scattering, capture, and fission cross sections in the unresolved resonance region from the energy independent parameters given in ENDF/B, File 2.

Method

The method follows the paper of Lane and Lynn (9) and we write the average scattering, fission, and capture cross section respectively as

$$\left\langle \sigma_{n,n} \right\rangle = \frac{K}{E} \sum_{J} \frac{g_{J}}{\langle D_{J} \rangle} \left[\left\langle \frac{\Gamma_{n} \Gamma_{n}}{\Gamma_{n}^{+} \Gamma_{f}^{+} \Gamma_{\gamma}} \right\rangle - \frac{2\Gamma_{n} \sin^{2} \varphi_{l}}{\sigma_{l}} \right] + \sigma_{p} \quad (1)$$

$$\left\langle \sigma_{n,f} \right\rangle = \frac{K}{E} \sum_{J} \frac{g_{J}}{\langle D_{J} \rangle} \left\langle \frac{\Gamma_{n} \Gamma_{f}}{\Gamma_{n}^{+} \Gamma_{f}^{+} \Gamma_{\gamma}} \right\rangle$$
, (2)

and

$$\left\langle \sigma_{n,\gamma} \right\rangle = \frac{K}{E} \sum_{J} \frac{g_{J}}{\langle D_{J} \rangle} \left\langle \frac{\Gamma_{n} \Gamma_{\gamma}}{\Gamma_{n}^{+} \Gamma_{f}^{+} \Gamma_{\gamma}} \right\rangle , \qquad (3)$$

where K = $(2\pi^2/k^2)E(ev)$, where $k = \frac{1}{\lambda} = 2.196771\times10^{-3} \div \left(\frac{AWRI}{AWRI+1.0}\right)\sqrt{E}$ and AWRI is the isotopic mass,

E = neutron energy in eV,

$$g_J = \frac{(2J+1)}{2(2I+1)}$$
, where I is the target nucleus spin and J is the compound nucleus spin,
 $\langle D_J \rangle$ = mean level spacing in eV for spin J resonances,
 $\sigma_P = \sum_{\ell} \sigma_{p\ell} =$ potential scattering cross section,
 $\sigma_{p\ell} = 4\pi (2\ell+1) \frac{\sin^2 \varphi_{\ell}}{k^2}$ where ℓ is the angular momentum and
 $\varphi_o = k\hat{a}$ where \hat{a} is the scattering radius (A)
 $\varphi_I = k\hat{a} - \tan^{-1}(k\hat{a})$ and etc.

and the rest of the quantities are different partial widths in eV. The quantities in equation (1) refer to one particular *l*-value. The brackets indicate averaging over the neutron and fission width fluctuations assumed to follow a χ^2 distribution of different degrees of freedom as given in the ENDF/B data. We would like to point here that the fluctuation correction factors $R_n l_{,J}$, $R_{\gamma l_{,J}}$, or $R_{f l_{,J}}$ are not calculated separately as the fluctuation correction corrections are applied by direct averaging as indicated in equations 1-3. The summation is over the different spin states. The averaging is done by the method of Greebler and Hutchins⁽¹⁰⁾ and corresponds to evaluating the double integrals on a 10x10 grid, and ν can vary from 1 to 4. The gamma width Γ_{γ} is assumed to follow a δ -function type of distribution corresponding to a large number degrees of freedom in the χ^2 distribution.

Incidentally, we note here that this program (1) takes into account only s- and p-wave contributions to the cross sections and (2) does not take into account inelastic scattering. This program uses the channel radius $a = (1.23 \times (AWRI \times 1.008668)^{1/3} + 0.8) \times 10^{-1}$ in units of 10^{-12} cm to calculate nuclear penetrabilities.

This program needs 21K octal memory for execution.

The data input is explained in great detail in the FORTRAN listing of the program and follows the ENDF/B format except for the first data card which is the title card.

Title Card Format (I10, 7A4, 2X, 3E10.4)

This reads in IRUN, RUN(1),, RUN(7), EO, EN, ESTEP.

-34-

- IRUN = Any run number. If this is zero the program exists, otherwise this card indicates the beginning of a new calculation and one can stack any number of these one behind another.
- RUN(1),, RUN(7) = Any alphanumeric information.
- E0 = Beginning energy for calculations in eV.
- EN = Ending energy for calculations in eV.
- ESTEP = Step interval in eV for calculations in eV.

This information is needed only for non-fissile nuclei.

- 1. Name of Code: AVRAGE3
- 2. Computer for which Code is designed: CDC-6600
- 3. <u>Nature of problem solved</u>: This Code calculates average scattering, capture, and fission cross sections from s- and p-wave data of the unresolved parameters of File 2 of ENDF/B.
- 4. <u>Method of calculation</u>: Theory of average cross section due to Lane and Lynn.⁽⁹⁾
- 5. <u>Restrictions on the complexity of the problem</u>: This program calculates average cross sections up to 100 energy values in the unresolved region. It does not allow for inelastic scattering and calculates only s- and p-wave contributions. Maximum y = 4.
- 6. <u>Typical running time</u>: Test run calculating s- and p-wave contributions to average scattering, capture, and fission cross sections of Pu-239 at 16 energy points and s- and p-wave contributions to average scattering at capture cross section of U-238 at 100 energy points took 5 secs of central processor time on the CDC-6600.
- 7. <u>Unusual feature of the program</u>: This program can allow for different degrees of freedom for fission width distribution of resonances of different spins.
- 8. Related auxiliary programs: None.
- 9. References: A. M. Lane and J. E. Lynn, Proc. Phys. Soc. A70, 557 (1957).
- 10. Machine requirements: Needs 21K octal memory.
- 11. Programming language: FORTRAN IV.
- 12. Operating system or monitor: Brookhaven National Laboratory version of CDC Scope 3.0 operating system.
- 13. Other programming or operating information: None.

- 14. <u>Name and establishment</u>: M. R. Bhat, National Neutron Cross Section Center, Brookhaven National Laboratory, Upton, New York.
- 15. <u>Material available</u>: Fortran deck with sample output.
- 16. <u>Category</u>:

PROGRAM AVRAGE4

This is a program to calculate scattering capture, and fission cross sections in the unresolved resonance region, with the ENDF/B Version II data for the unresolved parameters of File 2 which gives the average neutron, gamma and fission widths and widths for any competing inelastic processes as a function of energy.

Method

The method follows the paper of Lane and Lynn (9) and we write the average scattering, fission, and capture corss section respectively as

$$\langle \sigma_{n} \rangle = \frac{K}{E} \sum_{J} \frac{g_{J}}{\langle D_{J} \rangle} \left[\left\langle \frac{\Gamma_{n} \Gamma_{n}}{\Gamma_{n} + \Gamma_{f} + \Gamma_{\gamma} + \Gamma_{x}} \right\rangle - 2 \Gamma_{n} \sin^{2} \varphi_{\ell} \right] + \sigma_{p} \qquad (1)$$

$$\langle \sigma_{\mathbf{f}} \rangle = \frac{K}{E} \sum_{\mathbf{J}} \frac{g_{\mathbf{J}}}{\langle \mathbf{D}_{\mathbf{J}} \rangle} \left\langle \frac{\Gamma_{\mathbf{n}} \Gamma_{\mathbf{f}}}{\Gamma_{\mathbf{n}} + \Gamma_{\mathbf{f}} + \Gamma_{\gamma} + \Gamma_{\mathbf{x}}} \right\rangle , \qquad (2)$$

$$\langle \sigma_{\gamma} \rangle = \frac{K}{E} \sum_{J} \frac{g_{J}}{\langle D_{J} \rangle} \left\langle \frac{\Gamma_{n} \Gamma_{\gamma}}{\Gamma_{n} + \Gamma_{f} + \Gamma_{\gamma} + \Gamma_{x}} \right\rangle , \qquad (3)$$

where K = $(2 q^2/k^2)E(eV)$ where k is defined below,

E = neutron energy in eV,

$$g_J = \frac{(2J+1)}{2(2I+1)}$$
, where I is the target no

$$J = \frac{(2J+1)}{2(2I+1)}$$
, where I is the target nucleus spin and J is the compound nucleus spin,

 $\langle D_{J} \rangle$ = mean level spacing in eV spin J resonances, $\sigma_{p} = \sum \sigma_{pl}$ = potential scattering cross section.

$$\sigma_{p\ell} = 4\pi (2\ell+1) \frac{\sin^2 \varphi_{\ell}}{k^2} \quad \text{Where } \ell \text{ is the angular momentum and} \\ \varphi_0 = k\hat{a} \text{ where } \hat{a} \text{ is the scattering radius (A)} \\ \varphi_1 = k\hat{a} - \tan^{-1} (k\hat{a}) \\ \varphi_2 = k\hat{a} - \tan^{-1} \left(\frac{3k\hat{a}}{3-k^2\hat{a}^2} \right) \text{ where} \\ k = 2.196771 \times 10^{-3} \left(\frac{AWRI}{AWRI+1.0} \right) \sqrt{E(eV)} \\ \text{and } AWRI \text{ is the isotopic mass in units} \end{cases}$$

and AWRI is the isotopic mass in units of neutron mass.

2

 $\Gamma_{\rm x}$ = is a width in eV to allow for any competing inelastic processes, and the rest of the quantities are different partial widths in eV.

 $\Gamma_n = \Gamma_n^o \sqrt{E} \, V_{\ell} \mu_{\ell,J}$ where Γ_n^o is the reduced neutron width (GNO(I)), $\mu_{\ell,J}$ is the number of degrees of freedom in the neutron width distribution (AMUN), E the neutron energy and V_{ℓ} is the penetration factor defined as:

$$V_{\ell} = 1 \text{ for } \ell = 0$$

= $\rho^2 / (1 + \rho^2) \text{ for } \ell = 1$
= $\rho^4 / (9 + 3\rho^2 + \rho^4) \text{ for } \ell = 1$

where ρ = ka where k is the wave-number of the neutron in the center-ofmass system (see above) and a = $(1.23(\text{AWRI x } 1.008665)^{1/3} + 0.8) \times 0.1$ is the channel radius in units of 10^{-12} cm. The brackets indicate averaging over the neutron, fission , and any inelastic width fluctuations assumed to follow a χ^2 distribution of different degrees of freedom as given in the ENDF/B data. The summation is over the different spin states J. Hence, allowance is made for possible different degrees of freedom of the fission width distribution corresponding to different spin states. The averaging is done (10) by a method similar to that of Greebler and Hutchins, and corresponds to evaluating the double integrals on a 10 × 10 grid, and ν can vary from 1 to 4. The gamma width Γ_{γ} is assumed to follow a &-function type of distribution corresponding to a large number of degrees of freedom in the χ^2 distribution.

Incidentally, we note here that this program (1) takes into account only s-, p-, and d-wave contributions to the cross sections and (2) does take into account inelastic scattering. The scattering radius A in the unresolved resonance region of ENDF/B File 2 is used to calculate potential scattering while the nuclear radius a defined above is used to calculate nuclear penetrabilities as suggested in the new procedural modifications at the April 1970 CSEWG Meeting.

This program needs 58K (octal) memory for execution.

The data input is explained in great detail in the FORTRAN listing of the program and follows the ENDF/B format except for the first data card which is the title card.

Title Card Format (I10, 7A4)

Read in IRUN, RUN(1),, RUN(7)

IRUN = Any run number. If it is zero the program exits if non-zero it indicates the beginning of a new calculation. One can stack any number of these cases one behind the other.

RUN(1),, RUN(7) = Any alphanumeric in formation.

REACTOR CODE ABSTRACT

- 1. Name of Code: AVRAGE4
- 2. Computer for which Code is designed: CDC-6600
- 3. <u>Nature of problem solved</u>: This Code calculates average scattering, capture, and fission cross sections from s-, p-, and d-wave data of the unresolved parameters of File 2 of ENDF/B. The parameter corresponds to ENDF/B Version II data with energy dependent neutron, gamme, fission, and inelastic widths.
- Method of calculation: Theory of average cross section due to Lane and Lynn.⁽⁹⁾
- 5. <u>Restrictions on the complexity of the problem</u>: This program calculates average cross sections up to 100 energy values in the unresolved region. It allows for inelastic scattering and its width fluctuation and calculates only s-, p-, and d-wave contributions. Maximum $\gamma = 4$.
- <u>Typical running time</u>: Test run calculating s- and p-wave contributions to average scattering, capture, and fission cross sections of Pu-239 at 16 energy points and s- and p-wave contributions to average scattering and capture cross section of U-238 at 19 energy points took 3.5 secs of central processor time on the CDC-6600.
- 7. <u>Unusual feature of the program</u>: This program can allow for different degrees of freedom for fission width distribution of resonances of different spins.
- 8. Related auxiliary programs: None.
- 9. References: A. M. Lane and J. E. Lynn, Proc Phys. Soc. A70, 557 (1957).
- 10. Machine requirements: Needs 58K octal memory.
- 11. Programming language: FORTRAN IV.
- 12. <u>Operating system or monitor</u>: Brookhaven National Laboratory version of CDC Scope 3.0 operating system.
- 13. Other programming or operating information: None.

- 14. <u>Name and establishment</u>: M. R. Bhat, National Neutron Cross Section Center, Brookhaven National Laboratory, Upton, New York 11973.
- 15. Material available: FORTRAN deck with sample output.
- 16. <u>Category</u>:

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References

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		REA	D1	,(1	' I T	LE	(1)	, 1	=1	,7	۶,	ΙD	PL	,Т	EF	F.	N T /	٨В,	ΙN	CR	DSS	i,Ε	RR	OR,	۶I۱	/SF	γIN	51	GPØ21
C	IDPL=1	IF	00	PPI	ËR	В	RoA	DE	INE.	D	CR	05	S -	ŚΕ.	СТ	10	NS	AR	E	DES	SIR	ED	۶Ë	LSE	E 1	L D F	PL=;	051	GPØ22
Č	TCPE-E	FFFC		v = "	TE	MD	501	TI		ັດ	с , ,	τü	F	TA	20	C T	TA	u n	E C	000	TC	KE	iv	T M				SI	GP023
			n i		5.	100	* *			~ 0	-		-	16		۲	1 P N 1 P	- 1/ -		1.20	1.0	<u>ا</u> ت		1 19			- n	6	CPaula
C	NIABEN	OWRE	, rt		L 1	¥υ	<u> </u>	01	. N I	5	10	_ 8	E	US.	ΕU	1	N_1	. V A	E U	A 1			HE.	0	JPr	[L t	<u>. ה</u>	21	GFØZ4
C	BROADE	NED	ÇRI	0SS	s = S	ЕC	TIC	DN,	, Т	0	GE	T.	ΤН	ε	DO	PP	L, E F	7 B	IRO	ADI	ENE	D	CK	05:	S - S	SE (;11()51	GP025
C	N AT E	VERY	Έ.	NEF	GY	Ε	WE	: 1	'AK	E	ŤΗ	Ε	IN	TE:	R۷	AL	E٠	-N2	*D	EL'	T A	T0	E	+ N2	2#()EL	TA.	S 1	GPØ26
	FOR TH	5 1 N	TE	CR A	.1	ШЦ	FPF	- N	19 z	N T	40	12	٨	NΠ	n.	FI	T۸	15	: Ť	HE	n0	PP	Ē	RÍ	201	IST	▲ N 1	rs i	GP027
	NTAD-4	4 00			чн Ца	111					72	0 0	- <u>?</u>		2		ÊĈ.				00					5	• ••		00028
0	NIAB=1	1 08	5	5	SH0	UL.	<u> </u>	UF	11	CE	_ •	OR	_ A		ι, C	AS	53	• N	I A	8=	00	υ.	IN	150	9 E F			21	GPØZO
C	ERROR=	I F	Т.	HE .	RE	LA	TIV	1Ε.	ER	RO	R	BE	ΤW	ΕE	N	T₩	0 5	suc	CE	SS	Ι٧Ε	1	TE	RA	ΤĽ)NS)	51	GPØ29
C	OF THE	DOP	PLI	ER	ΙN	TE	GRA	1L	IS	L	ES	S	TH	AN	Ε	RR	OR	TH	ΞI	IN'	TEG	RA	ΤĪ	0N	RC	וטנ	' I NE	SI	GPØ30
	ASSUME	STH	ΔŤ	T۲	ŧ₽	TN	TEG	R 4	лĒ –	HА	S	co	NV	FR	GĒ	n	AND	ר ד	Т	ΓX '	TS		ΤY	PIC	CAL	_		S 1	GPØĴI
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C	ACCURA	CY O)F '	THE	F	ΙN	AL.	RE	ISU	LT	D	ES	IR	ΕD	A	ND	CC	OMP	UT	ER	TI	ME	A	V A I	ĨĹÁ	۱BL	Ε,	S I	GPØ34
C	IN PRA	CTIC	E	IT.	IS	F	OŨN	ID.	TH	A T	T	HE	S	ΡI	NS	0	F (DNL	Y	A I	FEW	R	ES	ON/	ANC	E S	5 AF	RS1	GPØ35
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C====	ALL PO	SSIB	ΙLΕ	SF	PIN	S	FC	R	ТΗ	Е	PA	RŤ	IC	UL	AR	Р	AR'	TIA	L	WAY	VΕ,	T	НŢ	S,	A V E	R	\ G E.	S	GP038
C	SPIN I	S CA	LC	۷LA	TE	D	FOF	۲ ۸	۱ G	IV	EN	۳	AR	GE	T	NU	CLE	EUS	S	PI	N A	ND	A	G	IVE	E N L	٧/	ASI	GPØ39
C	TN THT	S PR	in ci	RAN	4 1	N	CĂL	CI	lt Δ	τŤ	NG	Ť	HE	S	C &	ΤŤ	Ĩ R	TNG	C C	RÓ	SS-	SE	сτ	tŐ	N 1	V T T	н	SI	GP040
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C	INTERF	ERE	AM	ONC	; S T	T	HEN	1 S E	ΞĻV	ES		HO	WE	V E.	R,	IF.	A	GR	100	P	JF	RE	SU	NAI	NCE	- 5	HAS	551	GP042
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1	FORMAT	1714	. 2	x.,	5.	F5	. 1 .	21	5.	E1	Й.	4.	15	1														SI	GPØ48
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_	GO TO	1012																										21	
1011	PRINT2	5																										S I	GPØÞØ
	PRINT3	Ø, TE	FF	• N T	AB	, E	RRC	R.	IN	CR	0 S	S																S I	GPØ51
	PRINT2	5			-						-																	S	GPØ52
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	60 10	TATO	,																									21	
1012	CONTIN	UE																										51	64024
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C----GIVEN HENCE WE USE AWR WHICH IS MASS OF THE ELEMENT. SIGPØ6Ø PRINT17, ZA, AWR, NIS SIGPØÖI PRINT25 SIGPØÖŽ SIGPØÖJ J1=1 JF10=1 SIGPØ64 DO 101 I=1,NIS SIGP065 NRANGE=1 SIGP066 С SIGPØÖS PRINT25 PRINT18,I SIGPØÖÐ PRINT25 SIGPØ70 READ3, ZAI(1), ABN(1), NOT(4), LFW(1), NER(1), NOT(5) SIGPØ71 C----ZAI(I)=(Z,A) DESIGNATION OF ITH ISOTOPE ABN(I)=WT FRACTION OF ITH SIGP072 C---=-ISOTOPE LFW=1 FISSION WIDTHS ARE GIVEN,=0 FISSION WIDTHS NOT GIVENSIGP073 C----PR(1)=NO OF ENERGY RANGES USED SIGPØ74 PRINT19, ZAI(I), ABN(I), NER(I) SIGPØ75 NFRI=NFR(I) SIGPØ76 SIGPØ77 J2=1 C 106 READ3,EL(I,J2),EH(I,J2),LRU(I,J2),LRF(I,J2),NOT(6),NOSIGPØ79 SIGPØ80 11(7) SIGPØ81 SIGPØ82 C-----LRF INDICATES PARTICULAR TYPE OF RESONANCE FORMULA TO BE USED SIGPØ83 PRINT20, EL(1, J2), EH(1, J2), LRU(1, J2), LRF(1, J2) SIGPØ84 LRUIJ=LRU(I,J2) SIGPØ85 IF(LRUIJ-1)127,128,1010 SIGPØ86 127 PRINT1Ø SIGPØ87 GO TO 130 SIGPØ88 128 NMOM=1 SIGPØ89 Ċ READ3, SPI(1), AP(1), LIS(1), NOT(8), NLS(1, J2), NOT(9) SIGPØ91 C----SPI(1)=SPIN OF THE I=TH ISOTOPE, AP(1)=A+ SPIN DEPENDENT SCATTERINGSIGP092 C----LENGTH IN UNITS OF 1, 0E-12CM, AM(1)=A+, FOR SPIN INDEPENDENCEAM(1)=SIGP093 C----Ø,LIS(I)=Ø IMPLIES CALCULATE SCATTERING X-SECN FROM RESONANCE PARASIGPØ94 C----METERS PLUS FILE3,LIS(I)=1 IMPLIES CALCULATE CROSS-SECN FROM FILE3SIGPØ95 C----ONLY, NLS=NUMBER OF L=VALUES SIGP096 PRINT21,SPI(I),AP(I),NLS(I,J2),LIS(I) SIGPØ97 JI =1 SIGPØ98 C 104 READ3, C(I), AM(I), LANG(I, J2, JL), NOT(10), NRSOX, NRS SIGP100 C----C=CONST USED TO CALCULATE RHO=C+SQRT(E),AM=SEE ABOVE,LANG=L-VALUE SIGP101 C----OF THE ANGULAR MOMENTUM NRS=NUMBER OF RESONANCES SIGP102 PRINT22,C(I),AM(I),LANG(I,J2,JL),NRS SIGP103 NMOM=NMOM+1 SIGP104 J3=J1+(NRS=1) SIGP105 С RFAD4,((ARAY(K,J),K=1,6),J=J1,J3) THIS IS WHERE THE RESONANCE PARAMETERS ARE READ IN, ARAY(1,J)=ERESSIGP100 IN EV, ARAY(2,J)=J VALUE,ARAY(3,J)=TOTAL GAMMA, ARAY(4,J)=NEUTRON SIGP100 C C С WIDTH, ARAY(5, J)=GAMMA GAMMA, ARAY(6, J)=FISSION WIDTH, ALL WIDTHS ISIGP110 С N EV. SIGP111 PRINT25 SIGP112 SIGP113 PRINT23 PPINT26, ((ARAY(K, J), K=1, 6), J=J1, J3) SIGP114 PRINT25 SIGP115 Do 102 J=J1,J3 SIGP116 IRAY(1,J)=LANG(I,J2,JL) SIGP117 IRAY(2,J)=NRANGE SIGP118 IRAY(3,J)=I SIGP119 ERAY(1,J)=SPI(T)SIGP120

		STGP12	1
1 0 0		STOP12	2
102		010019	3
	JI=JI+NKS	210515	à.
		510516	3
	IF(NMOM-NLS(I,J2))104,104,103	SIGHT	2
103	NRANGE=NRANGE+1	SIGP12	2
	J2=J2+1	SIGP12	.7
	IF(NRANGE-NERI)106,106,1010	SIGP12	8
1010	NBES(I)=J1+JFID	SIGP12	9
		SIGP13	Ô
1 2 1		SIGPIS	1
701		STOPIS	2
		STOPIS	3
		STOPIS	ā
7		STOPIS	5
5		010013	Ā
4	FORMAI(OEI1,4)	510010	ž.
5	FORMAT(BEIL 4, SILW)	210010	6
6	FORMAT(2X,2E11.4)	SIGPLO	2
7	FORMAT(107H NEUTRON ENERGY(EV) SIGNN SIGCAP	SSIGP13	Y.
	1IGF SIGT SIGNMULT SIGTMULT >	SIGP14	0
8	FORMAT(2X,7E15.6)	SIGP14	1
9	FORMAT(10X,2E20,6)	SIGP14	2
10	FORMAT(20H ERROR IN INPUT DATA)	SIGP14	3
11	FORMAT(10X,2110)	SIGP14	4
12	FORMAT(10X.6110)	SIGP14	5
16	FORMAT(15A) NEUTRON ENERGYE15.6)	SIGP14	6
14	FORMATICES RECEIVER CHARGE WITHOUT DOPPLER BROADENING)	SIGPIÃ	7
1 -	FORMATION CRUSSESSECTIONS CALCOLATED WITH DODITIER DEVELORMAN	SICPIÃ	Å.
12	FORMAT(30H CRUSSHSECTIONS CALCOLATED WITH DUFFLER BROADENING)	AFSTOP14	ă.
17	FURMAT(SSH (Z,A) DESIGNATION OF THE ELEMENTELL, 4,22H ATTACK		ä
	I NEUTRONEII,4,12H NU UF ISOTUPESIO)	510515	ñ
18	FORMAT(24H DATA FOR ISOTOPE NUMBERIP)	210512	4
19	FORMAT(33H (2,A) DESIGNATION OF THE ISOTOPEELL,4,21H FRACTIONAL	ABSIGF12	5
	1UNDANCEE11,4,20H NO OF ENERGY RANGESI5)	SIGP12	္ရ
20	FORMAT(36H LOWER LIMIT OF THE ENERGY RANGE(EV)E11,4,18H UPPER	LISIGP12	4
	1MIT(EV)E11,4,6H LRU=I5,6H LRF=I5)	SIGP15	5
21	FORMAT(13H NUCLEAR SPINE11,4,18H SCATTERING LENGTHE11,4,15H NO C)F SIGP1>	<u>6</u>
	1L-VALUESI5,6H LIS=I5)	SIGP15	7
22	FORMAT(41H CONSTANT USED TO CALCULATE PENETRABILITYE11.4.22H SCA	TTSIGP15	8
	IFRING IFNGTH (A-)F11.4.17H ANGULAR MOMENTUMID.17H NO OF RESONANCE	SISIGP15	9
		SIGP16	ĝ
27	FORMATISSU FRES SPIN GTOT GN	SIGP16	i
L U		STGP16	ž
		STOPIA	3
24		510016	ă
25	FUKMAI(//)	010010	E.
20	$r \cup RMAI(0)(ZXJELL, H)(ZXJ)$	310410	ż
27	FORMAT(SSH GRUSS-SEGTIONS AT THERMAL ENERGY)	510710	1
28	FORMAT(2X,2E20.6,110)	516710	!
29	FORMAT(2x,4E11.4)	SIGP10	ð.
30	FORMAT(22H EFFECTIVE TEMPERATUREF5,1,41H IN DEGREES KELVIN, N	O SIGP10	9
	10F PIVOT POINTSI5,18H CONVERGENCE ERRORE10,4,13H AND INCROSS#15)	SIGP17	ø
31	FORMAT(53H THE INTEGRAL FOR DOPPLER BROADENING DID NOT CONVERGE)	SIGP17	1
C++-=	-THIS IS WHERE RESONANCES OF EACH ISOTOPE ARE ARRANGED IN INCREAS	SINSIGP17	2
C#	∍G ORDER IN L AND FOR EACH L IN INCREASING ORDER IN J.	SIGP17	3
	DO 133 I=1,NIS	SIGP17	4
	NRFSI=NRFS(I)	SIGP17	5
	CALL ORDER(I.NRESI)	SIGP17	6
133		SIGP17	7
17	FORMAT(10(1X,110))	SIGP17	8
13		SIGP17	ġ
		SIGPIS	Ø
		SIGPIR	11
	MRAILUSII-ARMILUSII "DUALE		-

	ARAY(4,I)=ARAY(4,I)*SCALE	SIGP182
	ARAY(5,I)=ARAY(5,I)+SCALE	SIGP183
	ARAY(6,I)=ARAY(6,I)#SCALE	SIGP184
135	CONTINUE	SIGP185
	NCOUNT=1	SIGP186
	DO 1330 I=1,NIS	SIGP187
	APX=AP(I)	SIGPIBB
	NREST=NRES(I)	SIGPIRO
		STGP190
	DO 1331 JENCOUNT.NIMT	SIGPISI
	CALL FACTS (ARAY (1, J), IRAY (1, J), PENFAR (J), SHIFAR (J), PS, CUNST, AWR.	SIGPI92
	1APX-1.0)	STOPIUS
1331		SIGF100
	NCOLNTENCOLNTENDEST	3105174
1330	CONTINUE	SIGPIF
	$D_{0} = 1/8 = 1 + NT(TA)$	S10F190
	DO 190 IIINADAL	SIGP19/
		5169190
4 0 0	CANTERNIC, LI ARAT(G, L)	SIGP199
100		SIGP200
~	CALL WINS(1,NICIAL,MOV,KOM)	SIGP201
C	ENER RESUMANCE IN AN ELEMENT ARE ARRANGED IN INCREASING ORDER IN	SIGP202
0	-ENERGY ALONG WITH THEIR TOTAL GAMMAS TO CALCULATE THE ENERGY MESH	SIGP203
U====	AT WHICH THE CROSS-SECTIONS ARE CALCULATED,	SIGP204
140		SIGP205
	PRINT25	SIGP206
		SIGP207
	E=ETHERM	SIGP208
	CALL SIGMA(ETHERM,AWR,1)	SIGP209
	PRINT25	SIGP210
	ELO=EL(1,1)+SCALE	SIGP211
	JFLAG(1)=1	SIGP212
	IRANGE=1	SIGP213
C=	-WE HAVE ARBITRARILY SET ELO=1.0E-11 MEV HERE TO BE ABLE TO DOPPLER	SIGP214
C	-BROADEN THERMAL CROSS-SECTIONS, LATER ON IN THE PROGRAM ELO IS READ	SIGP215
0	-IN FROM THE DATA AND COULD VARY FROM 1.00-11 TO 1.00-09MEV.	SIGP216
	PRINT8, ETHERM, (AREF(LL), LL=1,6)	SIGP217
	IF(IDPL-EQ.1)G0 TO 147	SIGP218
	GO TO 148	STCP2181
147	TFF=TFFF/293.0	STOPOLO
	DELTA=0.3177*SORT ((TEE*ETHERM)/AWR)	STCP220
c	CONTINUE	STCP221
•	CALL GRID(FTHERM.DELTA.NTAR.XTAR)	STCP222
	CALL GREAT2(DOPPIER, FINT, STAR, NTAR, FRROR, 15RR)	510F252
	PRINT28. FTHERM. FINT. JFL AG(1)	STCP224
	IF(IFRR.F0.1)PPINT31	SIGE224
148	PRINZ25	5100222
	PRINTZ	5100220
	PRINT25	510-227
	DO 124 JUSTINIS	5105220
	NERUI=NER (UU)	SIGF247
	DO 125 KK=1.NFPJJ	SIGPORT
		STOLSAT
		310F202
	F(I, RUIK=1)131.1321.125	5167200
131		5165204
701	- 0 - 1 - 0 - 1 - 0 - 0 - 0 - 0 - 0 - 0	2108522
1321		5167230
1051	1 TO 130	5167257
1320		SIGP2071
TOEN	ELUNER * ELNJUNK/ *30ALE EUNER = EN/ 11 KK/ *30ALE	SIGP238
		SIGP239
	CLU-CLUREF	SIGP240

	EHI=EHIREF	SIGP241
	GO TO 1240	SIGP242
132	ELO=EL(JJ,KK)*SCALE	SIGP243
	EHI=EH(JJ,KK)*SCALE	SIGP244
	IF (ELO.EQ.ELOREF.AND.EHI.EQ.EHIREF)GO TO 124	SIGP245
	GO TO 1240	SIGP2451
1240	MM=MAXPTS/(8+MAXRES)	SIGP246
	NN=MM	SIGP247
	IFLAG=1	SIGP248
	NŁŚKK=ŃLS(JJ.KK)	SIGP249
	J4=1	SIGP250
	ÎSTART=1	SIGP221
	IEND=1	SIGP252
117	IF(IEND EQ.0)GO TO 125	SIGP253
	J5=J4+1	SIGP254
	E1=ERAN(1, 14)	SIGP255
	G1=ERAN(2, J4)	SIGP256
	E2=ERAN(1, J5)	SÍGP257
	G2=ERAN(2, J5)	S1GP258
	1F(E1.1 T.EL 0. AND. E2.1 T.EL 0)GO TO 1120	SIGP259
	GO TO 1105	SIGP2>91
1105	IF (E1.LE.FLO.AND.E2.GT.ELO)GO TO 1110	SIGP260
	G0 T0 1111	SIGP2601
1110	E1=EL0	SIGP261
	G1=G2	SIGP262
	ISTART=0	SIGP263
	GO TO 1114	SIGP264
1111	IF(E1.GT.EL0.AND.E2.LE.EHI)G0 TO 1112	SIGP265
	GO TO 1113	SIGP2651
1112	IF(J4.EQ.1.AND.ISTART.EQ.1)G0 TO 1106	SIGP266
	G0 T0 1114	SIGP2661
1106	E2=E1	SIGP267
	G2=G1	SIGP268
	E1=ELO	SIGP269
	J4=J4-1	SIGP270
	ISTART=0	SIGP271
	GO TO 1114	SIGP272
1116	E2=EHI+G1/FLOAT (MM)	SIGP273
	G2=G1	SIGP274
	IFLAG=Ø	SIGP275
	GO TO 1114	SIGP276
1113	IF(E1,LT,EHI,AND,E2,GE,EHI)GO TO 1123	SIGP277
	GO TO 1124	SIGP2771
1123	E2=EHI	SIGP278
	G2=G1	SIGP279
	IEND=Ø	SIGP280
	GO TO 1114	SIGP281
1124	IF(E1.GE.EHI.AND.E2.GT.EHI)GO TO 125	SIGP282
	GO TO 1125	SIGP2821
1125	IF(IFLAG)1120,125,1120	SIGP283
1114	IF(E1,EQ,E2)GO TO 1120	SIGP284
	GO TO 1118	SIGP2841
1118	CONTINUE	SIGP285
	CALL SIEVE(E1, G1, E2, G2, MM, NN, NX, TEFF, AWR)	SIGP286
	CALL QIKS(1,NX,MOVE,KOME)	SIGP287
	GO TO 116	SIGP288
1120	IF(IEND.EQ,0)GO TO 125	SIGP289
	J4=J4+1	SIGP290
		SIGP291
116	UO 109 1=1,NX	SIGP292
	L=LX(1)	SIGHEAS

	JFLAGI=JFLAG(I)	SIGP294
	CALL SIGMA(E,AWR,KK)	SIGP295
	PRINTB, L, (AREF(LL), LL=1,6)	SIGP296
	IF (IDPL EQ.1)GO TO 141	SIGP297
		SIGP2971
141	IF (E, LI-E)HERM)GD IU 109	SIGP298
Ceresa	GU TU 1910 - IF THE NEUTRON ENERGY IS LESS TUAN & 0253 EV DORD ER BRUADENING -	SIGP2981
C=====	PASSED AS A DIFFERENT KERNEL SHOULD BE USED TO CALCULATE DOPPLER	510F277
Č	BROADENED CROSS-SECTIONS.	SIGPSNI
1410	TEF=TEFF/293,0	SIGP302
	DELTA=0.3177*SORT ((TEF*E)/AWR)	SIGP303
С	CONTINUE	SIGP304
	GO TO (1121,1122),JFLAGI	SIGP305
1121	CALL GRID(E, DELTA, NTAB, XTAB)	SIGP306
32	FORMAT(2X,11E11,4)	SIGP307
	CALL GREATZ(DOPPLER,FINT,XTAB,NTAB,ERROR,IERR)	SIGP308
	$[r_1] = [r_1] = [r_1$	SIGP309
		SIGPSID
1122		S16F311
	PRINT28, E, DOPE, JFLAG(1)	SIGP313
109	CONTINUE	SIGP314
	IF(IFLAG)1117,125,1117	SIGP315
1117	J4=J4+1	SIGP316
1050	IF(NTOTAL=J4)125,1250,117	SIGP317
1290		SIGP318
	G1=ERAN(2, J4)	SIGP319
125		SIGP320
124	CONTINUE	SIGP321
120		SIGPOZZ
13Ø		STGP324
	END	SIGP325
	SUBROUTINE ORDER(K,N1)	ORDRØØI
	COMMON ARAY, IRAY, ERAY, NOT, ZAI, ABN, NER, LFW, EL, EH, LRU, LRF, LANG, NLS,	ORDRØØZ
1	LNRES, LN, JN, PENFAR, SHIFAR, SPI, AP, LIS, C, AM, DREF, AREF, IRANGE, NIS,	ORDRØØ3
3	SINCROSS, IVSPIN, ELO, TEFF, DELTA, E, AWR	ORDRØØ4
	UIMENSIUN ARAY(0,500), IRAY(3,500), ERAY(2,500), NOT(20), ZAI(10),	ORDRØØS
1	LABN(10), NER(10), LFW(10), EL(10,10), EH(10,10), LRU(10,10), LRF(10,10)	ORDRØØO
.7	(10)), DECIMPINES(10), NRES(10), EN(20), DECEMPINEAR(200), SHIFA (500), SPI(10), AP(10), FIS(10), C(10), AM(10), DECEMPINEAR(200), SHIFA	RORDRØØ/
	TE(K=1)2.3	ORDRØØØ Oppøøøö
2	NTR=0	ORDRAIA
	NUML=Ø	ORDRØ11
	NUMJ=Ø	ORDRØ12
	NN=0	ORDRØ13
	MM=0	ORDRØ14
		ORDRØ1>
		ORDRØ16
3		
v	NTR=NTR+N1	
	0L=→Ø,9	ORDRØŽÔ
8	OL ≠OL +1 .Ø	ORDRØ21
	DO 101 N=NT,NTR	ORDRØŻŻ
	TERM=FLOAT (IRAY(1,N))	ORDRØ23
•	IF(OL=TERM)101,101,9	ORDRØ24
9	NN=NN+1	ORDRØ25
		ORDRØ26
		OKURØ27

	ARAY(J,N)=ARAY(J.NN)	ORDRØ28
	ARAY(J, NN) = A	ORDRØ29
100	CONTINUE	ORDRØ3Ø
	D0 1001 J=1.3	ORDRØSI
		ORDRØJZ
	TRAY(J, N) = TRAY(J, NN)	nRnRø33
		ORDRØ34
1001		OPDPRXS
1001		ORDHUGS
	ERAT(J,N)=ERAT(J,NN)	URDRØSB
	ERAT(J, NN) = LA	OKDROSA
1002	CONTINUE	ORDRØ40
101	CONTINUE	ORDRØ41
	IF(NN=NC)8,8,11	ORDRØ <u>4</u> 2
11	NUML=NUML+1	ORDRØ43
	LN(NUML)=NN-NC	ordrø <u>44</u>
	NC=NN	ORDRØ45
	NU=NT+LN(NUML)-1	ORDRØ46
	OM= 0,25	ORDRØ47
14	0M=0M+Ø-5	ORDRØ48
	DO 205 M=NT.NU	ORDRØÄŸ
	TERMJ=ARAY(2,M)	ORDRØ50
	IF (OM-TERMJ)205,205,15	ORDRØSI
15	MM=MM+1	ORDRØ52
		ORDRØ53
	A = A R A Y (J, M)	ORDRØ54
	A = A + (1 + M) = A + A + (1 + MM)	0808055
		OPDPRES
204		
204		
		URURUSS
		DRDRDOO
		OKDKNOT
2041	CONTINUE	OKUKN055
	D0 2042 J=1,2	ORDRØGS
	LAELRAY(J,M)	ORDRØ04
	ERAY(J,M)=ERAY(J,MM)	ORDRØ65
	ERAY(J,MM)=EA	ORDRØ66
2042	CONTINUE	ORDRØ67
205	CONTINUE	ORDRØ68
	IF(MM=MC)14,14,16	ORDRØ69
16	NUMJ=NUMJ+1	ORDRØ7Ø
	JN (NUMJ) = MM-MC	ORDRØ71
	MC=MM	ORDRØ72
	(LMUN)NL+TM=TA	DRDRØŻS
	IF(NN-MM)17.17.14	NRDRØZA
17	IF(NTR-NN)18.13.8	NRDRØ75
18	RETURN	ORDRØŻŚ
	END	ORDRØZZ
	SUBROUTINE SIGMA(0, BWR.KK)	STEMARI
	COMMON/F/YMIN(A) YMAY(A) YDFF/A)	STCMMM2
	COMMON ADV. TRAVE COMMANDY AND ADV NED LEW ELEM ADD DESTAND AD C	SIGNODE
	ANDER IN IN DENEAD SUIEAD SOT AD ITS CAM DEFENDER DINCE NIS	SIGMODO
	INCOSCIENTONICON ANTONICANTONICATICETTACTICATURA DE ANTONICATICA ANTONICA NO CONTRANCE, NIO, SU	510H004
	DIMENUSSINUSEIN,EEU,TEFF,DELTA,EJAMR DIMENSION IDIMIA SAAN TDIMIA SAAN SDIMIA SAAN NOTIOAN ANTIAN	SIGMOND
	UIMENSIUN ARAT(0,000), 1RAT(3,000), ERAY(2,000), NOT(20), ZAT(10),	SIGMODO
	LAUN(10), NEH(10), LFW(10), EL(10,10), EH(10,10), LRU(10,10), LRF(10,10),	SIGMØØ7
	<pre>eLang(10,2,2),NLS(10,10),NRES(10),LN(50), JN(150), PENFAR(500), SHIFAR</pre>	SIGMOUS
	>(>00), SPI(10), AP(10), LIS(10), C(10), AM(10), DREF(6), AREF(6)	SIGMØØ9
	PI=3,14159205358	SIGMØ10
	UO 4 J=1,6	SIGMØ11

	AREF(J)=0,0	SIGMØ12
4	CONTINUE	SIGMØ13
	TERROR=1,0E-03	SIGMØ14
	12=0	STGM015
	N2=Ø	SIGMØ16
		SIGMAIZ
		STCMRIB
		SIGNAIG
		SIGMAZA
	NRESTENRES(T)	SIGMOZI
	$\Delta P T = \Delta P (1)$	SIGMOZZ
3	NTRENTRESI	SIGN023
Ŭ	IF/NRESI110.110.100	SIGNOZA
100		SIGM025
102		SIGMOZÓ
	CALL FACTS(Q. TRAY(1,12), PF SF PS, CONSTERBUR, APT, 3 (4)	S16/1020
	SNCINE0.0	SIGHDZA
	SNCLC=0.0	SIGNOZO
	SNCLF=Ø.Ø	SIGNOLO
	SNNL 2=0.0	SIGNEOD
103		SIGMOS
104	N1=N2+1	SIGNOSS
	$N2=N2+N(1\Delta)$	SIGNOSA
	$G_{1=2} = 0 + (2, 0 + SPt(t) + 1, 0)$	SIGNUS
	$G_{1}=(2, 9 + 4RAY(2, N1) + 1, 9)/C_{1}$	SIGNOS
	X=1.0	SIGN037
	SPIN-APAY(2, N1)	SIGNDOV
		SIGNEGO
	CALL SPINOR(SPII.IPAV(1.E2), YOPIN)	SIGNDAD
	APDIFEARS (VSPIN-SPIN)	SIGN041
	IEVINSPIN ED 1160 TO 115	SIGNOT
	GO TO 116	SIGHD42 SIGHD421
116	TECABOTE LT. TERRORIGO TO 117	STGMOAS
	GO TO 115	STGM0431
117	X=0.0	SIGNOAA
115	SNNK23=0.0	SIGM045
	D0 108 K=N1.N2	SIGMO
	GNK=PF*ARAY(4.K)/PFNFAR(K)	SIGMOAT
	GK = GNK + ARAY(5, K) + ARAY(6, K)	SIGM048
	FRDK=ARAY(1,K)+((SHIFAR(K)-SF)*ARAY(4,K))/(2, Ø*PENFAR(K))	SIGMØ49
	FD=Q=FRDK	STGMASA
	DK=ED*FD+0.25*GK*GK	SIGMOSI
	SNNK2=GNK*GNK*COS (2.0*PS)	SIGM052
	SNNK2=SNNK2=2,Ø+GNK+(ARAY(5,K)+ARAY(6,K))+SIN(PS)+SIN(PS)	SIGMØ53
	SNNK2=SNNK2+2.0+GNK+ED+SIN (2.0+PS)	SIGMØ54
	SNNK2=SNNK2/DK	SIGMØ55
	SNGK=GNK#ARAY(5,K)/DK	SIGMØ56
	SNFK=GNK*ARAY(6,K)/DK	SIGMØ57
	SNGLN=SNGLN+SNNK2*GJ	SIGMØ58
	SNGLG=SNGLG+SNGK+GJ	SIGMØÞŸ
	SNGLF=SNGLF+SNFK+GJ	SIGMØ60
	SNNK3=0.0	SIGMØ61
	IF (K-N1)107,107,105	SIGMØ62
105	M1=K-1	SIGMØ63
	DO 106 M=N1,M1	SIGMØ64
	GNM=PF *ARAY(4,M)/PENFAR(M)	SIGMUES
	GM=GNM+ARAY(5,M)+ARAY(6,M)	SIGM066
	ERDM = ARAY(1,M) + ((SHIFAR(M) - SF) + ARAY(4,M))/(2,0 + PENFAR(M))	SIGMØ67
	EDD=Q-EHDM	SIGMØ65
	DM=EDD+LDD+0,25*GM+GM	SIGMØ69
	SNNM3=ED*EDD*Ø,25*GK*GM	SIGMØ7Ø

	SNNM3=SNNM3*2,Ø*GNK*GNM/(DM*DK)	SIGMØ71
	SNNK3=SNNK3+SNNM3	SIGMØ72
106	CONTINUE	SIGMØ73
107	CONTINUE Saura 7 - Saura 7 - S	SIGMD/4
4 77 9	SNNK20#SNNK2#SNNK2#SNNK0#X	SIGNUTS
140	CUNTINUS SNNL2#SNNL2+SNNK23#GI	SIGMOTO
		SIGM078
109	BETA=PI*ABN(I)/(CONSTE*CONSTE)	SIGMØ79
	AREF(1)=AREF(1)+SNGLN+BETA	SIGMØNØ
	AREF(2)=AREF(2)+SNGLG+BETA	SIGMØBI
	AREF(3)=AREF(3)+SNGLF*BETA	SIGMØ82
	AREF(4)=AREF(4)+BETA*(SNGLN+SNGLG+SNGLF)	SIGMØ83
	AREF(5)=AREF(5)+SNNL2+BETA	SIGMONA
	AREF(6)=AREF(6)=BETA*(SNGLG=SNGLF=SNNL2)	SIGMODO
440	IF(L2=N/R)160,110,110	SIGNUDO
* + 10	1 DH W = UH (T. KK) SIGE#9,9	STGMØÄB
	TELL BULK-111250.1250.125	SIGMØ89
1250		SIGMOOD
	D0 126 LL=1,NLSKK	SIGMØ91
	LURE #LANG(I,KK,LL)	SIGMØ92
	SS=FLOAT (LURE)	SIGMØ93
	CALL FACTS(Q,LURE,PF,SF,PS,CONSTA,BWR,API,3,0)	SIGMØ94
	TRM=(2,0*SS+1,0)#4,0*PI	SIGMOYS
	TRM=TRM+SIN(PS)+SIN(PS)/(CONSTA+CONSTA)	SIGMOYO
126		SIGMUY
125	GONTINOL ARSE(1)=ARSE(1)+SIGP#ARN(1)	SIGMA99
	ARFF(4) = AREF(4) + SIGP + ABN(I)	SIGM100
	AREF(5) = AREF(5) + SIGP * ABN(1)	SIGMINI
	AREF(6)=AREF(6)+SIGP*ABN(I)	SIGM102
112	CONTINUE	SIGM103
	RETURN	SIGM104
		SIGM105
•	SUBROUTINE FACTS(Q,L,PF,SF,PS,CONSTE,BWR,BP,PLOD)	FACIONI
C C	SUDDOLTING TO GALOW ATE DENETDATION AND	FACTORE
č	SUBRUUTINE TO TALUULATE PENETRATIUN AND SHIFT FACTORS	FACTORE
č	Q IS THE ENERGY I IS THE ANGULAR MOMENTUM PE PENETRATION FACTOR	FACTORS
č	SF THE SHIFT FACTOR AND PS THE PHASE SHIFT AP IS R CONSTE IS KM	FACTORS
Ċ	FOR DETAILS OF FORMULAE SEE GREGSON ET AL AEEW-M517(MLBW)1965	FACTØØ7
С		FACTØØ8
	DATA WNEUT/1,008665/	FACTOOS
		FACTOLO
	CONFLUEZ, 190//12#03#BWR#SURT(EAB)	FAUIDEE
C	LUNSTEEGUNHLUZ(DWRY1,0) _SINCE AND IS CIVEN WITH THE NEHTRON MASS AS HNITTY WE ADD ONE ADDVI	FACIDAE FEACTOIS
0	TO CONVERT TO THE CENTER-OF-MASS SYSTEM	FACTOIA
v -	ROE=BP*CONSTE	FACTOIS
	S=FLOAT (L)	FACTØ16
	IF(L,LE-0)GO TO 100	FACTØ17
	GO TO(110,120,130,140,150),L	FACTØ18
100	PF=ROL	FACT019
	51 =0,0 15/PLOD LT 2 01 CO TO 160	FAULDED
	DS-BWE TLATACHERTER AND AN TAN	FACTO22
	GD TO 170	FACT023
110	ROE2=ROE+ROE	FACT024
	DENOM=1-Ø+ROE2	FACTØ25
	PF=R0E2*R0E/DENOM	FACTØ26

	SF=-1,0/DENOM	FACTØ27
	IF(PLOD_LT,2,0) GO TU 160	FACT028
	PS≖ROE-ATAN (ROE)	FACT029
	IF(PS/RQE=0,000001)160,170,170	FACTØ3Ø
12Ø	RDE2=RDE+RDE	FACTØ31
	ROF4=ROE2+ROE2	FACTØ32
	DENOM=3.0+R022+R024+9.0	FACTØ33
	PF=R0E4+R0E/DENOM	FACTØ34
	SF==(18.0+3,0+R0E2)/DENOM	FACTØ35
	IF(PLOD_LT.2.0) GO TO 160	FACTOSO
	PS=ROE + ATAN (3.0+ROE/(3.0+ROE2))	FACTØ37
	IF(PS/R0E=0,000001)160,170,170	FACTØ38
130	ROE2=ROE+ROE	FACTØ39
	ROE4=ROE2+ROE2	FACTØŦØ
	ROF6=ROE4+ROE2	FACT041
	DENOM=225.0+45.0+R0E2+6.0+R0E4+R0E6	FACTØ42
	PF=R0E6+R0E/DENOM	FACT043
	SF==(675.0+90.0#R0E2+6.0#R0F4)/DENOM	FACTOAA
	IF(PLOD.LT.2.0) GO TO 160	FACTØ45
	PS=ROE+ATAN ((15,0+ROE+ROE2+ROE)/(15,0+6,0+ROE2))	FACTØ46
	IF(PS/ROF-0.000001)160.170.170	FACTØ47
140	ROF2=ROF+ROF	FACT048
	ROF4=ROF2+ROF2	FACTER
	ROF6=ROE4+ROE2	FACTOBO
	RDEB=ROE4+ROE4	FACTØSI
	DENOM=11025,0+1575.0*RCE2+135.0*RCE4+10.0*ROE6+ROE8	FACT052
	PF=R0E8*R0E/DENOM	FACT053
	IF(P, 0D-1 T, 2, 0) GO TO 160	FACTØ54
	SF==(44100.0+4725.0+R0E2+270.0+R0E4+10.0+R0E6)/DENOM	FACTØ55
	PS=R0E-ATAN ((105.0*R0E-10.0*R0E2*R0E)/(105.0-45.0	FACTØ56
1	#R0E2+R0E4))	FACT057
-	IF(PS/ROE-0.000001)160,170,170	FACTØ58
15Ø	RDE2=RDE+RDE	FACTØDO
-	ROF4=ROE2+ROE2	FACTOOD
	ROF6=ROE4+ROF2	FACTOOI
	ROF8=ROE4+ROE4	FACT062
	ROF10=ROF6+ROE4	FACTOOS
	DFN0M=893025,0+99225,0+R0F2+6300,0+R0F4+315,0+R0F6	FACTØ64
1	+15.0*R0E8+R0E10	FACT065
	PF=ROE10+ROE/OFNOM	FACTOOO
	SF=4465125,0+396900,0+R0E2+18900,0+R0E4	FACT067
1	+630,0+R0E6+15,0+R0E8	FACTØÖS
-	SF=-SF/DENOM	FACTØ69
	IF(PLOD-LT.2.0) GO TO 160	FACTOTO
	PS=ROE-ATAN ((945,0*ROE-ROE*(105,0*ROE2=ROE4))/(945,0+420,0*ROE2*	FACT071
1	.15,0*ROE4))	FACTØ72
	IF (PS/ROE.GE.0.000001) GO TO 170	FACTØ73
160	PS=0,0	FACTØ74
170	RETURN	FACTØ75
	END	FACTØ76
	SUBROUTINE MOV(I,J)	MOV ØØI
	COMMON/D/ERAN(2,501)	MOV Ø02
	I1=I	MOV Ø03
	J1=J	MOV ØØ <u>4</u>
	IF(11.EQ.0)11=501	MOV Ø05
	\$F(J1.EQ.0)J1=501	MOV Ø06
	ERAN(1, J1)=ERAN(1, I1)	MOV Ø07
	ERAN(2, J1)=ERAN(2, I1)	MOV ØØ8
	RETURN	WON NON
	END	MOV Ø10
	SUBROUTINE MOVE(1, J)	MOVEØØ1

MOVEØ02 COMMON/C/EX(101), JFLAG(101) MOVERÓS I1=I MOVEØØ4 J1=J IF(11.EQ.0)11=101 MOVEØØ5 IF(J1.EQ.0)J1=101 MOVEØØ EX(J1) = EX(I1)MOVEØØ7 JFLAG(J1)=JFLAG(I1) MOVEØØ8 MOVEØØ9 RETURN END MOVEDID FUNCTION KOM(I, J) KOM ØØ1 COMMON/D/ERAN(2,501) KOM ØØŻ 11=I KOM 003 J1=Ĵ KOM ØØ4 IF(11.E0.0)11=501 KOM ØØ5 IF(J1,EQ.0)J1=501 KOM ØØ6 EOM=ERAN(1, I1)-ERAN(1, J1) KOM 007 IF(EOM)100,101,102 KOM ØØ8 100 KOM==1 KOM ØØŸ GO TO 103 KOM Ø10 KOM Ø11 101 KOM=0 GO TO 103 KOM Ø12 102 KOM=1 KOM 013 103 RETURN KOM Ø14 KOM 015 END FUNCTION KOME(I,J) COMMON/C/EX(101), JFLAG(101) KOMEØØ2 11=1 KOMEØ03 KOMEØØ4 J1=J IF(11.EQ.0)11=101 KOMEØØS KOMEØØÓ IF(J1.EQ.0)J1=101 EOX=EX([1)+EX(J1))KOMEØØ7 IF(EOX)100,101,102 KOMEØØ8 100 KOME==1 KOMEØØ9 GO TO 103 KOMEØ10 101 KOME=0 KOMEØ11 KOMEØ12 GO TO 103 102 KOME=1 KOME013 103 RETURN KOME014 KOMEØ1> END SUBROUTINE QIKS (MM, NN, MOVE, COMPAR) **QIKSØØ1Ø** CQIKS ALL-IN-MEMORY SORT PROGRAM QIKS0020 MM = FIRST SUBSCRIPT QIKSØØ3Ø С C NN = LAST SUBSCRIPT (ARRAY IS IN COMMON) QIKSØØ4Ø MOVE AND COMPAR ARE USER SUPPLIED PROGRAMS С **GIKSØØ50** DIMENSION MSAVE (20), NSAVE (20) QIKSØØ6Ø KEYLOC(M,N) = (N+M)/2QIKSØØ7Ø I = Ø QIKSØØØØ QIKSØØ9Ø J=0 LEVEL = Ø QIKSØ100 M=MM QIKSØIIØ NENN QIKS0120 35 CONTINUE QIKSØ130 TEST FOR ONE OR TWO ITEMS OIKSØ14Ø C IF(N-M-1) 31,51,32 QIKSØ15Ø С 32 CONTINUE QIKSØ16Ø PARTITION AND SPREADER GO HERE, SEE BELOW, RETURN IS TO 8 C QIKSØ17Ø С PUSH DOWN QIKSØ18Ø 8 LEVEL=LEVEL+1 QIKSØI9Ø WORK ON SMALLEST PORTION С QIKSØ200 IF ((J=M) = (N-I)) 134, 134, 34 QIKSØ21Ø 134 MSAVE(LEVEL) = I QIKSØ22Ø

SPNR0041 SPNR0051 SPNRØØ2 SPNR004 SPNRØØS Frecompar(0,J))8,10,8 Continue Return to Main Program END Subroutine Spinor(s,L,XJ) Term=0,0 Denom=0.a If(s,E0.0,AND.L,EQ.0)GO TO 100 If(s,E0.0,AND.L,EQ.0)GO TO 100 So to 101 For S=0 AND S-WAVE RESONANCES SPINS ARE ALL KNOWN HENCE ONE NEEDS 51 IF(COMPAR(M,N))31,31,131 51 IF(COMPAR(M,N))31,31,131 5WAP IF ONLY TWO ITEMS ARE OUT OF ORDER 31 Call MOVE(M,0) Call MOVE(N,M) 31 IF (LEVEL) 151, 150, 151 50 RETURN IF (I - N) 110, 10, 110 I = I + 1 IF(COMPAR(Ø,1))10,12,10 IF (J - M) 108, 8, 108 KEY=KEYLOC(M,N) Call Move(key, 0) If (N - key, 17, 1, 17 Call Move(N,Key) GO TO 5 5 CONTINUE Hole at top If(COMPAR(0,J))5,5,7 CONTINUE Hole at Bottom If(compar(0,1))3,2,2 CALL MUYL CALL MUYL 60 TO 2 4 CONTINUE SPREADER GOES HERE -411 PARTITION -211 -22 1 - J) 1, 4, 1 MOVE(1,J) I - J) 6, 4, 6 MOVE(J,I) M = MSAVE(LEVEL) N=NSAVE(LEVEL) LEVEL=LEVEL<1 60 T0 35 MSAVE(LËVEL)=J NSAVE(LEVEL)=J END MAIN PARTITION न । POP UP M # MSA 1 = 1 + 1 1 F - 1 + 1 C A L - 1 0 A L - 1 0 A C 7 1=**∪**=1 2 = 7 Ħ Мн Т Xμ Ŀ C+---51 131 31 150 151 1 U 7 4 110 110 108 108 40 32 -N ю Q ŝ Ø

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Cerea		SPNRØØ6
101		SPNRØØ7
±		SPNR0071
100		SPNRØØA
100		SPNRAMA
4 73 73		SPNRAIA
100		SPNDA11
		CONDAT2
111		SPNRØ14
		SPNRULS
		SPNR0101
104	• TERM=TERM+XJ1+(2.0+XL+1.0)	SPNRØ14
	DENOM=DENOM+(2.0+XL+1.0)	SPNRØ19
	GO TO 106	SPNRØ16
105	• TERM=TERM+XL+(2.0*XJ1+1.0)	SPNRØ17
	DENOM=DENOM+(2,0+XJ1+1,0)	SPNRØ18
106	5 IF(XJ2,GT,XL)G0 T0 107	SPNR019
	GO TO 108	SPNRØ191
107	' TERM=TERM+XJ2*(2,0*XL+1,0)	SPNRØ20
	DENOM=DENOM+(2.0+XL+1.0)	SPNRØ21
	GO TO 109	SPNRØ22
108	• TERM=TERM+XL+(2,0+XJ2+1,0)	SPNRØ23
-	DFNOM=DENOM+(2.0+XJ2+1.0)	SPNR024
109	XURTERMIDENOM	SPNRØ25
	60 To 118	SPNR026
100		SPNR027
110		SPNRØZA
***		SPNRAZO
	SUBROUTINE CAUSSIO BELTA DOREN	CAUSANI
	COMMON ADAY TEAVED AND TAT ADA MED LEW PLET LEDITELANCINGS.	CALISONS
	ANDER IN DENERA SHEAD SOL AD ISE CAM DEE ADEE NEWLENSENSENSENSENSENSENSENSENSENSENSENSENSE	CAUSAAR
	INKES, LN, UN, FENFAR, SHIFAR, SPIJAF, LISJU, AMJUREF, AREF, IRANGE, NISJ	GAUSENS
	SINCROSS, IVSPIN, ELU, IEF, DELTA, E, AWR	GAUSON
	DIMENSION ARAT(0,500), [RAY(3,500), ERAT(2,500), NOT(20), ZAI(10),	GAUSUUS
	1ABN(10), NER(10), LFW(10), EL(10,10), EH(10,10), LRU(10,10), LRF(10,10),	GAUSDO
	2LANG(10,5,5), NLS(10,10), NRES(10), LN(50), JN(150), PENFAR(900),	GAUSODI
	3SHIFAR(500), SPI(10), AP(10), LIS(10), C(10), AM(10), DREP(6), AREF(6)	GAUSØØB
	DIMENSION ABC(9) WET(9)	GAUSØØ9
	DATA ABC/-3,190993201/8153,-2,26658058453184,-1,46855328921667,-0,	GAUSØ10
	172355101875284,0,0,0,72355101875284,1,46855328921667,2,26658058453	GAUSØ11
	2184,3.19099320178153/	GAUSØ12
	DATA WET/0.3960697726326E=04,0.4943624275537E=02,0.8847452739438E=	GAUS013
	1Ø1, Ø, 432651557ØØ26E+ØØ, Ø, 72Ø2352156Ø61E+ØØ, Ø, 432651557ØØ26E+ØØ, Ø, 8	GAUSØ14
	2847452739438E-01,0,4943624275537E-02,0,3960697726326E-04/	GAUSØ15
	DATA PHIRT/1.772454/	GAUSØ16
	TERM=0.0	GAUSØ17
	X=BELTA*ABC(9)	GAUSØ18
	IF(F-X) = 100.101	GAUSØ19
101		GAUSØZØ
		CAUS021
		GAUS022
		GAUSØ23
	CALL STOMA (7. AWR. TRANCE)	CAUSØ24
		CAUS025
1 0 0		CAUSO26
102	DADE TERMIDUT	CAUS027
		CAUSASA
4 11 11		GAUSD20
100		GAUSUAY
110	KETURN	GAUSOSO
		GAUSOSI
	SUBROUTINE GREATICEFINE, NTAB, JMAX, XTAB, MARTS, GOOF, INTER, ERROR,	GRILØUL
	1 IERR)	GRT1002
C	■CARRY OUT CONVERGENCE INTEGRATION SCHEME USING TRAPAZOIDAL RULE	GHT1003

C---= AND DOUBLING THE NUMBER OF REGIONS PER SUBINTERVAL FOR EACH GRT1004 C-----ITERATION, ONLY DOUBLE UP IN THOSE INTERVALS THAT HAVE NOT ALREADYGRT1005 C----CONVERGED. GRT1006 C----F **#SINGLE PRECISION FUNCTION TO BE INTEGRATED** GRT1007 C----FINT =THE RESULTING INTEGRAL GRT1008 C-----NTAB =NUMBER OF ORDINATES SUPPLIED (THERE ARE N=1 INTERVALS) GRT1009 C---JMAX =MAXIMUM ALLOWABLE NUMBER OF ITERATIONS GRT1010 =TABLE OF THE ORDINATE VALUES, RANGE OF INTEGRATION IS FROM XTAB(1) TO XTAB(NTAB) C----XTAB GRT1011 0----GRT1012 C-----PARTS =ARRAY OF DIMENSION NTAB, EQUAL TO THE PARTIAL INTEGRALS GRT1013 C----OVER EACH OF THE NTAB-1 INTERVALS GRT1014 C---=GOOF =ARRAY OF DIMENSION NTAB, EQUAL TO THE NORMAL ERROR IN EACH GRT1015 OF THE NTAB-1 INTERVAL. Ceees GRT1Ø16 C-----INTER #ARRAY OF DIMENSION NTAB, SEPECIFYING THE NUMBER OF GRTIØI7 SUBINTERVALS IN EACH INTERVAL GRT1018 C----RROR =ACCEPTABLE NORMAL ERROR GRT1019 C-----IERR = ERROR INDICATOR. SET TO ZERO IF METHOD CONVERGES, SET TO GRT1020 ONE IF METHOD DOES NOT CONVERGE 0----GRT1021 DIMENSION XTAB(NTAB), PARTS(NTAB), INTER(NTAB), GOOF(NTAB) GRT1022 C----BINITIALIZE VALUE OF THE INTEGRAL GRT1023 FINT=0.0 GRT1Ø24 C----CALCULATE THE NUMBER OF INTERVALS GRT1025 NM1#NTAB=1 C----CALCULATE ALLOWABLE ERROR PER INTERVAL GRT1026 GRT1027 ERRN=ERROR/FLOAT(NM1) GRT1028 C-----INITIALIZE APPROXIMATION TO INTEGRAL GRT1029 TOTAL=0.0 GRT1030 C----CALCULATE INITIAL APPROXIMATION GRT1031 DO 10 1=1,NM1 GRT1032 INTER(I)=1 GRT1033 PARTS(I)=0,5*(XTAB(I+1)*XTAB(I))*(F(XTAB(I+1))+F(XTAB(I))) CRT1034 10 TOTAL=TOTAL+PARTS(1) GRT1035 C----CALCULATE INITIAL ERRORS GRT1036 DO 15 I=1,NM1 GRT1037 15 GOOF(I)=PARTS(I) GRT1038 C----SET UP LOOP OVER ITERATIONS GRT1Ø39 DO 100 J=1, JMAX GRT1040 C----SAVE LAST APPROXIMATION GRT1041 TOTAL1=TOTAL GRT1042 C---- SET UP LOOP OVER INTERVALS GRT1043 DO 20 I=1,NM1 C-----CHECK FUR CONVERGENCE IN THIS INTERVAL GRT1044 GRT1045 IF(ABS(GOOF(I)/TOTAL),LT,ERRN) GO TO 20 GRT1046 C----CALCULATE DOUBLE INTERVAL GRT1047 DX=(XTAB(I+1)-XTAB(I))/FLOAT(INTER(I)) GRT1048 C---- DOUBLE NUMBER OF STEPS GRT1049 INTER(I)=2*INTER(I) GRT1050 C-----INITIALIZE CONTRIBUTION TO INTEGRAL GR71051 REST=0.0 GRT1052 II=INTER(I) GRT1055 C---- INITIALIZE ORDINATE GRT1Ø54 XNOW=XTAB(I)+0,5+DX GRT1055 C----SET UP LOOP OVER ORDINATES GRT1056 DO 30 K=1, II,2 GRT1057 REST=REST+F(XNOW) GRT1058 30 XNOW=XNOW+DX GRT1059 C----CALCULATE NEXT PARTIAL INTEGRAL GRT1060 REST=Ø,5*(PARTS(I)+DX*REST) GRT1061 C----=ADD NEW PARTIAL INTEGRAL AND SUBTRACT OLD PARTIAL INTEGRAL GRT1062 TOTAL=TOTAL+REST#PARTS(I) GRT1063 C-----CALCULATE NEW ERROR AND SET PARTIAL INTEGRAL TO NEW VALUE GRT1064

GRT1065 GOOF(I)=REST-PARTS(1) GRT1000 PARTS(1)=REST 20 CONTINUE GRT1067 CHHHRSCHECK FOR CONVERGENCE GRT1068 100 IF(ABS(1,=TOTAL1/TOTAL),LE,ERROR) GO TO 200 GRT1069 C----THE METHOD HAS NOT CONVERGED GRT1070 GRT1071 FINT=TOTAL GRT1072 IERR=1 GRT1073 RETURN GRT1074 C---- THE METHOD HAS CONVERGED GRT1075 200 FINT=TOTAL GRT1076 IERR=0 GRT1077 RETURN GRT1078 END GR72001 SUBROUTINE GREAT2(F, FINT, XTAB, NTAB, ERROR, IERR) C----CARRY OUT CONVERGENCE INTEGRATION SCHEME USING UP TO 200 INTERVALSGRT2002 C-----WHICH ARE THEN FURTHER SUBDIVIDED UNTIL CONVERGENCE OCCURS OR THE GRT2003 C----MAXIMUM ALLOWARLE NUMBER OF ITERATIONS IS EXCEEDED. THE SUBROUTINEGRT2004 C----ARGUMENTS ARE DEFINED AS FOLLOWS.,.... GRT2005 =FUNCTION TO BE INTEGRATED. GRT2006 C---F C----&FINT =THE RESULTING INTEGRAL C-----XTAB =TABLE OF ORDINATES (INTEGRATION INTERVAL IS FROM XTAB(1) TOGRT2000 GRT2009 C----XTAB(NTAB)) C-----NTAB =THE LENGTH OF THE XTAB TABLE (NUMBER OF ORDINATES), GRT2010 C----ERROR =ALLOWABLE NORMAL ERROR. C----IERR =ERROR INDICATOR SET TO ZERO IF METHOD CONVERGES, SET TO GRT2011 GR72012 UNE IF METHOD DOES NOT CONVERGE. CRT2013 C==== C----ONE IF METHOD DOES NOT CONVERGE OR TABLE (XTAB) IS TOO LONGGRT2014 GRT2015 DIMENSION XTAB(33), PARTS(33), GOOF(33), INTER(33) C----DEFINE THE MAXIMUM ALLOWABLE NUMBER OF ITERATIONS AND THE MAXIMUM GRT2010 C----TABLE LENGTH. GRT2017 GRT2018 DATA JMAX, NTABMX/20:1000/ GRT2019 C----DETERMINE IF TABLE IS TOO LONG GRT2020 IF(NTAB-GT,NTABMX) GO TO 100 C----CALL GENERAL INTEGRATION SUBROUTINE, GRT2021 222=F(5.0) GRT20211 CALL GREAT1(F,FINT,NTAB,JMAX,XTAB,PARTS,GCOF,INTER,ERROR,IERR) GRT2022 GRT2023 RETURN CRT2024 C----TABLE IS TOO LONG. GRT2025 100 IERR=1 GRT2026 FINT=0.0 RETURN GRT2027 GRT2Ø28 END DOPLOUI FUNCTION DOPPLER(X) COMMON ARAY, IRAY, ERAY, NOT, ZAI, ABN, NER, LFW, EL, EH, LRU, LRF, LANG, NLS, DOPLØØZ INRES, LN, JN, PENFAR, SHIFAR, SPI, AP, LIS, C, AM, DREF, AREF, IRANGE, NIS, DOPLØØ3 DOPLØØ4 **3INCROSS, IVSPIN, ELO, TEFF, DELTA, E, AWR** DOPLOUS DIMENSION ARAY(6,500), IRAY(3,500), ERAY(2,500), NOT(20), ZAI(10), 1ABN(10),NER(10),LFW(10),EL(10,10),EH(10,10),LRU(10,10),LRF(10,10),DOPL000 2LANG(10,5,5),NLS(10,10),NRES(10),LN(50),JN(150),PENFAR(500),SHIFARDOPL007 3(500), SPI(10), AP(10), LIS(10), C(10), AM(10), DREF(6), AREF(0) DOPLØØ8 DOPLOUS Z=(E=X)/DELTA DOPLUID 22=2+2 DOPLØ11 CALL SIGMA(X,AWR, IRANGE) DOPPLER =AREF(INCROSS) +EXP(+Z2)/(DELTA+1,772454) DOPLØ12 DOPLØ13 RETURN DOPLØ14 END SUBROUTINE GRID(Q, BELTA, NTAB, XTAB) GRIDØØI COMMON ARAY, IRAY, ERAY, NOT, ZAI, ABN, NER, LFW, EL, EH, LRU, LRF, LANG, NLS, GRIDØØ2 1NRES, LN, JN, PENFAR, SHIFAR, SPI, AP, LIS, C, AM, DREF, AREF, IRANGE, NIS, GRIDØØ3 **3INCROSS, IVSPIN, ELO, TEFF, DELTA, E, AWR** GRIDØØ4

1ABN(10),NER(10),LFW(10),EL(10,10),EH(10,10),LRU(10,10),LRF(: 2LANG(10,5,5),NLS(10,10),NRES(10),LN(50),JN(150),PENFAR(500), 3SHIFAR(500),SPI(10),AP(10),LIS(10),C(10),AM(10),DREF(6),AREF DIMENSION XTAB(33)	LØ,10),GRID006 GRID007 (6) GRID008 GRID009
2LANG(10,5,5),NLS(10,10),NRES(10),LN(50),JN(150),PENFAR(500), 3SHIFAR(502),SPI(10),AP(10),LIS(10),C(10),AM(10),DREF(6),AREF DIMENSION XTAB(33)	GRID007 F(6) GRID008 GRID009
3SHIFAR(500), SPI(10), AP(10), LIS(10), C(10), AM(10), DREF(6), AREF DIMENSION XTAB(33)	F(6) GRIDØØ8 GRIDØØ9
DIMENSION XTAB(33)	GRIDØØ9
	0010040
IGNURL=1	GRIUDIO
N2=NTAB/2	GRIDØ11
N21=N2+1	GRIDØ12
N22=N2+2	GRIDØ13
N3=NTAB-1	GRIDØ14
XTAB(N21) = 0	GRID015
DO 1410 I=N22,NTAB	GRIDØ16
XTAB(I) = XTAB(I-1) + BELTA	GRID017
II=NTAB+1+I	GRIDØ18
XTAB(1)=XTAB(11+1)+BLLTA	GRIDØ19
1410 CONTINUE	GRIDØZØ
	GRIUØZI
	GRIUØZZ
I (X TABI) 1412, 1412, 1411	GRIDØZS
	GRIDUZA
1411 CONTINUE	GRIDUZZ
17(1500KE, E0, 0) 50 10 1413	CRIU020
	6RIU0201 CRIU027
	CRIDZE/
	CRIDØZO
	CREDARN
	CPIDAN
	CRIDUUL
	CRIDASS
SUBROUTINE SIEVE(E1.G1.E2.G2.M.N.NY.BEEF.BWR)	STEVAŬĨ
	STEVAU2
	STEVANA
	STEVANSI
3/0/ N2 + 2 + N	SIEVANA
$D_{0} = 1 - 1 - 1 - 0 - 0 - 0 - 0 - 0 - 0 - 0 -$	SIEVANS
	SIEVANO
	STEVAUZ
	STEVAUS
DP=(1.5885F+00)+SQRT (TFF/BWR)	STEVOUS
C WHEN MULTIPLIED BY SORT(F) DP GIVES 5 TIMES CORRESPONDING DF	LTA SIEVOIO
DP1=nP+SQRT(E1)	SIEV011
DP2=DP+SORT (E2)	SIEV012
DG1=G1/FLOAT (M)	SIEVØ13
DG2=G2/FLOAT (M)	SIEV014
$E \times (1) = E1$	SIEVØ15
IF(G1.LT.DP1)G0 TO 1001	SIEVØ16
GO TO 1002	SIEVØ161
1001 JFLAG(1)=1	SIEVØ17
1002 ENDIF=ABS (E2-E1)	SIEVØ18
NX=1	SIEV019
DO 100 I=1,N	SIEVØ20
XX=E1+DG1+FLOAT (I)	SIEVØ21
IF(XX,LT,E2)G0 TO 107	SIEVØ22
GO TO 100	SIEVØ221
107 NX=NX+1	SIEVØ23
	SIEVØ24
IF(G1.L1.DP1)G0 TO 1003	SIEV025
	SIEV0251
1003 JFLAG(NX)=1	SIEVØ26
100 CONTINUE	SIEV027

DO 200 I=1,N XX=E2=DG2#FLOAT (I) IF(XX.GT.E1)GO TO 108 GO TO 200 108 NX=NX+1 EX(NX)=XXIF(G2,LT,DP2)G0 TO 1005 GO TO 200 1005 JFLAG(NX)=1 200 CONTINUE 110 DIFF=(E2=E1)/FLOAT (N2) IF(DIFF)101,102,102 101 PRINT103 PRINT2000,E1,E2,DIFF GO TO 104 103 FORMAT(32H CALLING SEQUENCE OF SIEVE WRONG) 2000 FORMAT(4H E1=E13,6,4H E2=E13,6,6H DIFF=E13,6) 102 N21=NX+1 NN=NX N22=N21+N2=2 NX=N22 E21=(E1+E2)/2.0 DP12=DP#SQRT (F21) E43=E2-E1-((G1+G2)/2.0) IF(E43,LT,DP12)G0 TO 1006 GO TO 1007 1006 DO 111 I=N21,N22 12=1-NN EX(I)=E1+DIFF*FLOAT (I2) JFLAG(I)=1 111 CONTINUE GO TO 1040 1007 DO 112 I=N21.N22 12=1=NN EX(I)=E1+DIFF*FLOAT (I2) DPTEST=UP#SQRT (EX(I)) IF(EX(I), LE, E21)GO TO 1008 GO TO 1009 1008 IF(G1.LT, DPTEST)G0 TO 1010 GO TO 112 1010 JFLAG(1)=1 GO TO 112 1009 IF(G2.LT.DPTEST)G0 T0 1011 GO TO 112 1011 JFLAG(1)=1 112 CONTINUE 1040 DO 113 I=1,NX DPF=DP+SORT (EX(I)) IF(DPF,E0.0,0)60 TO 113 TERM=EX(I)/DPF IF(TERM.LT,25,)G0 TO 114 GO TO 113 114 JFLAG(1)=1 113 CONTINUE 104 RETURN END

SIEVØ28 SIEVØ29 SIEVØJØ SIEVØJØ1 SIEVØ31 SIEVØJZ SIEV033 SIEVØ331 SIEV034 SIEVØ35 SIEVØ36 SIEVØ37 SIEVØJB SIEVØJŸ SIEVØ40 SIEVØ41 SIEVØ42 SIEVØ43 SIEV044 SIEVØ45 SIEVØ46 SIEV047 SIEVØ48 SIEVØ49 SIEVØ50 SIEVØ501 SIEVØ51 SIEVØSZ SIEVØ53 SIEVØ54 SIEVØ55 SIEVØ56 STEV057 SIEVØSS SIEVØSS SIEVØÓØ SIEVØÖI SIEVØ011 SIEVØ62 SIEV0621 SIEVØ63 SIEVØ64 SIEVØ65 SIEV0651 SIEVØ66 SIEVØ67 SIEVØ68 SIEVØ69 SIEVØÕ91 SIEVØ7Ø SIEVØ71 SIEVØ711 SIEVØ72 SIEVØ73 SIEVØ74 SIEVØ75

STOPLOT TEST.	TRON DATA		Ø 350. 11	2 1.0	E=4
26056.F+05	5.36724E+Ø	Ø	ø	4	Ø
26054.0	0.0584	Ø	Ø	1	Ø
475Ø	100.E+3	1	2	Ø	ø
ø.	.6	Ø	ø	2	Ø
.001175	ØĴØ	Ø	Ø	78	13
-15000.	.5E+Ø	5001,000	5000.	1.02	
7.83E+3	,5E+Ø	1202.16	1200.E+0	2,16	
52.1 E+3	,5E+Ø	2100.E+0	2100 E+0	.3E+Ø	
71.9 E+3	,5E+Ø	1600,E+0	1600.E+0	.3E+Ø	
98,5 E+3	,5E+Ø	400.E+0	400.E+0	.3E+0	
102.6 E+3	,5E+Ø	1375.E+Ø	1375.E+Ø	.3E+Ø	
132. E+3	,5E+0	1600.E+0	1600.E+Ø	.3E+Ø	
147. E+3	,5E+Ø	1950,E+Ø	1950.E+0	.3E+Ø	
173. E+3	,5E+Ø	4800.E+0	4800.E+0	.3E+Ø	
188.5 E+3	• 2E + Ø	38000 E+0	38000.E+0	1 SE + U	
245 E+3	• 2E + Ø	13000.E+0	13000.1+0	• 3E+0	
330, E+3	• 2E + Ø	2/20,E+0	2/20,E+0	10EFU	
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74, E+3	5E+0	425,E+0	425.E+Ø	1.E+Ø	
83.6 E+3	,5E+Ø	1000.E+0	1000.E+0	1.E+Ø	
123,5 E+3	,5E+Ø	150.E+Ø	150.E+0	1.E+Ø	
130, E+3	,5E+Ø	500.E+0	500.E+0	1.E+Ø	
141.3 E+3	,5E+Ø	2300.E+0	2300.E+0	1.E+Ø	
169, E+3	,5E+Ø	690.E+Ø	690.E+0	1.E+Ø	
188. E+3	•5E+Ø	3160.E+Ø	3160.E+Ø	1.E+0	
220, E+3	•5E+0	1300.E+0	1300.E+0	1.E+0	
243,5 E+3	,5E+0	300,E+0	300,2+0	1.6*0	
273 E+3	19E+0	3500 E+0	3500.E+0	1.140	
315, E+3	17E+0	2200 ETC	0700.E70	1.45.78/	
300, E+3	• <u>> E</u> + KI	9300 ET0	9300.E+0		
0021 E*0	, DE # 0	TARARTE	10000.540	1.1.4.4	12
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2350	5	1.0004	0004	1.	
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366ØØ.	5	1.43	.43	1.	
38300.	1,5	1,298	.298	1.	
45800.	·2	2.381	.381	2.	
51900.	2	2,685	.685	2.	
53300.	1.2	1.3/	.3/	1.	
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1630.	Ø,	1.08	25	,83	
475Ø.	Ø,	1,086	.256	.83	
7220.	1.	1.753	,923	,83	
7900.	1.	1.146	.316	,83	
12800.	2,	1,336	.506	,83	
13900.	2,	2,426	,776	1.65	
18000.	1.	2.71	1.06	1.65	
21300.	1.	6,92	1.92	5.	
26058.E+0	.0031E+0	Ø	Ø	1	Ø
4750.	100.E+3	1	2	Ø	ø
Ø,E+Ø	.60E+0	Ø	2	2	Ø
1,200E=3	0,0	Ø	2	6	1
-600,	.5	3,57	2,57	1,00	
1.200E=3	0.0	1	Ø	12	2
230.	,5	1,00654	.02654	1.	
359.	.5	1.0173	.0173	1.	

Z,A) DESIGNAT Omer Limit of Uclear Spin ø Ustant Used	10N OF THE ISOTO THE ENERGY RANN (000064400 SCATTI TO CALCULATE PERTI TO CALCULATE PER	ULF 2.6054F+64 Sec(EV) 4.7506F+7 Seting [Encit 6.0 Vetrabilit 1.1		NG LENGTH (A-)	LA NO UF ENERGY RANGES 1 15 LRU# 1 LRF# 2 LIS# 2 ANGULAR MOMENTUM 8,800025+800 ANGULAR MOMENTUM	Ø NO OF RESONANCES	5 7
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TA FOR ISOTO	PE NUMBER 2 10 N CMBER 2 10 N CMBER 2 11 CMBER 2 14 CMB	2	RACTIONAL ABU ACTIONAL ABU CONNEL ABU CINIT CINIT CINIT CINIT	ANGE 9.1688 (EV) 1.0000E+0.	1 NO OF ENERGY RANGES 2 1 LRUE 1 LRES 2		

(2.4) DESIGNATION OF THE ELEMENT 2.6056E+04 AT.WT/MASS OF NEUTRON 5.5367E+01 NO OF ISOTOPES

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DATA FOR ISOTOPE NUMBER

SIGPLOT TEST, IRON DATA,

TITLE

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4

-64-

6F	<u>0</u> ,00005+00	U, 0000E+00	U, 2000E+00	0 0000E+00	0,0006+00	U, DD00E+00	0,0000E+00	0,0000E+00	0,0000E+00	Ø , ØØØØE + ØØ	U . D000E+00	0,0000E+00	0, 0000E+00	0,0000E+00	Ú, B000E+00
GGAMMA	1.0100E+00	1.4400E+00	1.00005+00	1. 2020E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1,0000E+00	1, 0000E+20	1.0000E+00	1,0000E+00	1.0000E+00	1.0000E+00	1,0000E+00
ZU	5,7500E+02	1.4000E+03	4,2500E+02	1 . 0000E + 03	1,5000E+02	5,0000E+02	2,30005+03	6.9000E+02	3,1600E+03	1,3000E+03	3,0000E+02	3,5000E+03	5,5000E+03	9,3000E+03	1,00005+04
GTOT	5,7601E+02	1.4014E+03	4.2500E+02	1,0000E+03	1,5000E+02	5,0000E+02	2,3000E+03	6,9000E+02	3,1600E+03	1,3000E+03	3 . 0000E+02	3,5000E+03	5,5000E+03	9,3000E+03	1,0000E+04
SPIN	5,0000E-01	5,00005-01	5,0000E-01	5,0000E-01	5,0000E-01	5,0000E-01	5,0000E-01	5,0000E-01	5,00005-01	5,0000E-01	5,0000E-01	5, 2000E-01	5, 2000E-01	5,00005-01	5,00005-01
ERES	4,0000E+03	2.7700E+04	7.4000E+04	8.3600E+04	1.2350E+05	1,3000E+05	1.4130E+05	1.6900E+05	1.8800E+05	2,2000E+05	2.4350E+05	2,7300E+05	3.1500E+05	3,6000E+05	3.8200E+05

1 NO OF RESONANCES CONSTANT USED TO CALGULATE PENETRABILITY 1.18706-03 SCATTERING LENGTH(A+) 0.0000E+00 ANGULAR MOMENTUM

2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
П + + + N + + + + + + + + + + + + + + +
040404000440 0000000000000000000000000
 чччичи чччичичи ччичичи ччичичичи ччичичи <
0.011010100 0.00100000 0.00000000 0.000000000 0.00000000
 ERES ERES A. 55000 A. 55000 A. 27200 A. 27200 A. 27200 A. 27200 A. 27200 A. 27200 A. 27000 A. 2000 A. 404 A. 5000 A. 5000

M DATA FOR ISOTOPE NUMBER

Ø NO OF RESONANCES (Ž.A.) DESIGNATION OF THE ISOTOPE 2.6057E+04 FRACTIONAL ABUNDANCE 2.1700E-02 NO OF ENERGY RANGES 1 Lower limit of the energy range(ev) 4.7500E+03 Upper Limit(ev) 1.0000E+05 Lru= 1 LRF= 2 Nuclear Spin 5.0000E-01 Scattering Length 6.0000E-01 no of L-Values 2 Lis= 0 constant used to calrulate penetrability 1.19506-03 scattering Length(a-) 0.0000E+000 angular momentum

ŝ

G F	U, 0000E + 00	U. 0000E+00	U. BOBOE+DD	U, 2000E+00	U + 0000E + 00
GGAMMA	1,5000E+00	3.73006+00	5.0000E+00	8,3000E=01	8.3000E=01
S S	2 • 4000E + 02	4.5000E+02	3,0000E+03	2.5160E+03	2,6900E+02
GTOT	2,4150E+02	4 6373E+02	3,0050E+03	2,5168E+03	2,6983E+02
NIS	0,0000E+00	1,0000E+00	1,0000E+00	20 • 20 2 2 E + 2 2	1.00055+00
ERES	3,9000E+03	6.3200E+03	2.8000E+04	4.0500E+04	4.5500E+04

œ			н		2					
1 NO OF RESONANCES			Ø NO OF RESONANCES		1 NO OF RESONANCES				-	
MOMENTUM			SES 1 2 2 Momentum		MOMENTUM			SIGTMULT	1, 1389682E+Ø	SIGTMULT
,ØØØØE+ØØ ANGULAR	22022323 0000000 00000000 00000000 00000000		NO OF ENERGY RANG LRU= 1. LRF= IS= 8 aboot=400 angular	GF 6 0000E+00	.ØØØBE+ØØ ANGULAR	67 67 8,20005+00 6,20005+00		SIGNNMULT	L 1.137373E+01	SIGNNMULT
NG LENGTH (A-) Ø	ССАА СССАА СССАА СССА В 3 00000 С 4 00000 С 1 00 00000 С 1 00 00 00 00 00 00 00 00 00 00 00 00 00		ANCE 3,1000E-03 (EV) 1,0000E+05 -Values 2 L1 Ng Length(a-) 0,	GGAMMA 1,0000€+00	NG LENGTH(A+) Ø.	GGAMMA 4.00005+00 1.0000€+00		L S I N	Ø 1.558822E+Ø1	SIGT
ØE=Ø3 SCATTERI	0.00 0.00 14 0.00		ACTIONAL ABUND Upper Limit øreøj no of L øej scatteri	GN 2,5700E+00	ØE-Ø3 SCATTERI	GN 6,54006=03 1,73006=02		SIGF	ଔ , ଅଥିଖିଅଥିଥି = ଯା	SIGF
FRABILITY 1.193	610T 610T 610T 610T 1175305+00 1175305+00 11336055+00 2426055+00 242605+00 2710055+00 6,92005+00 6,92005+00		: 2,6058E+04 FR [EV] 4,7500E+03 [NG LENGTH 6,000 [RABILITY 1,200	6707 3,5700E+00	RABILITY 1.200	GTOT 1,00655€+00 1,0173€+00		SIGCAP	2,523085E+ØØ	SIGCAP
TO CALCULATE PENE'	000 0000 00000 00000 000000 000000 00000	PE NUMBER	ION OF THE ISOTOPE The emergy range øøøøe+øø scatter: To calgulate pene	5,0000E-01	TO CALCULATE PENEI	5 - 8 - 1 N 5 - 8 8 0 8 1 - 8 1 5 - 8 8 8 6 1 8 1 5 - 8 8 8 8 1 8 1	AT THERMAL ENERGY	(EV) SIGNN	02 1.336 513E+Ø1	(EV) SIGNN
CONSTANT USED	н н н н н н н н н н н н н н	DATA FOR ISOTO	(Z,A) DESIGNAT Lower Limit Of Nuclear Spin Ø Constant Used '	ERES #6,0000E+02	CONSTANT USED	ERES 2,3000E+02 3,5900E+02	CROSS-SECTIONS	NEUTRON ENERGY	2 - 538888E-4	NEUTRON ENERGY

4.7500006+03	6.785771F+ØØ	5.6027255-01	0.000000F+00	7.346044F+00	5.6936965+00	6.2539685+00
	6 FØDOFFFF ØØ		0 00000000000	6 6076675+00		5 4777085+00
4,7010025-03	0.3022351-00	2,412902E-03	0,0000000-00	0.00/00/2-00	2.4023121-00	3143//20L+00
5.137500E+03	6.4654Ø3E+ØØ	5,973383E=Ø3	0,000000E+00	6.471377E+00	5.410551E+00	5.416524E+ØØ
5.217705+03	A 4604875+00	6 3433055-03	0 000000F+00	6 466826F+00	5 44 77 50 5400	5.4197026+00
	6 500070=+00		a aaaaaaaa	6 580040-+00	5 570-(00.00	8 570744 5400
2.222000E+03	0,2005246+00	0,9710/2E-03	C SOCOSE SO	0 0005105400	2 2/03035+00	2 2/3341F-00
5.83627ØE+Ø3	7.275194E+00	1.643329E-02	0,0000005+00	7.291627E+ØØ	6.323456E+ØØ	6,33989ØE+ØØ
5 0135445+43	7 6035045+00	2 0304005-02	0 0000005+00	7 7130015+00	6 7604685+00	6 780778E±00
	7.09009942400	2,0000990-02	0,000000000000	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0,100,400,2000	
0,008137E+03	9,350/30E+00	3,432255E-02	0.0000005.00	9,385053E+00	8,444930E+00	8.479252E+00
6.300000F+03	1.367890E+01	6.217415E-Ø2	0,0000005+00	1.374108£+01	1.253046E+01	1.259264E+01
6.53000000+03	1 1538165+01	3 5190095-02	0 0000005+00	1 1573355+01	1 0130555+01	1.0167745+01
6 53 8/Em 07			a agaggar+ag	1 1 5 5 0 4 7 5 4 6 4		
0,231002E+03	1.171/48E+01	3,4905302-02	0,00000F+00	1,19924/6*01	1.011105E+01	1.014003E+01
6,760000E+03	1.039641E+01	2.128743E-02	0,000000E+00	1.041770E+01	9.013376E+00	9.034663E+00
6 7637305+03	1 0397385+01	2 1196395-02	ต้ ดดดดดดตะ⇒ดด	1 0418555+01	9 0140305-00	9.0361385+00
6 000000000000	4 40000000	4 0/70775 00	a acaacaac. aa	4 4700475-04		
0,9900005-03	1.1200006+01	1.9032//E=02	O O O O O O O C = O O	1,1308435401	A*A42808F+00	9,905440E+00
7.218247E+03	1.414936E+Ø1	3.261779E-Ø1	0,000000E+00	1.447554E+Ø1	1.287594E+01	1.320212E+01
7.2101235+03	1 4668055+01	7 8+07645-01	0 0000005+00	1 5449135+01	1 3308085-04	1.4176195+01
	A RECKERENCE					*
1.220000E+03	1.002007E+01	1,239844E+00	0.0000005+00	1.700042E*01	1.425398E+01	1.0/9382E+01
7,220876E+03	1.469754E+Ø1	7.81Ø644E-Ø1	0,000000E+00	1.54786ØE+Ø1	1.342535E+01	1.420642E+01
7 2217536+03	1 4204735+04	3 2630505-01	0 0000005+00	1 4531045+01	1 2933965+04	1.3250275+01
7 2221/202 00	1 7000045 . 6.	7 7000445 40		4 4070465+04		
1.2289201-03	1.3992201+01	3.7899441-02	0,0000001+00	1,4030105-01	1,2/23931+01	1.2/01036-01
7,372500E+03	1.656123E+01	2.761971E-Ø2	0,00000E+00	1.658885E+01	1,538890E+01	1,541652E+01
7.525000F+03	1.996881F+01	3,2792415-02	0,000000F+00	2.000160F+01	1 897588F+01	1.9008675+01
7 6775000+07	0 3094775.04	3 7077475 02	a aaaaaac+aa	0 3303805+01	3 3545005.01	2 2600055.01
7.077JU0E+03	2.3200/32+01	3.10/30/E=02	0,0000000-00	2,00200E+01	2,20000L+01	2:2002936+01
7,830000E+03	2.511229E+Ø1	3.8Ø6536E-Ø2	0,0000000+00	2,515035E+01	2.470823E+01	2.474630E+01
7.8475005+03	2 517165F+Ø1	3 794436F=02	0 000000F+00	2.5209605+01	2 48022BF+01	2.4840195+01
7 8450005+03	2 5497695+04	3 7070755-03	0 0000005+00	0 5075555541	2 4944085.01	0 4800945+64
7,0050002+03	5.019/00E+01	0,/0/2020	0,0000005-00	2,7200002401	2 4001405+01	2.4099001 = 01
7,882500E+03	2.019088E+01	3,846959E+02	0,0000005+00	2,522935E+01	2.488779E+01	2,492626E+01
7.898854E+Ø3	2.523834E+Ø1	2.589722E-Ø1	0.000000E+00	2.549731E+Ø1	2.496461E+01	2.522358E+01
7.8994275+23	2 5363225+01	5 9202545-01	0 0000005+00	2.5955245+01	2 5000505+01	2.5682525+01
7 00000005+07	0 6677676.04	4 44777755.00	a agggggggg		D 570.000.04	
7,900000000000	2.00/303E+01	1,14/3316+00	0,000000E+00	2.0/207/6+01	2,0001926+01	2,0449225+01
7,900573E+03	2,536117E+01	5.920071E-01	0,000000E+00	2,595318E*01	2,509046E+01	2,568247E+01
7.9Ø1146E+Ø3	2.523234E+Ø1	2.589441E-Ø1	0.00000000000	2.549129E+Ø1	2.496264E+Ø1	2.522158E+01
8.2950000+03	1 9197625+01	2 2530415-02	0 0000005+00	1.9220155+01	1 9235865+01	1.0258395+01
	1,715/005-01		0,00000002-00	4 (7((070+04	1,7235000000	1 77407880.04
0.040MMDE+03	1.3354081401	1,1991076-02	0.00000000000000	1.0000/E+01	1.3360/05+01	1.3312/01-01
9,085000E+03	1.020244E+01	7,076996E⇔Ø3	0,000000E+00	1,020951E+01	1.003792E+01	1,004499E+01
9.477960F+03	9.323108F+00	8.350098F-01	0,000000F +00	1.015812F+01	9.083403F+00	9.918413F+00
0 470000++07	1 0614445+04	2 091171 -+ 00	0 0000005+00	1 2405570+01	1 0774600.04	4 0455995+44
7 4/0700E+03	T.0014445401	2,0011016+00	0.000000000000	1.2099972401	1 03/4095-01	1,2400020401
9,480000E+03	1.277854E+01	4.159574E+00	0,000000E+00	1.093811E*01	1,25381ØE+01	1,669768E+01
9.481020E+03	1.061935E+01	2.081001E+00	0,00000000+00	1.270035E+01	1.037823E+01	1.245924E+01
9.4820405+03	9 3180555+00	8 3505695-01	0 0000005+00	1 0154015+01	9 077790E+00	0.0128475+00
0,040000000	7 7474505400	3 0403075 03	3 3334335+33	7 744704=+00	7 004 4 05 400	7 9047505.00
9 9100005-03	7.3131922+00	3.242/0/E-03	0,000000E+00	7,3103945-00	1.021110E+00	1,024372E+00
1,034000E+04	6.564929E+00	2,419987E-03	0,00000000+00	6,567349E+00	6,24176ØE+ØØ	6.2441802+00
1.0770005+04	6.031694F+00	1,92541ØF-Ø3	0,000000F+00	6.033619F+00	5 690138F+00	5.692064F+00
1 1109085+04	5 6609405 00	1 9600015+00	a agaggg + ag	7 5077645+00	5 700 005 00	7 4708405.88
1.1190900-04	2.0000402400	1.0029216400	0,000000000000	7.523761E+00	2.304159F+00	/:1/2049E+00
1,119949E+Ø4	5.720218E+00	4.654958E+00	0,00000000000	1,037518E+01	5.368506E+00	1.002346E+01
1.120200F+04	5.830226F+00	9.308277F+00	0.000000E+00	1.513850F+01	5.478464F+00	1.478674F+01
1 1000615+04	5 7755045+00	4 4551495+00	0 0000005+00	1 0300665+01	5 3874955+00	4 00300000
1,1200010.04	5./555662+66	4.0001492400	0,000000000000	1.0390000000	5,0036752-00	1.0030045401
1.1201021-04	5.072045t+00	1.0030/45+00	0,0000005+00	7.030124E+00	2,320232E+00	7,183311E+00
1.160000E+04	5.32Ø346E+ØØ	1.381587E-Ø3	0.000000E+00	5,321728E+ØØ	4.964ØØ7E+ØØ	4.965388E+ØØ
1.200000F+04	5 0626465+00	1 2139985-03	0 0000000 + 00	5.063860F+00	4 7050305+00	4.7062445+00
1 2400000000	A 878704F-00	1 0087445 07	a aaaaaar+aa	A B70904-100	A A804995-00	A ARTOCK - 00
T . C . O O O D F T D 4	7.030/001700	T.02031TF=03	N. UNNUNNETUN	037004E700		* + 403200F * NN
1,279866E+Ø4	4.802337E+00	2,700907E-01	0,000000E+00	2,0/2428E+00	4,449188E+00	4,719278E+00
1.279933E+04	5.047677E+00	6.737919E-Ø1	0,00000000+00	5,721469E+ØØ	4,694669E+ØØ	5.368461E+00
1.2800005+04	5.4598945+00	1.3467545+00	0.0000005+00	6.806648E+00	5 1062185+00	6.4520725+00
	5 0515845100		0 000000C-00	5 705770C+00	4 403070C.00	5 774 60 4 F + 60
1.20000/1-04	7.001006F40K	0,/3/0771-01	0.0000005-00	J. / 203/21 TUU	4.07/238E+00	2:3/1024E+00
1.280134E+04	4,804717E+00	2,701045E-01	0,000000E+00	5,074822E+00	4,450510E+00	4 . 72Ø614E+ØØ
1.307500E+04	4.513546E+00	9.679320E-04	0,000000E+00	4,514514E+00	4.162595E+00	4.163563E+00
1.3350005+04	4.394794F+00	9.259876F-04	0.000000F+00	4.3957205+00	4 0470885-00	4.0480115+00
110000000 04					· • • • • • • • • • • • • • • • • • • •	440400115400

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С	PROGRAM SIGMA2(INPUT,OUTPUT)	SIG	2001
	COMMON/D/ERAN(2,501)	SIG	2002
	COMMON/C/EX(101).JELAG(101)	SIG	2003
	COMMON/F/YMIN(6) YNAY(6) YPEF(6)	STG	2004
	COMMON E ASTRONY FRANCOVINCE LOS SER EL EN ED ED DE LE		1000
	COMMON ARAT, IRAT, ERAT, NOT, 241, ABN, NER, LEM, EL, EH, CRO, CRE	LANGINLS, SIG	2005
	INRES, LN, JN, PENFAR, SHIFAR, SPI, AP, AWRI, AM, DREF, AREF, BREF,	IRANGE, NIS, SIG	2000
	3INCROSS, IVSPIN, ELO, TEFF, DELTA, E, AWR	SIG	2007
	EXTERNAL MOV.KOM	516	2008
		510	วิลี่มีนี้
	EXTERNAL MOVELEDME	510	2000
	EXTERNAL DUPPLER	516	2010
	DIMENSION ARAY(6,500), IRAY(3,500), ERAY(2,500), NOT(20), Z	AI(10), SIG	2011
	1ABN(10),NER(10),LFW(10),EL(10.10),EH(10,10),LRU(10,10),	LRF(10,10).SIG	2012
	21 ANG (10.5.5) - NI S(10.10) - NRES(10) - N(50) - N(150) - PENEAP(500). STG	2013
	LEANG (10/2/2/)NEG (10/10/10/10/)NEG (10/2/)LEANG (10/2/)NEG (10/2/)		
	SSHIFAR(200), SPI(10), AP(10), AWRI(10), AM(10), UREF(6), AREF	(0) BREF (0,516	2014
	410)	SIG	2015
	DIMENSION TITLE(7),XTAB(33)	SIG	2016
	DATA MAXPTS, MAYRES, ETHERM/2000, 100,0,253F-01/	516	2017
C	THE A DOCTORY TO CALCENTE SCATTERING CAPTURE EISSION		2018
6	THIS A PROGRAM TO DALCOLATE SCATTERING, CAPTORE, FISTON	AND TOTAL SIG	2010
C	-CROSS-SECTIONS EITHER AS A SUM OF BREIT-WIGNER TERMS OR	WITH A SIG	2019
C	-MULTI-LEVEL FORMULA TAKING INTO ACCOUNT LEVEL-LEVEL INT	ERFERENCE, SIG	2020
Cre	-THIS PROGRAM MODIFIED ON 30.7.1970 TO INCLUDE NEW FORMA	T CHANGES SIG	2021
Č	-CIVING INDIVIDUAL ISOTOPE MASSES AND TWO DIFFEPENT NUCL	AP RADIT STG	2022
0	THE ADDITIONAL IS CONFERENCE TO ENTRY A PROCESSION THE PROPERTY AND A PROCESSION TO THE PROPERTY AND A PROPERTY	-AK KRUII 010	2622
(THESE FURMAL CHANGES CORRESPOND TO ENDERBY VERSION II DA	IA. 516	2020
C	-RUNS ON CDC=6600 AND PDP-10	SIG	20231
С		11111111111 51G	2024
•	PEADI (TITIE/I) I-1 7) IDDI TEEE NTAD INCOOSS ED	AD. TVSPIN STC	2025
~	READIS('ILE(I))III) OF CITERING ADDITION	CONTINETIN 210	2022
C====	-IDPL=1 IF DOPPLER BROADENED CRUSS-SECTIONS ARE DESIRED;	LSE INPLEDSIG	2020
C	-TEFF=EFFECTIVE TEMPERATURE OF THE TARGET IN DEGREES KEL	VIN, SIG	2027
C	⊡NTAB≖NUMBER OF PIVOT POINTS TO BE USED IN EVALUATING TH	E DOPPLER SIG	2028
Č	-BROADENED CROSS-SECTION. TO GET THE DOPPLER BROADENED C	RASS-SECTIONIG	2029
Č	NAT EVERY ENERGY E WE TAKE THE INTERVAL E-NORDELTA TO	AN2 HOFI TA STO	2030
-	TA ALEVERI ENERGT E WE TARE THE INTERVAL E-NETDELTA TO	WINZ BUELIA SIG	2000
C = =	FOR THE INTEGRAL WHERE N2=NTAB/2 AND DELIA IS THE DOPPL	R CONSTANTSIG	2231
0	-NTAB#11 OR SO SHOULD SUFFICE FOR ALL CASES, NTAB# ODD I	NTEGER. SIG	2032
0	FRROR= IF THE RELATIVE ERROR BETWEEN TWO SUCCESSIVE IT	ERATIONS SIG	2033
č	THE DODDLED INTERNAL IS LESS THAN EDROD THE INTERDAT	TON ROUTINESTO	2034
<u></u>	TO THE DUFFLER INTEGRAL IS LESS THAT ERROR THE INTEGRAT		2015
0	PASSUMES THAT THE INTEGRAL HAS CONVERGED AND IT EATIDS, I	FICAL SIG	2007
C==->	-VALUES COULD BE=1.0E=04, HOWEVER IT IS RECOMMENDED THAT	THE USER SIG	2030
C	-EXERCISE HIS JUDGEMENT IN FEEDING THIS VALUE COMMENSURA	TE WITH THESIG	2057
C	ACCURACY OF THE FINAL RESULT DESIRED AND COMPUTER TIME.	ĀVAILABLE. SIG	2038
Č	IN PRACTICE IT IS ECHNOLISIAT THE SPINS OF AN YA FEM PE	SONANCES APSTO	20.30
	The FRACTICE IT IS FOUND THAT THE SFINS OF UNLT A FEW RE	DESONANCES RASIG	
C = = = =	EKNOWN AS A RESULT OF DIRECT MEASUREMENT WHILE RESI OF T	TE RESUNANUSIG	2040
C	-ES ARE ASSIGNED AN AVERAGE SPIN WHICH IS EQUAL TO THE A	VERAGE OF SIG	2041
C	-ALL POSSIBLE SPINS FOR THE PARTICULAR PARTIAL WAVE. TH	IS AVERAGE SIG	2042
C	SPIN IS CALCULATED FOR A GIVEN TARGET NUCLEUS SPIN AND	A GIVENI -VASIG	2043
C	IN THIS PROCEAM IN CALCULATING THE SCATTERING CROSS-SEC	TION WITH STG	2044
03	THE FREE FREE THE ALCOLATING THE ACKITCHING CROSSED		5075
0	LEVEL TLEVEL INTERFERENCE, RESUMANCES OF A PARTICULAR SP	IN VALUE SIG	6042
C=	-INTERFERE AMONGST THEMSELVES. HOWEVER, IF A GROUP OF RES	JNANCES HASSIG	2046
C	-SPIN EQUAL TO THE AVERAGE SPIN .THEIR MUTUAL INTERFEREN	DE TERM IS SIG	2047
C	-SET FOUND TO FERD, IF IT IS DESIRED TO INCLUDE THIS MUTU	AL INTERFERSIG	2048
č	TER DINCH A IN COLUMN SE ELSE DUNCH A A	01010 (010 Line 10 Line	2040
0	DATATIN COLONN OF ELSE FUNCT A 8.	510	2010
	PHINISS	216	2020
	PRINT22	SIG	2001
	PRINT24.(TITLE(I).) 1.7)	SIG	2052
	PDINT25	019	2053
	TADATIZIA DV 45 ES 4 DIS E44 4 451	210	2044
1	r UKMAIL/A4/6A/19/10/1/210/19/10/	516	6 K / 7
	IF(IDPL-EQ,1)GO TO 1011	SIG	2000
	GO TO 1012	SIG	20551
1011	PRINT25	SIG	2056
	PRINT30. TEEE. NTAB. ERROR. INCROSS	SIG	2057
	DD1NF75	610 610	2058
	FR19167	516	2020
	GU TU 1913	SIG	ヒロンソー

1012 CONTINUE S1G2060 C 1013 READ3, ZA, AWR, NOT(1), NOT(2), NIS, NOT(3) SIG2062 C----EZA=(Z,A)DESIGNATION OF MATERIAL,AWR=AT,WT/NEUTRON MASS,NIS=NO OF SIG2063 C----ISOTOPES SIG2064 PRINT17, ZA, AWR, NIS SIG2065 PRINT25 5162066 J1=1 SIG2067 JFID=1 SIG2068 DO 101 I=1,NIS SIG2069 SIG2070 NRANGE=1 С PRINT25 S1G2072 PPINT18.I SIG2073 PRINT25 SIG2074 RFAD3, ZAI(I), ABN(I), NOT(4), LFW(1), NER(I), NOT(5) SIG2075 C----=ZAI(I)=(Z,A) DESIGNATION OF ITH ISOTOPE ABN(I)=WT FRACTION OF ITH SIG2076 C----ISOTOPE LFW=1 FISSION WIDTHS ARE GIVEN,=∅ FISSION WIDTHS NOT GIVENSIG2077 C---- NER(I) = NO OF ENERGY RANGES USED SIG2078 PRINT19, ZAI(I), ABN(I), NER(I) 5162079 NERI =NER(I) S1G2080 SIG2081 C 106 READ3,EL(I,J2),EH(I,J2),LRU(I,J2),LRF(I,J2),NOT(6),NOSIG2084 11(7) S1G2084 C----EL=LOWER ENERGY LIMIT OF A RANGE, EH=UPPER LIMIT OF A RANGE SIG2085 C-----RU=1 RESOLVED RESONANCE PARAMETERS, LRU=2 UNRESOLVED PARAMTRS SIG2086 C-----LRF INDICATES PARTICULAR TYPE OF RESONANCE FORMULA TO BE USED SIG2087 PPINT20,EL(1,J2),EH(1,J2),LRU(1,J2),LRF(1,J2) S1G2088 LRUIJ=LRU(I,J2) S1G2Ø89 IF(LRUIJ=1)127,128,1010 SIG2Ø90 127 PRINT10 S162091 GO TO 130 S1G2092 128 NMOM=1 SIG2093 C RFAD3, SPI(I), AP(I), NOT(7), NOT(8), NLS(I, J2), NOT(9) SIG2095 C---=-SPI(1)=SPIN OF THE I-TH ISOTOPE, AP(1)=A+ SPIN DEPENDENT SCATTERINGSIG2096 C-----LENGTH IN UNITS OF 1.0E-12CM, AM(I)=A-, FOR SPIN INDEPENDENCEAM(I)=SIG2097 C---=-NLS=NUMBER OF L-VALUES S1G2098 SIG2099 PRINT21, SPI(I), AP(I), NLS(I, J2) SIG2100 JI =1 С 104 READ3, AWRI(I), AM(I), LANG(I, J2, JL), NOT(10), NRS6X, NRS SIG2102 C---=-AWRI(I)=MASS OF THE I-TH ISOTOPE IN UNITS OF NEUTRON MASS, AM=SEE ASIG2103 C---==LANG=L-VALUE OF THE ANGULAR MOMENTUM, NRS=NUMBER OF RESONANCES. SIG2104 PRINT22, AWRI(I), AM(I), LANG(I, J2, JL), NRS SIG2105 NMOM=NMOM+1 SIG2106 J3=J1+(NRS-1) SIG2107 С READ4, ((ARAY(K,J),K=1,6), J=J1, J3) SIG2109 THIS IS WHERE THE RESONANCE PARAMETERS ARE READ IN, ARAY(1, J)=ERESSIG2110 С C IN EV, ARAY(2,J)=J VALUE,ARAY(3,J)=TOTAL GAMMA, ARAY(4,J)=NEUTRON SIG2111 WIDTH, ARAY(5, J)=GAMMA GAMMA, ARAY(6, J)=FISSION WIDTH, ALL WIDTHS ISIG2112 C С N EV. SIG2113 PRINT25 SIG2114 SIG2115 PPINT23 PRINT26, ((ARAY(K,J),K=1,6),J=J1,J3) SIG2116 PRINT25 SIG2117 DO 102 J=J1,J3 SIG2118 IRAY(1, J)=LANG(I, J2, JL) SIG2119 SIG2120 IRAY(2, J)=NRANGE

	IRAY(3, J) = I ERAY(1, J) = SPI(1)	SIG2121 SIG2122
102	CONTINUE J1=J1+NRS	SIG2124 SIG2125
1 4 7	JL=JL+1 IF(NMOM−NLS(I,J2))104,104,103	SIG2126 SIG2127
703	J2=J2+1 IF(NRANGE=NERI)106,106,1010	SIG2129 SIG2130
1010	NRES(I)=J1=JFIO JFID=J1	SIG2131 SIG2132
101	CONTINUE NTOTAL=J1=1	SIG2133 SIG2134
	SCALE=1.0E+00 PHI=3.14159265	SIG2135 SIG2136
3	FORMAT(2E11, 4, 4111)	SIG2137
5	FORMAT(8E11,4,3I10)	SIG2139
6 7	FORMAT(2X,2E11.4) Format(107h neutron energy(ev) Signn Sigcap	SIG2140 SSIG2141
2	LIGF SIGT SIGNNMULT SIGTMULT)	SIG2142
9	FORMAT(10X,2E20.6)	SIG2144
10 11	FORMAT(20H ERROR IN INPUT DATA) Format(10X,2110)	SIG2145 SIG2146
12	FORMAT(10X,6110) FORMAT(53H CROSS-SECTIONS CALCULATED WITHOUT DOPPLER BROADENING)	SIG2147 SIG2149
15	FORMAT(49H CROSS-SECTIONS CALCULTED WITH DOPPLER BROADENING)	SIG2150
16 17	FORMAT(15H NEUTRON ENERGYE15,6) Format(33H (2,A) DESIGNATION OF THE ELEMENTE11,4,22H AT,WT/MASS	SIG2146 DFSIG2151
18	1 NEUTRONE11,4,15H NO OF ISOTOPESI5) Format(24H data for isotope numberi5)	SIG2152 SIG2153
19	FORMAT(33H (Z,A) DESIGNATION OF THE ISOTOPEE11,4,21H FRACTIONAL .	ABSIG2154
20	FORMAT(36H LOWER LIMIT OF THE ENERGY RANGE(EV)E11,4,18H UPPER I	ISIG2156
21	FORMAT(13H NUCLEAR SPINE11.4,18H SCATTERING LENGTHE11.4,15H NO O	5162157 F SIG2158
22	1L-VALUESI5) Format(45H mass of the isotope in units of neutron masse11.4,22H	SIG2159 SSIG2160
	1CATTERING LENGTH(A=)E11,4,17H ANGULAR MOMENTUMI5,17H NO OF RESON.	ANSIG2161
23	FORMAT(85H ERES SPIN GTOT GN	SIG2163
24	I GGAMMA GF) Format(11h TITLE 7a4)	SIG2105
25 26	FORMAT(//) Format(6(2x,E11,4,2x))	SIG2166 SIG2167
27	FORMAT(33H CROSS-SECTIONS AT THERMAL ENERGY)	SIG2168
29	FORMAT(2x, 221, 3111) FORMAT(2x, 4211, 4)	SIG2170
<u>م</u> د	IGF PIVOT POINTSI5,18H CONVERGENCE ERRORE10.4.13H AND INCROSS=I5)	SIG21/1 SIG21/2
31 33	FORMAT(53H THE INTEGRAL FOR DOPPLER BROADENING DID NOT CONVERGE) Format(116H1 Program Sigma2, program to calculate Single or Mult	SIG2173 ILSIG2174
1	LEVEL BREIT-WIGNER CROSS-SECTIONS, USES ENDE/B VERSION II DATA)	SIG2175
C»;	G ORDER IN L AND FOR EACH L IN INCREASING ORDER IN J.	SIG2177
	NRESI=NRES(I)	SIG2179
133	CALL ORDER(I,NRESI) Continue	SIG2180 SIG2181

13	FORMAT(10(1X,110))	SIG2182
	DO 135I=1,NTOTAL	SIG2183
	ARAY(1,I)=ARAY(1,I) *SCALE	SIG2184
	ARAY(3.I)=ARAY(3.I)*SCALE	SIG2185
	ARAY(4, I)=ARAY(4, I)*SCALE	SIG2186
	ARAY(5, I) = ARAY(5, I) + SCALE	SIG2187
	ARAY(6, I) = ARAY(6, I) = SCALF	SIG2188
135	CONTINUE	S162189
102		SIG2190
	D0 1330 I=1.NIS	SIG2191
		ST62192
		STC2193
		5162194
		S102495
		0102172
	NEDI-NOUSII/	5162170
		5166177
	UC 1331 JENCUUNI, NEMT	5162170
	CALL FACIS(ARAY(1,J), IRAY(1,J), PENFAR(J), SHIFAR(J), FS, CONST, AWR,	2105733
4774		5162200
1001	CONTINUE	2102201
	NCDUNTERCOUNT + NRESI	5162202
1330	CONTINUE	5162203
	DO 108 I=1,NIOTAL	S162204
	ERAN(1,1) = ARAY(1,1)	5162205
	ERAN(2,1) = ARAY(3,1)	SIG2200
108	CONTINUE	S1G2207
	CALL DIKS(1,NIDTAL,MOV,KOM)	SIG2208
C	HERE RESONANCE IN AN ELEMENT ARE ARRANGED IN INCREASING ORDER IN	SIG2209
0e	-ENERGY ALONG WITH THEIR TOTAL GAMMAS TO CALCULATE THE ENERGY MESH	SIG2210
C-8-0	-AT WHICH THE CROSS-SECTIONS ARE CALCULATED.	SIG2211
146	PRINT27	SIG2212
	PRINT25	SIG2213
	PRINTZ	SIG2214
	E=ETHERM	SIG2215
	CALL SIGMA(ETHERM,1)	SIG2216
	PRINT25	SIG2217
	ELO#EL(1,1)*SCALE	SIG2218
	JFLAG(1)=1	SIG2219
	IRANGE=1	SIG2220
C	WE HAVE ARBITRARILY SET ELO=1.0E+11 MEV HERE TO BE ABLE TO DOPPLE	RSIG2221
C	-BROADEN THERMAL CROSS-SECTIONS, LATER ON IN THE PROGRAM ELO IS REA	DS162222
Ce	-IN FROM THE DATA AND COULD VARY FROM 1.0E-11 TO 1.0E-09MEV.	S1G2223
	PRINT8,ETHERM,(AREF(LL),LL=1,6)	SIG2224
	IF(IDPL EC,1)GO TO 147	SIG2225
	GO TO 148	SIG22251
147	TEF=TEFF/293.0	S1G2226
	DELTA=0-3177*SORT ((TEF*ETHERM)/AWR)	SIG2227
0	CONTINUE	SIG2228
	CALL GRID(ETHERM,DELTA,NTAB,XTAB)	S102229
	CALL GREAT2(DOPPLER;FINT,XTAB,NTAB,ERROR;IERR)	SIG2230
	PRINT28,ETHERM,FINT,JFLAG(1)	SIG2231
	IF(IERR.EQ.1)PPINT31	SIG2232
148	PRINT25	SIG2233
	PRINT7	SIG2234
	PRINT25	SIG2235
	D0 124 JJ=1,NIS	SIG2236
	NERJJ=NER(JJ)	SIG2237
	DO 125 KK=1,NERJJ	SIG2238
	I RANGE = KK	SIG2239
	LRUJK=LRU(JJ,KK)	SIG2240
	IF(LRUJK=1)131,1321,125	SIG2241

131	PRINT1Ø	SIG2242
	GO TO 130	SIG2243
1321	IF(JJ,E0,1)60 TO 1320	SIG2244
4 7 0 7	G0 T0 132	SIG22441
1320		SIG2242
		5162240
	EUTEEUTEE FuteeHtREF	S16224/
		5162240
132	ELD=FL(JJ,KK)*SCALE	SIG2250
	EHI=EH(JJ,KK)*SCALE	S1G2251
	IF (ELO, EQ, ELORFF, AND, EHI, EQ, EHIREF) GO TO 124	SIG2252
	GO TO 1240	SIG22521
1240	MM=MAXPTS/(8*MAXRES)	SIG2253
	NN=MM	S1G2254
	IFLAG=1	SIG2255
		SIG2226
	J4=1 STADT-1	5162227
		5162259
117	IF(IFND.EQ.0)G0 TO 125	5162260
	J5=J4+1	5162201
	E1=ERAN(1, J4)	SIG2262
	G1=ERAN(2, J4)	S1G2263
	E2=ERAN(1,J5)	SIG2204
	G2=ERAN(2, J5)	S1G2265
	IF(E1.LT.ELD,AND,E2.LT.ELD)GO TO 1120	SIG2266
44.85	GO TO 1105	SIG22001
1105	IF(E1.LE.ELU,ANU,E2,GT.ELU)G0 TO 1110	SIG2267
1110		51622071
****		5162269
	ISTART=0	SIG2270
	GO TO 1114	SIG2271
1111	IF (E1.GT, EL0, AND, E2, LE, EHI) GO TO 1112	SIG2272
	GO TO 1113	SIG22721
1112	IF(J4.EQ.1.AND.JSTART.EQ.1)GO TO 1106	51G2275
	<u>GO TO 1114</u>	SIG22731
1106		SIG2274
		51622/2
		5162275
	ISTARIE0	5162278
	GD TO 1114	S1G2279
1116	E2=EHI+G1/FLOAT (MM)	SIG2280
	G2=G1	SIG2281
	lFLAG≖Ø	SIG2282
	GO TO 1114	SIG2283
1113	IF(E1,LT,EHI,AND,E2,GE,EHI)GO TO 1123	SIG2284
1123		SIG22841
1120		5162202
		5162287
	GO TO 1114	SIG2288
1124	IF(E1,GE,EHI,AND,E2,GT,EHI)GO TO 125	SIG2289
	GO TO 1125	SIG22891
1125	IF(IFLAG)1120,125,1120	\$1G2290
1114	IF(E1,EQ,E2)GO TO 1120	SIG2291
	GO TO 1118	SIG22911
1119	CUNTINUL CALL STEVE/E1 C1 E2.C2 MM NN NY TEEE AURY	5162292
	CALL SIEVELELIGTIECIGEIMMINNINXIIEFFIAWRI	2105530

	CALL QIKS(1,NX,MOVE,KOME)	SIG2294	
	GO TO 116	SIG2295	
1120	IF(IEND.EQ.0)GO TO 125	SIG2296	
	4+1 = 4 ل	S1G2297	
	GO TO 117	SIG2298	
116	DO 109 Î=1,NX	SIG2299	
	F=FX(I)	5162300	
	JFLAGI=JFLAG(I)	SIG2301	
	CALL STGMA(E,KK)	S162302	
	PRINTS, E. (AREF(LL), LI =1,6)	SIG2303	
	IF(IDPL-EG.1)GO TO 141	S102304	
	GO TO 109	SIG23041	1
141	IF(E., T.FTHERM)GO TO 109	S1G2305	
	GO TO 1410	SIG23051	1
C	-IF THE NEUTRON ENERGY IS LESS THAN 0.0253 FV DOPPLER BROADENING	ISSIG2306	•
Č	PASSED AS A DIFFERENT KERNEL SHOULD BE USED TO CALCULATE DOPPLER	S1G2307	
C	-BROADENED CROSS-SECTIONS.	S162308	
1410	TFF=TEFF/293.0	SIG2309	
	DELTA=0.3177*SORT ((TEE*E)/AWR)	SIG2310	
С		\$162311	
Ŷ	GO TO (1121.1122)	5162312	
1121	CALL GRIDLE DELTA NTAR XTAR)	5162313	
32		5162314	
	CALL GREAT2(DOPDIER.FINT.YTAR.NTAR.FROOR.IFRD)	5162315	
	PRINT28.F.FINT.JFLAGIN	5162316	
	IF(IFBR, EQ. 1)PRINT31	5162317	
		5102318	
1122	CALL CAUSS (F. DELTA, DAPE)	5102310	
****		STC2320	
100		5162321	
***		5102021	
1117		6162323	
***'	$\sqrt{1}$	6162324	
1250		6102325	
1420		5102022	
		5102020	
125		0102328	
124		3105350	
100		5162327	
130		5162330	
100		2105321	
	LNU Suddahting Oiks (Mm NN Mave Compary)	- 2102302	3
00146	SUBROUTINE WITE THE INFINITUVE COMPANY	CINSCOULS GINSCOULS	9
CAINS	ALL-IN-MEMORI SURI FRUGRAM		2
ĉ	MM - FIRST SUBSURIET NN - LAST SUBSURIET (ADDAM IS IN COMMON)	OTKS0000	9 78
č	NN - LAST SUBSURIFF (ARRAY IS IN COMMUN) Move and compar are used subplifed proceams		у Я
v	DIMENSION MSAVE(20) ASAVE(20)	OIKSØØÁ	ы Я
		01450070	à
		OTKSAMAG	2
		011000000	у N
			9 Я
		01KS011	у Л
		01650120	'n
35	CONTINUE	01650130	à
c Ĵ	TEST FOR ONE OF TWO ITEMS	OIKSAIA	λ
-	IF(N+M+1) 31.51.32	01KSØ150	ź
c 32	CONTINUE	01/2014	x X
0 02	PARTITION AND SPREADER GO HERE. SEE RELOW DETHEN IS TO P	01KS0176	2
č	PHISH DOWN	011/50/14/	, x
ັຼຼ		OIKS0100	y X
c	WORK ON SMALLEST PORTION	01KS0200	/ 7
-	TOUT OF STREET FORTION	WINGER DE	•

GO TO 35 51 IF(COMPAR(M,N))31,31,131 C SWAP IF ONLY TWO ITEMS ARE OL 131 CALL MOVE(M,0) CALL MOVE(M,0) CALL MOVE(0,N) 31 IF(LEVEL) 151, 150, 151 150 RETURN POP UP a a a 0000 a 00 10 108 4 4 4 8 4 4 8 4 4 151 154 17 3 ين 4 œ <u>م</u> J o۰ З N 3 CALL MOVE(1,J) GO TO 5 6 CONTINUE HOLE AT TOP IF(COMPAR(0,J))5,5,7 7 CALL MOVE(N,KEY) 1 CONTINUE Hole at Bottom 1F(COMPAR(0,1))3,2,2 1 M = MSAVE(LEVEL) Level=level=1 Go To 35 L=Z (N = KEY) 17, 1 GO TO 35 MSAVE(LEVEL)#M NSAVE(LEVEL)#J END MAIN PARTITION IF(COMPAR(ゼッリ))8,10,8 Continue Return to main program 60× END SUBROUTINE MOV(I,J) COMMON/D/ERAN(2,501) 111 111 111 1 = 1 + CALL MOVE(1,J) GALL MOVE(J,I) r ŕ 4 σ 4 ÷ 17 OUT OF ORDER

	IF(I1.EQ.0)I1=501	MOV ØØ5
	IF(J1.E0.0)J1=501	MOV ØØ6
	ERAN(1, J1)=ERAN(1, I1)	MOV 007
	ERAN(2, J1)=ERAN(2, I1)	MOV ØØ8
	RETURN	MOV ØØ9
	END	MOV Ø10
	SUBROUTINE MOVE(1.J)	MOVEØØ1
	COMMON/C/Ex(101), JFLAG(101)	MOVEØØ2
		MOVEDUS
		MOVEDDA
	$IF(I_1, FQ, g)I_1 = 101$	MOVERUS
	$F(1) = F(0, \alpha) + 1 = 1 \alpha$	MOVERRE
	F(1) = F(1)	MOVEROZ
		MOVERNA
	OF THOM	MOVERNO
		MOVERIA
	END EINOTION KOMAT IN	NOVEDID
		KOM BBT
	COMMON/D/ERAN(2,501)	
		KOM 000
		KUM DOM
		KUM 000
		KUM DEO
	LOM=ERAN(1,11)~ERAN(1,J1)	KOM 007
	IF(EOM)100,101,102	KOM ØØ8
100	KOM==1	KOM 009
	GO TO 103	KOM 010
101	KOM=Ø	KOM Ø11
	GO TO 103	KOM 015
102	KOM=1	KOM 013
103	RETURN	KOM 014
	END	KOM Ø15
	FUNCTION KOME(I,J)	KOMEØ01
	COMMON/C/EX(101),JFLAG(101)	KOMEØØ2
	I1=I	KOMEØØ3
		KOMEØØ4
	ĪF(Ī1.EQ.Ø)I1=101	KOMEØØS
	IF(J1,EQ.0)J1=101	KOMEØØ6
	Eox = Ex(11) + Ex(11)	KOME007
	IF (EOX)100,101,102	KOMEØØ8
100		KOMEØØ9
	GO TO 103	KOMEØ10
101	KOME=Ø	KOMEØII
	GO TO 103	KOMEØ12
102	KOME=1	KOMFØ13
103	RETURN	KOME 014
	END	KOME015
	SUBROUTINE SPINOR(S, L, XJ)	SPNR001
		SPNRØØ2
	DENOM=0.0	SPNRØØ3
	IF (S. EQ. 0. AND.L. EQ. 0) GO TO 100	SPNRØØÅ
	GO TO 101	SPNR0041
C	FOR SEØ AND S-WAVE RESONANCES SPINS ARE ALL KNOWN HENCE ONE NEEDS	SPNRØØ5
C=====	-LEVEL+LEVEL INTERFERENCE.	SPNRØØ6
101	IF(S.EQ.0.)GO TO 102	SPNR007
	GO TO 103	SPNR0071
102	XJ=FI DĀT (L)	SPNRØØ8
***	GO TO 110	SPNRAUS
103		SPNRAIN
*×0		SPNRAII
111		SPNRA12
* * *	ALFREDATION ALF	CONDAT 7
		SLINUQTO

SPNRØ131 GO TO 105 104 TERM=TERM+XJ1*(2.0*XL+1.0) SPNRØ14 DENOM=DENOM+(2,0+XL+1,0) SPNRØ15 GO TO 106 SPNR016 SPNRØ17 105 TERM=TERM+XL*(2,0*XJ1+1,0) SPNR018 DENOM=DENOM+(2.0*XJ1+1.0) SPNR019 106 IF(XJ2.GT.XL)Gn TO 107 SPNRØ191 GO TO 108 SPNRØŽØ 107 TERM=TERM+XJ2*(2,0*XL+1,0) SPNR021 DENOM=DENOM+(2.0+XL+1.0) SPNRØ22 GO TO 109 108 TERM=TERM+XL*(2:0*XJ2+1:0) SPNR023 DENOM=DENOM+(2.0+XJ2+1.0) SPNR024 SPNR025 109 XJ=TERM/DENOM SPNR026 GO TO 110 SPNR027 100 XJ=0.0 SPNRØ28 110 RETURN SPNRØ29 END GRT2001 SUBROUTINE GREAT2(F,FINT,XTAB,NTAB,ERROR,IERR) C---GARRY OUT CONVERGENCE INTEGRATION SCHEME USING UP TO 200 INTERVALSGRT2002 C-----WHICH ARE THEN FURTHER SUBDIVIDED UNTIL CONVERGENCE OCCURS OR THE GRT2003 C----MAXIMUM ALLOWABLE NUMBER OF ITERATIONS IS EXCEEDED, THE SUBROUTINEGRT2004 C----ARGUMENTS ARE DEFINED AS FOLLOWS..... GRT2ØØ5 C---F GRT2006 =FUNCTION TO BE INTEGRATED. C---=FINT =THE RESULTING INTEGRAL GRT2007 C---₽-XTAB =TABLE OF ORDINATES (INTEGRATION INTERVAL IS FROM XTAB(1) TOGRT2008 GRT2009 C-----XTAB(NTAB)) GRT2010 C----DERROR =ALLOWABLE NORMAL ERROR. GRT2Ø11 C----IERR =ERROR INDICATOR SET TO ZERO IF METHOD CONVERGES, SET TO GRT2012 ONE IF METHOD DOES NOT CONVERGE, GRT2013 ONE IF METHOD DOES NOT CONVERGE OR TABLE (XTAB) IS TOO LONGGRT2014 C - - - - - -C -----DIMENSION XTAB(33), PARTS(33), GOOF(33), INTER(33) GR72015 C-----DEFINE THE MAXIMUM ALLOWABLE NUMBER OF ITERATIONS AND THE MAXIMUM GRT2016 GRT2017 C---=TABLE LENGTH GRT2018 DATA JMAX, NTABMX/20,1000/ C----DETERMINE IF TABLE IS TOD LONG IF(NTAB.GT,NTABMX) GO TO 100 GRT2019 GRT2020 C---- CALL GENERAL INTEGRATION SUBROUTINE. GRT2021 222=F(5.0) GRT20211 GRT2022 CALL GREAT1(F,FINT,NTAB,JMAX,XTAB,PARTS,GOOF,INTER,ERROR,IERR) CRT2023 RETURN GRT2024 C---=-TABLE IS TOO LONG. 100 IERR=1 GRT2025 GRT2026 FINT=0.0 RETURN GRT2027 GRT2Ø28 END GRT1001 SUBROUTINE GREAT1(F,FINT,NTAB,JMAX,XTAB,PARTS,GOOF,INTER,ERROR, GRT1002 1 IFRR) GRT1003 C----CARRY OUT CONVERGENCE INTEGRATION SCHEME USING TRAPAZOIDAL RULE C----= AND DOUBLING THE NUMBER OF REGIONS PER SUBINTERVAL FOR EACH GRT1004 C---G-ITERATION, ONLY DOUBLE UP IN THOSE INTERVALS THAT HAVE NOT ALREADYGRT1005 GRT1006 C---= CONVERGED GRT1007 C--->-F =SINGLE PRECISION FUNCTION TO BE INTEGRATED C---FINT =THE RESULTING INTEGRAL GRT1008 =NUMBER OF ORDINATES SUPPLIED (THERE ARE N-1 INTERVALS) GRT1ØØ9 C---D-NTAB C----JMAX =MAXIMUM ALLOWABLE NUMBER OF ITERATIONS GRT1010 C---azXTAB TABLE OF THE ORDINATE VALUES. RANGE OF INTEGRATION IS GRT1011 C----FROM XTAB(1) TO XTAB(NTAB) GRT1012 C-----PARTS =ARRAY OF DIMENSION NTAB, EQUAL TO THE PARTIAL INTEGRALS GRT1013 OVER EACH OF THE NTAB-1 INTERVALS GRT1014 C - - - - -

C=;G00F	=ARRAY O	F_DIMENS	SION N	TAB,	EQUAL	TO THE	E NORMAL	ERROF	1 N	EACH	GR71015
C	OF THE	NTAB-1 1	NTERV	AL.							GRT1016
C= INTER	=ARRAY O	F DIMENS	SION N	TAB	SEPEC	FYING	THE NUI	MBER OF			GRT1017
	SUBINTE	RVALS IN	EACH	INTE	RVAL						GRT1018
CICDB	- CDDOD TA	BLE NURM	AL LH	RUR		- ME 711				-	GHT1019
CSCIERK		NUICATOR	SEI		LKU I		JO CONVI	KGES:	SEI	10	GRI1020
C++-c+ DIMENS	UNE IF I Ston ytar	METHOD (/N9788) 6	DUES N	NTARN	INVERGE		CODE				GRT1021
CHRESSINITIA		NE OF TH	2011-01 2011-01	TCDAI		CIN AD1	GUUP (I	NIAD/			CPT1023
	N			EGRAL	•						CR11020
	ATE THE !		FINT	FRVAL	S						CRT1025
NM1 = NT	'AB≘1				. •						GRT1026
CCALCUL	ATE ALLO	WABLE EF	ROR P	ER IN	TERVAL	_					GRT1027
ERRN=E	RROR/FLO	AT(NM1)		-		-					GRT1028
C CINITIA	LIZE APP	ROXIMATI	ON TO	INTE	GRAL						GRT1029
TOTAL=	0.0										GRT1030
C==CALCUL	ATE INIT	IAL APPF	ROXIMA	TION							GRT1031
DO 10	I=1.NM1										GRT1032
INTER	1)=1										GRT1033
PARTS	1)=0,5*(XTAB(I+1	.)=XTA	B(I))	+(F(X)	AB(I+1	.))+F(X'	TAB(I)))		GRT1034
10 TOTAL=	TOTAL +PA	PTS(I)									GRT1035
CE-CALCUL	AFE INTE	IAL ERRO	DRS								GRT1036
15 000541	I=1;NM1 N=DADTS(•)									GRT103/
	D LOOP AV	 	TIONE								GRILDOO
	. ⊑00⊢ 0≬i	Y IIGNA Y	11002								CRTINÃO
Crene-SAVE L	AST APPRI	^ 7¥1M4T11) NE								CRT1041
TOTAL'1	=TOTAL										GRTIØAZ
CSET UP	LOOPOVI	ER INTER	VALS								GRT1043
DO 20	I=1,NM1		•								GRT1044
CCHECK	FOR CONVI	ERGENCE	IN TH	IS IN	TERVAL						GRT1045
IF (ABS	(GOOF(I).	/TOTAL),	LT, ER	RN) G	O TO 2	Ø					GRT1046
C=CALCUL	ATE DOUBI	"E INTER	VAL								GRT1047
DX=(XT	'AB(I+1)-'	XTAB(I))	/FLOA	T(INT	'ER(I))						GRT1048
CDOUBLE	NUMBER (DF STEPS	5								GRT1049
INTER	I)=2*INT	R(I)			-						GRT1050
CINITIA	LIZE CON	TRIBUTIC	IN TO	INTEG	RAL						GRT1021
REST#Ø											GRT1052
	ER(1)	* 21 4 17 17									GRT1023
		54DV									CRTICH
CSET UP	LOOP OV	FR OPDA	ATES								CPT1056
Dn 30	K=1.11.2										GRT1057
REST=R	EST+F (XN	נשר									GRT1058
3Ø XNOW=X	NOW+DX										GRT1059
C=CALCUL	ATE NEXT	PARTIAL	. INTE	GRAL							GRT1060
REST=Ø	.5+(PART	S(I)+DX#	REST)								GRT1061
C	W PARTIAL	INTEGR	AL AN	D SUB	TRACT	OLU PA	RTIAL	INTEGRA			GRT1062
	ATE NEW P	ST-PARTS		D . D T			70 115				GRT1003
GOOFII	AIL NER 8	TRAUK AN	ID SEI	F AR I	TAP TU	ILCRAL	, IU NEM	VALVE			CRT1004
PADTC/	1) = 0 E S T	AN 10(1)									CHTINES
20 CONTIN	UE										CRT1067
CCHECK	FOR CONVE	RGENCE									GRT1068
100 IF (ABS	(1,-TOTAL	1/TOTAL),LE.	ERROR) GO T	0 200					GRT1069
CTHE ME	THOD HAS	NOT CON	VERGE	D							GRT1070
FINT=T	OTAL										GRT1071
IERR∍1											GRT1072
RETURN											GRT1073
C-+-=-THE ME	THOD HAS	CONVERG	ED								GRT1074
ZOU FINI=I	UTAL										GRT1075

		1			a																																		~ 0	710	74
		<u>ا د</u>	. 17 -	Υ <u>Ξ</u>	2																																		65	148	
		RE	ΤL	١R	N																																		GH	110	111
		ĒN	D																																				GR	T 1 0	178
		sυ	BF	20	Ų٦	11	NE	0	R;	ΙD	(6	۱, (ΒE	LT	A	N N	ΤA	B	ιX	T A	B)																		GR	1 De	101
		c n	MA	٨'n	N	Δs	D A	v.		8	Ý.	E.	D٨	<u>.</u>	MI	17	. 2	۸	1	٨D	N.	NE	P	. 1	FW		71	. 51	4.1	DI			F.	1 4	N	2. 1	ai e	s.	C.R	ine	เด้อี
	4			20		, C '	10			N P	Ar		e L	÷e	AE		, 1 C m	?)		50	ля ў А Ш		- / C	х м	. n		(. 1	57	NIC		ه بيا ه ۱۱۸		~ 0	100	à à .
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	3	IN	CF	(0	55		IV	SF	1	Ν,	۴Ļ	,0	, T	EF	F 4	D	ΕL	T/	۹,	Ŀ,	AW	'R _	_										_						GR	tns	664
		DI	ME	ΞN	51	01	N	A F	K A '	Y (6,	, 51	ØØ),	11	X X	Υ(31	, 5	ØØ),	EF	۲A'	Υ(2,	50	00),	10,	r (1	20) ,i	ΖA	1(10)),	1		GR	IDø	105
	1	AΒ	N (11	Ø	,1	NE	R (11	ø)		.FI	W (10).	E	LI	10	ð.	10	۶.	E۲	10	10	,1	Ø		RL	11:	1Ø.	, 1	Ø).	با د	RF	(1	Ø,	10	a),	GR	IDø	06
	2	iΔ	NO	1	10		5.	51		NI.	ŝ	1	2	10	52	NI	PF	SI	11	Ø.		NI (5	٥ì	ίĴ	ĺм	4	ΓØ.		DF I	νF.	A R	(5	aa	́л.				6.R	na	07
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		DI	ME	N	SI	01	N	XI	ΓA Ι	B(33	5)																											GR	ţDø	10
		IG	NC	DR	E۹	1																																	GR	IDØ	11
		N2	ΞŅ	١Ŧ	A E	12	2																																GR	IDØ	12
		NO	4 5	= Ni	2.	. 1	-																																C.R.	้กด	1.3
		NO	5	- 14 - 14	2.	5																																	20	100	i a
			4	- N	<u> </u>	۲.																																	G n	100	12
		NJ	= 1	ΥT	AE		1																																GR	שטו	12
		XT	A E	3 (N2	1) =	Q																															GR	IDØ	16
		DO	1	L 4	10		1 =	NZ	22	, N	T/	B																											GR	10ø	17
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		00	1	4	11		1 =	1,	N.	T A	8																												GR.	IDØ	22
		XT	ΑE	31	ΞX	T	AB	(1)																														GR	IDø	23
		TE	13	(.		T.	1	41	2	. 1	41	2	. 1	41	1																								CR	nø	24
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		10	NU		E -																																		6.7	100	22
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		ĮF	(1	G	NC	RE	Ξ,	EG	1,6	0)	ĢÇ) .	ΓQ	1	41	. 3																							GR	ĮDØ	27
	1	GO	T	0	- 1	41	ι4																																GR	IDØ	271
1413	5	XT	AE	3 (1)	=1	ι.	ØΕ	=	83																													GR	İDØ	28
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	1	NR	ES	۰,	LN	1,	IN	, H	121	VF	AR		SH.	IF	AF		SP	14	A		AW	RI	11	AM	, U	HE	it ,	, A F	SF b	· , t	381	- F /	• 1	RA	NĢ	, <u> </u>	N]	[5,	GAL	120	03
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		11	= 10	•	Ø																																		GAL	120	21
)	XW	R =	A	WR	1 (ĸ)																															GAL	JSØ	22
	Į	ΒE	LT	A	= (Ø.	3	17	78	+	ØØ)+	S	٦R	T ((()*	ŢΕ	F)/;	XW	R)																	GAL	JSØ	23
			-																-																						

		X=BELTA+ABC(9)	GAUSØ24
		IF(E-X)100,100,101	GAUSØ25
	101	DO 102 I=1,9	GAUSØ26
		ABCI=ABC(I)	GAUSØ27
		WETI=WET(I)	GAUSØ28
		Z=E+ABCI*BELTA	GAUS029
		CALL SIGMA(2, IRANGE)	GAUSØ3Ø
	1	I1=I1+BREF(INCROSS,K)*WETI	GAUSØ31
	102	CONTINUE	GAUSØSZ
	1 0 0		GAUSUSS
	100	11=0,0 Tedu tedu te	GAUSUSA
	200		CAUSOSS
	200		CAUSAST
		Berlin	CAUSASA
			CAUSOSO
		SUBROUTINE FACTS (Q.L. PE.SE. PS. CONSTE. BWR. BP. PLOD)	FACTORI
С			FACTOOZ
č		SUBROUTINE TO CALCULATE PENETRATION AND	FACTODS
Ĉ		SHIFT FACTORS	FACTOOA
Ċ		Q IS THE ENERGY L IS THE ANGULAR MOMENTUM PF PENETRATION FACTOR	FACTODS
Ĉ		SF THE SHIFT FACTOR AND PS THE PHASE SHIFT AP IS R CONSTE IS KM	FACTODO
С		FOR DETAILS OF FORMULAE SEE GREGSON ET AL AEEW-M517(MLBŴ)1965	FACT007
¢			FACTOOS
		DATA WNEUT/1,008665/	FACTØØ9
		EAB=ABS(Q)	FACTØ10
		CONHLD=2,196771E-03*BWR*SQRT(EAB)	FACTØ11
_		CONSTE=CONHLD/(BWR+1.0)	FACTØ12
с-		SINCE AWR IS GIVEN WITH THE NEUTRON MASS AS UNITY WE ADD ONE ABOVE	FACTØ13
Ç-		TO CONVERT TO THE CENTER-OF-MASS SYSTEM	FACTØ14
			FACTOIS
		SEFLOAT (L)	FACTOLO
			FACTOR
	4 7 7	GU 10(110,120,130,140,150),L	FACIDIO
	100		FACIDIY
		JEAN ON LT 2 WY CO TO 160	FACTOR
			FACTORE
			FACT023
	110		FACTORA
			FACT025
		PF=R0E2+RDE/DENOM	FACTØ26
		SF=-1,0/DENOM	FACT027
		IF(PLOD-LT,2,0) GO TO 160	FACTØ28
		PS=ROE-ATAN (ROE)	FACT029
		IF(PS/RQE-0,000001)160,170,170	FACTØ30
	120	ROE2=ROE*ROE	FACT031
		ROE4=ROE2*ROE2	FACTØ32
		DENOM=3-0*R0E2+R0E4*9.0	FACTØSS
		PF=R0E4+R0E/DENOM	FACTOSA
		$SF = -(18 \cdot 0 + 3) \cdot 0 + R(0 + 2) / 0 = NOM$	FACTOSS
		IF (FLUU-LI, 2, 8) 60 10 100 PS-DAE_ATAN (3 0ADAE//3 0-DAED))	TAUIUJO
		ΤΟ-ΠΟΕ-ΑΙΑΝ ΙΟ.ΦΕΝΟΕ/ΙΟ.ΦΕΝΟΕ/Ι) ΤΓ/ΡΟ/ΡΟΓΕ/Α.ΑΑΛΦΑΦΑΙΙΙΑΑ.Τ7Α 17Α	FAULDO/
	130	RUES#BUE#B100000011001110110	FACTOS
		ROF4#ROE2*ROF2	FACTOAD
		ROF6=R0E4#R0E2	FACT041
		DENOM=225, 0+45, 0+R0E2+6, 0+R0E4+R0E6	FACTOAZ
		PF=ROE6#ROE/DENOM	FACT043
		SF=-(675,0+90,0*R0E2+6,0*R0E4)/DENOM	FACTØ44
		IF(PLOD-LT,2,0) GO TO 160	FACTØ45

	PS=R0E+ATAN ((15,0*R0E-R0E2*R0E)/(15,0=6,0*R0E2))	FACTØ46
	IF(PS/RQE-0,000001)160,170,170	FACTØ47
140	ROE2=ROE+ROE	FACT048
	ROE4≖ROE2*ROE2	FACTØ49
	ROE6≓ROE4*ROE2	FACTØSØ
	ROE8=ROE4 *ROE4	FACTØSI
	DENOM=11025,0+1575,0+R0E2+135,0+R0E4+10,0+R0E6+R0E8	FACTØ52
	PF=R0E8+R0E/DENOM	FACT053
	IF(PLOD LT.2.0) GO TO 160	FACTØ54
	SF=-(44100,0+4725,0*R0E2+270,0*R0E4+10,0*R0E6)/DENOM	FACTØ55
	PS=R0E-ATAN ((105,0*R0E=10,0*R0E2*R0E)/(105,0-45,0	FACTØS6
	1+RnE2+R0E4))	FACT057
	IF (PS/R0F=0.000001)160.170.170	FACTØ58
150	ROF2=ROF+ROF	FACTØSS
1 4	BOE4#BOE2#BOE2	FACT060
		FACTOOI
		FACTØ62
		FACTOS
	NGL49-NGL04-NGL4	FACT064
		FACT065
		FACTODO
	ГГЭЛОСІФИЛОСІЛЕЛОН СГЭЛЛЕГО ЛІЗОКОЙЛ ЛАВОСО, 1800Л ЛАВОСА	FACT067
	3	FACTOOR
	2 - DELYENDA	EACT069
		FACTOZÓ
	IF (FLU)/LI (2,0) GU IU IU Be-De-Atal (/045 00000000000000000000000000000000000	+ EACTO/1
	FSERUEMATAN ((945,00KUEGRUEM(ID5,00KUEZENDE4777,945,00KUEZENDE4	FACT072
		EACTO22
		FACTO73
100		FACID/T
1/0	RETORN	FACTOR
		PACIE/0
	SUBROUTINE URDER (K,NI)	
	UDAMMON ARAY, IRAT, ERAY, NUT, ZAI, ABN, NER, LFW, EL, EH, LRU, LRF, LANG, NLS	
	INRES, LN, JN, PENFAR, SHIFAR, SPIFAP, AWRI, AM, DREF, AREF, DREF, IRANGE, NI	SJURDRUBUS
	SINCHOSS, IVSPIN, ELO, TEFF, DELTA, E, AWR	URUR004
	DIMENSION ARAY(6,500), IRAY(3,500), ERAY(2,500), NOT(20), ZAI(10),	
	1ABN(10), NER(10), LFW(10), EL(10,10), EH(10,10), LRU(10,10), LRF(10,10	J,ORDROMO
	2LANG(10,5,5), NLS(10,10), NRES(10), LN(50), JN(150), PENFAR(500),	ORURUM/
	35HIFAR(200), SPI(10), AP(10), AWRI(10), AM(10), DREF(6), AREF(6), BREF(O, URURUMO
	410)	ORDRONA
_	IF(K-1)2,2,3	ORDRØIØ
2	NTR=Ø	ORDRØ11
	NUML=2	CRDRØ12
		ORDRØ13
	NN=0	ORDRØ14
	MM=Ø	ORDRØ19
	Ø = (L	ORDRØ16
	NC=Ø	ORDRØ17
	MC=Ø	ORDRØ18
3	NT=NTR+1	ORDRØ19
	NTR=NTR+N1	ORDRØ2Ø
	0L=-0.9	ORDRØ21
8	0L≖0L+1-Ø	ORDRØ22
	DO 101 N=NT,NTR	ORDRØ23
	TERM#FLQAT (IRAY(1,N))	ORDRØ24
	IF(0L-TERM)101,101,9	ORDRØ25
9	NN=NN+1	ORDRØ26
	DO 100J=1,6	ORDRØ27
	A=ARAY(J,N)	ORDRØ28
	ARAY(J,N) = ARAY(J,NN)	ORDRØ29
	ARAY(J,NN)=A	ORDRØJØ

10	Ø	CONTINUE	ORDRØ31
		DO 1001 J=1,3	ORDRØ32
		IA=IRAY(J,N)	ORDRØ33
		IRAY(J,N)=IRAY(J,NN)	ORDRØ34
		IRAY(J, NN) = IA	ORDRØ35
100	1	CONTINUE	ORDRØ36
• - ~	-	DO 1002 J=1.2	ORDRØ37
		EA=ERAY(J,N)	ORDRØ38
		ERAY(J,N)=ERAY(J,NN)	ORDRØ39
		ERAY (J.NN) = EA	ORDHØÅØ
100	2	CONTINUE	ORDRØ41
10	1	CONTINUE	ORDRØ42
	•	IF(NN-NC)8,8,11	ORDRØ43
1	1	NUML = NUML + 1	ORDRØ44
			ORDRØ45
		NC=NN	ORDRØ46
		NU=NT+LN(NUML)-1	DRDRØ47
		QM= 0.25	ORDRØ48
1	4	0M=0M+0.5	ORDRØ49
-		DO 205 M=NT,NU	ORDRØ50
		TERMJ=ARAY(2,M)	ORDRØDI
		IF(0M-TERMJ)205,205,15	ORDRØ52
1	5	MM=MM+1	ORDRØ53
-		D0 204 J=1.6	ORDRØ54
			ORDRØ55
		ARAY(J,M)=ARAY(J,MM)	ORDRØ56
		ARAY(J,MM)=A	ORDRØ57
20	4	CONTINUE	ORDRØSS
		DO 2041 J=1,3	ORDRØ59
		IA=IRAY(Ĵ,M)	ORDRØÓØ
		IRAY(J,M)=IRAY(J,MM)	ORDRØ61
		IRAY(J,MM)=IA	ORDRØ62
204	1	CONTINUE	ORDRØ63
		DO 2042 J=1,2	ORDRØ64
		EA=ERAY(J,M)	ORDRØ65
		ERAY(J,M)=ERAY(J,MM)	ORDRØ66
		ERAY (J, MM) = EA	ORDRØ67
2Ø4	2	CONTINUE	ORDRØ68
20	5	CONTINUE	ORDRØ69
		IF(MM=MC)14,14,16	ORDRØ7Ø
1	6		ORDRØ71
			ORDRØ72
		MC=MM	ORDRØ73
		(LMUN)NL+TN=TN	ORDRØ74
		IF(NN-MM)17,17,14	ORDRØ75
1	7	IF(NTR-NN)18,18,8	ORDRØ76
1	8	RETURN	ORDRØ77
		END	ORDRØ78
		FUNCTION DOPPLER(X)	DOPLONI
		LUMMON ARAY, IKAY, EKAY, NUT, ZAI, ABN, NER, LEW, EL, EH, LRU, LRF, LANG, NLS,	
	1	INRES, LN, JN, PENFAR, SHIFAR, SPI, AP, AWRI, AM, DREF, AREF, BREF, IRANGE, NIS,	DUPLOUS
	3	SINCHOSSIIVSPIN, ELU, TEFF, DELTA, E, AWR	
		UIMENSIUN ARAT(0,500), IRAT(3,500), ERAT(2,500), NUT(20), ZAT(10),	
	1	LADNAID/INCRALD/ICRAID/ICLAD/ICLAD/IC/ID/ID/ICRAD/ICA/ID/IC/ID/ID/ICA/ID/ID/ICA/ID/ID/ICA/ID/ID/ID/ID/ID/ID/ID/I 21 ANG/10/5.51.NIS/10.401.NDES/401.NDES/401.N/501.N/4501.DS/502.DS/502.	
	4	SCHIEVO(TOISCI) SOIIIQUI VOIIUU VOOLIAVI VAIIUV DOCEIVI VOCEIVI DOCEIV FTVO(TOISISCI) MFSITAIIUUUSITAIITUIS	
		VAUV nouti Huvannii ol (vinii Heliinii Hekitinii Heuvanii Poli (oli Hurl (oli Burl (ol	
	1	710/ TEE=TEEF/293 0	
			DOPLOT
		CALL STOMA(Y, IDANCE)	
		DO 100 ISLANDER	

	XWR=AWRI(I)	DOPLØ14
	CELTA=(0,3177E+00)*SQRT((TEF*E)/XWR)	DOPLØ15
	Z=(E-X)/CELTA	DOPLØ16
	Z2≡Z*Z	DOPLØ17
	T1=BREF(INCROSS;I)+EXP(=22)/(CELTA+1:772454)	DOPL018
	TERM=TERM+T1	DOPL019
100	CONTINUE	DOPLØ20
	DOPPLER=TERM	DOPL021
	RETURN	DOPLØ22
	END	DOPLØ23
	SUBROUTINE SIGMA(Q,KK)	SIGMØØ1
	COMMON/E/XMIN(6),XMAX(6),XREF(6)	SIGMØØ2
	COMMON ARAY, IRAY, ERAY, NOT, ZAI, ABN, NER, LFW, EL, EH, LRU, LRF, LANG, NLS,	SIGMØØ3
	1NRES,LN,JN,PENFAR,SHIFAR,SPI,AP,AWRI,AM,DREF,AREF,BREF,IRANGE,NIS,	SIGMØØ4
	3INCROSS, IVSPIN, ELO, TEFF, DELTA, E, AWR	SIGMØØ5
	DIMENSION ARAY(6,500), IRAY(3,500), ERAY(2,500), NOT(20), ZAI(10),	SIGMOUD
	1ABN(10),NER(10),LFW(10),EL(10,10),EH(10,10),LRU(10,10),LRF(10,10),	SIGMØØ/
	2LANG(10,5,5), NLS(10,10), NRES(10), LN(50), JN(150), PENFAR(200),	SIGMOUS
	35HIFAR(500),5PI(10),AP(10),AWRI(10),AM(10),DREF(6),AREF(6).BREF(6,	SIGMONY
	410)	SIGMOID
	PI=3,14159265359	SIGMOIL
		SIGMOLE
	AREF(J)=0,0	SIGMOIS
		SIGNOLT
_		SIGMULS
5	CONTINUE	SIGNULO
4		SIGNULT
		STGMDIG
		STGMOZÓ
		SIGMOZI
		SIGMOZZ
		SIGMØ23
	DO 12 J#1-NIS	SIGM024
		SIGM025
	APT=AP(I)	SIGM026
	XWR=AWRI(I)	SIGMØ27
	YWR=XWR+1,008665	SIGMØ28
	YWR=YWR++(1,0/3,0)	SIGM029
	APX=0.123+YWR+0.08	SIGMØ30
3	NTR=NTR+NRESI	SIGMØ31
	IF(NRESI)110,110,100	SIGMØ32
100		SIGMØ33
102	L2=L2+LN(LA)	SIGMØ34
	CALL FAGTS(Q,IRAY(1,L2),PF,SF,PX,CONSTE,XWR,APX,3,0)	SIGMØ35
	CALL FAGTS(Q,IRAY(1,L2),PX,SX,PS,CONSTE,XWR,API,3,0)	SIGMØ36
	SNGLN=0-0	SIGMØ37
	SNGLG=0.0	SIGMOSE
	SNGLF=2.0	SIGMOSY
107		SIGM040
100		SIGND 42
104		SIGMOAS
	C = 2 = 0 + (2 = 0 + (2 = 1 + 1 = 0)	SIGMAAA
	$G := (2, 0 \neq A R A Y (2, N1) + 1, 0) / G.$	SIGM045
	X=1.0	SIGMØ46
	SPIN=ARAY(2,N1)	SIGMØ47
	SPI1=SP1(1)	SIGMØ48
	CALL SPINOR(SPII, IRAY(1, L2), XSPIN)	SIGMØ49
	ABDIF=ABS (XSPIN=SPIN)	SIGMØÐØ
	IF(IVSPIN,EQ,1)GO TO 115	SIGMØDI

	GO TO 116	SIGM0511
116	IF (ABDIF.) T. TERROR) GO TO 117	SIGMOSZ
		STCMOBOL
		31040221
11/		SIGMOJS
115	SNNK23=U.0	SIGMUSH
	DO 108 K=N1.N2	SIGMØ55
	GNK=PF#ARAY(4,K)/PENFAR(K)	SIGMODO
	GK=GNK+ARAY(5,K)+ARAY(6,K)	SIGMØ57
	ERDK=ARAY(1,K)+((SHIFAR(K)-SF)*ARAY(4,K))/(2,Ø*PENFAR(K))	SIGMØ58
	ED=Q-ERDK	SIGMØÞ9
	DK=ED+ED+Ø,25+6K+GK	SIGMØÓØ
	SNNK2=GNK+GNK+COS (2.0+PS)	SIGMØ61
	SNNK2=SNNK2=2.0*GNK*(ARAY(5,K)+ARAY(6,K))*SIN(PS)*SIN(PS)	SIGM062
	SNNK2=SNNK2+2.0+GNK+FD+SIN (2.0+PS)	SIGMO63
	SNNK2=SNNK2/DK	SIGMOGA
	SNGK-GNK+ARAY(5.K)/DK	SIGMORS
		SIGMOGÓ
		SIGMORZ
		STCMAGH
		SIGNDOO
		SIGMD07
		SIGMUTU
	IF (K=N1)107,107,105	SIGMD/1
105		SIGMUZ
	DU 106 M=N1, M1	SIGMØ73
	GNM=PF #ARAY(4, M)/PENFAR(M)	SIGMD/4
	GM = GNM + ARAY(5, M) + ARAY(6, M)	SIGMØ75
	ERDM = ARAY(1,M) + ((SHIFAR(M) - SF) + ARAY(4,M))/(2,0 + PENFAR(M))	SIGMØ76
	EDD=Q-ERDM	SIGMØ77
	DM=EDD+EDD+0,25*GM+GM	SIGMØ78
	SNNM3=EU+EDD+0,25+GK+GM	SIGMØ79
	SNNM3=SNNM3+2.0+GNK+GNM/(DM+DK)	SIGMØ80
	SNNK3=SNNK3+SNNM3	SIGMØB1
106	CONTINUE	SIGMØÜŽ
107	CONTINUE	SIGMØBS
	SNNK23=SNNK23+SNNK2+SNNK3+X	SIGMØ84
108	CONTINUE	SIGMØ85
	SNNL2=SNNL2+SNNK23+GJ	SIGMØ86
	IF(12-N2)109.109.103	SIGM087
109	BETA=PI#ABN(I)/(CONSTE)	SIGMABB
		SIGMARO
		SIGMARA
		SIGMAÑI
		SIGMANZ
	AREF(T) - AREF(T) - CHARGE ARGENGEG ANGEF /	STGMA93
	AREF (2) FAREF (2) FONNER DETA ADEF (6) FAREF (2) FONNER ALVENDE (AND ELENNER)	SIGMOVÓ
	MREF (0) - AREF (0) - DELAW (SNGLG+SNGLF+SNNL2)	STCMASS
	CREET (1) 1 - CNOLNEDERA FOREF(1) 1	SIGNOV
		SIG 0270
	DREF (3,1)=3NGL+#BEIA+BREF (3,1)	SIGMOT
	DREF(4,1)=DETATIONGLOSIN	51GH070
	DREF (2) I) = SINNL29EL AFEREF (2) I)	SIGMUTT
	BREF (0, I) = BE A * (SNGLG+SNGLF+SNNLZ)+BREF (0, I)	SIGMILD
	IF (L2ENIH)100,110,110	SIGMILI
110		SIGM112
	LHUJK=LHU(J;KK)	SIGM114
	IF(LRUJK=1)1200,1250,125	SIGM114
1250	NLSKK=NLS(I,KK)	SIGM115
	DO 126 LL=1,NLSKK	SIGM116
	LURE=LANG(I,KK,LL)	SIGM117
	SS=FLOAT (LURE)	SIGM118
	CALL FACTS(Q,LURE,PF,SF,PS,CONSTA,XWR,API,3,0)	SIGM119
	TRM=(2,0*SS+1,0)*4,0*PI	SIGM120

	TRM=TRM+SIN(PS)+SIN(PS)/(CONSTA+CONSTA)	SIGM121
134		SIGMIZZ
125		SIGHIZO SIGHIZĂ
427		SIGM125
	APFF(5) = APFF(5) + S1GP + APN(1)	SIGM126
	ARFF(6) = AREF(6) + SIGP + ABN(1)	SIGM127
	BRFF(1,I)=BREF(1,I)+SIGP*ABN(I)	SIGM128
	BREF(4,1)=BREF(4,1)+SIGP*ABN(1)	SIGM129
	BREF(5,1)=BREF(5,1)+SIGP*ABN(1)	SIGM130
	BREF(6,1)=BREF(6,1)+SIGP*ABN(1)	SIGM131
112	CONTINUE	SIGM132
	RETURN	SIGMISS
	END Subpoliting Signated of ED CO M N NY REEF. DUBN	SIGMIN
	COMMONIAL SIEVELIJGIJEZJGZJMJNJNAJDER JDWRJ	STEVANZ
		STEVOUS
	GO TO 300	SIEV0031
300	N2=2+N	SIEVØØ4
	DO 10001=1,100	SIEVØ05
	JFLAG(I)=2	SIEVØØ6
1000	CONTINUE	SIEVØØ7
	TEF=BEFF/293,0	SIEVOUB
-	DP=(1,5885E+00)*SQRT (TEF/BWR)	SIEVONA
Ç	WHEN MULTIPLIED BY SORT(E) OF GIVES 5 TIMES CORRESPONDING DELIA	STEVUTO
	DD1=DF*S0RT (C1)	STEVATO
		SIEVOIS
	DG2=G2/FLOAT (M)	SIEV014
	EX(1)=E1	SIEVØ15
	IF(G1,LT,DP1)G0 T0 1001	SIEV016
	GO TO 1002	SIEVØ101
1001	JFLAG(1)=1	SIEVØ17
1002	ENDIF=ABS (E2-E1)	SIEVØ18
		SIEVOIS
		SIEVOZO
	16/3A FI 60)CU IV 104 YY=C1+D01*(CAFI (1)	SIEVOLI
	G_{0} To 120	SIEVŐŽŽI
107	NX=NX+1	SIEV023
-	EX(NX)=XX	SIEV224
	IF(G1,LT,DP1)G0 TO 1003	SIEV025
	GO TO 100	SIEV0251
1003	JFLAG(NX)=1	SIEVØ26
100	CONTINUE	SIEVØ27
	DO 200 ININ XX-EO-DCOMELONT (I)	SIEVOZO
	TELYM ET E11CO TO 100	SIEVASA
	GO TO 200	SIEVØJØ1
108	NX=NX+1	SIEVØ31
-	EX(NX)=XX	SIEVØJZ
	IF(G2,LT,DP2)G0 TO 1005	SIEVØ33
	GO TO 200	SIEVØ331
1005	JFLAG(NX)=1	SIEVØ34
200	CONTINUE	SILVOSS
110	UIFF=\C6GC1//FLVAL \N4/ 15/0155)101 100.400	510000
101	BLIN4103 TLINTIN3	SIEVOJS
***	PRINT2000, E1, E2, DIFF	SIEVØ39
	GO TO 104	SIEVØ40
103	FORMAT(32H CALLING SEQUENCE OF SIEVE WRONG)	SIEVØ41

2000	FORMAT(4H E1=E13,6,4H E2=E13,6,6H DIFF=E13,6)	SIEVØ42
102	N21=NX+1	SIEVØ43
	NN=NX	STEVØ44
	N22=N21+N2=2	SIFV045
	NX=N22	STEVAA
	E21=(E1+F2)/2.0	STEVAAZ
	DP12=DP*SQRT (521)	STEVAAA
	E43=F2-E1-((G1+G2)/2.0)	SIEVAA9
	IF(E43.LT.DP12)G0 T0 1006	SIEVOSO
	GO TO 1007	STEVASA1
1006	DO 111 I=N21.N22	SIEVØDI
	12=1-NN	SIEVØ52
	EX(I)=E1+DIFF*FLOAT (I2)	SIEVØÞS
	JFLAG(I)=1	SIEVØ54
111	CONTINUE	SIEVØ55
	GO TO 1040	SIEVØS6
1007	DO 112 I=N21,N22	SIEVØÞ7
	12=1=NN	SIEVØ58
	EX(I)=E1+DIFF+FLOAT (I2)	SIEVØSS
	DPTEST=DP*SQRT (EX(1))	SIEVØÓØ
	IF(EX(I),LE,E21)GO TO 1008	SIEVØÖI
	GO TO 1009	SIEVØ611
1008	IF(G1.LT,DPTEST)GO TO 1010	SIEVØŐŽ
	GO TO 112	SIEVØ621
1010	JFLAG(I)=1	SIEVØ63
	GO TO 112	SIEVØ64
1009	IF(G2.LT.DPTEST)GO TO 1011	SIEVØ65
	GO TO 112	SIEVØ651
1011	JFLAG(I)=1	SIEVØ66
112	CONTINUE	SIEVØ67
1040	DO 113 J=1,NX	SIEVØ68
	DPF=DP*SQRT (EX(I))	SIEVØ69
	IF(DPF,EQ,0,0)GO TO 113	SIEVØ691
		SIEVØ70
	IF(TERM-L1, 27,)60 TU 114	SIEVØ71
	GU 10 115	SIEVØ711
114		SIEVD/2
110		SILVØ/S
104	KETURN	SILVØ74
		SIEVØ/S

SIGMA2 TEST	IRON DATA	•	0 350.	11	2	1,ØE-4	
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52.1 F+3	5E+Ø	2100.E+0	2100	E+0		3E+Ø	
71.9 F+3	5E+Ø	1600.E+0	1600.	E+Ø		3E+Ø	
98.5 E+3	5E+Ø	400 E+0	400.	E+Ø	•	3E+Ø	
102,6 E+3	5E+Ø	1375,E+Ø	1375.	E+Ø	•	3E+Ø	
132. E+3	,5E+Ø	1600,E+0	1600.	E+Ø		3E+Ø	
147, E+3	,5E+Ø	1950,E+0	1950.	E+Ø	1	3E+Ø	
173. E+3	,5E+Ø	4800.E+0	4800.	E+Ø	•	3E+Ø	
188,5 E+3	,5E+Ø	38000.E+0	38ØØØ.	E+Ø		3E+Ø	
245. E+3	,5E+0	13000.E+0	13000.	E+Ø	•	3E+0	
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83.6 E+3	•5E+Ø	1000.E+0	1000.	E+Ø	1	•E+Ø	
123,5 E+3	,5E+Ø	150.E+0	150.	E+Ø	1	•E+0	
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243.5 E+3	5E+0	300.E+0	300.	E+Ø	1	.E+0	
273, E+3	5E+Ø	3500 E+0	3500.	E+Ø	1	.E+Ø	
315, E+3	,5E+Ø	5500,E+0	5500	E+Ø	1	.E+Ø	
360, E+3	,5E+Ø	9300 E+0	9300.1	E+Ø	1	•E+Ø	
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	10 11	
	6 NO OF RESONANCES	
	NO OF ENERGY RANGES 1 LRU# 1 LRF# 2 •) Øøøøe+øø angular momentum	222222 202020 44444 10202020 20202020 20202020 20202020 20202020
	ANCE 5,8400E=02 (EV) 1,0000E+05 -Values Tering Length(a=	ССС ССС ССС ССС ССС ССС ССС ССС ССС СС
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JE NUMBER 1	ION OF THE ISOTO THE ENERGY RANG 00006+00 SCATTE 310PE IN UNITS (000000 000000 0000000 0000000 0000000 0000
DATA FOR ISOTO	(Z.A) DESIGNAT Lower Limit of Nucclear SP1N 0, Mass of the 1s(14.5000 7.600 5.2100 5.2100 5.2100 5.2100 5.2100 5.2100 5.2100 5.2100 5.2100 5.2100 5.2100 5.2100 5.200 1.0200 5.2000 5.20000000 5.20000000000

PROGRAM SIGMA2, PROGRAM TO CALCULATE SINGLE OR MULTILEVEL BREIT-WIGNER CROSS-SECTIONS, USES ENDF/B VERSION II DATA

4

(2, A) DESIGNATION OF THE ELEMENT 2.6056E+04 AT.WT/MASS OF NEUTRON 5.5367E+01 ND OF ISOTOPES

SIGMA2 TEST, IRON DATA.

TITLE

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6101 5,80106 1,20266 1,20266 1,20266 1,20266 1,203 1,2	4,00000 1,37505+00 1,00005+00 1,95005+00 1,95005+003	4 800000 400000000000000000000000000000	2,7500E+03 3,0000E+03
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	9,000000000000000000000000000000000000	5,0000E-01 5,0000E-01 5,0000E-01	5,0000E-01 5,0000E-01
1 1.50005 7.50005 7.53006 5.21005 7.19005 7.19005 7.19005 7.1005 7.005 7	9.85000 + 04 1.02600 + 04 1.32000 + 05 1.47000 + 05	1.7300E+05 1.8850E+05 2.4500E+05	3 • 3000E + 05 3 • 7000E + 05

1 NO OF RESONANCES MASS OF THE ISOTOPE IN UNITS OF NEUTRON MASS 5.3476E+Ø1 SCATTERING LENGTH(A-) Ø.0000E+00 ANGULAR MOMENTUM

N

GF 0,00005+00 0,00005+00
GGAMMA 1.0000€+00 1.0000€+000
GN 1.0400€+00 1.1300€+00
6101 2,04006+00 2,13006+00
• \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$
ERES 9.4800E+03 1.4400E+04

N DATA FOR ISOTOPE NUMBER

-+

(2,4) DESIGNATION OF THE ISOTOPE 2.6056E+04 FRACTIONAL ABUNDANCE 9,1680E=01 NO OF ENERGY RANGES

LOWER LIMIT O NUCLEAR SPIN MASS OF THE I MASS OF THE I	F THE ENERGY RANI 6,0000E+00 SCATT SOTOPE IN UNITS I	GE(EV) 4.7500E+: ERING LENGTH 6. OF NEUTRON MASS	03 UPPER LIMI 00005=01 NO OF I 5.54545+01 SCA	T(EV) 1,00006+09 L-Values TTERING LENGTH(/	; LRU≅ 1 LRF≡ .=) ø,øøøøE≑øø ANGL	Z ILAR MOMENTUM	o N	JF RESONANCE	5
 4 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	00000000000000000000000000000000000000	 № 44 4400000 400000 4 № 44 4400000 400000 № 4000000000000000000000000000000000000	й 44 440 0 0 0 40 00 0 4 V 4 10 0 0 0 40 00 0 4 V 4 10 0 0 0 4 4 3 0	44444444444444444444444444444444444444	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2				
MASS OF THE 1	SOTOPE IN UNITS (OF NEUTRON MASS	5,5454E+Ø1 SCA'	TTERING LENGTH(#	-) 0,0000E+00 ANGU	LAR MOMENTUM	L NO	JF RESONANCE	3 12
4040884884848848484848484848484484444444	0004440400400 0004440400000 0000000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0	R4 0 4 0 4 0 0 0 4 4 0 0 0 0 4 0 0 0 0 0	4000000000000 4 1 + + + + + + + + + + + + + + + + + +	22222222222222 222222222222222 22222222				

ю ISOTOPE NUMAER DATA FOR (Z.A.) DESIGNATION OF THE ISOTOPE 2.6057E+04 FRACTIONAL ABUNDANCE 2.1700E-02 NO OF ENERGY RANGES 1 Lower Limit of the energy range(ev) 4.7500E+03 Upper Limit(ev) 1.00000E+05 Lru= 1 Lrf= 2 Nuclear SPIN 5.0000E-01 Scattering Length 6.0000E-01 NO OF L-VALUES 2 Mass of the isotope in Units of Neutron Mass 5.6446E+01 Scattering Length(a+) 0.0000E+00 Angular Momentum

ŝ

RESONANCES

Ч С 0 Z 9

> 0 , 0000E+00 ч С 1,5000E+D0 GGAMMA 2,4000E+02 Z U GTQT 2.4150E+02 0,0002E+00 NIds 3,9000E+03 ERES

	80			-4		N				
	DF RESONANCES			DF RESONANCES		JF RESONANCES				
	o z			o z		0v				
	H			2		4				
	JLAR MOMENTUM			GES 1 2 JLAR MOMENTUM		JLAR MAMENTUM			SIGTMULT	1,389662E+Ø1
	ANG			RAN AFF		ANG			F,	401
₽, 00005E+00 ₽, 00005E+00 ₽, 00005E+00 ₽, 00005E+00 ₽, 00005E+00) ଜ.ଉଉଉଉE+ଉଉ	222222222 0000000 0000000 0000000 000000		NO OF ENERGY LRU= 1 1) 0.0000E400	GF 6 - 0000 E + 00) 0,000E+00	GF GF 6, 8088E + 80 6, 8088E + 80		SIGNNMUL	1.13735@E
	-			1 + 1 7 0 0 7 + 20 0		H (A -				E + 01
: 7300 Е + 00 ; 0000 Е + 00 ; 300 Е - 01 ; 300 Е - 01 ; 300 Е - 01	VING LENGT	00000000000000000000000000000000000000		СЕ 3,1000 1,1,000 1,0000 1,105 2,105 2,105 1,50 1,50 2,51 2,50 2,50 2,50 2,50 2,50 2,50 2,50 2,50	GCAMMA . BBBBE+80	VING LENGT	ССАММА . 0000е + 00 . 000е + 00		S16T	1,588847
19 IU 10 00	T ER	80 80 80 80 61 71 1 1		0 - 1	**	TER	स स			0
••••••••••••••••••••••••••••••••••••••	6446E+Ø1 SCA	90000000000000000000000000000000000000		11084L ABUN UPPER LIMI 55141 NO OF 14366401 SCA	CN 5700€+00	'436E+Ø1 SCA	GN 540005=03 .73005=02		SIGF	0,00000E+
	5			8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8		5.1	04			80
4,6373E+02 3,0050E+03 2,5168E+03 2,5983E+03 2,6983E+02	NEUTRON MASS	4 1 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		2,60586+04 EV) 4,750864 NG LENGTH 6, NGUTRON MASS	GTOT 3 ,5700E+00	NEUTRON MASS	6101 1,06555+00 1,01735+00		SIGCAP	2,5 2 3121E+
	OF			N COP N COP		OF		ERGY		+ 0 +
1,0000E+00 1,0000E+00 1,0000E+00 1,0000E+000 1,0000E+000	PE IN UNITS	 SP1N SP1N SP1N SS000F S000F S	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	0 2 2 2 2 2 3 2 2 4 2 3 2 3 2 4 3 3 3 5 4 3 3 5 4 3 5 5 4 3 5 5 4 3 5 5 5 4 5 5 5 7 5 5 6 7 8 5 6 7 8 5 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 7 8	SP I N 5 , 0000E-01	STIN UNITS	5,00005-01 5,00005-01 5,00005-01	THERMAL EN	V) SIGNN	1,336535E
	50101		- Б.		-,	50101		S AT	E Z	192
6.30000 2.8000 4.05000 4.05000 4.05000 4.05000 4.04	MASS OF THE 15	С С С С С С С С С С С С С С	DATA FOR ISOT((Z.A) DESIGNA' LOWER LIMIT OF NUCLEAR SPIN 6 MASS OF THE IS	ERES #6,0000E+02	MASS OF THE IS	ERES 2,3000E+02 3,5900E+02	CROSS-SECTION	NEUTRON ENERG)	2,530000E-

SIGTMULT	6,2534646+80 8,4474076480	5 416645E+00	5,419848E+00	5,579563E+00 6.330046F+00	6 780655E+00	8,4783Ø8E+ØØ	1,258993E+01	1 01002/5+01	9,038091E+00	9.039606E+00	9,971789E+00	1+36121/E+01 1-418547E+01	1,580221E+01	1,421580E+01	1.0709400E+01	1,543097E+01	1,902773E+01	2,262631E+01	24//1875+01 2 4865705404	2.492546E+01	2,495183E+01	2,524887E+01	2,5707505+01 2,6473705+01	2,570744E+01	2,524683E+Ø1	1,927584E+01	1.0051256+01	9,924655E+00	1,246541E+01	1.2468815+01	9,919071E+00	7.027400E+00	0,2404915400 5.6938965400	7.173443E+00	1,002470E+01	1.478771E+Ø1	1,004008E+01	/ 1104/025400 4.9666645400	4 707347E+00	4 • 484254E+00	4,719779E+00 5 7585955404	6.452362E+00
SIGNNMULT	5.693567E+00 5.433383E+00	5.410671E+00	5.413503E+00	5,570591E+00	6.760353E+00	8 444000E+00	1,252778E+01	1 81.00000FF01	9.016798E+00	9.018405E+00	V * Y 7 2 1 4 3 E + 0 0	1.3404935+01	1.426337E+01	1,343528E+01	1.274655401	1.5403326+01	1,899490E+01	2,258919E+01	2.47.03/4F+01 0.480456F+04	2.488755E+01	2,491332E+01	2.499001E+01	2.011580E+01 0 530708F+01	2.511576E+01	2.498801E+01	1,925329E+01 1 334 apre-01	1.004417E+01	9.088678E+00	1,038167E+01	1.038520E+01	9,083046E+00	7,024155E+00	5.691969F+00	5.310626E+00	5,369999E+00	5.479952E+00	5,385189E+00 5,335189E+00	9.965981F+00	4,706132E+00	4,483155E+00	4,449910E+00 4,40E+00	5.106520E+00
SIGT	7.346115E+00 6.5083386	6,472119E+ØØ	6,467604E+00	6.590118E*00 7.202440F*00	7,714571E+00	9.384944E+00	1,073908E+01	1 * 10/44/F * 01	1.0421785+01	1,042268E+01	1,101049E+01	1.545917E+01	1,707550E+01	1.5488685+01	1.404100F #01 4.404100F #01	1.660390E+01	2.002107E+01	2,334725E+Ø1		2.526081E+01	2,525453E+01	2,552218E+01	2,574795401 2,6744995401	2,597772E+01	2.551611E+01	1,923683E+01 1 3375515+01	1.021535+01	1,016405E+01	1.270485E+01 1 6053705+01	1,270962E+01	1,015992E+01	7,319223E+80 6 6606071+00	6.035346F+00	7.525086E+00	1,037634E+01	1,513940E+01	1.039182E+01	5.302959F+BB	5,064939E+00	4.840765E+00	5,0/2936E+00	6.806045E+00
SIGF	0,000000E+00 0 0000005+000	0,00000E+00	0,000000E+00	6.000000E+00 0.000000E+00	C C C C C C C C C C C C C C C C C C C	0,00000E+00	0,000099E-00	0,0000000E≠000 5 333330005	0,0000000000000000000000000000000000000	0 000000E+00	0,000000F.00 0.000000F.00	0,00000E+00	0,000000E+00	0,300000E+00	0,00000055+00 0,0000005+00	0,00000E+00	0,000000E+00	0,0000000E+00 5,0000000E+00	<pre></pre>	0.000000E+00	0,000000E+00	000000E+00	₽ • ĕ Ø Ø Ø Ø Ø Ø Ø € • Ø Ø Ø • Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø	000000E+00	U, 000000E+00	0,000000E+00 0 000000E+00	0.000000E+00	0,000000E+00	6.000000E+00 0 0000005+00	0,0000005+00	B,000000E+00	0,000000E+00 0 000000E+00	0.000000E+00	0,000000E+00	0,000000E+00	Ø, ØØØØØØØE + ØØ	6 300000E+00	0.000000E+00	0,00000E+00	0,00000E+00	6 8000000F + 80	0 000000E+00
SIGCAP	5.598969E=01 5.413077E=03	5,974332E-03	6.344211E-05	8.471740E-03 1 642074F-03	2.030127E-02	3.430841E-02	0.214332E-02	3 4076455F80	2.12922E-02	2.120134E-02	1.404090E-07	7 805316E-01	1,538838E+00	7.805198E-01	3,791077F107	2,764881E-02	3.282913E-02	3.711650E-02 7 0.000EF-02	0.0109005502 3 7088635500	3.791625E-02	3.851254E-02	2.588650E-01	2.7109235E-01	5 916741E-01	2.588180E-01	2,255651E-02 1 200501F-02	7.084410E-03	8.359765E-Ø1	2,083741E+00 4 1447035400	2.083611E+00	8.360245E-01	3.245635E-03	2.4249/95-03 1.9268405-03	1,862818E+00	4.654700E+00	9,307759E+00	4 654891E+00	1.382423E-03	1.214665E-03	1.098849E-03	2.698693E-01 6 7775465-01	1.345842E+00
SIGNN	6.786218E+ØØ 6.502924F+ØØ	6,466145E+00	6.461260E+00	0.281146E+00 7.276010F+00	7.694269E+00	9.358635E+00	1.36/694E+01 1.453030F+01	1.100969646401 1.1518645401	1.0400496+01	1.040148E+01	1.129309E*01 . 4.603.5+01	1.467864E+01	1.553666E+Ø1	1.47Ø816E+Ø1	1.400368F+01	1.657625E+01	1.998824E+Ø1	2.331014E+01 2.531014E+01	C. 51 96895+81	2.52289E+Ø1	2.521602E+01	2.526331E+Ø1	с. 7300105+01 2.5598375+01	2.538605E+01	2.525729E+Ø1	1.921428E+01 1 334354E+01	1.020825E+01	9.328068E+00	1.862111E+01 1.27879+E+01	1.062600E+01	9.323898E+00	7.315977E+00 5 5470855+00	6.033419F+00	5.662268E+00	5.721642E+00	5.831645E+00	5,736932E+00 5,4734755400	5.321577E+00	5,063725E+00	4.839667E+ØØ	4.005007E+00 5 0483635400	5.460203E+00
NEUTRON ENERGY(EV	4 .75000E+03 4 .98+845F+03	5,1375øø£+ø3	5,213730E+03	5,83627855865+83	5,912500E+03	6 068135E+03	0, 50000000 + 03 1 51420000 + 234	0 • / 00000000 + 00 0 • 034 - 80 • 01 + 23 4	6,760000E+03	6,763730E+03	0, VV0000F100 4 010010F404	7.219123E+03	7,220000E+03	7,220876E+Ø3	7.228920F+03	7,372500E+03	7 + 525000E + 03	7,677500E+03 7 820000402	7 - 8475005 + 00	7,865000E+03	7,882500E+03	7,899854E+Ø3	7.988388F+83	7,980573E+83	7,901146E+03	8 • 295000E + 03 8 • 600000E + 03	9 885000E+03	9 477960E+03	9 4789866400 9 4800605403	9.481020E+03	9 * 482040E+03	9 * 9102000 + 100 - 0420000 + 22	1.0770005+04	1,119898E+04	1,119949E+04	1.120000E+04	1,120051E+04	1.160000E+01	1,200000E+04	1 240000E+04	1 + Z / Y000E + 04 1 . 77004 XF + 04	1,280000E+04

С	PROGRAM RAMP1(INPUT,OUTPUT) R	MP1001
	COMMON/D/ERAN(2,501) R	MP1002
	COMMON/C/EX(101), JFLAG(101) R	MP1005
	COMMON/E/XMIN(6), XMAX(6), XREF(6) Rommon Article Internet Commentation Article Internet Commentation	MP100
	CUMMUN ARAT, IRAT, ERAT, NUI, ZAI, ABN, NER, LEM, EL, EH, LRU, LRU, LANG, NES, R Ndrs I.N. IN Energe Shiftad St. Ad Abdi. An Dif Am. Def Adfe Bef. Idance Nis. D	MPINUS
	INCESTING OFFENERS STATANJSTIANJSTIAN SAN AND ONEF JAREF DOLEF JARANGE MANGE MANGE MANGE MANGE MANGE MANGE MANG	MP1007
	EXTERNAL MOV.KOM R	MPIGOS
		MP1009
	EXTERNAL DOPPLER R	MP1010
	DIMENSION ARAY(6,500), IRAY(3,500), ERAY(2,500), NOT(20), ZAI(10), R	MP1011
	ABN(10),NER(10),LFW(10),EL(10,10),EH(10,10),LRU(10,10),LRF(10,10),R	MP1012
:	LANG(10,5,5),NLS(10,10),NRES(10),LN(50),JN(150),PENFAR(500), R	MP1013
i	\$HIFAR(500),\$P1(10),AP(10),AWRI(10),AM(10),DREF(6),AREF(6),BREF(6,R	MP1014
	1Ø) R	MP1015
	DIMENSION TITLE(7), XTAB(33)	MP1016
-	DATA MAXPTS, MAXRES, ETHERM/2000, 100, 0, 0253/	MP1017
C+++==	REICH-MOORE FORMALISM USED TO CALCULATE SCATTERING, CAPTURE, FISSIONR	MP1018
C====	AND TOTAL CROSS-SECTIONS, RUNS ON CUC-6000 AND PDP-10, R This process because on the transferred of the new format changes.	MP1017
C	THIS FROGRAM MUDIFIED ON 30,7,1970 TO INCODE NEW FORMAL CHANGES AND AND THE DIFFERENT NUCLEAR RADII. R	MP1021
	THESE FORMAT CHANGES CORRESPOND TO ENDER VERSION IT DATA.	MP1022
r	$ \begin{array}{c} \mathbf{H} = \mathbf{O} = \mathbf$	MP1023
C	READ1.(TITIE(1).IFI.7).IDPL.TEEF.NTAB.INCROSS.FERDR	MP1024
C	IDPL=1 IF DOPPIER BROADENED CROSS-SECTIONS ARE DESIRED, ELSE IDPL=ØR	MP1025
Č	TEFF = EFFECTIVE TEMPERATURE OF THE TARGET IN DEGREES KELVIN. R	MP1026
C	NTAB=NUMBER OF PIVOT POINTS TO BE USED IN EVALUATING THE DOPPLER R	MP1027
C	BROADENED CROSS-SECTION, TO GET THE DOPPLER BROADENED CROSS-SECTIOR	MP1028
0	N AT EVERY ENERGY E WE TAKE THE INTERVAL E→N2*DELTA TO E→N2*DELTA R	MP1029
C	FOR THE INTEGRAL WHERE N2=NTAB/2 AND DELIA IS THE DOPPLER CONSTANTS.	MP1030
C	NTAB=11 OR SO SHOULD SUFFICE FOR ALL CASES, NTAB= ODD INTEGER, R	MP1031
C#;	ERROR= IF THE RELATIVE ERROR BETWEEN TWO SUCCESSIVE ITERATIONS R	MP1032
C	OF THE DOPPLER INTEGRAL IS LESS THAN ERROR THE INTEGRATION ROUTINER	MP1000
(ASSUMES THAT THE INTEGRAL HAS CONVERGED AND IT EXITS, TETLAL RUNNENDES CONTACTOR THE RECOVER AND THE RECOVER A	MP1035
C	VALUES GUOLD BEEL,BEER4, HUWEVER II IS RECOMMENDED THAT THE OSER RECOMMENDED THAT THE OSER RECOMMENDED THAT THE OSER RECOMMENDED THAT THE WITH THE DER	MP1036
C=====	ACCURACY OF THE FINAL RESULT DESTRED AND COMPUTER TIME AVAILABLE. R	MP1037
•	Prints Prints Reserved and Some File File Agencies and	MP1038
	PRINT25 R	MP1039
	PRINT24.(TITLF(I),I=1,7)	MP1040
	PRINT25 R	MP1041
1	FORMAT(7A4,2X,15,F5,1,215,E10.4) R	MP1042
	IF (IDPL EQ,1) GO TO 1011 R	MP1043
	GO TO 1012 R	MP1044
1011	PRINT25	MP1045
	PRINT30, TEFF, NTAB, ERROR, INCROSS	MP1046
	PRINT25 R	MP1047
1 0 1 0		MP1040
1012		MP1050
1013	$\mathbf{F} \mathbf{A} \mathbf{A} \mathbf{W} \mathbf{R} \mathbf{C} \mathbf{C} \mathbf{C} \mathbf{C} \mathbf{C} \mathbf{C} \mathbf{C} C$	MP1001
Cerea	Za=(Z.A)DESIGNATION OF MATERIAL AWREAT, WINFUTRON MASSINISENO OF	MP1052
C	ISOTOPES R	MP1053
•	PRINT17, ZA, AWR, NIS RI	MP1054
	PRINT25 RI	MP1055
	J1=1 Ri	MP1056
	JFID=1 Ri	MP1027
	DO 101 J=1,NIS R	MP1028
~	REANGL = 1. 2	MP1027
U	sssssssssssssssssssssssssssssssssssss	MP1001

PRINT18.I RMP1062 PRINT25 RMP1063 READ3, ZAI(1), ABN(1), NOT(4), LFW(1), NER(1), NOT(5) RMP1064 C = - = - ZAI(1) = (Z, A) DESIGNATION OF ITH ISOTOPE ABN(I) = WT FRACTION OF ITH RMP1065 C---=SISOTOPE LFW=1 FISSION WIDTHS ARE GIVEN,≠0 FISSION WIDTHS NOT GIVENRMP1066 C----NER(1)=NO OF ENERGY RANGES USED RMP1067 PRINT19, ZAI(I), ABN(I), NER(I) RMP1068 NERI=NER(I) RMP1069 RMP1070 J2=1 С 106 READ3,EL(I,J2),EH(I,J2),LRU(I,J2),LRF(I,J2),NOT(6),NORMP1072 1T(7) RMP1073 C-----EL=LOWER ENERGY LIMIT OF A RANGE, EH=UPPER LIMIT OF A RANGE RMP1074 C-----LRU=1 RESOLVED RESONANCE PARAMETERS, LRU=2 UNRESOLVED PARAMTRS RMP1075 C-----LRF INDICATES PARTICULAR TYPE OF RESONANCE FORMULA TO BE USED RMP1076 PRINT20, EL(1, J2), EH(1, J2), LRU(1, J2), LRF(1, J2) RMP1077 LRUIJ=LRU(I,J2) RMP1078 IF(LRUIJE1)127,128,1010 RMP1079 127 PRINT10 RMP1080 GO TO 130 RMP1081 128 NMOM=1 RMP1082 С READ3, SPI(I), AP(I), NOT(7), NOT(8), NLS(I, J2), NOT(9) RMP1084 C----SPI(I)=SPIN OF THE I-TH ISOTOPE, AP(I)=A+ SPIN DEPENDENT SCATTERINGRMP1005 C----LENGTH IN UNITS OF 1.0E=12CM.ALSO =SCATTERING LENGTH FOR SPIN INDERMP10051 C----PENDENT CASE, NLS=NUMBER OF L VALUES. RMP1086 PRINT21, SPI(I), AP(I), NLS(I, J2) RMP1087 JI =1 RMP1088 C READ3, AWRI(1), AM(1), LANG(1, J2, JL), NOT(10), NRS6X, NRS 104 RMP1090 C----AWRI(I)=MASS OF THE I-TH ISOTOPE IN UNITS OF NEUTRON MASS,AM=A-, RMP1091 C----THIS IS SET=0.0 FOR SPIN INDEPENDENT CASE. C----LANG=L-VALUE OF THE ANGULAR MOMENTUM.NRS=NUMBER OF RESONANCES. RMP1092 RMP1093 PRINT22, AWRI(I), AM(I), LANG(I, J2, JL), NRS RMP1094 RMP1095 NMOM=NMOM+1 J3=J1+(NRS-1) RMP1096 С READ4, ((ARAY(K, J), K=1, 6), J=J1, J3) RMP1098 THIS IS WHERE THE RESONANCE PARAMETËRS ARE READ IN, ARAY(1,J)=ERESRMP1099 C IN EV, ARAY(2, J)=J VALUE, ARAY(3, J)=NEUTRON WIDTH, ARAY(4, J)=GAMMA RMP1100 C WIDTH, ARAY(5, J)=FISSION WIDTH OF FIRST FISSION CHANNEL, ARAY(6, J)RMP1101 С =FISSION WIDTH OF SECOND FISSION CHANNEL, ALL WIDTHS ARE IN EV, C RMP1102 PRINT25 RMP1103 RMP1104 PRINT23 RMP1105 PRINT26, ((ARAY(K,J),K=1,6),J=J1,J3) PRINT25 RMP1106 Do 102 J=J1,J3 RMP1107 RMP1108 IRAY(1,J)=LANG(1,J2,JL) IRAY(2, J)=NRANGE RMP1109 IRAY(3, J) = IRMP1110 ERAY(1, J) = SPI(I)RMP1111 ERAY(2, J) = AP(I)RMP1112 102 CONTINUE RMP1113 J1=J1+NRS RMP1114 RMP1115 JI = JI +1 IF(NMOM-NLS(I, J2))104,104,103 RMP1116 103 NRANGE=NRANGE+1 RMP1117 RMP1118 J2=J2+1 IF (NRANGE=NERI) 106.106.1010 RMP1119 RMP1120 1010 NRES(I)=J1-JFID JFID=J1 RMP1121

101	CONTINU	IE,														RMP1122
	NTOTAL	:J1-1														RMP1123
	PHI=3.1	41592	26535	9												RMP1124
3	FORMATO	2E11	4,41	11)												RMP1125
4	FORMATO	6E11	4)	-												RMP1126
5	FORMAT	8E11	4,31	10)												RMP1127
6	FORMAT	2X.2E	11.4	>												RMP1128
7	FORMAT	76H N	NEUTR	ÓN EN	IERGY	(EV)		SIGNN		5	SIGC	P			SI	GRMP1129
	LF		SIGT	OTAL)											RMP1130
8	FORMAT	2X,7E	15.6	>												RMP1131
9	FORMAT	10X,2	2E2Ø.	6)												RMP1132
10	FORMAT(20H E	RROR	IN 1	INPUT	DAT	¥)									RMP1133
11	FORMATO	10X,2	2110)													RMP1134
12	FORMAT	10X,6	5110)													RMP1135
16	FORMAT	15H N	NEUTR	ON EN	IERGY	E15,	6)									RMP1130
14	FORMAT	53H C	ROSS	-SEC1	TIONS	CAL	CULA	TED W	ITHOUT	DOF	PLEF	K BK	UADI	ENIN	(G)	RMP1137
15	FORMATO	50H (ROSS	SECI	IONS	CAL	CULA	TED W	ITH DO	PPLE	R BI	CAD	ENI	NG)		RMP1138
17	FORMATO	33H ((Z,A)	DES	GNAT	ION	OFT	HE EL	EMENTE	11,4	,22)	I AT	• WT	/MAS	ss c	FRMP1109
:	1 NEUTRO	NE11	4,15	H NO	OFI	SOTO	PESI	5)								RMP1140
18	FORMAT	24H [ATA	FOR	ISOTO	PE N	UMBE	R15)								
19	FORMATO	33H ((Z,A)	DES	GNAT	ION	OF T	HE IS	OTOPEE	11,4	1,21	I FR	ACT	IONA	AL A	BRMP1142
:	LUNDANCE	E11,4	1,20H	NO C	DF EN	ERGY	RAN	GES 15)							RMP1149
2Ø	FORMAT	36H L	OWER	LIM	LT OF	THE	ENE	RGY R.	ANGE(E	EV)ES	L1,4,	18H	1	UPPE	ER L	IRMP1144
	(MIT(EV)	E11,4	1,6Н_	LRU	15,6	ΗĻ	RF=I	5)								RMP1149
21	FORMAT(13H N	NUCLE	AR SP	PINE1	1,4,	18H	SCATT	ERING	LENG	STHE	1,4	112	HN) (F	RMP1140
	1L-VALUE	S15)														RMP114/
22	FORMAT	ADH M	ASS	OF T	IE IS	UTOP	EIN		S OF P	NEUT)		1455	11	+ 4 + 2	22H	SKMP1140
	LCATTERI	NG LE	NGTH	(A=)E	11,4	,17H	ANG	ULAR	MUMENT	IUMI:	,1/	4 NU	0F	RES	UNA	NRMP1149
	20ES15)													~		RMP1120
	FORMAT	648		ERES			58	1 N			3 N				3 A M P	18KWLTTŠŤ
23																0401162
20		GF			7 . 4 .	GFB)										RMP1122
23 24 25	1 FORMAT (GF 11H 1	7A FITLE		744)	GFB)										RMP1154 RMP1153 PMP1154
23 24 25	1 FORMAT(FORMAT(GF 11H 1 //)	7A FITLE F14	4 2 4	744)	GFB)										RMP1124 RMP1153 RMP1154 PMP1155
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1331	CONTINUE	RMP1183
	NCOUNTENCOUNTENESI	RMP1184
1330	CONTINUE	RMP1185
	DO 108 IFI,NTOTAL	RMP1186
	ERAN(1,1)=ARAY(1,1)	RMP1187
	ABGFA=ABS(ARAY(5,I))	RMP1188
	ABGFB=ABS(ARAY(6,1))	RMP1189
	ERAN(2,1)=ARAY(3,1)+ARAY(4,1)+ABGFA+ABGFB	RMP1190
108	CONTINUE	RMP1191
	CALL GIKS(1, NTGTAL, MOV, KOM)	RMP1192
C=	-HERE RESONANCE IN AN ELEMENT ARE ARRANGED IN INCREASING ORDER IN	RMP1193
05	"ENERGY ALONG WITH THEIR TOTAL GAMMAS TO CALCULATE THE ENERGY MESH	RMP1194
C====	AT WHICH THE CROSS-SECTIONS ARE CALCULATED,	RMP119>
140		RMP1196
		RMP1197
		RMP1198
		RMP1199
	CALL RMSIGM(EIMERM,I)	RMP1200
		RMP1201
		RMP1202
		RMP1203
	IRANGERA Doinge Crucow (Addreite et al al	RMP1204
140	POINTOSETERMISCAREFCLUISLEISA/ DOINTOSE	RMP1209
140		RMP1200
		RMF1207
		RMF1200
		DMD1210
		DMP1211
	IRANGE=KK	RMP1212
		RMP1213
	IF(LRUJK=1)131.1321.125	RMP1214
131	PRINT10	RMP1215
	G0 T0 130	RMP1216
1321	IF(JJ.EQ.1)GO TO 1320	RMP1217
	GO TO 132	RMP1218
1320	ELOREF=EL(JJ,KK)	RMP1219
	EHIREF=EH(JJ,KK)	RMP1220
	ELO=ELOREF	RMP1221
	EHIEEHIREF	RMP1222
	GO TO 1240	RMP1223
1,32	ELO=EL(JJ,KK)	RMP1224
	EHIEEH(JJ,KK)	RMP1225
	IF (ELO, EQ, ELOREF, AND, EHI, EQ, EHIREF) GO TO 124	RMP1226
1040		RMP1227
1446	MMEMAAPIS/(G#MARKES)	RMP1228
		RMP1229
		RMP1230
		RMP1231
		DMD1233
		DMD1232
117	IF(IFND_F0.0)G0 T0 125	RMP1235
	J5=J4+1	RMP1236
	E1=ERAN(1, J4)	RMP1237
	G1=ERAN(2, J4)	RMP1238
	E2=ERAN(1, J5)	RMP1239
	G2=ERAN(2, 15)	RMP1240
	IF (E1, LT, ELO, AND, E2, LT, ELO) GO TO 1120	RMP1241
1105	IF(E1.LE,EL0,AND,E2,GT,EL0)G0 TO 1110	RMP1242
	GO TO 1111	RMP1243

1110	E1≖ELO	RMP1244
-	G1=G2	RMP1245
	ISTART=0	RMP1246
	GO TO 1114	RMP1247
1111	IF(F1.GT.FL0.AND.F2.LF.FHI)G0 T0 1112	RMP1246
****		PMP1249
4442	SU TU 1413	РМР125Й
* * * * *	IC (Jasedarian), ISTARI, EGTIGO (C. III)	DMD1251
4 4 17 6		DMP1252
1100		DMP1253
		DMD1254
		RMPIZZE
		RMPI299
	ISTARIED	RMP1250
	GD 10 1114	RMP1257
1116	E2=EHI+G1/FLOAT (MM)	RMP1228
	G2=G1	RMP1259
	IFLAG=0	RMP1260
	GO TO 1114	RMP1201
1113	IF(E1.LT.EHI.AND.E2.GE.EHI)GO TO 1123	RMP1262
	GO TO 1124	RMP1263
1123	E2=EHI	RMP1264
	G2=G1	RMP1265
	IENDEØ	RMP1266
	GO TO 1114	RMP1267
1124	IF(E1.GE.EHI.AND.E2.GT.EHI)GO TO 125	RMP1268
	GO TO 1125	RMP1269
1125	1F(1F) AG)1120.125.1120	RMP1270
1114		RMP1271
****		PMP1272
4419		DMP1274
1110	CONTINUE	DMD1074
	CALL SIEVE(EI)SIJE2, G2, MM, NN, NX, TEFF, AWA	RMF 12/7
	CALL UINS(I)NX, MOVE, KUME)	RMF1279
		RMP1270
1120	IF(IEND.EQ.0)GC TO 125	RMP12//
	J4=J4+1	RMP1278
		RMP12/9
116	D0 109 I=1,NX	RMP1280
	E=EX(I)	RMP1281
	JFLAGI=JFLAG(I)	RMP1282
	CALL RMSIGM(E,KK)	RMP1283
	PRINT8, E, (AREF(LL), LL=1,4)	RMP1284
	IF(IDPL-EQ.1)GO TO 141	RMP1285
	GO TO 109	RMP1286
141	IF(E.LT.ETHERM)GO TO 109	RMP1287
	G0 T0 1410	RMP1288
Ĉ -	IF THE NEUTRON ENERGY IS LESS THAN 0.0233 FV DOPPLER BROADENING IS	SRMP1289
	PASSED AS A DIFFERENT KERNEL SHOULD BE USED TO CALCULATE DOPPLER	RMP1290
vr e Cemess	BROADENED GROSS-SECTIONS.	RMP1291
1410		8MP1292
	IC: TL: / T-7-04/2	RMP1293
	$C_{1} = C_{1}	RMP1294
1121		RMP1295
 70	CALL CREDITERTRETEDIATED	RMP129A
52	- URMAINEN,144443177 CALL CDFAT9/NODDIES,EINT.YTAR.NTAP ED000-15001	PMP1297
	UNIL UNERTAINUTTLERAFTINIAAAUINIADJERRURJIERRA Doindale Eint IElacii	RMP1008
	TRINIEDEET INJUTEAUSI/	DMP1000
	17,1299-2014	DMD1300
1120	GUID INFORME DELTA DADEN	DMD1201
7755	CALL GAUSSICIUEIAIUUFE/	RHFIJWI DMD13W2
1.00		DMD1702
109		KMP1303
	IF (1FLAU) 111/, 160, 141/	KULTORA

111		RMP1305
125	lF(NTUTAL⊂J4)120,1200,117 Ø E1=FRAN(1.,J4)	RMP1306 RMP1307
_	G1=ERAN(2, J4)	RMP1308
4.2	GO TO 1116	RMP1309
12	2 CONTINUE 4 CONTINUE	RMP1310
12	Ø CONTINUE	RMP1312
13	Ø CALL EXIT	RMP1313
	END Sudraliting Oiks (Mm. NN Move Compary)	RMP1314
CQIK	S ALL-IN-MEMORY SORT PROGRAM	QIKSØØIØ
Ċ	MM = FIRST SUBSCRIPT	QIKSØØ3Ø
C	NN = LAST SUBSCRIPT (ARRAY IS IN COMMON)	QIKSØØ4Ø
U	DIMENSION MSAVF(20),NSAVF(20)	GIKS0050 GIKS0060
	KEYLOC(M,N)=(N+M)/2	QIKSØØ7Ø
	I = Ø	QIKSØØ8Ø
	しての 「「VF」 11 の	GIKSØØ9Ø
	M=MM	01KS0110
-	N=NN	QIKSØ12Ø
<u>ہ</u>	D CONTINUE TEST FOR ONE OR THO ITEMS	QIKSØ13Ø
U	IF(N=M=1) 31,51,32	01650150
C 3	2 CONTINUE	QIKSØ160
C	PARTITION AND SPREADER GO HERE, SEE BELOW. RETURN IS TO B	QIKSØ17Ø
L L	FUSH DUWN 8 LEVEI≢LEVEI+1	01650180
C	WORK ON SMALLEST PORTION	QIKSØŽØØ
47	IF ((J-M) = (N-I)) 134, 134, 34	OIKSØ21Ø
13	9 MSAVE(LEVEL) = I NSAVE(LEVEL) = N	QIKSØ220
	N=J	QIKS0240
	GO TO 35	QIKSØ25Ø
3	A MSAVE(LEVEL)⊐M NSAVE/LEVEL)−I	Q1KSØ26Ø
	M=I	01650290
	GO TO 35	QIKSØ29Ø
5	1 IF(COMPAR(M,N))31,31,131	QIKSØJØØ
13	SWAP IF UNLT IND TIEMS ARE OUT OF ORDER 1 CALL MOVE(M.Ø)	QIKS0310 01KS0320
	CALL MOVE(N,M)	QIKSØJJØ
~	CALL MOVE(0,N)	QIKSØ34Ø
ა: 15:	L IF (LEVEL) 151, 150, 151 7 RETURN	QIKSØ35Ø
C	POPUP	QIKSØ370
15:	L M = MSAVE(LEVEL)	OIKSØ38Ø
	N=NSAVE(LEVEL) FVFL=1FVFL=1	QIKSØ39Ø Oiksøåøø
	GO TO 35	QIKS0410
C	END MAIN	QIKSØ420
U 30	PARTILIUN 2 Tem	QIKSØ43Ø
	 N=U	QIKSØ45Ø
	KEY=KEYLOC(M,N)	QIKSØ46Ø
E	CALL MOVE(KEY, 0) 15 (n - Key) 17, 1 17	QIKSØ47Ø
1	7 CALL MOVE(N,KEY)	QIKS0480 DIKS0480
	CONTINUE	QIKSØ500
С	HOLE AT BOTTOM	QIKSØ51Ø

```
IF(COMPAR(0,1))3,2,2
    2 I=I+1
      IF (1 - J) 1, 4, 1
    3 CALL MOVE(I, J)
      GO TO 5
    6 CONTINUE
C
      HOLE AT TOP
      IF(COMPAR(0, J))5,5,7
    5 J=J=1
      IF (I = J) 6, 4, 6
    7 CALL MOVE(J.I)
      GO TO 2
С
    4 CONTINUE
      SPREADER GOES HERE
С
           PARTITION
C
      END
      SPREADER
C
    4 CALL MOVE(0,1)
   12 IF (I - N) 110, 10, 110
  110 i = i + i
      IF (COMPAR (0, 1))10,12,10
   10 IF (J - M) 108, 8, 108
  108 J = J = 1
      IF(COMPAR(0, J))8,10,8
C
    8 CONTINUE
      RETURN TO MAIN PROGRAM
ċ
      END
      SUBROUTINE MOV(1,J)
      COMMON/D/ERAN(2,501)
      11=I
      J1=J
      IF(I1.EQ.0)11=501
      IF(J1.EQ,0)J1=501
      ERAN(1, J1) = ERAN(1, I1)
      ERAN(2, J1) = ERAN(2, 11)
      RETURN
      END
      SUBROUTINE MOVE(1, J)
      COMMON/C/EX(101), JFLAG(101)
      I1=I
      ل=1ل
      IF(11.EQ.0)11=101
      IF(J1.EQ.0)J1=101
      EX(J1) = EX(I1)
      JFLAG(J1)=JFLAG(I1)
      RETURN
      FND
      FUNCTION KOM(I,J)
      COMMON/D/ERAN(2,501)
      I1=I
      J1=J
      IF(I1,EQ.0)I1=501
      IF(J1.EQ.0)J1=501
      EOM=ERAN(1, I1)-ERAN(1, J1)
      IF (EOM) 100, 101, 102
 100 KOM==1
      GO TO 103
 101 KOM=Ø
      GO TO 103
 102 KOM=1
 103 RETURN
      END
```

QIKSØ520 OIKSØ53Ø QIKSØ540 QIKS0550 QIKSØ56Ø QIKSØ>7Ø QIKSØ58Ø **GIKSØ590** QIKSØÓØØ QIKSØ610 Q1KSØ62Ø QIKSØ63Ø QIKSØ64Ø OIKSØ65Ø QIKSØ66Ø QIKSØ670 QIKSØ680 QIKSØ69Ø QIKSØ700 QIKSØ710 QIKSØ720 QIKSØ73Ø QIKSØ740 QIKSØ75Ø QIKSØ76Ø Q1KSØ77Ø MOV ØØ1 MOV DOZ MOV ØØ3 MOV Ø04 MOV 005 MOV 006 MOV ØØ7 MOV ØØ8 MOV ØØ9 MOV ØIØ MOVEØÜI MOVEØØZ MOVEØØS MOVEDOA MOVEØ05 MOVEØØ6 MOVEØ07 MOVEØØ8 MOVEDOS MOVEØIØ KOM ØØI KOM ØØŽ KOM ØØ3 KOM Ø04 KOM 005 KOM ØØ6 KOM ØØ7 KOM ØØ8 KOM ØØ9 KOM ØÌØ KOM Ø11 KOM ØÏZ KOM Ø13 KOM Ø14 KOM Ø15

KOMEØØ1 FUNCTION KOME(1, J) KOMEØØŽ COMMON/C/EX(101), JFLAG(101) KOMEØØS 11=I KOMEØØ4 J1=J IF(I1.EQ.0)I1=101 KOMEØØ5 IF(J1.EQ.Ø)J1=101 KOMEØØÓ EOX = EX(I1) - EX(J1)KOMEØØ7 IF(EOX)100,101,102 KOMEØØ8 100 KOME==1 KOMEØÙŸ GO TO 103 KOMEØ10 101 KOME=0 KOMEØII GO TO 103 KOMEØ12 102 KOME=1 KOMEØIS 103 RETURN KOMEØIÃ KOMEØ15 END SUBROUTINE GREAT2(F,FINT,XTAB,NTAB,ERROR,IERR) GRT2001 C+--E-CARRY OUT CONVERGENCE INTEGRATION SCHEME USING UP TO 200 INTERVALSGRT2002 C----EWHICH ARE THEN FURTHER SUBDIVIDED UNTIL CONVERGENCE OCCÜRS OR THE GRT2003 C-----MAXIMUM ALLOWARLE NUMBER OF ITERATIONS IS EXCEEDED, THE SUBROUTINEGRT2004 C---- ARGUMENTS ARE DEFINED AS FOLLOWS GRT2005 =FUNCTION TO BE INTEGRATED. GRT2006 C---F C----FINT =THE RESULTING INTEGRAL GRT2007 C+----XTAB =TABLE OF ORDINATES (INTEGRATION INTERVAL IS FROM XTAB(1) TOGRT2008 GRT2009 0----XTAB(NTAB)) C---- ATAB = THE LENGTH OF THE XTAB TABLE (NUMBER OF ORDINATES). GRT2010 C----ERROR =ALLOWABLE NORMAL ERROR, GRT2Ø11 C---==IERR ==ERROR INDICATOR SET TO ZERO IF METHOD CONVERGES, SET TO GRT2Ø12 ONE IF METHOD DOES NOT CONVERGE, GRT2013 ONE IF METHOD DOES NOT CONVERGE OR TABLE (XTAB) IS TOO LONGGRT2014 C----C . - - - -DIMENSION XTAB(33), PARTS(33), GOOF(33), INTER(33) C---=DEFINE THE MAXIMUM ALLOWABLE NUMBER OF ITERATIONS AND THE MAXIMUM GRT2016 C----TABLE LENGTH. GRT2017 DATA JMAX, NTABMX/20,1000/ GRT2018 GRT2Ø19 C---- DETERMINE IF TABLE IS TOO LONG IF (NTAB.GT, NTABMX) GO TO 100 GRT2020 GRT2Ø21 C----CALL GENERAL INTEGRATION SUBROUTINE. 222=F(5.0) GRT20211 CALL GREAT1(F,FINT,NTAB,JMAX,XTAB,PARTS,GOOF,INTER,ERROR,IERR) GRT2022 RETURN GRT2023 C---= TABLE IS TOO LONG. GRT2024 GRT2025 100 [ERR=1 FINT=0.0 GRT2026 GRT2027 RETURN GRT2028 END SUBROUTINE GREAT1(F,FINT,NTAB,JMAX,XTAB,PARTS,GOOF,INTER,ERROR, GR71001 1 IERR) GRT1002 C----CARRY OUT CONVERGENCE INTEGRATION SCHEME USING TRAPAZOIDAL RULE GRT1003 C-----AND DOUBLING THE NUMBER OF REGIONS PER SUBINTERVAL FOR EACH GRT1004 C-----ITERATION, ONLY DOUBLE UP IN THOSE INTERVALS THAT HAVE NOT ALREADYGRT1005 C---⊯-CONVERGED. GRT1006 =SINGLE PRECISION FUNCTION TO BE INTEGRATED Co--o-F GRT1007 GRT1008 C--- FINT =THE RESULTING INTEGRAL C----=NTAB =NUMBER OF ORDINATES SUPPLIED (THERE ARE N=1 INTERVALS) GRT1009 C---G-JMAX =MAXIMUM ALLOWABLE NUMBER OF ITERATIONS C---G-XTAB =TABLE OF THE ORDINATE VALUES, RANGE OF INTEGRATION IS C---GG FROM XTAB(1) TO XTAB(NTAB) GRTIMÍØ GRT1011 GRT1012 C---- PARTS EARRAY OF DIMENSION NTAB, EQUAL TO THE PARTIAL INTEGRALS GRT1013 C---s-OVER EACH OF THE NTAB-1 INTERVALS GRT1014 C----G00F =ARRAY OF DIMENSION NTAB, EQUAL TO THE NORMAL ERROR IN EACH GRT1015 C---=5 OF THE NTAB+1 INTERVAL. GRT1016 C---=JINTER #ARRAY OF DIMENSION NTAB, SEPECIFYING THE NUMBER OF GR71017

C---s; SUBINTERVALS IN EACH INTERVAL GRT1018 C-----ERROR =ACCEPTABLE NORMAL ERROR C----=IERR =ERROR INDICATOR, SET TO ZERO IF METHOD CONVERGES, SET TO GRT1020 C----- ONE IF METHOD DOES NOT CONVERGE GRT1021 DIMENSIUN XTAB(NTAB), PARTS(NTAB), INTER(NTAB), GOOF(NTAB) GRT1Ø22 C---- INITIALIZE VALUE OF THE INTEGRAL GRT1025 FINT=0.0 GRT1024 C----CALCULATE THE NUMBER OF INTERVALS GRT1025 NM1=NTAB=1 C----CALCULATE ALLOMABLE ERROR PER INTERVAL GRT1026 GRT1027 GRT1Ø28 ERRN=ERROR/FLOAT(NM1) C----INITIALIZE APPROXIMATION TO INTEGRAL GRT1029 GRT1030 TOTAL=Ø·Ø C----CALCULATE INITIAL APPROXIMATION GRT1031 GRT1032 DO 10 I=1,NM1 INTER(1)=1 GRT1033 PARTS(1)=0,5*(XTAB(1+1)-XTAB(1))*(F(XTAB(1+1))+F(XTAB(1))) GRT1034 GRT1035 10 TOTAL=TOTAL+PAPTS(I) C-----CALCULATE INITIAL ERRORS GRT1036 GRT1037 DO 15 I=1,NM1 15 GOOF(I)=PARTS(T) GRT1038 C----SET UP LOOP OVER ITERATIONS DO 100 J=1, JMAX C---=-SAVE LAST APPROXIMATION GRT1039 GRT1040 GRT1041 TOTAL1=TOTAL C----SET UP LOOP OVER INTERVALS GRT1042 GRT1043 DO 20 I=1,NM1 GRT1Ø44 C-----CHECK FOR CONVERGENCE IN THIS INTERVAL GRT1045 IF(ABS(GOOF(1)/TOTAL), LT, ERRN) GO TO 20 GRT1Ø46 GRT1047 C----CALCULATE DOUBLE INTERVAL DX=(XTAB(I+1)-XTAB(I))/FLOAT(INTER(I)) GRT1Ø48 C----DOUBLE NUMBER OF STEPS GRT1049 INTER(I)=2*INTER(I) GRT1000 C-----INITIALIZE CONTRIBUTION TO INTEGRAL GRT1051 GRT1052 REST=0,0 GRT1055 II=INTER(I) C----TNITIALIZE ORDINATE GRT1054 XNOW=XTAB(1)+Ø.5+DX GRT1055 C----SET UP LOOP OVER ORDINATES GRT1056 Do 30 K=1, II, 2 GRT1057 REST=REST+F(XNOW) GRT1028 GRT1059 30 XNOW=XNOW+DX C----CALCULATE NEXT PARTIAL INTEGRAL GRT1060 REST=0,5*(PARTS(I)+DX*REST) GRT1061 GRT1062 C----=ADD NEW PARTIAL INTEGRAL AND SUBTRACT OLD PARTIAL INTEGRAL TOTAL=TOTAL+REST=PARTS(I) GRT1063 C----CALCULATE NEW FROR AND SET PARTIAL INTEGRAL TO NEW VALUE GRT1064 GOOF(I)=REST=PARTS(I) GRT1065 GRT1066 PARTS(1)=REST GRT1267 20 CONTINUE C----CHECK FOR CONVERGENCE GRT1068 100 IF(ABS(1,-TOTAL1/TOTAL), LE, ERROR) GO TO 200 GRT1069 GRT1070 C----THE METHOD HAS NOT CONVERGED FINT=TOTAL GRT1071 GRT1072 IERR=1 GRT1075 RETURN C----THE METHOD HAS CONVERGED GRT1Ø74 200 FINT=TOTAL GRT1075 CRT1076 IERR=Ø RETURN GRT1077 GRT1078 END

SUBROUTINE GRID(Q, BELTA, NTAB, XTAB) GRIDØØ1 COMMON ARAY, IRAY, ERAY, NOT, ZAI, ABN, NER, LFW, EL, EH, LRU, LRF, LANG, NLS, GRIDØ02 INRES, LN, JN, PENFAR, SHIFAR, SPI, AP, AWRI, AM, DREF, AREF, BREF, IRANGE, NIS, GRIDØDS **JINCROSS, IVSPIN, ELO, TEFF, DELTA, E, AWR** GRIDØØ4 DIMENSION ARAY(6,500), IRAY(3,500), ERAY(2,500), NOT(20), ZAI(10), GRIDØØ5 1ABN(10),NER(10),LFW(10),EL(10,10),EH(10,10),LRU(10,10),LRF(10,10),GRID006 2LANG(10,5,5),NLS(10,10),NRES(10),LN(50),UN(150),PENFAR(500),GRID007 35HIFAR(500),SPT(10),AP(10),AWRT(10),AM(10),DREF(6),AREF(6),BREF(6,GRID000 410) GRIDØØ9 DIMENSION XTAB(33) GRIDØ10 IGNORE=1 GRIDØ11 N2=NTAB/2 GRIDØ12 N21=N2+1 GRIDØ13 N22=N2+2 GRIDØ14 N3=NTAB-1 GRIDØ15 GRIDØ16 XTAB(N21)=Q DO 1410 I=N22,NTAB GRIDØ17 XTAB(I)=XTAB(I=1)+BELTA GRIDØIÖ II=NTAB+1-I GRIDØÏ9 XTAB(II)=XTAB(II+1)=BELTA GRIDØŻØ 1410 CONTINUE GRIDØ21 DO 1411 1=1,NTAB GRIDØ22 XTABÍ=XTAB(I) GRIDØ23 IF (XTABI)1412,1412,1411 GRIDØ24 1412 IGNORE=Ø GRID025 1411 CONTINUE GRIDØŻÓ IF(IGNORE,EQ,Ø)GO TO 1413 GRIDØ27 GO TO 1414 GRIDØ271 1413 XTAB(1)=1.0E=03 GRIDØ28 DO 1415 1=1,N3 GRID029 I1=I+1 GRÌDØ30 XTAB(I1)=XTAB(1)+FLOAT (I)+BELTA GRIDØ31 1415 CONTINUE GRIDØ32 1414 RETURN GRIDØ33 END GRIDØ34 SUBROUTINE GAUSS(Q, BELTA, DOPE) CAUSODI COMMON ARAY, IRAY, ERAY, NOT, ZAI, ABN, NER, LFW, EL, EH, LRU, LRF, LANG, NLS, GAUS002 INRES, LN, JN, PENFAR, SHIFAR, SPI, AP, AWRI, AM, DREF, AREF, BREF, IRANGE, NIS, GAUSØØ3 **3INCROSS, IVSPIN, ELO, TEFF, DELTA, E, AWR** GAUS004 DIMENSION ARAY(6,500), IRAY(3,500), ERAY(2,500), NOT(20), ZAI(10), GAUSØØ5 1ABN(10),NER(10),LFW(10),EL(10,10),EH(10,10),LRU(10,10),LRF(10,10),GAUS006 2LANG(10,5,5),NLS(10,10),NRES(10),LN(50),JN(150),PENFAR(500), GAUSØØ7 3SHIFAR(502), SPI(10), AP(10), AWRI(10), AM(10), DREF(6), AREF(6), BREF(6, GAUS000 410) GAUSØØ9 DIMENSION ABC(9), WET(9) GAUSGIÖ DATA ABC/-3,19099320178153,-2,26658058453184,-1,46855328921667,-0,GAUS011 172355101875284,0,0,0,72355101875284,1,46855328921667,2,26658058453GAUS012 2184,3.19099320178153/ GAUS013 DATA WET/0,3960697726326E=04,0,4943624275537E=02,0,8847452739438E=GAUS014 101,0,4326515570026E+00,0,7202352156061E+00,0,4326515570026E+00,0,8GAUS015 2847452739438E-01,0,4943624275537E-02,0,3960697726326E-04/ GAUS016 DATA PHIRT/1,772454/ GAUSØIŽ TEF=TEFF/293.0 GAUSØ18 TERM=0,0 GAUSØ19 DO 200 K=1,NIS GAUSOZO T1=0,0 GAUSØŹI XWR=AWRI(K) GAUSØ22 BELTA=(0,3177E+00)*SORT((Q*TEF)/XWR) GAUS023 X=BELTA*ABC(9) GAUSØ24 IF(E-X)100,100,101 GAUSØ25 101 DO 102 I=1,9 GÁUSØ26

ABCI=ABC(I) GAUSØ27 WETI=WET(I) GAUSØ28 Z=E+ABCI+BELTA GAUSØ29 CALL RMSIGM(Z, IRANGE) GAUSØ3Ø T1=T1+BREF(INCROSS,K)+WETI GAUSØ31 102 CONTINUE GAUSØ32 GO TO 110 GAUSØ33 100 71=0.0 GAUSØJÄ 110 TERM=TERM+T1 GAUSØ35 200 CONTINUE GAUSØ36 DOPE=TERM/PHIRT GAUSØJŽ RETURN GAUSØ38 GAUSØJ9 END SUBROUTINE FACTS(0,L,PF,SF,PS,CONSTE,BWR,BP,PLOD) FACTØØ1 C FACTOÓZ SUBROUTINE TO CALCULATE PENETRATION AND C FACTOOS SHIFT FACTORS FACTØØÅ С Q IS THE ENERGY L IS THE ANGULAR MOMENTUM PF PENETRATION FACTOR SF THE SHIFT FACTOR AND PS THE PHASE SHIFT AP IS R CONSTE IS KM FOR DETAILS OF FORMULAE SEE GREGSON ET AL AEEW=M517(MLBW)1965 С FACT005 С FACTORS C FACT007 C FACTØØ8 DOUBLE PRECISION PS, CONSTE, ROE, ROE2, ROE4 FACTØØŸ EAB=ABS(Q) FACTØÍØ CONHLD=2,196771E=03*BWR*SQRT(EAB) FACTØ11 CONSTE=CONHLD/(BWR+1,0) FACTØ12 C----SINCE AWR IS GIVEN WITH THE NEUTRON MASS AS UNITY WE ADD ONE ABOVEFACTOIS C---= TO CONVERT TO THE CENTER-OF-MASS SYSTEM FACTØ14 ROE=BP+CONSTE FACTOIS S=FLOAT (L) FACTØ16 IF(L.LE.0)GO TO 100 FACT017 GO TO(110,120,130,140,150),L FACTOIS 100 PF=R0E FACTØ19 SF=Ø,Ø FACTOZO IF(PLOD.LT.2.0) GO TO 160 FACTØ21 PS=ROE FACT022 GO TO 17Ø FACT023 110 ROE2=ROE+ROE FACT024 DENOM#1.0+ROE2 FACTØ25 PF=ROE2+ROE/DENOM FACT026 FACT027 SF==1.0/DENOM IF(PLOD LT, 2,0) GO TO 160 FACT028 PS=ROE-DATAN(ROE) FACT029 IF(PS/ROE-0,000001)160,170,170 FACTOSO 120 ROE2=ROE+ROE FACTØĴÌ ROE4=ROE2+ROE2 FACTOSZ DENOM=3.0+ROE2+ROE4+9,0 FACTØSS PF=R0E4*R0E/DENOM FACTØ34 SF=-(18.0+3,0*ROE2)/DENOM FACTØ35 IF(PLOD.LT,2,0) GO TO 160 FACTØ36 PS=ROE-DATAN(3,0+ROE/(3,0-ROE2)) FACTØ37 IF(PS/ROE=0,000001)160,170,170 FACTØĴŰ 130 ROE2=ROE*ROE FACT039 FACTØÅØ ROE4=ROE2*ROE2 ROE6=ROE4+ROE2 FACTOAI DENOM=225.0+45.0+R0E2+6.0+R0E4+R0E6 FACTØ42 PF=R0E6+R0E/DENOM FACT043 SF=-(675,0+90,0*R0E2+6,0*R0E4)/DENOM FACTØÄÄ IF (PLOD. LT. 2, 0) GO TO 160 FACT045 PS=ROE-DATAN((15,0*ROE-ROE2*ROE)/(15,0-6,0*ROE2)) FACT046 IF(PS/ROE-0,000001)160,170,170 FACT047 140 ROE2=ROE*ROE FACT248
	RDE4=RDE2+RDE2	FACTØ49
	RDF6=RDE4*RDE2	FACTØÐØ
	RDF8=RDE4+RDE4	FACTØDI
	DENOM=11025,0+1575,0*R0E2+135,0*R0E4+10,0*R0E6+R0E8	FACTØSZ
	PF=R0E8*R0E/DENOM	FACTØDS
	IF(PLOD LT.2.0) GO TO 160	FACTØ54
	SF=-(44100.0+4725.0*R0E2+270.0*R0E4+10.0*R0E6)/DENOM	FACTØ55
	PS=R0E+DATAN((105,0*R0E=10,0*R0E2*R0E)/(105,0=45,0	FACTØSÓ
1	L*R0E2+R0E4))	FACTØ57
	IF (PS/ROE=0,000001)160,170,170	FACTØSS
150	ROE2=ROE*ROE	FACTØ59
	ROE4=ROE2*ROE2	FACT060
	ROE6=ROE4+ROE2	FACTØ61
	ROE8=ROE4*ROE4	FACT062
	ROE10=RUE6*ROE4	FACTØ63
	DENOM=893025.0+99225.0+R0E2+6300.0+R0E4+315.0+R0E6	FACT064
1	L+15.0*ROE8+ROE10	FACTØ65
	PF=ROE10*ROE/DENOM	FACT066
	SF=4465125,0+396900,0*R0E2+18900,0*R0E4	FACT007
1	L+630,0+R0E6+15.0+R0E8	FACTOOB
	SF=-SF/DENOM	FACTØ69
	IF(PLOD.LT.2.0) GO TO 160	FACTØ7Ø
	PS=ROE-DATAN((945,0*ROE=ROE*(105,0*ROE2=ROE4))/(945,0*ROE2+	FACTOVI
1	L15,0*R0E4))	FACTOZ
	IF(PS/RUE.GE.0.000001) GO TO 170	FACIO/S
160		FAU1074
1/0		FACIOTO
	END Subscripting Order(K, N1)	ORDRAUI
	SUHROUIINE URDER(KINI) Common Aday (dan not 741 Adm Ned (en en en en en en estand nu s	0808002
	UDMMUN ARAT, IRAT, ERAT, NUT, ZAI, ABN, NER, ERA, ERA, ERA, ERA, ERA, ERAN, NER, ERAN, ER	ORDRØØÅ
	UNRESIENTUNTEENTARTSATTARTSATTAFTSANTTAATTAATTAATTAATTAATTAATTAATTAATTAA	ORDRANA
	DIMENSION A RAY(A, 500) + TRAY(3, 500) + TRAY(2, 500) + NOT(20) + 741(10) + 0	ORDRORS
-	ABN(10).NFR(10).+FW(10).FI(10.10).FH(10.10).IRU(10.10).LRF(10.10).	ORDRØØ6
	21 ANG (10.5.5) - NI S (10.10) - NRES (10) - IN (50) - JN (150) - PENFAR (500) -	ORDRØØ7
3	SHIFAR(500), SPI(10), AP(10), AWRI(10), AM(10), DREF(6), AREF(6), BREF(6,	ORDRØØS
	10)	ORDRØØ9
	IF(K-1)2,2,3	ORDRØ10
2	NTR=0	ORDRØ11
	NUML=2	ORDRØ12
	NUMJ=0	ORDRØ13
	N N = Ø	ORDRØ14
	M M = Ø	ORDRØ15
		ORDRØ16
	N C = Ø	ORDRØ17
	MC=0	ORDRO18
3	NT=NTR+1	ORDROIN
		OPDPRZE
0		
D		ORDRØ23
		ORDRØZŽ
	15(0) - TERM1101.101.9	ORDRØ25
0	IF VOLTENER I IVIJI VIJI NNENNET	ORDRØZE
,	DO 100J=1.5	ORDRØ27
	A=ARAY(J,N)	ORDRØ28
	ARAY(J,N) = ARAY(J,NN)	ORDRØ29
	ARAY(J,NN) = A	ORDRØ30
100	CONTINUE	ORDRØSI
	DO 1001 J=1.3	ORDRØ32
	IA=IRAY(J,N)	ORDRØ33

	IRAY(J,N)=IRAY(J,NN)	ORDRØ34
	IRAY(J, NN)=IA	ORDRØ35
1001	. CONTINUE	ORDR036
	DO 1002 J=1,2	ORDRØ37
	EA=ERAY(J,N)	ORDRØSB
	ERAY(J,N)=ERAY(J,NN)	OKDRØ39
	ERAY(JINN)=EA	OKUR040
1002	CONTINUE	URUR041
101	CONTINUE	DRDRØ43
1 I	NUMBENDALT.	0808045
		ORDRØ46
		ORDRØ47
		ORDRØ48
14		ORDRØ49
-	DD 205 MENT, NU	ORDRØ50
	TERMJ=ARAY(2,M)	ORDRØ91
	IF(OM-TERMJ)205,205,15	ORDRØ22
15	; MM=MM+1	ORDRØÞS
	DO 204 J=1,6	ORDRØ24
	A=ARAY(J,M)	ORDRØSS
	ARAY(J,M)=ARAY(J,MM)	DRDRØSS
	ARAY(J,MM)=A	
204	CONTINUE	
		0408261
	IRAY (J, M) = IRAY (J, MM)	DEDE062
2241		DRDR065
2041		nRnRø64
		ORDRØ65
	ERAY(J,M)=FRAY(J,MM)	ORDR066
	ERAY(J.MM)=EA	ORDRØ67
2042	CONTINUE	ORDRØ68
205	CONTINUE	ORDRØ69
	IF(MM-MC)14,14,16	ORDRØ70
16	NUMJ=NUMJ+1	ORDRØ71
	JN (NUMJ) = MM-MC	ORDRØ72
	MC=MM	DRDRØ73
	NT=NT+JN(NUMJ)	
	IF(NN=MM)17,17,14	UKUKØ/2
17	1F(NTR=NN)18,18,8	ORDRO/0
18	END	08080//
	ENU Function DOPPLER/YN	
	COMMON ARAY, TRAY, FRAV. NOT. 241, ARN. NER LEEW. FL. FULL RULL REALANG. NUS.	DOPL 002
	INRES. IN. IN. PENEAR, SHIFAR, SPI, AP, AWRI, AM, DREF, AREF, BREF, IRANGE, NIS.	DOPLOOS
	31NCRASS. IVSPIN. ELO. TEFE. DELTA. E. AWR	DOPLOU4
	DIMENSION ARAY(6,500), IRAY(3,500), ERAY(2,500), NOT(20), ZAI(10),	DOPLOUS
	1ABN(10), NER(10), LFW(10), EL(10,10), EH(10,10), LRU(10,10), LRF(10,10),	DOPLOUG
	2LANG(10.5,5),NLS(10,10),NRES(10),LN(50),JN(150),PENFAR(500),	DOPL007
	35HIFAR(500), SPI(10), AP(10), AWRI(10), AM(10), DREF(6), AREF(6), BREF(6,	DOPLOUS
	410)	DOPLØØ9
	TEF=TEFF/293,0	DOPLØ10
	TERM=0,U	DOPLØ11
	CALL RMSIGM(X, IKANGE)	DUPLUIZ
	DO 100 I=1,NIS	
	XWK=AWK1(1) CC: Ri-10 31775,001+Sppt//TCEAC)/YUD)	
	UELIA=(W,UI//E+WW/#DGKI((IEF#E//XWK/ Z=/F_Y)/AFITA	DOPL016
	6-11977 ULL A	

	22=2#2 T1=88FF(1NCROSS.1)#FYP(=22)/(CFLTA=1-772454)	DOPLØ17
100	CONTINUE	
	DOPPLERATERM	DOPLOZÍ
	RETURN	DOPL022
	END	DOPLØ23
	SUBROUTINE ABCMAT(A, B, C)	ABOMØØI
	DOUBLE PRECISION A, B, C	ABCMØØ2
	DIMENSION A(3,3), B(3,3), C(3,3)	ABCMØØS
	DO 100 [=1,3	ABCMØØ4
		ABCMØØ5
	Dn 1a2 K=1.3	ABCMODD
	$C(I_{J}) = C(I_{J}) + A(I_{J}K) + B(K, J)$	
102	CONTINUE	ABCMONS
101	CONTINUE	ABCMØIØ
100	CONTINUE	ABCMØ11
	RETURN	ABCMØ12
		ABCMØ13
	SUBROUTINE FROBNS(A, B, C, D)	FROBØØI
	DOUBLE PRECISION A, B, C, D, O	FROBØØ2
C	D_{1} THIS SUDDUTING (3,3), $B(3,3)$, $D(3,3)$, $D(3,3)$, $G(3,3)$	FROBØØ3
C====	-PARTS SUBROUTINE INVERTS A COMPLEX MATRIX WITH REAL AND IMAGINARY	FROBØØ4
Cerec	F INVERSE. FROMENTIESSCHUM METHOD OF INVERSION	THEROBOOD
• •,	DO 200 I=1.3	FR05000
	DO 201 J=1,3	FROBUUT
	C(I,J) = A(I,J)	FROBADO
201	CONTINUE	FROBRIR
200	CONTINUE	FROBØII
	CALL THRINV(A,3,IND)	FROBØ12
	IF(IND,EQ,1) GO TO 500	FROBØIS
	CALL ABCMAT(A,R,G)	FROBØ14
	CALL ABCMAT(B,Q,D)	FROBØ15
		FROBØ16
		FRUBUL/
203		FRUBULO
202	CONTINUE	FROBULY FROBUZÓ
	CALL THRINV(C, 3, IND)	FROBMER
	IF(IND,EQ.1) GO TO 500	FROBØ22
	CALL ABGMAT(Q,C,D)	FROBØ23
	DO 204 I=1,3	FROBØ24
	D0 205 J=1,3	FROBØ25
205		FROBØ26
205		FROBØ27
207		FROBUZO
500	PRINT501	FRUBUZY
	GO TO 502	FROBOOD
501	FORMAT(52H TROUBLE IN INVERTING THE COMPLEX MATRIX, JOB ABORT.)	FROBØ32
5ø2	RETURN	FROBØ33
	END	FROBØ34
	SUBROUTINE THRINV(D,N,KIMERR)	THRIØÜI
CINVE	HIS SYMMETRIC MATRIX (D(1,J), J=1,N, J=1,J)	THRIØ02
	DUUBLE PRECISION D.S.FODEY	THRIØØS
	NIMEBD=4	THRI004
55	CONTINUE	THRIØDS
26	D01J=1.N	THRIDUO
		14441

29	D021=1.J	THRIØØ8
		THRIDDO
2		THRIØIØ
2		740101011
1		
30		
	FODEY#1,~D(LK,LR)	THRIDIS
	IF(FODEY ,EQ, 0,0) GO TO 333	
	D(LR,LR) = 1./FODEY	THRIDIP
31	CONTINUE	THRIDIO
	GO_TO_27	THRID17
333	KIMERR=1	THRIDIO
	G0T01001	THRIDIA
27	D041J=1,N	THRIØZØ
	S(J)=D(LR,J)	THRIØZI
32	IF(J-LR)28,41,28	THRIØ22
28	D(j,LR)=D(j,LR)*D(LR,LR)	THR 1025
	D(LR;J)=D(J;LR)	THR1024
41	CONTINUE	THRI025
33	D0 7J=1,N	THRIØ26
34	IF(J-LR) 6,7,6	THR1027
6	DO 503 I=1,J	THR1028
35	IF(I=LR) 8,503,8	THR 1029
8	D(I,J)=D(I,J)+D(I,LR)+S(J)	THRIØSØ
	D(J,I) = D(I,J)	THRIØĴĪ
503	CONTINUE	THRIØĴŹ
7	CONTINUE	THR1033
1001	RETURN	THRIØ34
- 11	END	THR1035
	SUBROUTINE SIEVE(E1,G1,E2,G2,M,N,NX,BEFF,BWR)	SIEVØÐÍ
	COMMON/C/EX(101), JFLAG(101)	SIEVØØ2
	JF(E2.) T.E1)GO TO 101	SIEVØØ3
		SIEVØØ31
300		SIEVØÛÅ
0	DO 1000I=1.100	SIEVØØ5
		SIEVØØ6
1000		SIEVØØŻ
1000		STEVOUS
	10-44 58855-400460PT (TEE/DWR)	STEVØØ9
r	WHEN MINI TEN IED BY SADTIES DE GIVES 5 TIMES COPPESPONDING DELTA	STEVOIO
L.	MEN NOUTIFIELD BY SURVEY DE SIVES 2 TIMES SURVED DE TA	STEVAII
		STEVZIZ
		STEVAIS
		STEVAIA
		STEVAIS
	EALITELA JELES LE DELLES TO 1001	SIEVAIA
		STEVAI61
4 0 0 4		STEVAIT
1001	UFLAGIT/-I ENDIGIDE/EG//EG_E11	SIEVOIR
1002	ENUIF = ADS (EZ-RI)	STEVOIS
		STEVAZA
		STEVOZÍ
		STEVA22
	1 CO TO 100 CU 10 10 10 CO	STEVØ221
4 (3 7		STEVO23
101		STEVOZA
	LA, NA/ "AA 15/01 T DP1)CO TO 1003	STEV025
	CO TO 100 11/01/11/02 10 1000	SIEV0251
1007		STEVAZÓ
1003		STEVAZZ
TOD	UNITING	STEVRZB
	XX-E3-DC39E1 UVI (1) DC υρα 1-Tim	SIEVAZA

	IF(XX.GT.E1)GO TO 108	SIEVØJØ
	GO TO 200	STEVØ301
128	3 NX=NX+1	STEVASI
	FX/NX) = XY	SILVDUL
	LANNA/700 15/07 1 T DD2000 TO 1005	SIEVOSZ
		SIEVØSS
		SIEVØ331
1005	JFLAG(NX)=1	SIEVØ34
200	J CONTINUE	STEVASS
110) DIFF=(E2=E1)/F! OAT (N2)	STEVAS
	LE(DIEE)101.102.102	CIEV037
101		5124007
101	PRINTANA EA EA DIFE	SIEVUSO
	FRINI2000,E1,E2,DIFF	SIEVØ39
	GO TO 104	SIEVØ40
103	S FORMAT(32H CALLING SEQUENCE OF SIEVE WRONG)	SIEVØÄII
2000) FORMAT(4H E1=E13.6,4H E2=E13.6,6H DIFF=E13.6)	STEVA42
102	P N21=NX+1	STEV#43
		SILVER
		SILVOMA
		SIEVØ45
	NX=N22	SIEVØ46
	E21=(E1+E2)/2.0	SIEVØ47
	DP12≖DP*SQRT (E21)	SIEVØÄŠ
	E43=E2-E1-((G1+G2)/2,0)	STEVA
	1F(F43, LT, DP12) GO TO 1006	STEVASA
		SIEVOJO
1 12 12 6		SIEVODOL
1000	TO III I TAREANCE	SIEVØPI
		SIEVØŻŻ
	EX(I)=E1+DIFF*FLOAT (I2)	SIEVØÞÖ
	JFLAG(I)=1	SIEVØ54
111	CONTINUE	STEVASS
	GO TO 1040	STEVANA
1007	DO 112 L=N21.N22	SIEVOSS
		SIEVODI
		SIEVØ28
	EX(I)=E1+DIFF@FLOAT (I2)	SIEVØ29
	DPTEST=UP+SQRT (EX(I))	SIEVØ6Ø
	IF(Ex(I),LE,E21)GO TO 1008	SIEVØÕI
	GO TO 1009	SIEVa611
1008	IF(G1.IT.DPTFST)GD TO 1010	STEVAN
		3154005
1010		STEVNOLT
1010		SIEVNOS
		SIEVØ64
1009	IF(G2,L1,DPTEST)G0 TO 1011	SIEVØ65
	GO TO 112	SIEVØ651
1011	JFLAG(I)=1	SIEVOGO
112	CONTINUE	SIEVANT
1040		SIEVOOT
		STEVNOO
		SIEVØOV
	IF (DPF, EG, 0, 0) FO 113	SIEVØ691
	IERM=EX(I)/DPF	SIEVØ7Ø
	IF(TERM-LT.25.)GO TO 114	SIEVØ71
	GO TO 113	SIEV0711
114	JFLAG(I)=1	STEVATZ
113	CONTINUE	STEV073
104	RETURN	SIEV070
	END .	SIEVOIN
	END Suddaliting Destanta was	SIEVØ72
	SUBRUUIINE RMSIGM(Q)KK)	RMSGØØ1
	CUMMON/E/XMIN(6),XMAX(6),XREF(6)	RMSGØØ2
	COMMON ARAY, IRAY, ERAY, NOT, ZAI, ABN, NER, LFW, EL, EH, LRU, LRF, LANG, NLS.	RMSGØØ3
	1NRES, LN, JN, PENFAR, SHIFAR, SPI, AP, AWRI, AM, DREF, AREF, BREF, IRANGE, NTS	RMSGODA
	JINCROSS, IVSPIN, ELO, TEFF, DELTA, E, AWR	RMSGANS
	DIMENSION ARAY (6,500), IRAY (3,500), FRAY (2,500), NOT (20), ZAT (10)	PMSCANA
	$1\Delta PN(10), NEP(10), I = U(0), CE (10),	
		KM36007

	21	, A	NG	; (1,	σ,	5	, 5	5)	, I	۱L	S ((1)	Ø,	1	Ø)	,	NR	E	S (10))		N (5(3)	, J	N (1!	50),	PΕ	NF	AR	(:	PPI	ø)	,			F	MSG	008
	35	ŜН	† F	Å	R	(5	Ø	ø:		Śſ	۶Ÿ	(1	Ø),	A	P (1	ø)		٩W	RI	0	10	۰,	AN	10	10),	D	REI	FÌ	6)	, A	RE	F I	16),	BR	EF	6)	, F	MSG	009
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102	Ĺ	2	=	2	+1	- N	10	L	()																																F	MSG	Ø40
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	5	SΙ	G٨	IG	1:	Ø		Ø																																	F	MSG	044
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	5	51	GN	IT	I	= Ø	١.	Ø																																	F	MSG	Ø <u>47</u>
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	Â	2	= A	R	À١	1	5	, K																																	R	MSG	268

	15(42)200.201.202	RMSGØ69
200	A2=-S0RT(=A2)	RMSGØ7Ø
		RMSC071
201		RMSC#72
		RMSC#73
200		PMSC074
202		DHEORTE
900	AJEAKATIO, N/	
7 17 4		DHSCATT
301		RM300//
200		RM360/0
502		RM360/V
707		RMSG000
303		RMSG001
400	DEN=D1+++++2+0,22++ARAY(4,K)+ARAY(4,K)	RMSGØ82
	R(1,1) = R(1,1) + ((0,2) = RAY(4,K) = A1 = A1)/DEN)	RMSGDOS
	S(1,1) = S(1,1) - ((0, 0 + 0) + (+ + A) + A)/(0 + 0)	RMSG004
	R(1,2) = R(1,2) + ((0,2) = ARAY(4,K) = A1 = A2)/DEN)	RMSG000
	S(1,2) = S(1,2) - ((0,3 + D) + F + A + A + A + 2) / U = N)	RMSG000
	R(1,3) = R(1,3) + ((0,2) = ARAY(4,K) = A1 = A3)/DEN)	RMSG007
	S(1,3) = S(1,3) = ((0,5) = 0 + 1 + A + A + A + A + A + A + A + A + A	RMSGØ88
	R(2,2)=R(2,2)+((0,2)+ARAY(4,K)+A2+A2)/DEN)	RMSGØ89
	S(2,2)=S(2,2)-((0,5*DIFF*A2*A2)/DEN)	RMSGØ90
	R(3,3)=R(3,3)+((0,25*ARAY(4,K)*A3*A3)/DEN)	RMSCØ91
	S(3,3)=S(3,3)-((0,5*DIFF*A3*A3)/DEN)	RMSGØYZ
	R(2,3)=R(2,3)+((0,25*ARAY(4,K)*A2*A3)/DEN)	RMSGØ93
	S(2,3)=S(2,3)-((0,5*DIFF*A2*A3)/DEN)	RMSGØ94
108	CONTINUE	RMSGØ99
	R(2,1)=R(1,2)	RMSGØ96
	S(2,1)=S(1,2)	RMSGØ97
	R(3,1) = R(1,3)	RMSGØ98
	S(3,1)=S(1,3)	RMSGØ99
	R(3,2)=R(2,3)	RMSG100
	S(3,2)=S(2,3)	RMSG101
	D0 11 JJJ=1,3	RMSG102
	D0 12 KKK=1,3	RMSG103
	B(JJJ*KKK)=R(JJJ*KKK)	RMSG104
12	CONTINUE	RMSG105
11	CONTINUE	RMSG106
	CALL FROBNS(R,S,RI,SI)	RMSG107
	RHO1=RI(1,1)	RMSG108
	RH02=SI(1,1)	RMSG109
	P1=DCOS(2,0*PS)	RMSG110
	P2=-DSIN(2,0+P5)	RMSG111
	TERMT=(1.0-P1*(2.0*RH01=1.0)+2.0*P2*RH02)+2.0	RMSG112
	TERMT=GJ*TERMT-4,Ø*GJ*DSIN(PS)*DSIN(PS)	RMSG113
	T1=RI(1,2)	RMSG114
	T2=SI(1,2)	RMSG115
	T3=RI(1,3)	RMSG116
	T4=SI(1,3)	RMSG117
	TERMF=GJ*(T1**2+T2**2+T3**2*T4**2)*4,0	RMSG118
	TERMG=(RH01**2+RH02**2)*(B(1,1)+1,0)+(T1**2+T2**2)*(B(2,2)=1,0)+	RMSG119
1	(T3*#2+T4##2)#(B(3,3)=1,0)	RMSG120
	TERMG=TERMG+2.0*(RH01*T1+RH02*T2)*B(1,2)+2.0*(RH01*T3+RH02*T4)*	RMSG121
1	B(1,3)+2,0*(T1+T3+T2+T4)*B(2,3)	RMSG122
	TERMG=4,Ø*GJ*TERMG	RMSG123
	TERMN=TERMT=TERMF=TERMG	RMSG124
	SIGNNI=SIGNNI+TERMN	RMSG125
	SIGNGI=SIGNGI+TERMG	RMSG126
	SIGNFI=SIGNFI+TERMF	RMSG127
	SIGNTI=SIGNTI+TERMT	RMSG128
	IF(L2-N2)109,109,105	RMSG129

100	PETA-PIAARN(I)/(CONSTRACONSTE)	RMSG130
109	APEF/1) = AREF(1) + SIGNNI+BETA	RMSG131
		RMSG132
		RMSG133
		RMSG134
		RMSG135
	BREF (1, 1) = BREF (1, 1) + SIGNNI + BE IA	PMSG1.56
	BREF(2, I)=BREF(2, I)+SIGNGI+BETA	PMSC1 37
	BREF(3, I) = BREF(3, I) + SIGNFI + BETA	PMSC1 38
	BREF(4,1)=BREF(4,1)+SIGNTI+BETA	RH3010D
	IF(L2-NTR)100,110,110	RMSG109
11 Ø	SIGP=0.0	RMSG140
	LRUJK=LRU(1,KK)	RMSG141
	IF(LRUJK=1)1250,1250,125	RMSG142
125ø	NLSKK=NLS(I,KK)	RMSG143
	DD 126 LI =1, NLSKK	RMSG144
	LURE=LANG(I,KK,LL)	RMSG145
	SSEFI DAT(LURE)	RMSG146
	CALL FACTS (Q.LURE, PZ, SZ, PS, CONSTA, XWR, API, 3,0)	RMSG147
	TPM=(2,0+SS+1.0)+4.0+PI	RMSG148
	TRM=TRM+DSIN(PS)+DSIN(PS)/(CONSTA+CONSTA)	RMSG149
	SICP-SICP+TRM	RMSG100
126	CONTINUE	RMSG191
125	ADDER(1)=AREF(1)+STORMARN(1)	RMSG152
127		RMSG153
	DOFF(1 TY-DOFF(1, TY-STOPADACT)	RMSG124
	DEE (1) - DEE (4 1) + 010 P + 01(1)	RMSG155
	BREF (4,1)=BREF (4,1)+SIGFWABN(1)	RMSG126
112	CONTINUE	RMSG157
	RETURN	RMSG158
	END	11120120

	_				4 95-04	
MOCK PU-241	RAMP1 TEST	DATA.	0550.0 1	1 4	1,05-04	
940241.0	238,9859	Ø		,	1	6
940241.0	1.0	Ø	1	•	1	6
1.0	20.0	1	3	5	Ø	Ø
2.5	0.9772	Ø	R	9	1	Ø
238.9850	0.0	ø	¢	3	90	15
-0 160	2.0	0.029E-03	4.ØE-02	4.ØØØE	-02 2,000	E-02
0.100	3 0	0.0516-03	4.0F - 02	5.0005	-02 2.500	E-02
0.200	2,0	0.6605-03	4.05-02	-1.600F	-02 1.60	E-02
4.300	2.0	0.4305-03	4.05-02	8.000F	-02 8.000	E-02
4.500	5.0	0 4705-07		1 00 000C	-02-35.000	F-02
5,920	2.0	2,4302-03			-02-05-00	E-02
6,930	3.0	0.710E-03	4.0E=04		-02 6 000	NE-02
8,600	2.0	1.0000-03	4.0L-0		- 22 0 0 00	AF _ 00
9,500	3.0	0.180E-03	4.ØE=0		-02 0,001	02 02
10.100	2.0	1,500E-03	4. ØE≂Ø;	5 N.000F	-02 90.000	01-02
12.780	3.0	Ø,790E=Ø3	4.0E-0;	2 20,0005	-02 3,50	DE-02
13.400	2.0	2.200E-03	4.ØE-Ø;	2 1.40ØE	-02 2,50	0E-02
14.750	3.0	6,200E-03	4.ØE=Ø;	2 1.400 E	-02 1.40	0E=02
15.980	2.0	1.520E=03	4.ØE=Ø;	2 40,0008	-02 6,50	0E-02
16.690	3.0	1.230E=03	4.0E-0	2 10,0000	-02 8,000	0E-02
17 830	2.0	3.200E-03	4.0E=0	2 -0.300	-02 2.001	00-02
11,000	610	012002-00			-	

NEUTRON ENERGY(EV)	SIGNN	SIGCAP	SIGF	SIGTOTAL
2,530000E-02	9.968436E+00	3,062950E+02	5,856657E+02	9,019291E+02
NEUTRON ENERGY(EV)	SIGNN	SIGCAP	SIGF	SIGTOTAL

GN

2,9000E-05

5.1000E-05

CROSS-SECTIONS AT THERMAL ENERGY

4.3ØØØE+ØØ	2,0000E+00	6,6ØØØE-04	4.0000E=02	-1.6000E-02	1.6000E-02
4,5800E+00	3.0000E+00	4,3000E-04	4,0000E=02	8,0000E-02	8,0000E-02
5.92ØØE+ØØ	2,ØØØØE+ØØ	2,4300E-03	4,0000E-02	1.0000E+00	-3,5000E-01
6.9300E+00	3.0000E+00	7,1000E-04	4,0000E=02	3,5000E=02	6,0000E-02
8.6ØØØE+ØØ	2,0000E+00	1 0000E-03	4,0000E-02	=2,0000E-02	6,0000E-02
9.5000E+00	3,0000E+00	1,8000E-04	4,0000E=02	≈4.0000E ⊎02	8,0000E-02
1.0100E+01	2,0000E+00	1,5000E-03	4,0000E-02	Ø,ØØØØE+ØØ	9.0000E-01
1.278ØE+Ø1	3,0000E+00	7,9000E-04	4,0000E-02	2,0000E-01	3,5000E-02
1.340ØE+01	2,0000E+00	2,2000E-03	4,0000E-02	1,4000E=02	2,5000E-02
1,4750E+01	3,0000E+00	6,2000E-03	4.0000E=02	1,4000E=02	1,40005-02
1.598ØE+Ø1	2,0000E+00	1,5200E-03	4,0000E-02	4,0000E=01	6,5000E-02
1.669ØE+Ø1	3,0000E+00	1,2300E-03	4,0000E=02	1.0000E-01	8,0000E-02
1.783ØE+Ø1	2,0000E+00	3,2000E-03	4,0000E-02	•3,0000E=03	2,0000E-02

(Z,A) DESIGNATION OF THE ISOTOPE 9,4024E+05 FRACTIONAL ABUNDANCE 1,0000E+00 NO OF ENERGY RANGES 1 LOWER LIMIT OF THE ENERGY RANGE(EV) 1,0000E+00 UPPER LIMIT(EV) 2,0000E+01 LRU= 1 LRF= 3 NUCLEAR SPIN 2.5000E+00 SCATTERING LENGTH 9,7720E+01 NO OF L-VALUES 1 MASS OF THE ISOTOPE IN UNITS OF NEUTRON MASS 2,3899E+02 SCATTERING LENGTH(A=) 0,0000E+00 ANGULAR MOMENTUM 0 NO OF RESO

GFA

4,0000E=02

5 00005-02

GFB

2,00005-02

2,5000E-02

DATA FOR ISOTOPE NUMBER 1

ERES

-1.6000E-01 2.6000E-01

(Z,A) DESIGNATION OF THE ELEMENT 9,4024E+05 AT.WT/MASS OF NEUTRON 2,3899E+02 NO OF ISOTOPES 1

GGAMMA

4.0000E-02 4.0000E-02

TITLE MOCK PU-241 RAMP1 TEST DATA,

SPIN

2,0000E+00

3.0000E+00

PROGRAM RAMP1, PROGRAM TO CALCULATE CROSS-SECTIONS ACCORDING TO THE REICH-MOORE FORMALISM, USES ENDF/B VERSION II

1,000000E+00	1.058544E+01	4.900407E+00	6,772793E+00	2,225864E+Ø1
1.036330E+00	1.055058E+01	4.552330E+00	6.920150E+00	2.202306E+01
1.072660F+00	1.051761E+01	4.253114F+00	7.085793F+00	2.185652F+Ø1
1 8250005+00	1 0016075+01	2 2717525+00	1 1188755+01	2 3476575+01
	0 4380085-00		1 4440075+04	
5,0200005+00	7,4/0000E+00	2.0140002700	1.0002931-01	2 0/00071-01
3,4/50002+00	8.230103E+00	2./25111E+00	2.080102L+01	4,106289E+01
4.22734ØE+ØØ	5.104560E+00	2,650225E+02	1,355504E+02	4,056774E+02
4,26367ØE+ØØ	8.831456E+ØØ	6,450148E+02	3,4Ø2282E+Ø2	9,940745E+02
4,300000E+00	3.043822E+01	1,584601E+03	1,069601E*03	2,68464ØE+Ø3
4,336330E+00	3.186469E*Ø1	9,107009E+02	9.132591E+Ø2	1.855825E+Ø3
4.370900r+00	2.108056E+01	3.779431F+Ø2	5.675073E+02	9.665309E+02
4.372660F+00	2.052070E+01	3.567806F+02	5.526902F+02	9.299915F+02
4.3795705+00	1 9210145+04	3 0091625+02	5 1095695+02	8 4909225+02
4 440000 - 00	1 3006455.04	1 4434470.00	A 769031E-02	5 947740E+02
4,43070555400	1.0220492401	1,4034476402	7,300031E+02	2,703/72E+62
4,4/9/852+00	1.1//5516+01	1.3140302+02	4,0000025402	0,3102902-02
4,510000E+00	1,100440E+01	1.4004002+02	2,050123E+02	/,10502/E+02
4,580000E+00	1.384179E+Ø1	1.699030E+02	7,029183E+02	8,866631E+02
4.6802 <u>1</u> 5E+00	1.510298E+01	8 ,895554E+Ø 1	3 . 722261E+Ø2	4,762846E+Ø2
4,780430E+00	1.332331E+Ø1	4.045471E+01	2,030781E+02	2,568561E+Ø2
4.915000F+00	1.183322E+Ø1	2,079535E+01	1.519174E+02	1.845459E+02
5.223785F+ØØ	1.036864F+01	1.163614F+01	1.7082265+02	1.928274F+Ø2
5.2500000+00	1 0301705+01	1 1473856+01	1.7544915+02	1.9700485+02
5 5850000+00	0 0004755+00	1 2036365465401	2 5650135402	2 7861715+02
	4 0450955404	1,2000000000	2,0009105402	2,1001/10-02
5,72000000000	1.0000792401	1.3600100701	3 2177100*82	3,7031095+02
0.1/2500E+00	1.1193062+01	1,340941E+01	5.0002/46+02	3,2400991702
0,425000E+00	1.091700E+01	1,440035E+01	2,438126E+02	2.091905E+02
6,616215E+ØØ	1.004552E+0 <u>1</u>	2,218022E+01	2,202129E+02	2,524387E+Ø2
6,677500E+00	9,570393E+00	2,959330E+01	2,264784E+Ø2	2,656421E+Ø2
6,79429ØE+ØØ	8.371799E+ØØ	7.467768E+Ø1	3.153549E+02	3,984044E+02
6.862145E+ØØ	8.879Ø52E+ØØ	1.775740E+02	5.515465E+Ø2	7.379996E+02
6.930000F+00	1.809265F+01	3.452943F+02	9.409558F+02	1.304343F+03
6 907855c+00	2 1074535+04	1 7380515402	B 0035385100	7 1403355+00
7 9 4 5 7 4 9 5 4 9 7	2,10/4/20401	7 447405.04	2033302+02	7 6400075+02
7.005/10E-00	1./921092401	7.144300E+01	2,/202301+02	3,019003E+02
7.347500E+00	1.3440092+01	1,2304002+01	1.138803E+02	1,3969/02+02
7,7650ØØE+ØØ	1,166345E+01	6,508113E+00	9,027773E+01	1,084493E+02
8,182500E+00	1.025646E+01	1,088876E+01	1,142373E+Ø2	1,353825E+Ø2
8,479000E+00	9,194361E+ØØ	7,555Ø25E+Ø1	3,162147E+02	4,009593E+02
8.539500E+00	1.204646E+01	1.851301E+02	5.432464E+02	7,404229E+02
8.600000E+00	2.572665E+Ø1	3.831Ø15E+Ø2	7.050983E+02	1.113926E+Ø3
8.660500F+00	2.454734F+01	1.891886F+Ø2	1.836176F+02	3.973535F+02
8.7210005+00	1 8640615+01	7 4018945+01	2.8640115+01	1.2219975+02
8,8250000000	1 4680655+04	2 6582595+01	3 6160755+00	4.4889225+01
	1 2437075+04	1 0033795401	3 6339675+01	A 840032E+01
9,050000E+00	1,213/032401	1,0033/22+01	2.0320072401	9 07/0055+01
9,2750000000	1.090433E+01	1.0904016+01	0,04/1122001	0,2340052+01
9,339820E+00	1.054623E+01	1.473751E+01	7,964074E+01	1,049245E+02
9.419910E+00	1.016821E+01	2.829259E+01	1,305088E+02	1,689696E+Ø2
9,500000E+00	1.11966ØE+Ø1	5.097808E+01	2,142998E+Ø2	2,764744E+02
9,580090E+00	1.216397E+Ø1	2.855911E+01	1.639949E+02	2,047180E+02
9,629250E+00	1.198685E+Ø1	1.877122E+Ø1	1.430153E+02	1.737734E+02
9.650000F+00	1,190027E+01	1.639476E+Ø1	1.395057E+02	1.678008E+02
9.660180F+00	1.1860795+01	1.547843F+01	1.385668F+Ø2	1.659060F+02
9.8000005+00	1 1608415+04	1.0A1038F+04	1.5040765+02	1.7262645+02
0 0500000000000	1 1860045+04	1 0053755104	1 7005005100	1 9409465105
7 7 7 7 7 9 9 9 9 1 7 9 9 9 9 9 9 9 9 9	1 2422405+01	1 0015455+01	▲ 1 2020717以後 1 7704775×00	1 05/5175105702
T BERGREETCI	1.0572025401	1.001010L+01	1 / JULJ/LVUZ	4 57747LOLTUC
1.0570756+01	1.203/952+01	3.380104F+00	0./410001+01	0,2004/8E+01
1.077000E+01	1,208537E+01	4,153931E+00	9,115512E+Ø1	2,/39442E+01
1,104150E+01	1,147766E+Ø1	3,316095E+00	2,293927E+Ø1	3,773303E+01
1.144000E+01	1.065231E+01	3,060883E+00	1,302784E+01	2,674104E+01
1,211000E+01	9.055921E+00	5,067992E+00	1,926266E+01	3,338657E+Ø1
1.250421E+01	7,469381E+00	1.438958E+01	7.350651E+01	9,536547E+01
1.2642105+01	7.0497045+00	3.0178045+01	1.655657F+02	2.0279345+02
MIRCHETAR OF			# 0 / 2 0 / L - D E	CITE FORCEDE

С	PROGRAM	ADLE	RINP	UTIC	UTP	UT)																	AC	LRØØ1
	COMMON	D/ERA	N(2,5	01)		~ • •																	AC	LRØØZ
	COMMON	404V1	1017	א ביוקן א ביוקו		01)	57	0			. .	۱		120				a١						1 8003
	1NER/101		10.5	1 / 1 0	. 1 0	210	1/0	Ø.	103 V		20	110	.10	(2 K 7) .		800 5/1	<u>а</u> .	10	# \.				- A L	RAAS
	21 ANG(10)	1.5.5)	NIS(10.1	<i>а</i>).	NRF	Sti	ต่า	-SP	ΞĒ	10		P(1	1011		150	10	1	Å M	(16)).		- A C	ROUS
	JAWRJ(10	1) . L I (10).N	XX (1	0).	ABG	(10	.6	3)	Ň	ĴŜ	(10	. 5	5)	Ā	J	ø.	5,	5)	•			AC	LRØØT
	4AREF (6)	TEFF	DELT	A,E					• • •	•	-	-	• •		•			•	•				AC	LRØØS
	DIMENSI	ON TI	TLE (7)																			AC	I RØØŸ
	EXTERNA	L MOV	KOM																				AC	ILRØ10
	EXTERNA	L MOV	E, KOM	E		•			. .														AC	LRØ11
	DATA MA	XPTS,	MAXRE	S,ET	HER	M/2	000	11	00,	0.	25	5E ~	Ø1/	·	_			/					AD	LKØ12
C~=	THIS IS	S A PR		TO	CAL	CUL	ALE	T		L.	CAN		RE	AN	D	FIS	SI	ON	_C1	205	SS.		AD	LRDIS
	- SECTION	13 FRU 5 FRU			RES 0AD	PUN	NC	116		CR T	- A1 	155	K F	- A H - NI T	AM TO	2. I 6 N 4 1	67. 0	÷.	1 11			3		
Casas	-FUNCTION		175 TH		HE	CON	STA	NT	100	FI) äp	7 # 1		MD		R A	83	A 2 & #	201	IS I	้ม่ก	τλΠ	RAIK
Ceeee	= INCLUDE	DIN	THE A		PΔ	RAM	FTF	RS	ā	ΔN	n i	, . ⊢∆	s I	17	TS	ົກເ	NF	Ť	N	SON	15			LRø17
Č====	-EVALUAT	IONS.	RUNS	ON	BOT	HC	ōc-	66	ØØ	AN	DF	•Dp	-16	2.	• •	-				•			AD	LRØ16
C =	-ENDF/B	VERSI	ON II	DAT	A																		AÖ	LRØ19
С	1111111	11111	11111	1111	111	111	111	11	111	11	111	111	111	111	11	111	11	11	111	111	.11	.11:	1 A D	LR020
-	*	READ1	.,(TIT	LE	211	<u>-1</u>	71,	ID	PL,	TE	FF,						-						AD	LRØ21
C====	-IOPL=1 -Tccc-cc	IF DU	VE TE	BKQ	ADE	NED	CR	05	5 = 5 r = 7	LC		JNS	AF	35. 25.0	DE	514	ED		51	- 1	DP	' Ļ ≓I		LROZZ
0	GILFFACE	FEUII	PPIN	1742	ATU	RC	07	1 H	C., I	АП	ے و	! 1	IN L	JEG	RE	23		L 7	1 14 1	ł				R024
			PRIN	725																				LRØ25
			PPIN	T43																			AD	LR026
			PRIN	125																			AD	LR027
			PRIN	T24,	(TI	TLE	(1)	11	=1,	7)													AD	LRØ28
	PRINT2	5																					AD	LR029
			PRIN	T2/1	DPL	, TE	FF																AD	LRØ30
	PRINT25) 744 "	V		、																			LRUSI
<u>د</u>	20000000	222222	22222	2020	222	, ,,	222	22	222	22	222	222	222	,,,,	22	222	22	22	222	,,,,	222	000	44 7 A C	Ra33
1013			READ	3.24	. AW	RIN	01(1)	• NO	TC	2)	NT	SIN	IOT	13)				- 6, 6				LR034
C	-ZA=(Z,A	DESI	GNATI	ON O	FM	ATE	RIA	Ē,	AWR	= A	T . V	IT/	NEL	JTR	0N	MA	SS	# N	IS	× N C) ()F	AD	LR035
C	SOTOPE	S																					٨D	LRØ36
			PRIN	T17,	ΖA,	AWR	, N I	S															٨D	LR037
	PRINT25	i i																					AD	L RØSB
	J1=1 JE:D-1																							LR039
		T≖1.N	15																					I RØÅI
	NRANGE	:1	, 0																				AD	LRØ42
С	3333333	333333	33333	3333	333	333	333	33	333	33	333	533	333	333	33	333	33	33:	333	333	33	333	3 A D	R043
	PRINT25	;																					AD	LR044
			PRIN	T18,	I																		AD	LR045
	PRINT25						~ ~ ~ ~	• .		.							•						AD	
C	- 3 4 7 (7) -	(7	READ	O I ZA	1(1) • A	BN(1)	, NU	1(4	4) (75		WCI	21	NEI	8(1	11	NU' Tir	T (3 8 N	>		T LI	AU	LR04/
	_ISNINI/#		1 FIS	STON	LUN	UF NTU	۲ (L		130	VE	- <u>-</u> 	чо 10	N V 1 5 T 5	. / = 	M I O N	- r n - W 1		141 48	UN NC	יט דו	1		U A U N A U	I RAÃO
C		NO OF	ENER	GY R	ANG	ES	ŬSF	ם	01		••				014						•	v I	AD	LROSO
			PRIN	T19,	ZAI	(1)	AB	N(Į),	NER	R ())											AD	LR0>1
	NERI=NE	R(I)																					AD	LR052
_	J2=1																						AD	LRØ53
C	444444	44444	44444	4444	444	444	444	44	444	44	444	44	444	44	44	444	44	44	444	44	44	444	4 A D	LRØ54
100	1 7 / 7 1		READ	JIEL	(1)	J2)	, E H	11	i J2	11	-RL	11	2 ل و	11	LKI	- (1	1 J	21	NC	1.1.6	0)	, N (U A U	LR055 LR054
C	==: =E:=:0WF	RENE	RGY	IMIT	OF	A	RAN	GE	F	Hal	IPF	ER	17	MT	T 1	ΟF	A 1	RAI	NGF	-				LR057
C=-;	=LRU=1 R	ESOLV	ED RE	SONA	NCE	PA	RAM	ETE	ERS	L	ξŲ.	2	บงิค	εŝ	۱۵	VED	i	PAI	RAM	TR	s		AD	LR058
C===;	LRF=4 I	NDIČA	TES T	ΗΑΤ	THE	AD	LER	- À [JLE	RI	F O F	έMU	LAE	S	нοι	JĻŌ	B	ΕI	USE	D	TO	I	AD	LR059
C	-CALCULA	TE CR	oss≠s	ECTI	ONS											-							AD	LRØGØ
			PRIN	T2Ø,	EĻ(I, J	2),	EH	(1,	J2;) • L	.RU	(1,	J2),1	RF	(1)	ډل و	2)				AD	LRØÖÍ

LRUIJ=LRU(I,J2) IF(LRUIJ=1)127,128,1010 ADLRØ62 ADLROOS 127 PRINT10 ADLR064 GO TO 130 ADLRØ65 ADL RØ66 128 NMOM=1 С READ3, SPI(I), AP(I), NOT(7), NOT(8), NLS(I, J2), NOT(9) ADLR068 C----_SPI(1)=SPIN OF THE I=TH ISOTOPE, AP(1)=A+ SPIN DEPENDENT SCATTERINGADLR069 C-----LENGTH IN UNITS OF 1,0E-12CM, AM(1)=A-, FOR SPIN INDEPENDENCEAM(1)=ADLR070 C----NLS=NUMBER OF L=VALUES. ADERØŻI PRINT21, SPI(I), AP(I), NLS(I, J2) ADLR072 ADLRØ73 С ADĽRØ75 104 READ3, AWRJ(I), NOT(11), LI(I), NOT(12), NX6X, NXX(I) PRINT37, AWRJ(I) ADLR276 PRINT41,LI(I) ADLRB77 PRINT38,NXX(I) ADLRØ78 PRINT25 ADER079 C----AWRJ(I)=RATIO OF THE MASS OF THE I-TH NUCLEUS TO THE NEUTRON MASS, ADLROBO C-----LI(I)=5 IF TOTAL AND CAPTURE ,LI(I)=6 IF FISSION AND CAPTURE AND ADLROBO C-----LI(I)=7 IF TOTAL, CAPTURE AND FISSION CROSS-SECTIONS ARE GIVEN. ADLROBO C----NXX(1)=2 IF THE BACKGROUND PARAMETERS ARE GIVEN FOR THE ADLRØ83 C----TOTAL AND CAPTURE CROSS-SECTIONS, NXX(I)=3 IF THE BACKGROUND PARA-ADLR084 ADĒRØBS C-----METERS ARE GIVEN FOR TOTAL, CAPTURE AND FISSION CROSS-SECTIONS. NMOM=NMOM+1 ADLR086 NXXI=NXX(I) ADERØB7 C DO 1001 J=1,NXXI ADERØ89 READ4, (ABG(I,K,J),K=1,6) ADLRØ90 GO TO (1002,1003,1004),J ADLRØ91 1002 PRINT33 ADLRØ92 GO TO 1005 ADLRØ93 1003 PRINT34 AULRØ94 GO TO 1005 ADLRØ95 1004 PRINT35 ADLRØ96 ADLRØ97 1005 PRINT36, (ABG(I,K,J),K=1.6) PRINT25 ADL-RØ98 1001 CONTINUE AULROSS C-----ABG(I,K,J) ARE THE BACKGROUND PARAMETERS WHICH ARE SUPPOSED TO ACCADER100 C-----OUNT FOR THE TAILS OF RESONANCES WHICH ARE OUTSIDE THE ENERGY RANGADERIDI C----E UNDER CONSIDERATION. ADLR102 Ċ. READ3,NOT(13),NOT(14),LANG(Ĩ,J2,JL),NOT(15),NJS(I,J2,ADŰR104 1JL),NOT(16) AULR105 C-----LANG(1, J2, JL) GIVES THE ANGULAR MOMENTUM OF THE RESONANCES. NJS ISADLR106 C----THE NUMBER OF J-VALUES. ADLR107 PRINT39, LANG(1, J2, JL), NJS(1, J2, JL) ADLRIDS NJSIJ=NJS(I,J2,JL) ADLR109 ADLR110 J4=1 С 202 READ3, AJ(1, J2, JL), AM(1), NOT(17), NOT(18), NLJ12, NLJ ADLR112 PRINT25 ADLR113 PRINT40,AJ(1,J2,JL),NLJ C----AJ GIVES THE SPIN OF THE RESONANCES IN THIS GROUP, THIS SHOULD BE ADLR115 C-----A FOUR DIMENSIONAL ARRAY, SINCE A FOUR DIMENSIONAL ARRAY CANNOT BEADLR116 C----AM(1)=A- SPIN DEPENDENT SCATTERING LENGTH IN UNITS OF 1.0E-12CM. ADLR119 C-----AM(I)=0.0 AT PRESENT IN ENDF/B, NLJ= NUMBER OF RESONANCES WITH A ADLR120 C---#+GIVEN L AND J VALUE, ADLR121 J3=J1+(NLJ-1) ADER122

С	A A A	A A	A A .	A A	A A	A A	A A	A,	A A A	A A	A A	A,	A A	A A	A	A A	AA	A	A A	A,	A A	A A	A A	A A	AA	A.	AA.	A A	AA	AA	AA	A A	A A	AA	AA	A A A	AD	LR123
	DO	10	ØØ	J	= J	1,	J3	;																													ΑD	LR124
							RF	A	D4,	, (٨R	Α'	Y1	(K		J)	1	(=	1,	6	>																AD	LR125
							RE	A	04,	, (٨R	Α'	Y 2	(K		J)	• *	(=	1,	6	>																AD	LR126
1000	CON	TI	NU	E,	_											-						_				_											AD	LR127
<u> </u>	THE	SE	ا ۸	RE	्रा	HE	_ ^	D	EF	<u> </u>	A D	L	ER	R	E	SC	IŅ	Ņ	ĊΕ		PA	RA	M	ΞŢ	EF	₹S	•										AD	LK128
C	ARA	¥1,	(1	ر. ه) =	MU	11,	A	RAY	1	(2		13	= /	U.	Ι,	AF	A 5	Y1	G	3,	J I	. = (٦i	1 A	R.	A Y :	1(4,	53	= =	Ι Τ .					AU	LK12Y
C	ARA	Y1	(5	ل ۽)=	ΜĻ	IF,	A	RAI	(1	(0	•	Ϋ́,	= \	0	ŗ,	AF	ζA	<u>72</u>	2	1,	11	1 3 (31		R	AY	2(21	22		IF.					AU	LK100
(ARA	15	(3. 25	ر ا) =	MU		Ał	R A I	2	(4		()	≖N	101	ι,	AF	(A	¥ 2	(;	21	J1	- (نا د	A A	K.	AT	< \	0 1	1	÷г	rų,						10132
	PRI	NE	22																																			18133
		NT	21	5																																	AD AD	I R134
	PD1	N T	20. 201																																		ÂD	1 R135
	PRT	NT	23	. e.	٨R	ΔΥ	11	1			۸R	۵.	¥ 1	(2	• • •			R	ΔΥ	1	(3		D .	۰. ۵	RA	Y	1 (4.	J	•	= ر	11.	J3)			AD	LR136
	PRI	NT	25				•	-	, .				•			* '		• •		-						•••	- •		-	••							AD	LR137
	PRI	NT.	31																																		AD	ER138
	PRI	NY	23	. 0	AR	AY	1(5	, J 1		٨R	٩	Y1	(6		J)	. 4	R	AY	2	(1		12,	• A	RA	1	2 ()	2,	J	ل و	<u>ب</u> =	11,	J3)			AD	LR139
	PRI	NT	25												,												-			-							AD	LR140
	PRI	NŤ	32																																		٨D	LR141
	PRI	N٣	23	, (AR	AY	2(3	, J)	•	٨R	۸,	۲2	(4		J)		R	ΑY	2	(5		1),	, A	RA	Y	2(6,	J)	ل و	= ,	11,	J3	5)			٨D	LR142
	J1=	J1	+ NI	L J																																	ΑD	LR143
	= 4 ل	J4	+1																																		AD	LR144
	IF(14	- N,	JS	IJ) 2	02	11	202	21	2Ø	3																									AD	LR142
2Ø3	77=	JĽ:	*1																																		AD	LK140
	PRI	NT	22						• • •	a					a .	7																					AU	
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1010	JET		.11	- 0	. .	ų.		, 																													AD	LR162
101	CON	TI	NIII	F																																	AD	LR163
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1	K)F	10	.3)																																	ΑD	LR167
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4	FOR	MA	T (6E	11	14)																														AD	LR169
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24	FOR	MA	T (;	11	Н	T I	TL	E			7	A٩	4)																								٨D	LR191
25	FOR	MA	Τ(,	//)																																٨D	LR192

26	FORMAT(12(1X,F8,5,2X))	ADLR193
27	FORMAT(33H_CROSS-SECTIONS AT THERMAL ENERGY)	ADLR194
28	FORMAT(4(E13,6,1X,I1))	ADLR195
29	FORMAT(30H THE BACKGROUND PARAMETERS ARE)	ADLR196
3Ø	FORMAT(74H MUT NUT G	T ADLR197
	1 HT)	ADLR198
31	FORMAT(74H MUF NUF G	F ADËR199
	1 HF)	ADLR200
32	FORMAT(74H MUC NUC G	C ADER201
	1 HC)	ADLR202
33	FORMAT(50H BACKGROUND PARAMETERS FOR THE TOTAL CROSS=SECTION)	ADLR203
34	FORMAT(52H BACKGROUND PARAMETERS FOR THE FISSION CROSS+SECTION)	ADLR204
35	FORMAT (52H BACKGROUND PARAMETERS FOR THE CAPTURE CROSS-SECTION)	ADLR205
36	FORMAT(4H A1=E18,6,4H A2=E18,6,4H A3=E18,6,4H A4=E18,6,4H B1=E1	8,6ADLR206
:	1,4H B2*E18,6)	ADLR207
37	FORMAT(48H MASS OF THIS ISOTOPE IN UNITS OF NEUTRON MASS E11.4) ADLR208
38	FORMAT(4H NX=15,102H IF NX=2 TOTAL AND CAPTURE BCKGRND PARAMETE	RS ADER209
	LGIVEN, IF NX=3 TOTAL, CAPTURE AND FISSION PARAMETERS GIVEN)	ADLR210
39	FORMAT (35H ANGULAR MOMENTUM OF THE RESONANCESI10.19H NUMBER OF	J_SADLR211
	1TATESI10)	ADI R212
40	FORMAT (29H JaVALUE FOR THESE RESONANCESES.2.57H NUMBER OF RESON	ANCADER213
	LES FOR THE ABOVE L-VALUE AND THIS J ISI10)	ADL R214
41	FORMAT(4H LI=15,109H IF LI=5 TOTAL AND CAPTURE. LI=6 FISSION AN	
	LAPTURE, AND I=7 TOTAL CAPTURE AND FISSION CROSS-SECTIONS GIVEN) ADI 8216
42	FORMAT (106H1 PROGRAM ADLER, CALCULATES CROSS-SECTIONS FROM ADLE)	
_	LDLFR PARAMETERS WITH OPTION FOR DOPPLER BROADENING.)	
43	FORMAT(24H ENDE/B VERSION II DATA.)	
	DO 108 I=1.NTOTA	
	TERM1=ARAY1(1.1)	ADER223
	IF (TERM1.FQ.0.0.0R.TERM2.FQ.0.0)GO TO 1080	ADER223
	Gn 1081	ADE 02231
1080	TERM1=ARAY1(5,T)	
-	TERM2=ARAY1(6,1)	A0[R225
	IF (TERM1, EQ. 0.0. OR, TERM2, EQ. 0, 0) GO TO 1082	
		ADL P2261
1081	ERAN(1, I)=TERM1	
		AD <u>L</u> N227
		ADLN220
1082		1000250
		ADI 8231
	IF(TERM1.EQ.0.0.0R.TERM2.EQ.0.0)G0 T0 1084	ADER232
	G0 T0 1085	ADER2321
1083	ERAN(1,I)=TERM1	
-	ERAN(2.I)=TERM2	10 8234
	GO TO 108	ADE R235
1084	PRINT10	ADI 8236
	GO TO 130	ADI 8237
1085	ERAN(1, I)=TERM1	ADLR238
	ERAN(2, I)=TERM2	ADI 8239
108	CONTINUE	ADI H240
	CALL QIKS(1,NTOTAL,MOV,KOM)	ADI R241
	PRINT11	ADLR242
	PRINT25	ADLR243
	PRINT27	ADL R244
	PRINT25	ADLR245
	PRINT14	ADLR246
	PRINT25	ADLR247
	E=ETHERM	ADLR248
	CALL ADSIGMA(E,NIS,1,0)	ADLR249
	PRINT8, E, (AREF(LL), LL=1, 3)	AD1 8250
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	PRINT25
	PRINT12
	PRINT25
1500	GO TO 1901 Printi3
1200	PRINT25
1501	PRINT14
120	CONTINUE
	D0 124 JJ=1,NIS
	NERJJENER(JJ)
	IRANGE=KK
	LRUJK=LRU(JJ,KK)
131	IF(LRUJK=1)131,1321,125
701	GO TO 130
1321	IF(JJ,EQ,1)GO TO 1320
1320	GO TO 192 FLORFF=FL (JJ.KK)
	EHIREF=EH(JJ,KK)
	ELO¤ELOREF Fut=chtbcc
	GO TO 1240
132	ELO=EL(JJ,KK)
	IF(E)O.EQ.EUORFF.AND.EHI.EQ.EHIREF)GO TO 124
	GO TO 1240
1240	MM=MAXPIS/(4+MAXRES) NN-MM
	IFLAG=1
	NLSKK=NLS(JJ,KK)
	J4=1 ISTART=1
	IEND=1
117	IF(IEND-EQ,0)GO TO 125
	E1=ERAN(1, J4)
	G1=ERAN(2, J4)
	G2=ERAN(2, J5)
	IF(E1.LT.ELO, AND.E2, LT.ELO)GO TO 1120
1105	GU TO 1102 IF(F1.LE.FLO.AND.F2.GT.FLO)GO TO 1110
	GO TO 1111
1110	E1=ELO G1=C2
	ISTART=Ø
1111	GO TO 1114 JE/E1 CT ELO AND E2 LE EMILICO TO 1112
****	GO TO 1113
1112	IF(J4.EQ.1, AND, ISTART, EQ.1)GO TO 1106
1106	E2=E1
	G2=G1
	J4=J4-1
	ISTART=Ø
1116	GU TU 1114 E2=EHI+G1/FLOAT (MM)

ADLR251 ADLR252 ADLR253 ADLR254 ADL R255 ADL R256 ADL R257 ADLR258 ADLR259 ADLR260 ADLR201 ADLR202 ADLR203 ADL R264 ADL R265 ADL R265 ADLR267 ADL R268 ADL R269 ADLR2691 ADLR270 ADLR271 ADLR272 ADLR273 ADLR274 ADLR275 ADLR276 ADLR277 ADLR2771 ADLR278 ADLR279 ADLR280 ADLR281 ADLR283 ADLR283 ADLR283 ADLR284 ADLR285 ADL R286 ADL R287 ADL R288 ADL R288 ADL R289 ADLR290 ADLR291 ADLR2911 ADL R292 ADL R2921 ADL R293 ADL R293 ADL R294 ADL R295 ADL R295 ADL R295 ADLR2971 ADLR2981 ADLR298 ADLR298 ADLR399 ADLR399 ADLR399 ADLR392 ADLR392 ADLR303 ADLR304 ADLR305

1005 005 1250 1117 1120 1118 1125 1114 1123 1113 1124 109 116 GO TO 1114 4 IF(E1.GE.EHI.AND.E2.GT.EHI)GO TO 60 TO 1125 15 IF(IFLAG)1120,125,1120 14 IF(E1.E4.E2)GO TO 1120 60 TO 1118 LII=LI(1) IF(LII=5)500,501,502 0 PRINT1005 5 FORMAT(23H ERROR INPU J4=J4+1 G0 T0 117 D0 109 I=1,NX COMMON/D/ERAN(2,501) COMMON/C/EX(101),JFLAG(101) COMMON/C/EX(101),JFLAG(101) COMMON ARAY1(6,500),ARAY2(6,500),NOT(20),ZAI(20),ABN(10), 1NER(10),LFW(10),EL(10,10),EH(10,10),LRU(10,10),LRF(10,10), 2LANG(10,5,5),NLS(10,10),NRES(10,10),AP(10),LIS(10),AM(10), 3AWRJ(10),LI(10),NXX(10),ABG(10,6,3),NJS(10,5,5),AJ(10,5,5), 4AREF(6),TEFF,DELTA,E TEF=TEFF/293,0 CONTINUE CONTINUE Call Sieve(e1,g1,e2,g2,mm,nn,nx,Teff,Awr) Call Qiks(1,nx,move,kome) IF(NTOTAL~J4)129,1250,117 E1=ERAN(1,J4) G1=ERAN(2,J4) IF(E1.LT.EHI.AND.E2.GE.EHI)GO Go To 1124 E2≖EHI CONTINUE G2=G1 ST ဓ 14=14+1 JFLAG1=JFLAG(I) CALL ADSIGMA(E,NIS,KK,10PL) PRINT8.E,(AREF(LL),LL=1,3) IF (IEND EQ, Ø) GO IF(IFLAG)1117,125,1117 GO TO 116 UBROUTINE ADSIGMA(0,NIT,KK, IDPL) 20 =EX(1) To 1116 ERROR INPUT 3 125 DATA LI(1)) TO 1123 5 125

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	GO TO 112	ADSG025
501		ADSGØ26
	ĞO TO 600	ADSGØ27
502	IF(L11-6)500.503.504	ADSGØ28
503		ADSG029
		ADSG030
504		ADSG031
504		ADS6032
505		1090033
000	NREST INREST IN	1050034
	APIEAP(1)	ADSG004
	AWRJ[=AWRJ[]/	ADSGUUD
	WN=2,190771E=03*(AWRJI/(AWRJI+1,0))*AP1	AUSGUSO
	WAVE=2.196771E=03*(AWRJI/(AWRJI+1.0))	AUSGUSZ
	CC=1,0/(WAVE++2)	ADSG038
	CC=CC*3.1415927	AUSGUSY
	BELTA=0.3177#SORT((TEF#Q)/AWRJI)	ADSG040
	IF(IDPL-EQ,0)GO TO 700	ADSG0401
	BETA=(CC+1,7724538)/BELTA	ADSGØ41
700	XOMEGA=2.0×WN*F12	ADSGØ <u>4</u> 2
	SIGT=0,0	ADSGØ <u>4</u> 3
	SIGC=0,0	ADSG044
	SIGF=0,0	ADSGØ45
	$N \times X = N \times X (I)$	ADSGØ46
	IF (NXXI-EQ.2) GO TO 1000	ADSGØ47
	GO TO 1001	ADSG0471
1000	TAILT=ABG(I,1,1)+(ABG(I,2,1)/Q)+(ABG(I,3,1)/(Q++2))+	ADSGØ48
1	(ABG(I.4.1)/(Q**3))*ABG(I.5.1)*Q*ABG(I.0,1)*Q*Q	ADSG049
-	TATIT=TATIT+CC/E12	ADSGØ50
	Tatl C = aBc(1, 1, 2) + (ABc(1, 2, 2)/0) + (ABc(1, 3, 2)/(0) + 2)) +	ADSGØ51
-		ADSG052
		ADSG053
		ADSG054
		ADS6055
1004		ADSCROC
TNNT	$\frac{1}{10} = \frac{1}{10} $	10568561
4 8 8 9	GU TO 1000 Tan Performante Alexaberto 2 Alexaberto 3.11/(0002))	
1002	A = A B (1) + A B (1) + A B (1) + A B (1) = A B (1) + A B (1)	1000001
-		ADSC059
		ADSCRAAR
	1A1LF=ABG(1,1,2)+(ABG(1,2,2)/Q)+(ABG(1,5,2)/(G++2))*	1050000
	1(ABG(1,4,2)/(U##3))+ABG(1,5,2)+U+ABG(1,5,2)+U+U+U	ADSUDUL
	TAILF=TAILF+CC/L12	ADSGUOZ
	TAILC=ABG(I,1,3)+(ABG(I,2,3)/Q)+(ABG(I,3,3)/(Q++2))+	AUSGUBS
	1(ABG(I,4,3)/(Q**3))+ABG(I,5,3)*Q*ABG(I,0,3)*Q*Q	
	TAILF=TAILF+CC/E12	ADSGUOS
	GO TO 1010	AUSGUOO
1003	PRINT1004	ADSG007
1004	FORMAT(24H ERROR INPUT DATA NXX(I))	ADSGØ6B
1010	N1=N2+1	ADSG069
	N2=N2+NRESI	ADSGØ70
	DO 108 K=N1,N2	ADSGØ71
	IF(LT,EQ,0)GO TO 300	ADSG072
	XMUT=ARAY1(1,K)	ADSGØ73
	XNUT=ARAY1(2;K)	ADSGØ74
	XGT=ARAY1(3,K)	ADSGØ75
	XHT=ARAY1(4,K)	ADSGØ76
	S1=XGT+COS(XOMEGA)+XHT+SIN(XOMEGA)	ADSG077
	S2=XHT+COS(XOMEGA)+XGT+SIN(XOMEGA)	ADSGØ78
	IF(IDPL-EQ,0)GD TO 201	ADSG079
	GO TO 202	ADSGØ791
201	DEN=(XMUT_Q)**2*(XNUT**2)	ADSGØ <u>8</u> ø
	TERM=(XNUT*S1+(XMUT=Q)*S2)/DEN	ADSGØ81

	SIGT=SIGT+(TERM*CC*T1)
	GO TO 300
202	SXI=(XMUT-Q)/BELTA
	ETA=XNUT/BELTA
	CALL PFCN(SXI,ETA,U,V)
	TERM=T1+(S1+U+S2+V)
	SIGT=SIGT+TERM&BETA
300	IF(LF,EW,0)GO TO 400
	XMUF=ARAY1(),K)
	XNUF=ARAY1(0,K)
	XGF=ARAY2(1)K)
	AME FARATZIZINI 15/1581 - 00 0100 - 70 301
	10 TO 1010100 10 001
301	00 10 002 DENE(XMUE=0)aa2+/XNUEaa2)
001	TERM#(XNUE*XGE+(XMUE=0)#XHE)/DEN
	SIGF=SIGF+TFRM+CC#T1
	Ga Ta 400
302	SXI=(XMUFaQ)/BELTA
	ETA=XNUF/BELTA
	CALL PECN(SXI, ETA, U, V)
	TERM=T1*(U*XGF+V*XHF)
	SIGF=SIGF+TERM+BETA
400	IF(LC.EQ,Ø)GO TO 108
	XMUC=ARAY2(3,K)
	XMUC=ARAY2(3,K)
	XNUC=ARAY2(4,K)
	XGC=AHAY2(D)K)
	AMUEANATZNOIN/ TE/TNDI 20 0100 TO 401
	LE (IDEL·EG:0760 10 701 CO TO 402
401	DFN=(XMUC=0)**2+(XNUC**2)
	TERM=(XNUC+XGC+(XMUC=Q)+XHC)/DEN
	SIGC=SIGC+TERM+CC+T1
	GO TO 108
402	SXI=(XMUC#E)/BELTA
	ETA=XNUÇ/BELTA
	CALL PECN(SXI, ETA, U, V)
	TERM=T1+(U+XGC+V+XHC)
4.00	SIGC=SIGC+TERM#BETA
108	
	SIGP=(2·0/Q)*(1:0*LUS(XUMEGA))*CU
	S107-S107-TATLT
	SIGF=SIGF+TAILF
	SIGC=SIGC+TAILC
	IF(LT.EQ.Ø)SIGT=Ø,Ø
	AREF(1)=AREF(1)+ABN(1)+SIGT
	AREF(2)=AREF(2)+ABN(1)+SIGF
	AREF(3)#AREF(3)+ABN(1)+SIGC
112	CONTINUE
	RETURN
	END Sudbouting Sievelet of ED or M N My Spee Duby
	COMMONIC/EVIAGE ELICIATE
	16/F2 + T.F1) CONTO 101
	GO TO 300
300	N2=2*N
	DO 1000I=1,100
	JFLAG(1)=2
1000	CONTINUE

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с	TEF=SEFF/293,0 DP=(1,5885E+00)*SQRT (TEF/BWR) WHEN MULTIPLIED BY SQRT(E) DP GIVES 5 TIMES CORRESPONDING DELTA DP1=DP*SQRT(E1) DP2=DP*SQRT (E2) DG1=G1/FLOAT (M)	SIEVØ28 SIEVØ19 SIEVØ11 SIEVØ11 SIEVØ13 SIEVØ13
1001 1002	EX(1)=E1 IF(G1.LT.DP1)GO TO 1001 GO TO 1002 JFLAG(1)=1 ENDIF=ABS (E2-E1)	SIEV015 SIEV016 SIEV0161 SIEV017 SIEV018
4.07	NX=1 D0 100 I=1,N XX=E1+DG1*FLOAT (I) IF(XX.LT.E2)G0 T0 107 G0 T0 100	SIEVØ19 SIEVØ20 SIEVØ21 SIEVØ22 SIEVØ221
107	NX=NX+1 EX(NX)=XX IF(G1.LT.DP1)G0 TO 1003 G0 TO 100	SIEV023 SIEV023 SIEV025 SIEV0251
1003 100	JFLAG(NX)=1 CONTINUE DO 200 I=1,N XX=E2-DG2*FLOAT (I) JF(XX-GT_F1)GO_T0_108	SIEVØ26 SIEVØ27 SIEVØ28 SIEVØ29 SIEVØ29
1Ø8	EC TO 200 NX=NX+1 EX(NX)=XX IF(G2.LT.DP2)GO TO 1005	SIEV0301 SIEV031 SIEV032 SIEV033
1005 200 110	GO TO 200 JFLAG(NX)=1 CONTINUE DIFF=(E2-E1)/FLOAT (N2) IS(DIFE)101 101 102	SIEV0331 SIEV034 SIEV035 SIEV035 SIEV035
101	PRINT103 GO TO 104	SIEV038 SIEV039
103 102	FORMAT(32H CALLING SEQUENCE OF SIEVE WRUNG) N21=NX+1 NN=NX N22=N21+N2-2 NY-N32	SIEV042 SIEV042 SIEV042 SIEV043 SIEV044
	E21=(E1+E2)/2,0 DP12=DP+SQRT (E21) E43=E2-E1=((G1+G2)/2,0) IF(E43,LT,DP12)G0 T0 1006	SIEVØ45 SIEVØ46 SIEVØ47 SIEVØ48
1006	GO TO 1007 DO 111 I=N21,N22 I2=I@NN EX(I)=E1+DIFF*FLOAT (I2)	SIEVØ481 SIEVØ49 SIEVØ50 SIEVØ51
111	JFLAG(I)=1 CONTINUE CO. TO. 1040	SIEV052 SIEV053 SIEV054
1007	DO 112 I=N21,N22 I2=I-NN FY(I)=F1+DIFF+F1 OAT (I2)	SIEV055 SIEV056 SIEV057
	DPTEST=DP*SQRT (EX(I)) IF(EX(I),LE,E21)GO TO 1008	SIEVØ59 SIEVØ59
1008	IF(G1.LT.DPTEST)GO TO 1010 GO TO 112	SIEVØ60 SIEVØ601

1010	JFLAG(I)=1	SIEVØ61
	GO TO 112	SIEV062
1009	IF(G2.LT,DPTEST)GO TO 1011	SIEVZOS
	GO TO 112	SIEVØOJ1
1011	JFLAG(I)=1	SIEV064
112	CONTINUE	SIEVØ65
1040	Do 113 I=1.NX	SIEVØ66
•	DPF=DP+SQRT (FX(1))	SIEVØ67
	JE(DPE E0.0.0)60 TO 113	SIEVØ671
		SIEVØ68
	TECTERM 17.5.0360 TO 114	SIEVØ69
		STEV0691
114		SIFV070
113		SIEVOZI
104		STEVOTZ
104		STEVATS
	ENU Subballing Rechériteta (L.V.)	PECNOUNT
CRECO	SUBROUTINE FORNSATIETAJUJV	PECNOUNZ
	SUBRUCHTRE TO STALDATE THE COMPLEX PROBABILITY INTEGRAL	DECNADAS
	AS A DUNIOUR INTEGRAL	PECNAUUS
		PECNOUNA
	VIMF(E)=(H/FHI)=((XL=E)*EXF((=(E**2/)/((AL=E)**2*(I**2/)	DECNOOD
	1 ANF (2)=SIN(2)/00S(2)	PF CNODO/
	VALF(±)={0,00417109392019+±4(29,001304010404+±4(000;22011000	PECNOUNO
	114+14(3020,3043121033+14(21303,202420000+2*(411/0,/3002*233+	PF CND Q Q J
-	22* (27002,791034034+2*(2810,00149+0003))))))/(1,0*2*(32,3	PFUNDELD
	3+ #4 (1023, / 3+ #4 (7304, 3/ 3+ #4 (4229, 66 / 3+ #1 (60002, 3+3/ 3)	PFCNUDII
	4+2*(/3901,9312)+2*(19830,1328129)))))))	PF UNDUTZ
		PECNOULS
	PHI=3.141292030	PFCNBDIA
		PFCN0010
	Y1=ABS(LTA)	PFUNDELD
	IF (X1) 11,22,11	PFCNDDI
11	IF (Y1) 77,99,77	PFCN2018
99	IF (X1-2.0) 991,991,992	PFUNDULY
992	IF (X1-5,9) 9921,9922,9922	PFCN0020
9922	1=0	PFCN0021
	DWSN=∅,∅	PFCN0022
	Dw=1.0	PFCN0023
993	I=I+1	PFCNUDZA
	GIG=1	PFCNUDZO
	DW = DW + ((2, 2 + GIG = 1, 2))(2, 2 + (X1 + 2)))	PFCN0020
	IF (DW-TERROR) 994,994,995	PFCN0027
995	DWSN=DW5N+DW	PFCN0028
	GO TO 993	PFCN0029
994	DWSN*DWSN+1,0	PFCN0030
	DWSN=(DWSN)/(2,0*X1)	PECNODOL
	IF (SXI) 9941,9941,9942	PFCN0032
994 <u>1</u>	U = EXP (-(X1**2))	PFCN0033
	V=((2,0)/SQRT (PHI))*DWSN	PFCN0034
	V=-V	PFCN0035
	GO TO 88	PFCN0030
9942	U=EXP (-(X1**2))	PFCN0037
	V=((2,Ø)/SQRT (PHI))#DWSN	PFCNØØ38
-	GO TO 88	PFCNØØ39
9921	1=0	PFCN0040
	DWSN=0,0	PFCNØØ41
	AXE=(0,1)/(X1**2)	PFCN0042
9923	I=I+1	PFCNØØ43
	GIG=1	PFCNØ044
	GIG=2.Ø*GIG-1.Ø	PFCN0045
	GIG=GIG*GIG	PFCNØØ46

	TFRMa(FXP (=(GTG+AXE+(X1++2))))/(GIG+AXE=1.0)		PECN0047
	ARSTRM=ARS (TERM)		PFCN0048
	15 (ABSTOM-TERDOR) 9925.9925.9924		PFCNØØ49
0004	NEN-DUSNATERM		PECNOOSO
7729			PFCNØØ51
0025	DUCAN (2 0) SORT (AYE/DUT) SOUSA		PECNØØ52
7720	DWONEL2-07-OURT LAAL/FAL/FUNON DWONEL20 STACORT (DUT)AEVO (_/VIBEOT)ATANE/DUT/10 Ø8SORT	(AXE)))	PECNON53
	UWSNIE(D, S)*SURI (PHI/WEXP (#(XI**2/)*TANF(PHI/(2,0*306))		DECN0054
			DECNORS
	UWSNEUWSN+UWSN1		PECNONS
/	1F (SX1) 9920,9920,9927		PFCN0057
9926	U=EXP (-(X1*+2))		OF CHURCH
	V=((2.0)/SQRT (PHI))*UWSN		PFCN0020
	V=-V		PFCNDD29
	GO TO 88		PFCN0000
9927	U=EXP (-(X1**2))		PFCN0001
	V=((2,Ø)/SQRT (PHI)) +DWSN		PFCN0002
	GO TO 88		PFCNØØ63
991	1=0		PFCN0064
	DWSN≖Ø.Ø		PFCNØØ65
	$DW = \bullet (1, 0)$		PFCNØØ66
996			PFCNØØ67
//0	GICHT		PFCN0068
	$DW = DW = (12, 0 = 1 \times 1 = 2))/(2, 0 = C[G = 1, 0))$		PECNONOS
	DW==DW		PFCNØØ7Ø
			PFCNØØ71
	10 (ABCH_TERPARA 097.007.008		PECN0072
000	TE (ADDDW=(ENNOR) 3777377330		PECN0073
770			PECN0074
007			PECNOUTS
997	$\frac{1}{2} \frac{1}{2}		DECNONTS
	IF (SX1) 99/1,99/1,99/2		PFCN0070
9971	U=EXP (-(X1**2))		PFCN0077
	V=((2.0)/SQRT (PHI))*DWSN		PFUN0070
	V=-V		PFCNDD/9
	GO TO 88		PFCN0000
9972	U=EXP (-(X1**2))		PFCN0001
	V=((2,0)/SQRT (PHI))*DWSN		PFCN0082
	GO TO 88		PFCN0083
22	IF (ETA) 44,55,66		PFCNØØ84
44	IF(Y1=1.5)444,445,445		PFCNØ085
444	U=EXP (Y1**2)*(1,0+ERRORF(Y1))		PFCNØØ86
	V=0.0		PFCNØØ87
	GO TO 88		PFCNØØ88
445	X2=1.0/(Y1+Y1)		PFCNØØB9
	$1=2.0 \neq FXP$ (Y1 $\neq \neq 2$) = (VA) F(X2)/Y1)		PFCNØØ9Ø
			PFCNØØ91
	CO TO 88		PFCNØØ92
55			PECNODY3
- 25			PFCNØØ94
			PECNOUSS
6.6	UU IU OV 15144-1 51664 465 665		PECNODOS
444	$\frac{1}{12} \left(\frac{1}{12} \left(\frac{1}{12} \right) \left(\frac{1}{12} \left(\frac{1}{12} \right) \left(\frac{1}{12} \left(\frac{1}{12} \right) \left(\frac{1}{12} \right) \left(\frac{1}{12} \left(\frac{1}{12} \right) \left(\frac{1}$		PECN0097
004	OFFYD (11**2)*(1.0*CRCORF(11))		DECN0098
			PECNANO
			DECNATAA
005			DECNATA
	U=VALF(X2)/Y1		- FFUNDADA
	V=0,0		PECNOLOZ
	GO TO 80		PECNOLOG
_ 77	IF(X1=0.04)770,770,771		
77Ø	IF(Y1=0.04)772,772,771		PECNELUS
772	H=0,5		PRUNULUO
	GO TO 773		PFCN0107

771	RHO=SQRT (X1**2*Y1**2)	PFCNØ108
	TERL=ALOG(TERROR)	PFCN0109
	RH01=PHI=PHI=Y1=Y1	PFCNØ110
	IF(RH01-0.1)1011,1012,1012	PFCNØ111
1011	RH01≠Ø.1	PFCNØ112
1012	RH01≖AB\$ (RH01)	PFCN0113
-	RH02#AL0G((1.13*RH0)/RH01)	PFCN0114
	H1=PHI/SORT (RHO2=TER))	PFCN0115
		PECNØLIA
		PECNALIZ
1021		DECNO118
1022		DECN0110
1022		PECN0117
	NHUMEALUG((1,1)MAA ARU)	PFUNDICO
** ** **	H=PHI/SGRI (RHOW=IERL)	PFUNDIZI
//3		PFCNØ122
	RW= (2,0) + X1 + AI	PFCN0123
	CN=(2,0)*PHI*X1/H	PFCN0124
	T = 0, 0	PFCNØ125
	AU=UREF(Ø,Ø)	PFCNØ126
	UPOS=0,0	PFCNØ127
123	T=T+H	PFCNØ128
	UT=UREF(T)	PFCN0129
	IF(UT+TERROR) 122,122,1231	PFCNØ13Ø
1231	UPOS=UPQS+UT	PFCNØ131
	GO TO 123	PFCNØ132
122	UNEG=Ø,Ø	PFCN0133
	S=0,0	PFCN0134
125	S=S-H	PFCNØ135
	US=UREF(S)	PFCNØ136
	IF(US-TERROR) 124.124.1241	PFCNØ137
1241		PFCN0138
	G0 T0 125	PECNUISS
124		PECNOLÃO
	G0 T0 126	PFCN0141
126	VPoS=0.0	PECN0142
		PECNØ143
		PECN0144
128		PECN0145
120		DECN0146
		PECNOLAO
	ADSTIADS (VI)	PF CND147
4074	$\frac{1}{100} = \frac{1}{100}	
14/1		PFUNDITY
40-	GU TO 128	PECNULOU
127		PECNO121
	VNEG=0,0	PF CN0192
130	S=S-H	PECNULOS
	VS=VIMF(S)	PFCNØ134
	ABSPS=ABS (VS)	PFCNØ155
	IF(ABSPS-TERROR) 129,129,1291	PFCNØ156
1291	VNEG=VNEG+VS	PFCNØ127
	GO TO 130	PFCNØ158
129	AV=AV+VPOS+VNEG	PECNØ159
	U1=AU	PFCN0160
	V1=AV	PFCN0101
	POLR=(2-0*EXP (Y1**2-X1**2)*(EXP (2,0*AL)*COS (BM)-EXP (AL)*	PFCNØ162
:	1COS (CN-BM)))/(1,0-2,0+EXP (AL)+COS (CN)+EXP (2,0+AL))	PFCN0163
	POLI=-(2,0+EXP (Y1++2-X1++2)+(EXP (2,0+AL)+SIN (BM)+EXP (AL)+	PFCN0164
	1SIN (CN-9M)))/(1,0-2,0*EXP (AL)*COS (CN)*EXP (2.0*AL))	PFCN0165
	PHIH=PHI/H	PFCN0166
	IF(Y1-PHIH) 300,400,500	PFCNØ167
300	A=1.0	PFCN0168

	B=1,Ø	PFCNØ169
	GO TO 600	PFCNØ17Ø
400	A=0.5	PFCN0171
	8=0.5	PFCNØ172
	GO TO 600	PFCN0173
500		PFCNØ174
		PFCN0175
600		PFCNØ176
000		PFCN0177
		DECN0178
77		
- 33	IF (SXI) 331,08,333	PFOND477
331	IF (ETA) 441,88,443	PFCNDLOD
553	IF (ETA) 661,88,663	PF UNDIO1
441	U=2,0*EXP (Y1**2=X1**2)*COS (2,0*X1*Y1)*U1	PFCN0102
	V==2.0*EXP (Y1**2*X1**2)*SIN (2.0*X1*Y1)=V1	PFCN0183
	GO TO 88	PFCN0184
443	U=U1,	PFCN0185
	V=-V1	PFCN0186
	GO TO 88	PFCN0187
661	U=2.0*EXP (Y1**2=X1**2)*COS (2.0*X1*Y1)=U1	PFCNØ188
	V=2.0*EXP (Y1**2=X1**2)*SIN (2.0*X1*Y1)*V1	PFCN0189
	GO TO 88	PFCN0190
663		PFCNØ191
		PFCNØ192
88	ŘEŤŮRN	PFCNØ193
	END	PFCN0194
	FUNCTION FRRORE(X)	FRRFØØI
	- ONG 100 ENGON (A)	FRREAM2
	UAIA FIMIIAZIANIA ASTASIOSTA (A4446430)	EDDEQUA
•		EDDE AVA
	=1,0/(1,0/F************************************	ERREDUC
	ERRORF =1.0~((({A)*!*A4}*T*A3)*!*A2)*!*A1/*!*EXP(#X**2)	ERRF UUU
	RETURN	
		ERRFUUT
	SUBROUTINE_MOV(I_J)	MUVUUL
	COMMON/D/ERAN(2,501)	MUVUUZ
	I1=I	MOVDOS
	J1=J	MOVUU4
	IF(I1.EQ.0)I1=501	MOV005
	IF(J1,EQ.0)J1=501	MOV005
	ERAN(1,J1)=ERAN(1,I1)	MQVØØ7
	ERAN(2,J1)=ERAN(2,I1)	MOVØØB
	RETURN	MOVUBY
	END	MOVU1U
	SUBROUTINE MOVE(I,J)	MOVEØØ1
	COMMON/C/EX(101).JFLAG(101)	MOVEØØŽ
	I i = I	MOVEØØŠ
		MOVEØØ4
	IF(I1,FQ.0)I1=101	MOVEØ05
	IF(J1.FQ.0)J1=101	MOVEØØ6
		MOVEØØ7
	JFLAG(JI)=JFLAG(II)	MOVEØØ8
	RETURN	MOVEØŬŸ
	END	MOVEDIÖ
	FUNCTION KOM(1.J)	KOMØØI
	COMMON/D/EPAN(2.501)	комия2
	UUMMUM/U/CNAMISE/201/ 11-1	KOMAAS
	11-1	комия
	UT (11 E() (0) 11 = 501	комияь
	1 C / 1 C () () 1 1 = 5 () 1	комияб
	EON-EON(1 11)-EDAN(1 11) 17(J1+EW+#/JJ1-EDAN(1 11)	KOM007
	LUM-LTAN(1)[1]/=[TAN(1)J]/ 15/500/100 101 100	K GRIBBY K OMBAR
	1F(FDW)100,101,105	K U H U U U U

	100	KOM==1	KOMØØ9
	1 01 1	GO TO 103	KOMØ10
	101	GO TO 103	KOMØ12
	102	KOM=1	KOMØ13
	103	RETURN	KOMØ14
		END Function Komp(t)	KUMU12 Komégúi
		COMMON/C/EX(101), JFLAG(101)	KOMEØØŽ
		[1=]	KOMEØØ3
		J1=J 16/11.60.0)11=101	KOMEØØ4
		1F(J1.EQ.0)J1=101	KOMEØØÓ
		EOX#EX(]1)~EX(]1)	KOMEØØ7
	4 04 04	IF (EOX)100,101,102	KOMEØØ8
	100	GO TO 103	KOMEØIØ
	101	KOME=0	KOMEØ11
	100	GO TO 103 Kove-1	KOMEØ12
	103	RETURN	KOMEØIG
		END	KOMEØ15
~ 0	TVC	SUBROUTINE QIKS (MM,NN,MOVE,COMPAR)	QIKSØØ1Ø
C	142	ALLSINGMEMURT SORT PROGRAM Mm = First subscript	QIKS0020
Ĉ		NN = LAST SUBSCRIPT (ARRAY IS IN COMMON)	QIKSØV4Ø
С		MOVE AND COMPAR ARE USER SUPPLIED PROGRAMS	QIKSØØ5Ø
		UIMENSIUN MSAVE(20):NSAVE(20) KEVLOC(M.N)=(N+M)/2	OIKS0000
			QIKSØØ8Ø
		J=0	QIKSØØ9Ø
			QIKSØ10Ø
		N=NN	OIKSØIZØ
_	35	CONTINUE	QIKSØ13Ø
С		TEST FOR ONE OR TWO ITEMS	QIKSØ14Ø
С	32	CONTINUE	GIKS0160
C		PARTITION AND SPREADER GO HERE, SEE BELOW, RETURN IS TO 8	QIKSØ170
C	0	PUSH DOWN	OIKSØ18Ø
С	•	WORK ON SMALLEST PORTION	GIKSØŽØØ
		IF ((J=M) - (N-1)) 134, 134, 34	QIKSØ21Ø
	134	MSAVE(LEVEL) = I	QIKSØ22Ø
		NSAVE VLEVELV-N N=J	QIKS0230
	_ .	GO TO 35	QIKS0250
	34	MSAVE(LEVEL)=M	QIKSØ26Ø
		MSAVE(LEVEL)EQ Mai	OTKS0280
	-	GO TO 35	QIKSØ29Ø
~	51	IF(COMPAR(M,N))31,31,131 Shar is only the items are only as order	QIKSØSØØ
U	131	CALL MOVE (M.D)	01KS0320
		CALL MOVE(N,M)	GIKSØ33Ø
	74	CALL MOVE(0,N)	OIKS0340
	15Ø	TE (TEAET) TAT' TAN' TAT BELIBU	UIKSØ35Ø
Ç		POPUP	QIKS0370
	151	M = MSAVE(LEVEL)	QIKSØ38Ø
		N=NSAVE(LEVEL)	QIKSØ39Ø

C C	32	LEVEL=LEVEL=1 GO TO 35 END MAIN PARTITION I=M J=N
C	54 17 1	CALL MOVE(KEY, Ø) IF (N - KEY) 17: 1, 17 CALL MOVE(N,KEY) CONTINUE HOLE AT BOTTOM LE(COMPAR(M:1))3:2:2
	2	I=I+1
	3	CALL MOVE(1,J)
С	6	CONTINUE HOLE AT TOP
č		1F(COMPAR(Ø,J))5,5,7
	5	J=J-1
		IF (I - J) 6, 4, 6
	7	CALL MOVE(J,I)
		GO TO 2
С	4	CONTINUE
С		SPREADER GOES HERE
С		END PARTITION
С		SPREADER
	4	CALL MOVE(0,1)
	12	IF (I = N) 110, 10, 110
	110	I = I + I
	107	IF (COMPAR(0)1))10,12,10
	1018	
	400	1F(COMPAR(0.1))8.10.8
С	8	CONTINUE
Ĉ	-	RETURN TO MAIN PROGRAM
		END

QIKS0400
DIKS0410
01650420
01850430
01450440
OTKSØ45Ø
OIKSDÃÁD
01850400
01450480
01850490
OIKSONO
OIKSAHIA
01450520
OIKSOPED
01450540
OIKSOKBO
DINSODOO
NINSUSOU
GINSU270
01150200
GINSUSTU
GIKSUOUU
QIKS0010
OIKSUDZU
01450030
QIKSDO4D
UIKS0090
QIKS0000
QIKS00/0
GIKS0000
QIKSØ69Ø
QIKS0700
QIKSØ71Ø
QIKSØ72Ø
QIKSØ730
QIKSØ74Ø
QIKSØ75Ø
QIKSØ76Ø
QIKSØ77Ø

ADLER TEST. U-233 DATA.		0293.0	
92233, 231,0375	Ø	Ø	1 Ø
92233, 1,0	Ø	1	1 Ø
0.790 60.0	1	4	ØØ
2.5 1.00925	ø	Ø	1 Ø
231.0375 0.0	6	Ø	18 3
	0.0	Ø. 0	a.a a.a
0.0 0.0	0.0	0.0	a.a a.a
	0.0	Ø.Ø	a.a a.a
a a a a	0.0	0	1 0
	0	Ø	876 73
2,5 5,0	i v	Ø _2.	7000F+00 3.7000F=01
-2 57265-07-8 27365+04-2	70005+00	3 70005-01 1.	A119F-04-6.8078F-06
=2·9/20E=03=8·2330E=04=2	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	a	9000E-01 7 000VE-02
Ø • Ø -7 1093⊏-07-4 00455-06 1		7 00005-02 4	2644F=07=6.0920F=08
-3.1403E-0/-1.5442E-00 1	. ODDDE-DI	A	AD005-00 3 50005-01
	42005+00	3 50005-01 3	54865-06-1 1103F-05
9.04016-05-5-19056-05 1		3.5000E-01 01	7000E+00 1 3000E-01
	**********	2 0000r-04 1	000000000 1,200000-01
1.04405-04-4 410/6-0/ 1	10005-00	1.20005-01 3	2000/E-09 0,0004E-00
			47475-05 0 97085-04
0.5002E-05 2.0881E-05 2	.2900E+00	2.0000E-02 20	
			3000E+00 5,0000E=01
5.6869E-05-6.4000L-07 3		2.0000E=01 20	4520LODE 1,000LERNO
			AGETE-DE 1 3050F-04
3.14046-05 1 0/0/6-02 3	.0300L+00	0.0000E=02 1	50005.00 3 0000F-01
	E DAGE . GA	7 0000r-04 B	70745-06-4 4730F-06
0.05/0E-05-8-2084E-02 4	. 52006+00	3.900000001 5	77005.00 + 9000F-01
		0, 2, 1 90005-01 5	1 CODE+00 1,0000E+01
1.56202-05-3 8/422-02 5	./ 300E+00	1,00000001 01	10201-00-0.2/471-00
	andar. an		- 771 AF- 95 4 97595-94
2.5643E-04 5 2802E-05 6	. 8000E+00	A. NNNNE #NS 0	1314E-05 4.0357E-00
0. 0 0			4900E+00 9,0000E+02
7.9501E-06 2 1170E-00 7	.4900E+00	A'NNNNE+N5 5	1,50/0E=00
Ø. Ø.		0. 8	.0300E+00 2.0000E+01
2.3332E-05-1 1118E-06 B	3.6300E+00	2.6000E=01 3	,5029E-06=2,8320E=00
Ø. 0 e		0. 9	.1500E+00 1.4000E+01
2.2373E-05-2.3180E-05 9	.1500E+00	1.4000E-01 4	.8431E-00-9.4420E-0/
Ø. Ø. 2		0. 1	.0350E+01 1.6000E+01
4.1572E-04 5.1934E-06 1	L.0350E+01	1,6000E=01 8	-2800E-05 3.007PE-00
Ø, Ø 2	0.	0. 1	.1280E+01 2,0000E-01
5.297ØE-05 1 4057E-05 1	L.1280E+01	2.0000E=01 5	.4523E=06=5.0107E=00
0. 0. 2	0.	Ø. 1	.1750E+01 1.6000E-01
9.7624E-06-6.3204E-06 1	1.175ØE+Ø1	1.6000E-01-1	.0493E-05-3,5029E-07
Ø. Ø. Ø	0.	0, 1	,2760E+01 1,7000E=01
3.5308E-04 6 7229E-05 1	L.2760E+0 <u>1</u>	1.7000E-01 4	,8873E=05 3,5334E=06
Ø. Ø Ø	2.	Ø. 1	.3470E+01 2.0000E-01
5.1934E-05 2.5495E-05 1	1.3470E+01	2,0000E=01 1	,4910E-05-5,3010E-00
Ø. Ø. Ø	0.	Ø. 1	.3660E+01 1.4000E-01
7.4794E-05-3.2013E-05 1	1.366ØE+Ø <u>1</u>	1.4000E-01 3	1678E=06 2,3/77E=00
Ø. Ø		0. 1	,5280E+01 1,2000E+01
1.8151E-04-5 5650E-05 1	L.5280E+01	1.2000E-01 /	.05/6E=05=4.410/E=00
Ø. Ø 8	σ,	0. 1	.6130E+01 2.2000E-01
1.5429E-04-7 5693E-06 1	1.6130E+01	2.2000E-01 8	.2090E-06-4.5842E-06
Ø. Ø Ø	0.	Ø. 1	.6520E+01 1.3000E-01
1.4357E-04 4 0527E-05 1	1.652ØE+Ø1	1.3000E-01 3	.0475E=05 6.6250E=06
Ø. Ø Ø		Ø. 1	.7930E+01 1,2000E-01
0.4438E-05 6 3357E-06 1	1.7930E+01	1.2000E-01 1	++0212+02 2,102/E=00
Ø. Ø Ø		Ø. <u>1</u>	.8420E+01 2.1000E-01
9.0755E-05 7.4627E-07 1	1.842ØE+Ø1	2.1000E-01 1	. 0006E-05=1.9190E-06
Ø. Ø	7 .	Ø. 1	.8800E+01 1.5000E-01
3.2556E-04-6.9144E-05 1	1.886ØE+Ø1	1.5000E-01 5	.3070E=05 4,6908E=06

Ø	•	0 -	ø.	ø.	2.0530E+01 2.0000E-01
1	.6876E-Ø4	1-0158E-05	2,0530E+01	2.0000E=01	2.8617E-05 1.2184E-06
ø	•	Ø	Ø.	ø.	2.1850E+01 1.3000E-01
1	.9918E-Ø4	1-3316E-04	2.1850E+01	1.3000E-01	5.2391E=05 1.7310E=05
ø	•	Ø	ø,	Ø.	2.2230E+01 2.4000E-01
8	.1222E-Ø4-	1 2172E-04	2.223ØE+Ø1	2.4000E-01	9.8431E-05-1.2047E-05
ø	•	Ø	0.	Ø.	2,2940E+01 3.8000E-01
1	.4414E-Ø4	2 2236E-06	2.2940E+01	3.8000E=01	-1.4179E-05-1.1895E-05
õ	•	Ø.	Ø.	Ø.	2.3540E+01 3.3000E-01
õ	.8112F-05-	-1.4114F-04	2.35405+01	3.30000=01	6.1072F-06 4.6147F-06
ø		Ø.	0.	Ø.	2.51305+01 1.90005-01
ĩ	2617F-Ø4-	-A 4088F-05	2.5430F+01	1.9000F=01	2.11095-05-4.87365-07
â	i da engan da linina.	а.	0.	0	2.61905+01 1.70005-01
ã	.8584F-04	1.59465-05	2.61905+01	1 70005-01	
a		Q.	a.	0	2.6570E+01 2.4000E-01
õ	.45635-08	1.77735-05	2.6570F±04	2 40005-04	1.96315-05 1.37835-05
a		<u>и</u> .	0	0	2.73906+01 4.30006-01
õ	.03025-05-	4 67075-05	2.73905+04	4.30005-01	1.16366-05 5.34576-06
ā		<u>л</u> .	0	N COLLET	2.83306+01 1.60006-01
ĩ	46035-08	7.49735-05	2 83305+04	1 60005-01	1.77585-05-6.39665-07
a	40002-09	3.0700 <u>C</u> .07	2.0300L401	U T'ODDDF"DT	2.80905+04 3 00005-01
ž	11535-04	8 75725-06	2 8090F±04	3 00005-04	2.68355-05-1.16665-05
ø	.11205-04		0 2.0770L+01	0.00005-01	2.04605+04 7 00005-02
4		4 74695-08	2 94605+04	7 00005-00	4.85845-04-1 00525-04
a		1-14012-01	2.70002-01	0	3.0450F+01 1 0000F-01
4		0 87855-06	3 04505+04	* 0000E=04.	-9.50405-07-4.949ÅF-06
7		2.07022.00	0.01000401	T.00005-01	3 0740C-04 4 4000C-04
2	97945-0E	0	8 0 760 F + 04	1 AGGGGA	1 7000E+01 1.4000E+01
<i>'</i>	. 73742-09	7 22052-05	3.0/00[#01	1.400000-01	1 1 7 9 1 0 0 0 1 1 2 7 7 2 8 0 0
0	10575-04-	Ø· 4 43445-04	8. 3.10005+01	4 7000 = 04	1,80005-05-8 74005-06
2	. TRANE - MA	.T.TOTTE-04	0.12002401	4./000E-01	
2	• • • • • • • • • • • • • • • • • • • •	0 0 0 0 7 5 - 0 5	8 10805±04	1 40005-04	3 50075-05-1 00465-05
1	.03145-04	1 900/6-00	3.19001-01	1.40000-01	3.5227E-05-1.0207E-05
6		U	7 37405+04	0, 4 30005-04	-1 3000E=01 4,3000E=01
0	•1103E=054	1 40016-04	3.2/402=01	4.30005-01	-1.0070E-06-1.6407E-00
0	•		0.	4 (A A A A	3.40306401 8.60006401
1	.4034E-04	4 80005-00	3.40301+01	0.0000L=01	*3,4648E=03=3,6774E=05
2			Ø. 3. 45705.0.	Ø.	3,4530E+01 4,2000E=01
2	.0101E-04	4 9/41E-00	3.4530E+01	4.20005-01	0+2/48L=06 2+2201L=00
0		0 04465-66	N	(U.	3.5190E+01 1.2000E+01
4	.0420E-00-	-9-2440E-00	3.51906+01	1.20005-01	*2:2207E*00 1:0007E*00
0	77775 (88-	0 7 50585-05	N. 7 54695.04	N	1 7760F 04 0 4576F 04
1	.///SE=05*	3.3730E-03	3.34001+01	1.70005-01	1 1 / 302E=00 9,45/0E=00
0	• 	0 9470E-05	10. 7 6EA0E.04	U. 9 00005-00	3 000000000000000000000000000000000000
0	· >>>>>E=05	2.01006-00	3.05406+01	9.0000E-02	4,9908E=05 0,3013E=00
4		0 4 57445-05	N. 7 70000-04	P. 40005-04	3.7500E+01 2.4000E=01
1	· I372E-04	4.5/091-02	3,/5002+01	2.40002=01	7.995/E-00 4.7001E-00
ø			0.	Ø.	3.94602+01 2.80002-01
1	./3/02-04	1.75306-04	3.94001+01	2.90005-01	=2.2003E=00=1.0733E=05
0	•	0	0.	0	3,9570E+01 1,0000E=01
2	. 9546E-06-	9-8538E-05	3.9570E+01	1.6000E=01	-0.4271E-06 1.300/E-05
9		0	10. A 710605.04	0.00005-01	4 • 0000E • 01 4 • 9000E • 01
1	• 44226-04*	1 41/36-04	4.00005001	4.90005-01	
07		0 01055-05	N. 10605.04	0, aaaar - ao	
3	·1/22E=05	2-01956-05	4.10005+01	9,0000E=02	1.03/22+03 4.90022+00
0		0 - 64745-05	N 34385-84	1 00005-04	7.20201+01 1.200000-01 7 44040-05 5 47710 04
7	· JYZJE-05	2-24346-02	7.20202401	A''<0≈05≥01 4''<0≈01	4.3470E+04 4 40000 04
Ű	•	0 54745.04	4 3470E+04	1 40005-04	1,05105-05-4 47515-07
	06955-05			<u>т</u> , чорог, ч01	- こうちつ マビックト・ロノンロド 受灯 /
2	.Ø685E-Ø5	0.2130E-00	0 1	0	4.4440EL04 6 4000E-04
Ø	.0685E-05	0. 0. 7.87155-05		0,	4.4640E+01 5.6000E=01 5.33055-04 9 12245-04
9 Ø 1	.0685E-05 .1797E-04	0- 3-8715E-05	0. 4.4640E+01	0. 5.6000E=01	4.4640E+01 5.6000E-01 5.3305E-06 9.1228E-06

1.6966E-05-6 0691E-05	4.531ØE+01	5.2000E-01	6.8383E-06-6.9601E-06
Ø. Ø	ø.	ø.	4.6010E+01 8.0000E-02
3.876ØE-Ø5-2 4612E-Ø5	4.6010E+01	8,0000E=02	2.1977E-05=6.2291E=06
Ø. Ø	Ø.	Ø.	4.7170E+01 2.3000E=01
1.1409E-04-9 8081E-06	4.7170E+01	2.3000E-01	5.5894E-06-5.6656E-06
0. 0	ø. [–]	Ø.	4.864ØE+Ø1 1.3ØØØE+Ø1
2.5373F-04-3 2836E-05	4.864ØE+Ø1	1.3000F-01	1.2224E-04 5.0107E-06
0. 0	Ø.	Ø.	4.9120F+01 9.0000F-02
1.3753F-05-9 7320E-06	4.9120E+01	9.0000E=02-	3.3049E-06-7.0819E-06
0. 0.	0.	Ø.	5.0210E+01 4.5000E=01
7.76735-05-4.57055-05	5.02105+01	4.5000F=01-	2.58915-07-6.15295-06
	Я.	0	5.0990F+01 3.8000F-01
2.7077F-08-6 8535F-07	5.09905+01	3.80005=01=	2.28455-06-1.24895-05
Ø. Ø.	a.	0.002002.01	5.1950F+01 6.2000F-01
2.36525-05-6 61745-05	5.19505+01	6.2000F=01=	2.48865-05 1.08135-06
	0	0	5.20105+01 2.20005-01
7 28755-05-9 77005-05	5 20105-04	2 20000-01	1.03975-05 3.67045-06
	0,27102401	0	5.30705+04 1 40005-01
8 • 8775 05-7 44765-06	5 70705+04	1 AGGGE-04	
9-1037E-05-3-4435E-05	3.39/0E401	1.40005-01	5 A770E-04 0 0000E-02
0 19385-05 1 13635-05	5 47705±04	0 aaaar_ao	3.07805-05 3.01415-06
7.1720E-03 1.1302E 03	2,4//0E#01	,	
0. 374AF 05 4 0505F-04	0. 5.6000F±04	0.70000-01	9,00901+01 2,70001-01 9 97745-04 3 90765-07
9.33145-03 1.99225-04	0,00702401	2./040C-01	5 4354E-06 3.00/2E-01
0. 7 77955 04-9 49775-05	0, 5 47505±04	8. 3.0000c=04	3 4744E-05 9 0414E-06
3.33956-04-8.19376-05	3.03505401	0.00005-01	5 7/94E-01 / 04/08E-01
Ø • Ø • 4 76975 Ø4 7 60475-Ø6	8 74805×04	V, 00000-04	3 14005-05 1 86895-04
4.33076-04 3.39436-03	3.14005401	4,70005401	2,40021-05 4,08001-00
		р, Э. 700 аг 04	
1.41002-04 3.95902-05	5.0510E+U1	2.30005-01	1.5/03E=05=3.0/05E=00
	0.	0.	0.1300E+01 4.0000E-01
2.82532-04 / 23122-05	0.13006+01	4.0000E=01	1.2717E=00=1.7971E=00
	0.	Ø.	0.2500E+01 2.0000E=01
1.0427E-04-2 2784E-05	0,2500E+01	2,0000E-01	0.0410E=00=3,9903E=06
Ø. Ø.	0.	0.	0.4300E+01 4.0000E-01
3.4727E-04-3 3582E-05	6.4300E+01	4.0000E-01	D.4082E-05=2.4642E=05

TA. I EFFECTIVE TEMPERATURE(*K) 295;000 Nt 9.2233E+04 AT.WT/MASS OF NEUIRON 2.3104E+02 NO OF ISOTOPES 1		DF 9,2233E+04 FRACTIONAL ABUNDANCE 1,0000E+00 NO OF ENERGY RANGES 1 E(EV) 7,9000E-01 UPPER LIMIT(EV) 6,0000E+01 LRU= 1 LRF= 4 RING LENGTH 1,0092E+00 NO OF L+VALUES 1 OF NEUTRON MASS 2,3104E+02 TURE, LI=6 FISSION AND CAPTURE, AND LI=7 TOTAL CAPTURE AND FISSION CROSS-SECTIONS 0 TURE, LI=6 FISSION AND CAPTURE, AND LI=7 TOTAL CAPTURE AND FISSION PARAMETERS GIVEN	TOTAL CROSS⇔SECTION 0,00000E+00 A3≊ 0,000000E≠00 A4≂ 0,000000E+00 B1≡ 0,00000E+00 B2≡	FISSION CROSS≖SECTION 0,000000E+00 A3≊ 0,000000E+00 A4≕ 0,000000E+00 B1≖ 0,00000E+00 B2≢	CAPTURE CROSS-SECTION 0,000000E+00 A3≐ 0,000000E+00 A4≕ 0,000000E+00 B1≖ 0,000000E+00 B2
633 JATA. N Ø EFFECTIVE TEMPERATURE(+K) 293,ØØØ ELEMENT 9.2233E+Ø4 AT.WT/MASS OF NEUIRON 2.3104E+Ø2		<pre>ISOTOPE 9.2233E+04 FRACTIONAL ABUNDANCE 1.00000E+00 Y RANGE(EV) 7,9000E-01 UPPER LIMITEV) 6,0000E+01 SCATTERING LENGTH 1.0092E+00 NO OF L-VALUES 1 UNITS OF NEUTRON MASS 2.3104E+02 ND CAPTURE, LI=6 FISSION AND CAPTURE, AND LI=7 TOTAL ND CAPTURE BCKGRND PARAMETERS GIVEN,IF NX=3 TOTAL,CA</pre>	R THE TOTAL CROSS⇔SECTION .= 0,000006E+00 A3ª 0,00006≠00 A4= 0	R THE FISSION CROSS-SECTION .= 0,000000E+00 A3ª 0,00000E+00 A4= 0	R THE CAPTURE CROSS-SECTION .= 0,000000E+00 Å3= 0,00000E+00 A4= 0
DPTION TO DOPPLER BRAADEN (2, A) DESIGNATION OF THE	DATA FOR ISOTOPE NUMBER	(2,4) DESIGNATION OF THE Lower Limit of the Energ Nucclear Spin 2.5000E+00 Mass of this isotope in Li= 6 if Li=5 total A NX= 3 if NX=2 total A	BACKGROUND PARAMETERS FO A1= 0,00000E+00 A2	BACKGROUND PARAMETERS FO A1= 0.000000E+00 A2	BACKGROUND PARAMETERS FO A1= 0,000000E+00 A2

PROGRAM ADLER, CALCULATES CROSS-SECTIONS FROM ADLER-ADLER PARAMETERS WITH OPTION FOR DOPPLER BROADENING.

ADLER#ADLER PARAMETERS FOR THIS ISOTOPE

MUT	NUT	GT	HT
0.000000E+00	0.00000E+00	0.000000E+00	0.00000E+00
A 9000000 + 90	0 000000-00	0 0000005+00	0 0000005+00
	0,000000000000		0,000000000000
0.000000E+00	0,00000E+00	0.0000000000	0,00000E+00
Ø ØØØØØØE+2Ø	0,00000E+00	0,000000E+00	Ø,ØØØØØØE+ØØ
Ø,ØØØØØØE+00	0.00000E+00	0.00000000+00	Ø,000000E+00
0.000000F+00	0.00000F+00	2. 400000F+00	0. 900000F+00
0 0000005+00	0 00000000000	3 0000005+00	0 000000F+00
	0,0000000000000		a agaaggr, úú
	D. ODODDDE + DD	0,0000002+00	
9.000000E+00	9.00000E+00	0,00000E+00	0,000000000000
0,00000E+00	Ø,ØØØØØØE+ØØ	Ø,ØØØØØØE+ØØ	0,000000E+00
Ø,ØØØØØØE+ØØ	0,00000E+00	Ø.000000E+00	0,00000E+00
0.000000F+00	0.00000F+00	2. 000000F+00	0.00000E+00
0 000000F+00	2 200000E+00	0 00000E+00	0 00000F+00
	0,000000E+00	0,000000C+00	
0.00000000000	0,000000E+00	0.00000000000	0.000000000000
0.000000L+00	0,00000E+00	0,00000E+00	0 000000E+00
0,000000E+00	2,320000E+00	0,000000E+00	0,00000E+00
Ø,ØØØØØØE+ØØ	Ø,000000E+00	0,000000E+00	Ø,Ø00000E+00
0.000000E+00	0.200000F+00	0.000000E+00	0.000000E+00
0 000000E+00	0.00000000000	3 000000E+00	0 000000F+00
	0 0000000.00	3 33333375+33	0 000000C-00
	D 000000000000000000000000000000000000		0,00000000000
0.0000000000000	0,00000000000	0,000000000000	0.00000E+00
9 000000E+00	0.300000E+00	0,00000000000	0,00000F+00
0,000000E+00	0,ØØØØØØE+ØØ	0,00000E+00	Ø,ØØØØØE+00
0,000000E+00	0.000000E+00	0.000000E+00	0.000000000000
0,000000E+00	0.200000E+00	Ø.000000E+00	0.00000000+00
0.00000F+00	0.90000F+00	0,00000F+00	0.020000F+00
0 000000F+00	0 0000000000	0 0000005+00	0 000000F+00
	0.00000000000		
			0.000000E+00
0.00000E+00	0.000000E+00	0,00000E+00	0,000000E+00
0.000000000000	9.00000E+00	0,000000E+00	D. 000000E+00
Ø,000000E+00	0,00000E+00	0,00000E+00	Ø,ØØØØØE+00
Ø,ØØØØØØE+ØØ	0,00000E+00	Ø,ØØØØØØE+0Ø	0,000000E+00
Ø.ØØØØØØE+ØØ	0.020000E+00	0.00000E+00	Ø.000000E+00
0.000000F+00	0. 200000F+00	0.00000F+00	0.00000F+00
0 0000005+00	0.000005+00	0 000000F+00	0.00000F+00
	0 00000000000	a aaaaaaE+aa	0 000000C-00
		0.000000000000	0.000000000000
0.000000E+00	0,00000E+00	0.00000000	0.0000000000000000000000000000000000000
0.000000E+00	0.000000E*00	0,00000000000	0,00000000000
Ø.000000E+00	0.000000E+00	Ø,000000E+00	0,00000E+00
0,000000E+00	0,00000E+00	0,00000000+00	Ø,ØØØØØØE+00
0.000000E+00	Ø,ØØØØØØE+ØØ	0.00000E+00	Ø,000000E+00
0.000000E+00	0.00000E+00	0.00000000+00	0.000000E+00
0 000000F+00	C 00000C+00	0 00000F+00	0 000000F+00
	0 0000000-00	0 000000C+00	0 000000E+00
0 00000005+00			
0.00000000000	0,00000000000	0,00000000000	0,00000000000
0.00000E+00	0.00000E+00	0.00000E+00	6.00000E+00
0,000000E+00	0,00000E+00	0,00000E+00	0,000000E+00
Ø,ØØØØØØE+ØØ	0,00000E+00	0,00000E+00	Ø,200000E+00
Ø,ØØØØØØE+ØØ	0,000000E+00	0,000000E+00	Ø,000000E+00
0.00000000+00	0,000000E+00	0.00000E+00	Ø,ØØØØØØE+ØØ
0.000000F+00	0.000000F+00	0.00000E+00	0.000000E+00
9.000000F+00	0.000000F+00	0.000000F+00	0.00000F+00
a aaaaaa=+aa	0 0000005-00	0 000000E+00	0 000000E-00
0 000000000000	0 000000C-00	0 000000E-00	0 000000E+00
A AAAAAAE . 30	0 000000L=00	0 0000000C-00	4 4046495.400 9 10100005400
0.000000E+00	0.00000000	0.0000001+00	0,00000000000
0.000000E+00	0.000000E+00	0,00000000000	0.00000E+00
0.000000E+00	0,00000E+00	0,000000E+00	0.00000E+00
Ø,ØØØØØØE+00	0,000000E+00	0,00000E+00	Ø,000000E+00

0,000000E+00	Ø,ØØ00ØØE+ØØ	Ø,000000E+00	0,00000E+00
Ø,ØØØØØØE+Ø3	Ø,ØØØØØØE+ØØ	0,00000E+00	0,000000E+02
0,000000000000	0,00000E+00	0,00000E+00	0,00000E+00
0,000000E+00	Ø,ØØØØØØE+ØØ	0,000000E+00	0,00000E+00
Ø,ØØØØØØE+Ø0	0,000000E+00	0,00000E+00	0,000000E+00
0.000000E+00	Ø,ØØØØØØE+ØØ	0,00000000000	Ø,000000E+00
Ø,ØØØØØØE+ØØ	0,00000000000	0,000000E+00	Ø,000000E+00
0,000000E+00	Ø,000000E+00	0,000000E+00	0,000000E+00
0,000000E+00	Ø,ØØØØØØE+ØØ	0,000000E+00	Ø,ØØØØØØE+00
0,000000E+00	0,000000E+00	0,00000000000	Ø,000000E+00
0,000000E+00	0,000000E+00	Ø,ØØØØØE+ØØ	0,00000E+00
0,000000E+00	Ø,Ø©ØØØØE+ØØ	Ø,ØØØØØØE+ØØ	0,000000E+00
0.000000E+30	0,00000E+00	0,000000E+00	0,000000E+00
0,000000E+00	0,00000E+00	0,00000E+00	0,00000E+00
Ø.ØØØØØØE+90	0,00000E+00	0,000000E+00	¢,030000E+00
MUE	NHE	GF	HF
-2.790000F+00	3.7000005-01	=2.572600E=03	#8.233600E=04
1.800000F-01	7.0000005-02	=3.198300F=07	-1.2945005-00
1.4200005+00	3.5000000-01	9.840100F=05	-5.1965005-05
1.780000E+00	1.2000005-01	1.699800E=04	=4,416720F=07
2.290000F+00	5.0000005-02	6.500200F-05	2 688100F=05
3.300000000000	5.0000000-01	5.686900F=05	-6.460600F-05
3.630000E+00	8.0000000-02	3.140400F=05	1.0707005-05
4.520000E+00	3.900000F-01	6.657000F=05	-8.268400F-05
5.7300000 + 90	1.800000E-01	1.562600E-05	-3.874500E-05
6.800000E+00	9.000000E-02	2.564300E-04	5.280200E-05
7.490000E+00	9.000000E-02	7.950100E-06	2.117000E-06
8.6300000000	2.600000E-01	2.333200E-05	■1.111800E-06
9.150000E+00	1,400000E-01	2.237300E=05	-2.318000E-05
1,035000E+01	1,600000E-01	4 157200E+04	5 193400E-06
1.128000E+01	2.000000E-01	5,297000E-05	1,405700E-05
1,175000E+01	1,600000E-01	9,762400E-06	-6,320400E-06
1,276000E+01	1,700000E-01	3,530800E=04	6,722500E+05
1.347000E+01	2,000000E-01	5,193400E=05	2,549500E-05
1.366000E+01	1.400000E-01	7,479400E=05	-3,201300E-05
1,528000E+01	1.200000E-01	1.815100E-04	•5,565000E •05
1,613000E+01	2,200000E-01	1,542900E-04	-7,569300E-06
1.652000E+01	1,300000E-01	1,435700E-04	4,052700E-05
1.793000E+01	1,200000E-01	6,4438ØØE-05	6,335700E-06
1.842000E+01	2,100000E-01	9,075500E-05	7,462700E-07
1.886000E+01	1,500000E-01	3,255600E-04	-6,914400E-05
2,053000E+01	2,200000E-01	1,6876ØØE=04	1,015800E-05
2.185000E+01	1,300000E-01	1,991800E-04	1,331600E-04
2,223000E+01	2.40000E-01	8,122200E=04	-1,217200E-04
2.294000E+01	3.820000E-01	1.441400E-04	2,223600E-06
2,354000E+01	3,300000E-01	9,811200E-05	-1.411400E-04
2.513000E+01	1.920200E-01	1,261700E=04	-6,408800E=05
2.0190002+01	1./000005-01	4,858400E=06	1,594600E-05
2,05/00000+01	2,40000000=01	9,456300E-05	1,777300E=05
2.739000E+01	4,300000E-01	2,0302005-05	-1,670700E+05
2,0000001+01	1,000000E-01	3,400300E+05	3.073300E-07
2,0770001+01	3,00000E=01 7,00000E=02	3,117300E=04	8,70/200E-00
2,700000L+01 7 0450005+04	1 000000L-01	0,000000L=00	14/40700Em02
3,0100001+01 7 0760005±04	1,000000E=01, 1,000000E=01	4,00000L=00 7,030400C=05	72,8785001=00 7 0005005-05
3,070000L701 3,100000E-04	1,400000EF01 4 700000EF01	/ ,737400と=07 う 1067005=07	-1 434400E#00
3 1980005-01	1 40000000-001	<pre><</pre>	-1,101100E=04 1 0007005=05
3.2740b0F+01	4.3000005=01	6.110300F=05	=1.400100F=04
		0,4100901-00	AL ANNING MAL

3 ,403000E+ 01	6,600000E-01	1,4634ØØE=Ø4	4,866ØØØE-05
3 4530005+01	4 2000005-01	2 616100F=04	4 974100F-05
7 5400000-04	1 20000000000	A 0400000-05	-0 0446005-06
3.9190002401	1.20000000	4,0420000-005	-9,2440000000
3,546000E+01	1,700000E-01	1,777300E=05	-3.595800E-05
3.654000E+01	9,000000E+02	8.559300E=05	2,813000E-05
3.7500000 +01	2.40000000-01	1.1392005-04	4.576600E=05
7 0440000-004		4 7770005-04	1 7574005-04
3.940000E+01	2.00000E-01	1.73700000-004	1,7536000000
3.957000E+01	1,600000E-01	2,9546ØØE=Ø6	-9,853800E-05
4.006000E+01	4.900000E-01	1.445200E=04	-1.417300E-04
4 106000F+01	9 0000005 02	3 1755005+05	2.019500F-05
4 343000000000	1 00000000-01	0 1007005-05	5 543400E-05
4.2020002.001	1.200000000	7,0723002-00	2, 3434002-03
4.34/0006+01	1.400000E=01	5,068500E-05	8,513600E-00
4.464000E+01	5,600000E-01	1,179700E-04	3,871500E-05
4.531000F+01	5.200000F=01	1.6966005-05	-6.069100E-05
A 601000E+01	8 000000-00	3 8760005-05	-0 461000E-N5
4.0010002+01	0.000000000000	3.0700002-03	-214012000-000
4./1/000E+01	2.300000E=01	1,140900E≈04	-3'808700F-NÖ
4.864000E+01	1,300000E-01	2.537300E=04	-3,2836ØØE-Ø>
4.912000F+01	9.000000F=02	1.375300F=05	-9.732000E=06
5 0010005+01	4 5000005-01	7 7477000-05	- 5705005-05
2.0210005+01		/./0/3002-05	-4,5785882-85
5,099000E+01	3,800000E=01	2.7277005-05	=6,853500E=0/
5,195000E+01	6,200000E=01	2,365200E=05	-6,617400E-05
5.291000E+01	2.2000005-01	7.287500F=05	-9.770000E-05
5 307/10/05+01	1 400000-01	9 183700E-05	-7 4475005-05
		9,100/00E-00	
5.477000E+01	A . NONNONE - NS	A'TASSNOF #N2	1,1302001=03
5.609000E+01	2,700000E-01	9,3314ØØE=05	1,952500E=04
5.635000E+01	3.000000F-01	3.339500E=04	-8.193700E-05
5 7480005+01	4 9000005-01	4 3587005-04	3 5943005-05
			7 0500000
2.021000E+01	2.300000E-01	1,4100005-04	3.9998005-09
6.130000E+01	4,000000E-01	2,825300E-04	7,231200E=05
6.250000E+01	2.000000F-01	1.642700E-04	-2.278400E-05
6 430000E+01	4 0000005-01	3 4727005-04	-3 358200F-05
MUC	NUC	GC	HC
	2.1000005-01	TIGITADACADA	-0100/000L-05
1.800000E-01	1.000000E=05	4.204400E=07	-0.045000F-00
1.420000E+00	3,500000E-01	3,5486ØØE+Ø6	-1,110300E-05
1.780000E+00	1.200000F-01	3.988700E-05	8.833400E-06
2 2000000 +00	5.0000005-02	5 6747005-05	2 8328005-06
7 7000000.00	5 000000000000	0 ÅEDØØØE-ØA	1 0664 00E - 06
3,300000E+00	2.00000E=01	2,4520002400	1.0001000-00
3,630000E+00	8.000000E-05	1.405700E=05	1,3250001-00
4,520000E+00	3,900000E-01	5,787400E-06	-4,173000E-06
5.730000E+00	1.800000E-01	5.102000E-06	-3.274400E-06
6 800000E+00	9 0000005-02	8 7314005-05	4 035900F-06
			4 B070000-06
7.490000E+00		2,0000005005	1,3010005-00
8 6300002E+00			
9.150000F+00	2,600000E-01	3,502900E-06	-2.832800E-06
	2.600000E-01 1.400000E-01	3,502900E-06 4,843100E-06	-2,83280ØE-0ô -9,44260ØE-07
1.03500000+01	2.600000E-01 1.400000E-01 1.60000E-01	3,502900E-06 4,843100E-06 8,286600E-05	-2,832800E-06 -9,442600E-07 3,609500E-06
1.035000E+01	2.600000E-01 1.400000E-01 1.600000E-01 2.000000E-01	3,502900E-06 4,843100E-06 8,286600E-05 5,452300E-05	-2,832800E-06 -9,442600E-07 3,609500E-06 -5,010700E-06
1.035000E+01 1.128000E+01	2.600000E-01 1.400000E-01 1.600000E-01 2.000000E-01	3,502900E-06 4,843100E-06 8,286600E-05 5,452300E-06	-2,832800E-06 -9,442600E-07 3,609500E-06 -5,010700E-06
1.035000E+01 1.128000E+01 1.175000E+01	2.603000E-01 1.400000E-01 1.600000E-01 2.000000E-01 1.600000E-01	3,502900E-06 4,843100E-06 8,286600E-05 5,452300E-06 *1,049300E-05	-2,832800E-06 -9,442600E-07 3,609500E-06 -5,010700E-06 -3,502900E-07
1.035000E+01 1.128000E+01 1.175000E+01 1.276000E+01	2,600000E-01 1,400000E-01 1,600000E-01 2,000000E-01 1,600000E-01 1,600000E-01	3,502900E-06 4,843100E-06 8,286600E-05 5,452300E-06 *1,049300E-05 4,887300E-05	-2,832800E-06 -9,442600E-07 3,609500E-06 -5,010700E-06 -3,502900E-07 3,533400E-06
1.035000E+01 1.128000E+01 1.175000E+01 1.276000E+01 1.347000E+01	2.60000E-01 1.400000E-01 1.600000E-01 2.000000E-01 1.600000E-01 1.600000E-01 1.700000E-01 2.00000E-01	3,502900E-06 4,843100E-06 8,286600E-05 5,452300E-06 1,049300E-05 4,887300E-05 1,491000E-05	-2,832800E-06 -9,442600E-07 3,609500E-06 -5,010700E-06 -3,502900E-07 3,533400E-06 -5,361000E-06
1.035000E+01 1.128000E+01 1.175000E+01 1.276000E+01 1.347000E+01 1.36000E+01	2.603000E-01 1.400000E-01 1.600000E-01 2.000000E-01 1.600000E-01 1.700000E-01 2.00000E-01 1.400000E-01	3,502900E-06 4,843100E-06 8,286600E-05 5,452300E-06 1,049300E-05 4,887300E-05 1,491000E-05 3,167800F-06	-2,832800E-06 -9,442600E-07 3,609500E-06 -5,010700E-06 -3,502900E-07 3,533400E-06 -5,361000E-06 2,375900E-06
1.035000E+01 1.128000E+01 1.175000E+01 1.276000E+01 1.347000E+01 1.366000E+01	2.603000E-01 1.400000E-01 1.600000E-01 2.000000E-01 1.600000E-01 1.700000E-01 2.00000E-01 1.400000E-01	3,502900E-06 4,843100E-06 8,286600E-05 5,452300E-06 *1,049300E-05 4,887300E-05 1,491000E-05 3,167800E-06 7,057600E-05	-2,832800E-06 -9,442600E-07 3,609500E-06 -5,010700E-06 -3,502900E-06 -5,361000E-06 2,375900E-06 2,375900E-06
1.035000E+01 1.128000E+01 1.175000E+01 1.276000E+01 1.347000E+01 1.366000E+01 1.528000E+01	2.603000E-01 1.400000E-01 1.600300E-01 2.000300E-01 1.600000E-01 1.700300E-01 2.000000E-01 1.400000E-01 1.200000E-01	3,502900E-06 4,843100E-06 8,286600E-05 5,452300E-06 1,049300E-05 4,887300E-05 1,491000E-05 3,167800E-05 7,057600E-05	-2.832800E-00 -9.442600E-00 -5.010700E-00 -3.502900E-00 -3.533400E-00 -5.361000E-00 2.375900E-00 -4.416700E-00
1.035000E+01 1.128000E+01 1.175000E+01 1.276000E+01 1.347000E+01 1.366000E+01 1.528000E+01 1.613000E+01	2.603000E-01 1.400000E-01 1.600000E-01 2.000000E-01 1.600000E-01 1.700000E-01 2.000000E-01 1.400000E-01 1.200000E-01 2.200000E-01	3.502900E-06 4.843100E-06 8.286600E-05 5.452300E-05 4.887300E-05 1.491000E-05 3.167800E-05 3.267600E-05 8.209000E-05	$\begin{array}{c} -2 & 832800 = -267 \\ -9 & 442600 = -267 \\ 3 & 609500 = -267 \\ -5 & 010700 = -265 \\ -5 & 502900 = -265 \\ -3 & 502900 = -265 \\ -5 & 361000 = -265 \\ -5 & 361000 = -265 \\ -4 & 416700 = -265 \\ -4 & 584200 = -265 \\ -4 $
1.035000E+01 1.128000E+01 1.175000E+01 1.276000E+01 1.347000E+01 1.366000E+01 1.528000E+01 1.613000E+01 1.652000E+01	2.603000E-01 1.400000E-01 1.600000E-01 2.000000E-01 1.600000E-01 1.700000E-01 1.400000E-01 1.200000E-01 1.200000E-01 1.30000E-01	3,502900E-06 4,843100E-06 8,286600E-05 5,452300E-05 4,887300E-05 1,491000E-05 3,167800E-05 3,167800E-05 8,209000E-06 3,047500E-05	-2.832800E-06 -9.442600E-07 3.609500E-06 -5.010700E-06 -3.502900E-06 -5.351000E-06 -2.375900E-06 -4.416700E-06 -4.584200E-06 -4.584200E-06
1.035000E+01 1.128000E+01 1.175000E+01 1.276000E+01 1.347000E+01 1.366000E+01 1.528000E+01 1.613000E+01 1.652000E+01 1.793000E+01	2.603000E-01 1.400000E-01 1.600000E-01 2.000000E-01 1.600000E-01 1.700000E-01 2.00000E-01 1.20000E-01 1.300000E-01 1.20000E-01 1.20000E-01 1.20000E-01	3.502900E-06 4.843100E-06 8.286600E-05 5.452300E-06 1.049300E-05 1.491000E-05 3.167800E-05 8.209000E-06 3.047500E-05 8.20900E-05	-2,832800E-06 -9,442600E-07 3,609500E-06 -5,010700E-06 -3,502900E-06 -5,361000E-06 2,375900E-06 -4,46700E-06 -4,584200E-06 6,625000E-06 2,162700E-06
1.035000E+01 1.128000E+01 1.175000E+01 1.276000E+01 1.347000E+01 1.366000E+01 1.528000E+01 1.613000E+01 1.652000E+01 1.793000E+01 1.84200E+01	2.603000E-01 1.400000E-01 1.600000E-01 2.000000E-01 1.600000E-01 1.700000E-01 1.200000E-01 1.200000E-01 1.30000E-01 1.20000E-01 1.20000E-01 2.100000F-01	3.502900E-06 4.843100E-06 8.286600E-05 5.452300E-06 4.843300E-05 1.491000E-05 3.167800E-06 7.057600E-05 8.209000E-06 3.047500E-05 1.465100E-05 1.000600E-05	-2.832800E-00 -9.442600E-00 -5.010700E-00 -3.502900E-00 -3.502900E-00 -3.53400E-00 -3.53400E-00 -4.416700E-00 -4.584200E-00 -4.584200E-00 -2.162700E-00 -1.919000E-00
1.035000E+01 1.128000E+01 1.175000E+01 1.276000E+01 1.347000E+01 1.366000E+01 1.528000E+01 1.613000E+01 1.652000E+01 1.793000E+01 1.842000E+01 1.842000E+01	2.600000E-01 1.400000E-01 1.600000E-01 2.000000E-01 1.600000E-01 1.70000E-01 1.200000E-01 1.200000E-01 1.200000E-01 1.200000E-01 1.200000E-01 1.200000E-01 1.200000E-01 1.200000E-01 1.200000E-01	3,502900E-06 4,843100E-06 8,286600E-05 5,452300E-05 4,887300E-05 1,491000E-05 3,167800E-05 3,167800E-06 7,057600E-05 8,209000E-06 3,047500E-05 1,465100E-05 5,367000E-05	-2.832800E-06 -9.442600E-07 3.609500E-06 -5.010700E-06 -5.3502900E-06 -5.361000E-06 2.375900E-06 -4.416700E-06 -4.584200E-06 -4.584200E-06 -2.162700E-06 -1.99000E-06 -4.690820E-06
1.035000E+01 1.128000E+01 1.175000E+01 1.276000E+01 1.347000E+01 1.366000E+01 1.528000E+01 1.613000E+01 1.652000E+01 1.793000E+01 1.842000E+01 1.886000E+01 1.886000E+01	2.603000E-01 1.400000E-01 1.600300E-01 1.600000E-01 1.600000E-01 1.70000E-01 1.200000E-01 1.200000E-01 1.200000E-01 1.30000E-01 1.200000E-01 1.50000E-01 1.50000E-01	3.502900E-06 4.843100E-06 8.286600E-05 5.452300E-05 4.887300E-05 1.491000E-05 3.167800E-05 3.167800E-05 8.209000E-06 3.047500E-05 1.465100E-05 1.465100E-05 1.600600E-05	$\begin{array}{c} -2 & 832800 = -26 \\ -9 & 442600 = -27 \\ 3 & 609500 = -26 \\ -5 & 010700 = -26 \\ -5 & 502900 = -26 \\ -3 & 502900 = -26 \\ -3 & 503400 = -26 \\ -3 & 5361000 = -26 \\ -3 & 5361000 = -26 \\ -4 & 416700 = -26 \\ -4 & 584200 = -26 \\ -4 & 584200 = -26 \\ -4 & 584200 = -26 \\ -4 & 584200 = -26 \\ -4 & 690800 = -26 \\ -4 & 69080 = -26 \\ -4 & 690 $

2,185000E+01	1,300000E-01	5.239100E=05	1.731600E=05
2.223000E+01	2.400000E-01	9.843100E-05	-1.204700E=05
2,294000E+01	3,800000E-01	-1,417900E-05	-1,189500E-0>
2.354000E+01	3,300000E-01	6,107200E-06	4.614700E-06
2,513000E+01	1,900000E=01	2,110900E-05	-4,873600E-07
2,619000E+01	1.700000E-01	≈8,696300E+06	-2,132200E=06
2,657000E+01	2,400000E=01	1,963100E-05	1,378300E-05
2,739000E+01	4,300000E=01	1,163600E-05	5.345700E-06
2.833000E+01	1,600000E-01	1.775800E-05	=6,39660ØE+07
2,899000E+01	3.000000E-01	2,683500E-05	-1,166600E=05
2,966000E+01	7,000000E-02	4,858400E∞06	-1 005200E-06
3,015000E+01	1.00000000-01	≥9,594900E=07	=1,949400E=06
3,076000E+01	1,400000E-01	1,791000E-05	1,294500E=06
3,120000E+01	4,700000E-01	1,880900E+05	-8,742000E-06
3.198000E+01	1.400000E-01	3,5227005-05	-1.026500E-05
3,274000E+01	4,300000E-01	=1,309800E-06	=1.646400E=05
3.403000E+01	5,600000E-01	-3,464800E-05	=3,699400E=05
3,453000E+01	4,200000E-01	6,2748ØØE-06	2,228100E=05
3,519000E+01	1,200000E-01	-5,5589Ø0E-06	1.888500E-06
3,546000E+01	1,700000E-01	1,736200E-06	9 457800E-06
3.654000E+01	9,000000E-02	2,9988005-05	8,361300E-06
3,750000E+01	2,400000E-01	7,995700E=06	4,706100E-06
3,946000E+01	2,800000E-01	=2,208300E=06	=1.873300E-05
3,957000E+01	1,600000E-01	⇒6,427100E=06	1.306700E-05
4.006000E+01	4,900000E-01	1,305200E-05	1.667700E-05
4.106000E+01	9,000000E-02	1.637200E-05	4,980200E=06
4.262000E+01	1,200000E-01	2,6424ØØE-05	5,437100E-06
4 347000E+01	1,400000E-01	1,053900E-05	-1,675300E-07
4.464000E+01	5,600000E-01	5,330500E-06	9,122800E-06
4.531000E+01	5,200000E-01	6,8383ØØE-06	-6,960100E=06
4,601000E+01	8,00000000-02	2,197700E-05	=6,229100E=06
4,717000E+01	2,300000E-01	5,5894ØØE-Ø6	-5.665600E-06
4.864000E+01	1.30000000-01	1.2224ØØE-Ø4	5.010700E-06
4,912000E+01	9,000000E-02	=3,304900E=06	-7,081900E=06
5,021000E+01	4 . 500000E-01	=2,589100E-07	-6,152900E-06
5,099000E+01	3,8000000-01	-2,284500E-06	-1,248900E-05
5,195000E+01	6 200000E-01	-2,488600E-05	1,081300E-06
5,291000E+01	2,200000E-01	1,239700E-05	3,670400E-06
5.397000E+01	1,400000E-01	1,717900E-05	3,472400E=06
5,477000E+01	9,000000E*02	3,078000E-05	3,914100E-06
5,609000E+01	2,700000E-01	8,8334ØØE-Ø6	3,807500E=07
5,635000E+01	3,000000E-01	3,434400E-05	8,041400E-06
5.748000E+01	4,900000E-01	2,400200E-05	4,888800E=06
5,851000E+01	2,300000E-01	1,576300E-05	=3,076500E=06
6,130000E+01	4,000000E-01	1,271700E-05	=1,797100E-06
6,250000E+01	2,000000E-01	8,541000E-05	-3,990300E-06
6,430000E+01	4,000000E-01	5,408200E-05	-2,464200E-05

ADLER-ADLER CROSS-SECTIONS FOR THIS ELEMENT

TROSS-SECTIONS AT THERMAL ENERGY

NEUTRON ENERGY(EV) TOTAL X-SECTION FISSION X-SECTION CAPTURE X-SECTION

CROSS-SECTIONS NOT DOPPLER BROADENED

NEUTRON ENERGY(EV)	TOTAL X-SECTION	FISSION X=SECTION	CAPTURE X-SECTION
7,900000E-01	0,00000000000	1.161008E+02	9,006454E+00
8,230000E=01	0,0000000000	1,1571875+02	9,343404E+00 0,7056935+00
0.0000000000		T*70AC0F+05	9.3935232400
9,100000E→01	0,000000E+00	1 # 4332921 # 1/2 * 249440 F + 1/2	4 04 1 0 1 0 E + 0 1
9.300000E=01 9.700000E=04	0 000000E + 00	1.3405415+02	1 0865225+01
	0 000000C+00	4 3470855+02	1 4 9 4 9 4 9 5 7 9 4
1 0420005-00	0 000000C+00	1.4941595+02	1 2251535+01
1,07000000000	0,000000F+00	1.4884605+02	1 305792E+01
1.070000000	0,000000E+00	1.488460F+02	1 305792F+01
1.105000E+00	0.00000F+00	1.582335E+02	1.426979E+01
1.140000E+00	0,000000E+00	1.692363E+02	1.574855E+Ø1
1.140000E+00	0.00000E+00	1.092363E+02	1.574855E+Ø1
1,168000E+00	0,0000000+00	1,792582E+02	1.715593E+01
1.210000E+00	0,00000000+00	1,963328E+02	1.970238E+01
1.231000E+00	0,000000E+00	2,057450E+02	2.119558E+01
1,280000E+00	0,000000E+00	2,296199E+Ø2	2,532049E+01
1,294000E+00	Ø,000000E+00	2.368252E+02	2,667538E+01
1,350000E+00	Ø,000000E+00	2, <u>0</u> 64782E+02	3,293553E+01
1,357000E+00	0,00000E+00	2,702130E+02	3,381631E+Ø1
1,420000E+00	0,00000E+00	3,034496E+02	4,281927E+01
1,456000E+00	0,00000000000	3,224419E+Ø2	4.897963E+Ø1
1,490000E+00	Ø,000000E+00	3,415267E+02	5,572214E+01
1,4920002+00	0,0000000000	3.427200E+02	5.6153576+01
1,528000E+00	0,0000000000	3,065928E+02	6,477248E+01
1,560000E+00	0,00000E+00	3,937/54E+02 7 077/54E+02	7,4199042+01
1.20400000-000		0 + 7 / 401E + 02	7,332877L=01
1 630000000000	0 000000E+00	41712/201402 A 3901785+02	8,943/12C+01 1 0/3572C+02
1.636000000000	0,000000E+00	4,7274/0E+02 5,052494F±02	1 0777495+02
1.660000000000	0,0000000+00	5.6952755+02	1 2290805+02
1.672000F+00	0.000000F+00	5.961533F+02	1.315074E+02
1.684000E+00	0.00000F+00	6.32976ØE+02	1.405066E+02
1.700000E+00	0.0000000+00	6.861321E+Ø2	1.529312E+02
1,708000E+00	Ø, ØØØØØØE+ØØ	7,137733E+Ø2	1,59118ØE+02
1.708000E+00	0,00000E+00	7,137733E+02	1,591180E+02
1.732000E+00	Ø,ØØØØØØE+ØØ	7,945725E+Ø2	1,758568E+02
1.744000E+00	Ø,000000E+00	8,290315E+02	1,820382E+02
1.756000E+00	0,000000E+00	8,554532E+Ø2	1,858469E+02
1.770000E+00	Ø.00000E+00	8,722724E+02	1,865439E+02
1.780000E+00	0,000000000000	8,733790E+02	1,843208E+02
1.8040000000	0,000000E+00	8,0818796+02	1,7039446+02
1 831000E+00 1,020000E+00	0 000000E+00	/ BUIDOJ4L+84 7 5841495189	1 AROONOC+82
1 88340065400	0 000000C+00 0 000000C+00	/ # 400107E706 6 6836785103	4 9497885-09
1 8760005-00	0 000000C+00 0.000000C+00	5 7716878100	1 0357095-03
1 8820005-00	0.00000C+00	5.5413475409	4.867/27548
1 90000000000	0.0000005-00	4. 9841425102	8 8050675104
***********	NINCANNE-NA	7 * C 9 4 7 4 5 7 8 5	0,000,0001

PROGRAM AVRAGES (INPUT, OUTPUT) AVG3ØØ1 C----THIS PROGRAM CALCULATES AVERAGE CAPTURE AND FISSION CROSS-SECNS 4VG3002 C-----FROM ENDF/B DATA, LIMITATIONS=1, CALCULATES S AND P-WAVE X-SECNS AVG3003 C----ONLY'2. INELASTIC EFFECTS NOT ALLOWED FOR, 3. WIDTH FLUCTUATIONS OF AVG3004 C-----THIS PROGRAM MODIFIED ON 21.9.70 TO TAKE INTO ACCOUNT THE NEW AVG3005 AVG3006 C----FORMAT MODIFICATIONS WHICH GIVE THE ISOTOPE MASS AWRI AND THE NEW AVG3007 C---=-RECOMMENDATION TO USE THE RADIUS A=(1.23+AWRI**(1/3)+0.8)*0.1 AVG3ØØ8 C----TO CALCULATE PENETRABILITIES AND USE A DIFFERENT RADIUS TO OBTAIN AVG3009 C----POTENTIAL SCATTERING, RUNS ON CDC-6600 AND PDP-10. AVG3Ø1Ø DIMENSION RUN(7), BLA(20), ES(100), MUFA(10), DA(10), XJA(10), XXJA(10), AVG3011 1GNO(10),GG(10),GFE(100,10),MUFB(10),DAB(10),XJB(10),XXJB(10), AVG3Ø12 AVG3Ø13 2GNOB(10), GGB(10), GFEB(100,10), MUFF(10), MXJA(10), AVG3Ø14 3GIGGS(100),GIGGP(100),GIGFS(100),GIGFP(100),GISS(100),GISP(100) COMMON/XBAR/XX(4,10) AVG3Ø15 DATA XX/0.005252,0.051755,0.112925,0.169150,0.037171,0.163095, 10.265600,0.340780,0.103126,0.288421.0.404385,0.480571,0.207836, AVG3Ø16 AVG3017 20.431766,0.547724,0.617825,0.359852,0.599210,0.704048,0.762381, AVG3018 30.574283,0,800=60,0,882440,0,922898,0.879334,1.053224,1.096835, 41.111387,1.334210,1.393010,1.374373,1.350285,2.105227,1.916230, AVG3Ø19 AVG3Ø2Ø 51.786357,1,697511,4.390800,3.301643,2.824583,2.546602/ AVG3021 READ1, IRUN, (RUN(I), I=1,7), EO, EN, ESTEP AVG3023 881 AVG3Ø24 IF(IRUN.EQ,0)Gn TO 8800 AVG30241 GO TO 882 AVG3Ø25 882 PRINT39 PRINT35 AVG3Ø26 AVG3027 PRINT40 AVG3Ø28 PPINT35 PPINT27, IPUN, (RUN(I), I=1,7), EO, EN, ESTEP AVG3029 C----IF IRUN EQUALS ZERO THE PROGRAM EXITS, RUN(1) TO RUN(7) ANY TITLE AVG3030 C----IN COLUMNS 11 TO 38, E0, EN, ESTEP ALL IN EV NEED BE GIVEN ONLY FOR AVG3031 C----- NON-FISSILE NUCLEUS. THE PROGRAM THEN CALCULATES THE AVERAGE AVG3032 C-----CROSS-SECTIONS FROM EØ TO EN IN STEPS OF ESTEP, FOR A FISSILE NUCLAVG3Ø33 C----THE CROSS-SECTIONS ARE CALCULATED FOR THOSE ENERGIES ES(I) FOR WHIAVG3034 AVG3Ø35 C-----THE FISSION WIDTHS ARE GIVEN.EXCEPT FOR THE TITLE CARD ALL THE C----REST OF THE DATA CARDS ARE IN ENDE/D FORMAT FOR UNRESOLVED PARAS AVG3Ø36 C----METERS IN FILE 2. AVG3Ø37 AVG3Ø38 1 FORMAT(110,744,2X,3E10,4) AVG3Ø39 NFLAG1=1 AVG3Ø41 RFAD 2, EN1, EN2, LRU, LRF, LFI PRINT26, EN1, EN2, LRU, LRF, LFI C----EN1=LOWER ENERGY LIMIT OF A RANGE, EN2=UPPER LIMIT, LRU=1 IMPLIES AVG3042 AVG3043 C-----RESOLVED PARAMETERS, LRU=2 UNRESOLVED PARAMETERS, LFI=Ø NON-FISSILEAVG3044 AVG3045 C----ISOTOPE, LFI=1 FISSILE ISOTOPE, 2 FORMAT(2E11,4,4I11) AVG3Ø46 READ2, SPIN, A, BLA(2), BLA(3), NE, NLS AVG3048 AVG3049 PRINT28, SPIN, A, NE C-----SPIN=NUCLEAR SPIN, A=SCATTERING LENGTH IN UNITS OF 1.0*E-12 GM. AVG3050 C----NE=NUMBER OF ENERGY VALUES AT WHICH FISSION WIDTHS ARE TABULATED, AVG3051 C----NLS=NUMBER OF 1. STATES. AVG3052 IF NES IS ZERO IT IS A NONFISSILE NUCLEUS, THIS IS DONE TO GET AVG3053 C-----AROUND THE FACT THAT LFI IS GIVEN ONLY IN FILE1 FIRST SECTION AVG3054 C----AND NOWHERE IN FILE 2 AVG3055 IF(NLS)040,640,641 AVG3056 AVG3057 641 PRINT23 AVG3Ø58 PRINT35 AVG3059 PRINT24 AVG3060 PRINT35
READ3, (ES(I), I=1, NE) AVG3062 PRINT29 AVG3063 PRINT3.(ES(I),I=1,NE) AVG3064 C----ES(I)=ENERGY VALUES AT WHICH FISSION WIDTHS ARE TABULATED. AVG3ø65 3 FORMAT(6E11.4) AVG3066 READ2, AWRI, BLA(5), LA, BLA(6), NJS, JA AVG3068 PRINT34, AWRI, LA, NJS AVG3069 C----THESE ARE SPNAVE PARAMETERS, C-----AWRIEISOTOPIC MASS IN UNITS OF THE NEUTRON MASS, LAEANGULAR MOMENTMAVG3071 C-----NJS=NO OF SPIN STATES FOR THIS L-VALUE, JA=NJS FOR NON-FISSILE NUC, AVG3072 JA=NJS AVG3073 NRENLS AVG3Ø74 AVG3076 DO 644 1=1.JA READ2, BLA(7), BLA(8), LA, MUFA(I), BLA(9), BLA(10) AVG3077 RFAD3,D4(I),XJA(I),XXJA(I),GNO(I),GG(I),DRAT AVG3078 PRINT35 AVG3079 PRINT30,DA(I),XJA(I),GNO(I),GG(I) AVG3Ø8Ø ILLIAD=INT(XXJA(I)) AVG3Ø81 PPINT31, ILLIAD AVG3082 PRINT32, MUFA(I) AVG3Ø83 PRINT33 AVG3084 RFAD3, (GFE(11,1),11=1,NE) AVG3085 PRINT3, (GFE(II, I), II=1, NE) AVG3086 644 CONTINUE AVG3Ø87 C-----THESE ARE S-WAVE PARAMETERS FOR A FISSILE NUCLEUS, AVG3088 C-----LA=ANGULAR MOMENTUM,MUFA(I)=NUMBER OF DEGREES OF FREEDOM FOR FISSNAVG3089 C-----WIDTH DISTRIBUTION FOR THE I-TH SPIN STATE. AVG3090 C----DA(I)=MEAN LEVEL SPACING I-TH SPIN STATE, XJA(I)=FLOATING PT VALUE AVG3091 C----OF J, XXJA(I)=NUMBER OF DEGREES OF FREEDOM FOR NEUTRON WIDTH DSTRNAVG3092 C----GNO(1)=AVERAGE REDUCED NEUTRON WIDTH(EV), GG(1)=AVERAGE GAMMA WDTH, AVG3093 C-----GFE(II,I)=AVERAGE FISSION WIDTH FOR I-TH SPIN STATE AND II-TH ENERAVG3094 C----GY WHERE II RUNS FROM 1 TO NE. AVG3095 IF (NR-2)2085,95,88 AVG3096 AVG3Ø97 640 NFLAG1=0 PRINT22 AVG3098 PRINT35 AVG3099 PRINT24 AVG3100 PRINT35 AVG3101 FROM NOW ON NFLAG1 ZERO INDICATES A NONFISSILE NUCLEUS С AVG3102 NLS=NE AVG3103 NR=NLS AVG3104 READ2, AWRI, BLA(5), LA, BLA(6), NUS, JA AVG3106 PRINT34, AWRI, LA, JA AVG3107 DO 6400 1=1, JA AVG3108 READ3, DA(I), XUA(I), XXUA(I), GNO(I), GG(I), DRAT AVG3109 PRINT30, DA(1), XJA(1), GNO(1), GG(1) AVG3110 ILLIAD=INT(XXJA(I)) AVG3111 PRINT31, ILLIAD AVG3112 6400 CONTINUE AVG3113 C----*THESE ARE S-WAVE PARAMETERS FOR A NON-FISSILE NUCLEUS. AVG3114 C-----THESE ARE THE SAME AS THOSE READ IN AFTER READ CARDS 5 AND 6 AVG3115 IF (NR=2)2085,95,88 AVG3116 95 IF(NFLAG1)646,646,647 AVG3117 647 READ2, AWRI, BLA(5), LB, BLA(6), NJS, JB AVG3119 PRINT35 AVG3120 PRINT25 AVG3121

	PRINT35										4	VG3122
		PRINT34	4, AWRI	, LB, N	JS						۵	VG3123
	J8=NJS										A	VG3124
C	99999999999	999999999	999999	99999	99999	999999	999999	99999	999999	99999999	999994	VG3125
-	DO 648 I=	1.JB									4	VG3126
		READ	D2.BLA	(7),8	LA(8)	LE,MU	FB(1),	BLA(9),BLA	(10)	A	VG3127
		REAL	13.048	111.X	JECTY	.XXJR(T) GNC	B(1).	GGB(I	DRAT	4	VG3128
	PRINT35				••••••						Å	VG3129
	1.101.02	POIN	UT 3 0 . D	ARITA	X 187	T	8(1).6	GRITA			A	VG3130
		1		7 (7 7 1	9(1))	• / • • • •		0.5 (1 /			2	VG3131
		10,61	1734 1		0.711						, ,	VG3132
		0011	1132 M	HELAU HER/A	、							VC3133
			91061M		/ t		•					VC3434
		55.AU	301(6r 1777	FO(II	*****	T=TNNE)				, , , , , , , , , , , , , , , , , , ,	VC3435
			9100 77 / 45			7	•				, , , , , , , , , , , , , , , , , , ,	VC3434
		FRIM	IS, GF	FRITT	* 7 3 * 7	TETNE	.)				P	V03130
048	CONTINUE				г -						A	VG0107
C	THESE ARE	PHWAVE	PARAM	LTERS	_ OR	A 1155	ILE NU	ICLEUS				V03130
C	L8=ANGULA	R MOMENT	TUM, NJ	S=NUM	BER O	F SPIN	SIATE	S,JB≖	NUSF	JR A NU	N-FISA	VG3139
C	SILE NUCLI	EUS,DAB	(I) = ME	AN LE	VEL S	PACING	FURT	HE I-	IH SP	IN STAT	E, A	VU3140
0	;XJB(1)=FL(OATING F	PT,_VA	LUE O	FJF	OR THE	I⇔TH	SPIN	STATE	XXJB(I)= A	VG3141
C=====	NUMBER OF	DEGRFES	SOFF	REEDO	M FOR	NEUTR	ON WID	DI HT	STRIB	UTION F	OR A	VG3142
C	THE ISTH S	STATE,ML	JFB(İ)	=SAME	FOR	FISSIC	IN WIDT	H DIS	TRIBU	TION,	4	VG3143
C	GNOB(I)=R	EDUCEN N	VEUTRO	N WID	TH I	-TH SP	IN STA	TE=NE	UTRON	WIDTH(EV)/ A	VG3144
C	(XXJB(I)#	SORT(F):	PENET	RATIO	N FAC	TOR)	IN CAL	CULAT	ING T	HE PENE	TRATNA	VG3145
C	FACTOR ,TI	HE NUCLE	EAR RA	DIUS	USED	IS GIV	EN BY	=(1.2	3*AWR	I **(1/ 3	5)+Ø.8A	VG3146
C	·) #0.1	WHERE AV	RI=AW	RI#1.	00866	5	GGB((I) = AV	ERAGE	GAMMA	WDTH A	VG3147
C	-WIDTH.GF	EB(11.1)	=AVER	AGE F	ISSIO	NWIDT	H FOR	I-TH	SPIN S	STATE A	ND A	VG3148
	IT_TH ENER	RGY VALL	JE WHE	RE IT	VART	ES FRO	M 1 TC	NF.			4	VG3149
0 +	60 TO 208	5			•			· · • •				VG3150
C												VG3151
646		PFAD2.	AWRI.R	1 1 2 9 1	.18.8	1 4 (1 0)	BIAT1	11.18	00000		<u>ل</u>	VG3152
040	PDINT25	ACAUCIA	446110		10010		1					VG3153
	r KINI 67	DRINTS	4		0						2	VG3154
	D	- FALGIO	* / M N N 1	12013	p						, ,	
		-1 10										VC.5155
	UQ 6460 I	=1,JB		m/ • >	v in/+			00/11	ccp/	-		VG3122
	UU 6460 I	=1,JB RE/		8(1),	XJB(I),XXJE	(1),GN	OB(I)	,GGB(I),DRAT	•	VG3155 VG3156
	UQ 6460 I	=1,JB RE/ PRIN	AD3,DA NT30,D	B(I), AB(I)	'X'DB(X'DB(I),XXJE I),GNC	(1),GN (B(1),G	408(I) 68(I)	,GGB(I),DRAT	· 6	VG3155 VG3156 VG3157
	UU 6460 I	=1,JB RE/ PRIN ILL	AD3.DA NT30,D IAD=IN	B(I), AB(I) T(XXJ	XJB(I ,XJB(XJB(),XXJE I),GNC	(I),GN (B(I),G	\08(I) G8(I)	,GGB(I),DRAT	. A A A	VG3155 VG3156 VG3157 VG3158
	00 6460 1	=1,JB REJ PRIN ILL PPIN	AD3,DA NT30,D IAD=IN NT31,I	B(I), AB(I) T(XXJ LLIAD	B(I)) XJB(I XJB(I),XXJE I),GNC	(I),GN (B(I),G	\08(I) G8(I)	,GGB(I),DRAT	- A A A A	VG3155 VG3156 VG3157 VG3158 VG3159
6460	CONTINUE	=1,JB REJ PRIN ILL PPIN	AD3, DA NT30, D IAD=IN NT31, I	B(I), AB(I) T(XXJ LLIAD	B(I)) XJB(I XJB(I),XXJE I),GNC	H(I),GN (B(I),G	NOB(I) GB(I)	,GGB(I),DRAT		VG3155 VG3156 VG3157 VG3158 VG3159 VG3160
6460 C=====	CONTINUE	=1,JB REJ PRIN ILL: PPIN Pewave	AD3,DA NT30,D IAD=IN NT31,I PARAM	B(I), AB(I) T(XXJ LLIAD ETRS	XJB(I ,XJB(B(I)) FOR A),XXJE I),GNC NON-F	ISSILE	NOB(I) GB(I)	,GGB(EUS,	I), DRAT	- A	VG3155 VG3156 VG3157 VG3158 VG3159 VG3160 VG3161
6460 C=====	CONTINUE THESE ARE THEM ARE	=1,JB REJ PRIN ILL: PPIN Pewave The Same	AD3,DA NT30,D IAD=IN NT31,I PARAM E AS T	B(I), AB(I) T(XXJ LLIAD ETRS HE PA	XJB(I ,XJB(B(I)) FOR A RAMET),XXJE I),GNC NON-F RS DEF	ISSILE	NOB(I) GB(I) NUCL	,GGB(EUS, : FISSI	I),DRAT Some of Le nucl	EUS A	AVG3155 AVG3156 AVG3157 AVG3158 AVG3159 AVG3160 AVG3161 AVG3162
6460 C C	CONTINUE These are Them are Above afti	=1,JB REJ PRIN ILL PPIN PEWAVE THE SAME ER READ	AD3,DA NT30,D IAD=IN NT31,I PARAM E AS T CARD	B(I), AB(I) T(XXJ LLIAD ETRS HE PA 9	XJB(I ,XJB(B(I)) FOR A RAMET),XXJE I),GNC NON-F RS DEF	ISSILE	OB(I) GB(I) I NUCL	,GGB(EUS, S FISSI	I),DRAT Some of Le nucl	EUS A	AVG3155 AVG3156 AVG3157 AVG3158 AVG3160 AVG3161 AVG3161 AVG3162 AVG3163
6460 C C 2085	CONTINUE THESE ARE THEM ARE ABOVE AFTI T=2,19677	=1, JB PRIN ILL: PPIN P=WAVE THE SAME ER READ 1E=03*()	AD3,DA NT30,D IAD=IN NT31,I PARAM E AS T CARD AWRI/(B(I), AB(I) T(XXJ LLIAD ETRS HE PA 9 AWRI+	XJB(I ,XJB(B(I)) FOR A RAMET 1.0))),XXJE I),GNC NON-F RS DEF	(I),GN (B(I),G (ISSILE INED F	OB(I) GB(I) Inucl Or A	,GGB(EUS, : FISSI	I),DRAT Some of Le nucl	- A A A A A A A A A A A A A A A A A A A	AVG3155 AVG3156 AVG3157 AVG3158 AVG3160 AVG3161 AVG3162 AVG3163 AVG3164
6460 C C 2035	CONTINUE THESE ARE THEM ARE ABOVE AFTI T=2.19677: CONST=19.	=1, JB PRIN ILL: PFWAVE THE SAME ER READ 1E=03*(J 7392288)	AD3,DA NT30,D IAD=IN NT31,I PARAM E AS T CARD AWRI/((T*T)	B(I), AB(I) T(XXJ LLIAD ETRS HE PA 9 AWRI+	XJB(I ,XJB(B(I)) FOR A RAMET 1.0))),XXJE I),GNC NON-F RS DEF	(I),GN (B(I),G (ISSILE INED F	NOB(I) GB(I) I NUCL Tor A	,GGB(EUS, S FISSI	I),DRAT Some of Le nucl	EUS A	AVG3155 AVG3156 AVG3157 AVG3158 AVG3160 AVG3161 AVG3162 AVG3163 AVG3164 AVG3164
6460 C C 2035	CONTINUE THESE ARE THEM ARE ABOVE AFTI T=2.19677: CONST=19, PHIFOR= 1:	=1, JB PRIN ILL: PEWAVE THE SAME ER READ 1E=03+(J 7392288) 2,56637:	AD3,DA NT30,D IAD=IN NT31,I PARAM E AS T CARD AWRI/((T*T) 1	B(I), AB(I) T(XXJ LLIAD ETRS HE PA 9 AWRI+	XJB(I ,XJB(B(I)) FOR A RAMET 1.0))),XXJE I),GNC NON-F RS DEF	ISSILE INED F	NUCL	,GGB(EUS, S FISSI	I),DRAT Some of Le nucl	. A EUS A A A	AVG3155 AVG3155 AVG3157 AVG3158 AVG3159 AVG3161 AVG3162 AVG3163 AVG3164 AVG31641 AVG31641 AVG3165
6460 C C 2085	CONTINUE THESE ARE THEM ARE ABOVE AFTI T=2.196777 CONST=19 PHIFOR= 1 ASS=AWRI#	=1,JB PRIN PRIN PPIN P=WAVE THE SAME ER READ 15=03*(1) 73920880 1.608665	AD3,DA NT30,D IAD=IN NT31,I PARAM E AS T CARD AWRI/((T*T) 1 5	B(I), AB(I) T(XXJ LLIAD ETRS HE PA 9 AWRI+	XJB(I ,XJB(B(I)) FOR A RAMET 1.0))),XXJE I),GNC NON-F RS DEF	ISSILE INED F	NOB(I) GB(I) I NUCL For A	,GGB(EUS. 9 FISSI	I),DRAT Some of Le nucl	EUS A	AVG3155 AVG3156 AVG3157 AVG3158 AVG3160 AVG3160 AVG3162 AVG3164 AVG31641 AVG3165 AVG3166
6460 C C 2085	CONTINUE THESE ARE THEM ARE ABOVE AFTI T=2.196777 CONST=19 HIFOR= 11 ASS=AWRI* CRT=ASS**	=1,JB PRIN PRIN PPIN PPIN POWAVE THE SAME ER READ 15=03*(1) 7392088, 2,5066375 1,00/3,0	AD3,0A NT30,0 NT30=IN NT31,I PARAMT CARD CARD (T+T) 1 5 7)	B(I), AB(I), T(XJ LLIAD ETRS HE PA 9 AWRI+	XJB(I ,XJB(B(I)) FOR A RAMET 1.0))),XXJE I),SNC NON-F RS DEF	(I),GN (I),G	NOB(I) GB(I) Cor A	,GGB(EUS, S FISSI	I),DRAT Some of Le nucl	EUS A A A A A A A A A A A A A A A A A A A	AVG3155 AVG3157 AVG3157 AVG3158 AVG3160 AVG3160 AVG3163 AVG3164 AVG3165 AVG3166 AVG3166 AVG3166
6460 C C 2085	CONTINUE THESE ARE THEM ARE ABOVE AFTI T=2,19677 CONST=19, PHIFOR=14 ASS=AWRI# APFN=(0,12)	=1, JB PRIN PRIN PRIL PPIN PEWAVE THE SAME ER READ 1E=03+(J) 73920885 2.566375 1.00866 (1.0/3.0 23+CRT+(J)	AD3,DA NT30,D IAD=ÎN NT31,I PARAM E AS T CARD AWRI/(/(T*T) 1 5 7) 0,08)	B(I), AB(I) T(XJ LLIAD ETRS HE PA 9 AWRI+	XJB(I ,XJB(B(I)) FOR A RAMET 1.0))),XXJE I),GNC NON-F RS DEF	(I),GN B(I),G ISSILE INED F	GB(I) GB(I) OR A	,GGB(EUS. 5 FISSI	I),DRAT SOME OF LE NUCL	EUS A A A A A A A A A A A A A A A A A A A	AVG3155 AVG3157 AVG3157 AVG3159 AVG3160 AVG3161 AVG3162 AVG3163 AVG3164 AVG31641 AVG3165 AVG3167 AVG3167 AVG3168
6460 C C 2035	CONTINUE THESE ARE THEM ARE ABOVE AFT T=2,19677: CONST=19, PHIFOR= 1: ASS=AWRI# CRT=ASS** APEN=(0.1: PRINT38.44	=1, JB PRIN PRIN PPIN PEWAVE THE SAME ER READ 1E=03*(J 7392288 2,56637 1.00856 (1.0/3.0 23*CRT+0 PEN	AD3, DA NT30, D IAD=IN NT31, I PARAM E AS T CARD AWRI/((T+T) 1 5 7, 08)	B(I), AB(I) T(XXJ LLIAD ETRS HE PA 9 AWRI+	XJB(I ,XJB(B(I)) FOR A RAMET 1.0))),XXJE I),GNC NON-F RS DEF	ISSILE INED F	GB(I) GB(I) OR A	,GGB(EUS, S FISSI	I),DRAT Some of Le nucl	EUS A A A A A A A A A A A A A A A A A A A	AVG3155 AVG3157 AVG3157 AVG3158 AVG3160 AVG3161 AVG3162 AVG3163 AVG3164 AVG31641 AVG3164 AVG3165 AVG3166 AVG3168 AVG3168 AVG3168
6460 C C 2035	CONTINUE THESE ARE THEM ARE THEM ARE THEM ARE T=2,19677 CONST=19, PHIFOR= 1: ASS=AWRI* CRT=ASS** APEN=(Ø.1: PRINT3B,AA PRINT3B,AA	=1, JB PRIN PRIN PPIN PPIN PEWAVE THE SAME ER READ 1E=03*(J 73920R8) 2.56637 1.008665 (1.0/3.0 23*CRT+0 PEN PEN 1E=03*(J 1.00865 (1.0/3.0 23*CRT+0 PEN PEN PEN PEN PEN PEN PEN PEN	AD3, DA NT30, D IAD=IN NT31, I PARAM E AS T CARD CARD CARD (/(T*T) 1 5 7, 08) AWR1/(B(I), AB(I) T(XXJ LLIAD ETRS P AWRI+	XJB(I ,XJB(B(I)) FOR A RAMET 1.0))),XXJE I),GNC NON-F RS DEF	ISSILE INED F	SGB(I) SGB(I) Inucl Sor A	,GGB(EUS. 5 FISSI	I),DRAT Some of Le Nucl	EUS A A A A A A A A A A A A A A A A A A A	AVG3155 AVG3157 AVG3157 AVG3158 AVG3160 AVG3161 AVG3162 AVG3164 AVG3164 AVG3164 AVG3165 AVG3166 AVG3166 AVG3167 AVG3168 AVG3169 AVG3170
6460 C 2035	CONTINUE THESE ARE THEM ARE THEM ARE THEM ARE T=2.19677 CONST=19, PHIFOR= 1 ASS=AWRI* CRT=ASS** APEN=(0.1 PRINT38,AI C=2.19677	=1, JB PRIN PRIN PPIN PEWAVE ER READ 15=03*(J 7392088, 2,56637; 1.008866; (1.0/3.0 23*CRT+0 23*CRT+0 PEN 03*(J 67715-003*(J	AD3, DA NT30, D IAD=IN NT31, I E AS T CARD (T+T) 1 5 2) 7, 08) AWRI/(1 3+(AWRI/ 3+(AWRI/ 3+(AWRI/ 1)	B(I), AB(I) T(XXJ LLIAD ETRS AWRI+ AWRI+	XJB(I ,XJB(B(I)) FOR A RAMET 1.0))),XXJE I),SNC NON-F RS DEF #A	ISSILE INED F	GB(I) GB(I) Inucl Tor A	,GGB(EUS, S FISSI	I),DRAT Some of Le nucl	EUS A A A A A A A A A A A A A A A A A A A	AVG3155 AVG31556 AVG31558 AVG31559 AVG3160 AVG31641 AVG31641 AVG31641 AVG31641 AVG31641 AVG31641 AVG3165 AVG3166 AVG3165 AVG3165 AVG3165 AVG3165 AVG3167 AVG3171
6460 C C 2035	CONTINUE THESE ARE THEM ARE ABOVE AFTI T=2.196777 CONST=19 HIFOR= 1 ASS=AWRI* CRT=ASS** APEN=(0.1 PRINT38,AU C=2.196777 CPEN=2.196777	=1, JB PRIN PRIN PRIL PPIN PPIN ER READ 15-03*(1 2,566371 (1,0/3.0 23*CRT+0 PEN 15-03*(1 23*(2) 24,00 23*CRT+0 PEN 15-03*(1 200,000 200,00000000	AD3, DA NT30, DA IAD=ÎN NT31, I E AS T CARD /(T+T) 5 7) 0, 08) AWRI/(AWR 3*(AWR A 300	B(I), AB(I) T(XXJ LLIAD ETRS HE PA AWRI+ AWRI+	XJB(I ,XJB(B(I)) FOR A RAMET 1.0)) 1.2)) RI+1.),XXJE I),GNC RS DEF #A Ø))#AF	EN	GB(I) GB(I) Inucl Tor A	,GGB(EUS, S FISSI	I), DRAT Some of Le nucl	EUS A A A A A A A A A A A A A A A A A A A	AVG3155 AVG3155 AVG3157 AVG3158 AVG3158 AVG3160 AVG3164 AVG3164 AVG3164 AVG3165 AVG3165 AVG3165 AVG3165 AVG3165 AVG3167 AVG3172 AVG3172
6460 C C 2035	CONTINUE THESE ARE THEM ARE THEM ARE THEM ARE THEM ARE THEM ARE TT=2.196777 CONST=19. ASS=AWRI* CRT=ASS** APEN=(Ø.11 PRINT3B,AM C=2.196777 CPEN=2.190 IF (NFLAGI IF (NFLAGI	=1, JB PRIN PRIN PPIN PPIN PPIN PPIN PEWAVE ER READ 15-03*(1 7392088) 16-03*(1 10/30 (1.0/30) 23*CRT+(1 00/30) 23*CRT+(1 00/30) 2000 23*CRT+(1 00/30) 2000 2000 2000 2000 2000 2000 2000 2	AD3, DA NT30, DA NT31, I PARAM E AS T CARD ((1+T) 5 7) 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	B(I), AB(I) T(XXJ LLIAD ETRS HE PA AWRI+ AWRI+ I/(AW	XJB(I ,XJB(B(I)) FOR A RAMET 1.0)) 1.2)) 1.3))), XXJE I), SNC NON-F RS DEF #A Ø)) #AF	EN	GB(I) GB(I) Tor A	,GGB(EUS, S FISSI	I),DRAT Some of Le nucl	EUS A A A A A A A A A A A A A A A A A A A	VG3155 VG3156 VG3157 VG3157 VG3158 VG3160 VG3161 VG3162 VG3165 VG3165 VG3166 VG3166 VG3166 VG3167 VG3168 VG3170 VG3171 VG3172 VG3173
6460 C 2085	CONTINUE THESE ARE THEM ARE ABOVE AFT T=2,19677 CONST=19, PHIFOR= 11 ASS=AWRI* CRT=ASS** APEN=(0.12 PRINT38,AI C=2,19677 CPEN=2,196 IF(NFLAG1 THIS TAKE)	=1, JB PRIL PRIL PPIL PPIL PPIL PPIL PPIL PPIL PPIL PPIL 2.566375 1.00866375 1.00866375 2.566375 2.566375 1.00866375 2.567575 2.56757575 2.56757575 2.56757575 2.56757575 2.56757575 2.56757575 2.5675757575 2.5675757575 2.5675757575757575 2.567575757575757575757575757575757575757	AD3, DA NT30, DA NT31, I PARAM AST AST CARD ((T+T) 5 7, 08) 7, 08) AWRI/((T+T) 5 7, 08) AWRI/(AWR 7, 300 DF THE	B(I), AB(I) T(XXJ LLIAD ETRS HE PA AWRI+ I/(AW NONF	XJB(I ,XJB(B(I)) FOR A RAMET 1.0)) 1.0)) 1.0)) I.0)) I.0)) I.0))),XXJE I),SNC NON-F RS DEF #A Ø))#AF E NUCL	EN	GB(I) GB(I) OR A	,GGB(EUS. : FISSI	I),DRAT Some of Le nucl	EUS A A A A A A A A A A A A A A A A A A A	AVG3155 AVG3157 AVG3157 AVG3158 AVG3159 AVG3160 AVG3162 AVG3163 AVG3164 AVG3165 AVG3167 AVG3167 AVG3167 AVG3167 AVG3167 AVG3174
6460 C 2035 C 2005	CONTINUE THESE ARE THEM ARE ABOVE AFT T=2.19677 CONST=19. PHIFOR=14 CRT=ASS** APEN=(0.11 PRINT38,AI C=2.19677 CPEN=2.190 IF(NFLAG1 THIS TAKES	=1, JB PRIN PRIL PPIN PPIN PPIN PPIN PPIN PPIN PPIN PPIN 2.56637 1.00866 (1.0/3.0 23*CR PEN 1E+03*(J 020,200 S CARF (AD3, DA NT30, D IAD=IN NT31, I PARAM E AS T CARD (/(T+T) 1 5 2) 7.08) AWRI/(3*(AWR 2, 300 DF THE	B(I), AB(I) T(XXJ LLIAD ETRS AWRI+ AWRI+ I/(AW NONF	XJB(I ,XJB(B(I)) FOR A RAMET 1.0)) 1.0)) RI+1. ISSIL),XXJE I),GNC RS DEF #A Ø))#AF E NUCL	EI	NOB(I) GB(I) OR A	,GGB(EUS, S FISSI	I),DRAT Some of Le nucl	EUS A A A A A A A A A A A A A A A A A A A	AVG3155 AVG3157 AVG3157 AVG3158 AVG3158 AVG3160 AVG3162 AVG3162 AVG3164 AVG3164 AVG3165 AVG3166 AVG3167 AVG3167 AVG3170 AVG3177 AVG3173 AVG3175
6460 C 2035 C 200	CONTINUE THESE ARE THEM ARE THEM ARE ABOVE AFTI T=2.19677 CONST=19, PHIFOR= 11 ASS=AWRI* CRT=ASS** APEN=(Ø.1 PRINT38,AI C=2.1967 CPEN=2.196 THINT38,AI CPEN=2.196 THIS TAKE E=E0 I=1	=1, JB PIL PIL PPI PPI ER READ 15-03*(1) 73922088 1.008665 (1.073.0 23*CRT+(071E-03*(1) 077E-03)220,20 S CARF (AD3, DA NT30, D IAD=IN NT31, I E AS T CARD (/(T*T) 1 5 7, 08) (/(T*T) 1 5 7, 08) (/(T*T) 1 5 7, 08) (/(T*T) 1 5 7, 08) (/(T*T) 1 5 7, 0 7, 0 7, 0 7, 0 7, 0 7, 0 7, 0 7, 0	B(I), AB(I), T(XXJ LLIAD ETRS AWRI P AWRI I/(AW NONF	XJB(I ,XJB(B(I)) FOR A RAMET 1.0)) 1.2)) RI+1. ISSIL),XXJE I),SNC RS DEF #A Ø))#AF E NUCL	EN EI	NOB(I) GB(I) Inucl Tor A	,GGB(EUS. : FISSI	I),DRAT Some of Le nucl	EUS A A A A A A A A A A A A A A A A A A A	AVG3155 AVG3155 AVG31558 AVG31558 AVG3160 AVG3160 AVG3164 AVG3164 AVG3164 AVG3164 AVG3164 AVG3164 AVG3164 AVG3166 AVG3168 AVG3171 AVG3171 AVG3174 AVG3175 AVG3175 AVG3175
6460 C 2035 C 200 200	CONTINUE THESE ARE THEM ARE THEM ARE ABOVE AFT CONST=19, PHIFOR= 1 ASS=AWRI* CRT=ASS** APEN=(0.1 PRINT38,AI C=2.196779 CPEN=2.190 IF(NFLAGE IF(NFLAGE E=E0 I=1 GIG=0.0	=1, JB PRIN PRIN PPIN PPIN PPIN PPIN FR READ 15-03*(J 7392088) 20885 (1.00365 (1.0/3.0 23*CRT+0 15-03*(J 07715-03*(J 07715-03) 200,200 S CARF (AD3, DA NT30, DA IAD=IN PARAT CARI, I CARI, I AU (T+T) 57, 08) (T+T) 3*(AW DF THE DF THE	B(I), AB(I), T(XXJ LLIAD ETRS 9 AWRI+ I/(AW NONF	XJB(I ,XJB(B(I)) FOR A RAMET 1.0)) RI+1. ISSIL),XXJE I),SNC RS DEF #A Ø))#AF E NUCL	EN	GB(I) GB(I) Inucl Tor A	,GGB(EUS. : FISSI	I), DRAT Some of Le nucl	EUS A A A A A A A A A A A A A A A A A A A	AVG3155 AVG3155 AVG3155 AVG3155 AVG3160 AVG3164 AVG3164 AVG3164 AVG3164 AVG3164 AVG3164 AVG3164 AVG3164 AVG3164 AVG3164 AVG3167 AVG3172 AVG3177 AVG3174 AVG3174 AVG3175 AVG3176 AVG3176 AVG3176 AVG3176 AVG3176 AVG3177 AVG3167 AVG3167 A AVG3167 A AVG3167 A AVG3167 A AVG3167 A A A A A A A A A A A A A A A A A A A
6460 C 2035 C 200 204	CONTINUE THESE ARE THEM ARE ABOVE AFTI T=2.19677; CONST=19.77; CONST=19.77; CONST=19.77; CONST=10.77; CONST=1	=1, JB PRIN PRIN PPIN PPIN PPIN PPIN PER READ 15-03*(J 2,5686371 2,5686371 2,5686371 (1,0/3.0 23*CRT+0 PEN 15-03*(J 5) 200,200 S CARE (AD3, DA NT30, DA IAD=IN VT31, I E AS T CARD /(T+T) 52 00 AWRI/(T+T) 52 00 AWRI/(T+T) 53 00 AWRI/(AWR 05 THE	B(I), AB(I) T(XXJ LLIAD ETRS AWRIA AWRIA AWRIA I/(AW NONF	XJB(I ,XJB(B(I)) FOR A RAMET 1.0)) RI+1. ISSIL),XXJE I),SNC RS DEF ¢))+AF E NUCL	EN	GB(I) GB(I) Inucl Tor A	,GGB(EUS, S FISSI	I), DRAT Some of Le nucl	EUS A A A A A A A A A A A A A A A A A A A	AVG3155 AVG3157 AVG3157 AVG3158 AVG3158 AVG3160 AVG3164 AVG3164 AVG3164 AVG3165 AVG3165 AVG3165 AVG3165 AVG3176 AVG3177 AVG317
6460 C 2035 C 200 200 204	CONTINUE THESE ARE THEM ARE THEM ARE THEM ARE THEM ARE THEM ARE THEM ARE TE2.19677 CONSTEI9. PHIFORE 11 ASSEAWRI# CRTEASS** APEN=(0.11 PRINT38,AI CE2.19677 CPEN=2.196 THIS TAKES E=E0 IF (NFLAGI THIS TAKES E=E0 IE1 GIS=0.0 ES(I)=E	=1, JB PRIL PRIL PPIN PPIN PPIN PPIN P=WAVE ER READ 15-03*(3) 2.5066365 (1.0/3.6 23*CRT+0 16771E-03 220,200 S CARF (AD3, DA NT30, DA IAD=ÎN V PARAT E AS T CARD /(T*T) 5 7, 08) AWRI/(T 7, 008) AWRI/(AWR 2, 300 DF THE	B(I), AB(I) T(XXJ LLIAD ETRS HE PA AWRI AWRI I/(AW NONF	XJB(I ,XJB(B(I)) FOR A RAMET 1.0)) 1.0)) 1.0)) RI+1. ISSIL),XXJE I),GNC RS DEF ¢))*AF E NUCL	EN	OB(I) GB(I) OR A	,GGB(EUS, S FISSI	I), DRAT Some of Le nucl	EUS A A A A A A A A A A A A A A A A A A A	AVG3155 AVG3157 AVG3157 AVG3158 AVG3158 AVG3160 AVG3164 AVG3165 AVG3165 AVG3165 AVG3165 AVG3166 AVG3166 AVG3176 AVG3177 AVG3167 AVG3167 AVG3167 AVG3167 A AVG3167 A AVG3167 A AVG3167 A AVG3167 A AVG3167 A AVG3167 A AVG3167 A A A A A A A A A A A A A A A A A A A
6460 C 2085 C 2085	CONTINUE THESE ARE THEM ARE THEM ARE ABOVE AFT T=2.196777 CONST=19. PHIFOR= 11 ASS=AWRI CRT=ASS** APEN=(Ø.11 PRINT3B,AI C=2.196777 CPEN=2.196 THIS TAKE E=E0 I=1 GIG=Ø.Ø GIS=Ø.Ø ES(I)=E E2=SQRT(E	=1, JB PRIL PRIL PPIL	AD3, DA NT30, D IAD=IN NT31, I PARAM CARD CARD CARD ((T+T) 1 5 7, 08) AWRI/((T+T) 1 5 7, 08) AWRI/((T+T) 1 5 7, 08) AWRI/(AWR 0, 300 DF THE	B(I), AB(I), T(XXJ LLIAD ETRS AWRI+ AWRI+ I/(AW NONF	XJB(I ,XJB(B(I)) FOR A RAMET 1.0)) 1.2)) RI+1. ISSIL),XXJE I),GNC NON-F RS DEF Ø))*AF E NUCL	EN EI	GB(I) GB(I) OR A	,GGB(EUS, S FISSI	I), DRAT Some of Le nucl	EUS A A A A A A A A A A A A A A A A A A A	AVG3155 AVG3157 AVG3157 AVG3158 AVG3159 AVG3160 AVG3164 AVG3164 AVG3164 AVG3165 AVG3165 AVG3166 AVG3167 AVG3167 AVG3177 AVG3177 AVG3177 AVG3177 AVG3177 AVG3177 AVG3177 AVG3178 AVG3178 AVG3179
6460 C 2035 C 200 200	CONTINUE THESE ARE THEM ARE THEM ARE ABOVE AFTI T=2,19677 CONST=19, PHIFOR= 1: ASS=AWRI* CRT=ASS** APEN=(Ø.1: PRINT3B,AA C=2,19677 CPEN=2,191 IF(NFLAG1 THIS TAKES E=E0 I=1 GIG=Ø,Ø GIS=Ø,Ø ES(I)=E E2=SORT(E RHO=C+E2	=1, JB PRIN PRIL PPIL PPIL PPIL PPIL PPIL PPIL PPIL PPI SCATE (1,0/3,0 (1,0/3,0 (1,0/3,0 (2,0/3,0 (1,0/3,0) (1,0/3	AD3, DA NT30, D IAD=IN N PARAM E AS T CARD ((T*T) 5 7, 08) AWRIY (AWR 2, 300 DF THE	B(I), AB(I) T(XXJ LLIAD ETRS AWRI P9 AWRI I/(AW NONF	XJB(I ,XJB(B(I)) FOR A RAMET 1.0)) 1.0)) RI+1. ISSIL),XXJE I),GNC RS DEF #A Ø))#AF E NUCL	EN EI	OB(I) GB(I) OR A	,GGB(EUS. S FISSI	I), DRAT Some of Le Nucl	.EUS .A. .A. .A. .A. .A. .A. .A. .A. .A. .A	AVG3155 AVG3157 AVG3157 AVG3158 AVG3159 AVG3160 AVG3162 AVG3164 AVG3164 AVG3165 AVG3166 AVG3166 AVG3166 AVG3167 AVG3177 AVG3177 AVG3177 AVG3177 AVG3177 AVG3177 AVG3178 AVG3167 AVG3177 AVG3178 AVG3177 AVG3177 AVG3177 AVG3177 AVG3178 AVG3177 AVG3178 AVG318 AVG3178 AVG3178 AVG318

RH02=RH0++2 AVG3182 RHOPN2=RHOPEN++2 AVG3183 WAVE=2,196771E-03*E2*(AWRI/(AWRI+1.0)) AVG3184 PSS=RH0 AVG3185 PSP=RHO-ATAN (PHO) AVG3186 SIGPTS= (SIN (PSS)/WAVE)##2 AVG3187 SIGPTS=SIGPTS*PHIFCR AVG3188 SIGPTP=(SIN(PS=)/WAVE) ++2 AVG3189 SIGPTP=SIGPTP+PHIFOR AVG3192 SIGPTP=3,0+SIGPTP AVG3191 DO 201 J=1, JA GJ=(2.0*XJA(J)+1.0)/(2.0*SPIN+1.0) AVG3192 AVG3193 GJ=GJ/2.Ø AVG3194 (L)ALXX=LALXX AVG3195 GN=GNO(J)+E2+XXJAJ AVG3196 MU=INT (XXJAJ) AVG3197 GAMMAEGG(J) AVG3198 GALPHA=GN AVG3199 GBETA=0.0 AVG3200 GF=0.0 AVG3201 TERM=(CONST#GJ#GN#GG(J))/(E#DA(J)) AVG3202 TERS=(CONST#GJ#GN#GN)/(E#DA(J)) AVG3203 CALL GCAP(GALPHA, GEETA, GAMMA, GF, MU, GC) AVG3204 CALL GSCAT(GALFHA, GRETA, GAMMA, GF, MU, GS) AVG32Ø5 GC=GC*TERM AVG3206 GS=GS+TERS AVG3207 CORR=(CONST*GJ+2,0*GN*SIN(PSS)*SIN(PSS))/(E*DA(J)) AVG32071 GS=GS-CORR AVG32072 GIG=GIG+GC AVG3208 GIS=GIS+GS AVG3209 201 CONTINUE AVG3210 GIGGS(I)=GIG AVG3211 GISS(I) = GIS+SIGPTS AVG3212 IF (NR=2)205,204,88 AVG3213 206 GIG=0.0 AVG3214 GIS=Ø.Ø AVG3215 DO 207 J=1.JB AVG3216 GJ=(2.0*XJB(J)+1.0)/(2.0*SPIN+1.0) AVG3217 AVG3218 GJ=GJ/2.0 VL=RHOPN2/(RHOPN2+1,Ø) AVG3219 XXJBJ=XXJB(J) AVG3220 MU=INT (XXJBJ) AVG3221 GN=GNOB(J)+E2+VL+XXJBJ AVG3222 GAMMA=GGB(J) AVG3223 GF=Ø,Ø AVG3224 GALPHA=GN AVG3225 GBFTA=Ø.Ø AVG3226 TERM=(CONST*GJ*GN*GGB(J))/(E*DAB(J)) AVG3227 TERS=(CONST#GJ#GN#GN)/(E#DAB(J)) AVG3228 CALL GCAP(GALPHA, GBETA, GAMMA, GF, MU, GC) AVG3229 CALL GSCAT(GALPHA, GBETA, GAMMA, GF, MU, GS) AVG3230 GC=GC*TERM AVG3231 GS=GS*TERS AVG3232 CORR=(CONST*GJ*2,Ø*GN*SIN(PSP)*SIN(PSP))/(E*DAB(J)) AVG32321 AVG32322 GS=GS+CORR GIG=GIG*GC AVG3233 GIS=GIS+GS AVG3234 207 CONTINUE AVG3235 GIGGP(I)=GIG AVG3236 AVG3237 GISP(1) #GIS+SIGPTP 205 E=E+ESTEP AVG3238

	IF(E.GT.EN)GO TO 202	AVG3239
	GO TO 203	AVG32391
2Ø3	I=I+1	AVG3240
	GO TO 204	AVG3241
295	NC = I	AVG3242
	GO TO 400	AVG3243
300	DO 210 I=1,NE	AVG3244
	E=ES(I)	AVG3245
	E2=SQRT(E)	AVG3246
	RHO=C+E2	AVG3247
	RHOPEN=CPEN+E2	AVG3248
	WAVE=2.196771E+03#E2#(AWRI/(AWRI+1.0))	AVG3249
	PSS=RH0	AVG3250
	PSP=RHOWATAN (RHO)	AVG3251
	SIGPTS=(SIN(PSS)/WAVE)+*2	AVG3252
	SIGPTS=SIGPTS*PHIFOR	AVG3253
	SIGPTP=(SIN(PSP)/WAVE) **2	AVG3254
	SIGPTP=SIGPTP*PHIFOR	AVG3255
	SIGPTP=3,0*SIGPTP	AVG3256
	RH02=RH0++2	AVG3257
	RHOPN2=RHOPEN**2	AVG3258
	VL=RHOPN2/(RHOPN2+1,0)	AVG3259
	GIG=Ø.Ø	AVG3260
	GIF=0.0	AV63201
		AVG3202
	$\begin{array}{c} UU \geq 21 U^{\#} I_{0} UA \\ C = 10 \text{(MAX)} I_{0} \left(1 \right) + 1 \text{(MAX)} \left(1 \right) + 1 $	AVG3263
	GJA(2:0*KJA(J)+1:0//(2:0*3F1N+1:0/	AV03065
		AV63265
		AV63267
		AVG3268
		AVG3269
	GAMMA=GG(J)	AVG3270
	GALPHA=GN	AVG3271
	GBETA=GFE(I,J)	AVG3272
	TERM=(CONST*GJ*GN*GFE(I,J))/(E*DA(J))	AVG3273
	TERG=(CONST*GJ*GG(J)*GN)/(E*DA(J))	AVG3274
	TERS=(CONST+GJ+GN+GN)/(E+DA(J))	AVG3275
	CALL GFIS(GALPHA,GRETA,GAMMA,MU,NU,GS)	AVG3276
	CALL GSPE(GALPHA,GBETA,GAMMA,MU,NU,GC)	AVG3277
	CALL SCAF(GALPHA,GBETA,GAMMA,MU,NU,SF)	AVG3278
	GS≈GS⇔TERM	AVG3279
	GC≈GC*TERG	AVG3280
	SF=SF*TERS	AVG3281
	CORR=(CONST*GJ*2,0*GN*SIN(PSS)*SIN(PSS))/(E*DA(J))	AVG32811
	SF=SF=CQRR	AVG32812
	GIG=GIG+GC	AVG3282
	GIF=GIF+GS	AVG3283
.	GIS=GIS+SF	AVG3284
211		AV63285
		AVG3200
		AVG3287
	0155117#015*510FT5	
240	17 (NKTZ)2101212100	AV63209
c 12	GIC=0.0	AV63290
		AVG3291
	DO 213 J⊯1.JB	AVG3293
	GJ=(2.0*XJB(J)+1.0)/(2.0*SPIN+1.0)	AVG3294
	$G_{J=G_{J}/2.0}$	AVG3295
	XX1B1=XX1B(1)	AVG3296

	MU=1NT (XXJBJ)	AVG3297
	NU=MUFB(J)	AVG3298
	GN=GNOB(J)+E2+XXJBJ+VL	AVG3299
	GAMMA=GGB(J)	AVG3300
	GALPHARGN	AVG3301
	GBETA≠GFEB(I,J)	AVG3302
	TERM=(CUNST*GJ*GFEB(1,J)*GN)/(E*DAB(J))	AVG3303
	TERG=(CONST*GJ*GN*GGB(J))/(E*DAB(J))	AVG3304
	TERS=(CUNST#GJ#GN#GN)/(E#DAB(J))	AVG3305
	CALL GEIS(GALPHA, GBETA, GAMMA, MU, NU, GS)	AVG3306
	CALL GSPE(GALPHA, GBETA, GAMMA, MU, NU, GC)	AVG3307
	CALL SCAF(GALPPA, GBETA, GAMMA, MU, NU, SF)	AVG3308
	GS#GS#TERM	AVG3309
		AVG3310
		AVG3311
	CURRE(CUN) = COP2.00 CUP3 IN(PSP) = SIN(PSP) / (E=UAE(J))	AV633111
		AV033112
		AVC3313
		AVG3314
213	CONTINUE	AV63315
	GIGGP(I) = GIG	AVG3316
	GIGFP(I)=GIF	AVG3317
	GISP(I)=GIS+SIGPTP	AVG3318
21Ø	CONTINUE	AVG3319
	GO TO 410	AVG3320
4 Ø Ø	PRINT1Ø	AVG3321
10	FORMAT(72H AVERAGE SCATTERING AND CAPTURE CROSS-SECTIONS FOR A NON	AVG3322
:	1-FISSILE NUCLEUS)	AVG3323
	PRINT11, (RUN(J); J=1,7)	AVG3324
11	FORMAT(9H TITLE 7A4)	AVG3325
	PRINT12,ED,EN	AVG3326
12	FORMATIC24H ENERGY LIMITS LOVER E10.4.10H UPPER E10.4)	AVG332/
4011	GO 10 (401,402),NR	AVG3328
401		AV63329
	$PDINT4A_{1}CC(1) CICC(1) I=4 NC)$	AVG3330
	DINTER (CSV1/,0133(1),1+1,NC)	AV60301
		AVC3333
13	FORMAT/53H NEUTRON ENERGY/EV) S-WAVE CAPTURE ROSS-SECTION)	AV63334
36	FORMAT(53H NEUTRON ENERGY (EV) S-WAVE SCATONE (BOSS-SECTION)	AVG3335
14	FORMAT(222.6)	AVG3336
	PRINT14, (ES(I), GIGGS(I), I=1, NC)	AVG3337
	GD TO 880	AVG3338
402	PRINT21	AVG3339
	PRINT37	AVG3340
	D0 7001 I=1.NC	AVG3341
	TOTAL=GISS(I)+¢ISP(I)	AVG3342
-	PRINT16,ES(I),GISS(I),GISP(I),TOTAL	AVG3343
7001	CONTINUE	AVG3344
		AVG3345
15	FRINTID Formation Neutron Engrowery, Studye disturg groeps section	AVG3340
	DEMANE CADTIDE CONCELECTION TOTALS	AVG3349
37	FORMATILIAH NEUTRON ENERGY/EVY CLUALVE CONTONS COOSSECTION	AV63340
	P-WAVE SCATRNG CROSS-SECTION TOTAL)	AV63350
16	FORMAT(4X,F13,6,17X,F13,6,21X,F13,6,21X,E13,6)	AVG3351
	D0 7000 1=1.NC	AVG3352
	TOTAL=GIGGS(I)+GIGGP(I)	AVG3353
	PRINT16, ES(I), GIGGS(I), GIGGP(I), TOTAL	AVG3354
7000	CONTINUE	AVG3355
		· · · · · ·

41	GO TO 880 1 PRINT17	AVG3356
1	FORMAT(76H AVERAGE SCATTERING CAPTURE AND FISSION CROSS-SECTIONS	FAVG3358
	10R & FISSILE NUCLEUS)	AVG3359
	PRINT11, (RUN(J), J=1, 7)	AVG336Ø
4.1	GO TO (411,412),NR	AVG3361
4 L	PRINT21 Print36	AVG3363
	PRINT14, (ES(I), GISS(I), I=1.NE)	AVG3364
	PRINT35	AVG3365
	PRINT13	AVG3366
	PRINT14, (ES(I), GIGGS(I), I=1, NE)	AVG3367
1	FRINTL8 V FORMAT(53H NEUTRON ENERGY(EV) S-WAVE EISSION CROSS-SECTION)	AVG3300
-	PRINT14, (ES(I), GIGFS(I), I=1, NE)	AVG3370
	GO TO 880	AV63371
41	PRINT21	AVG3372
	PRINT37 DO 7000 1=1.NF	AVG3373
	TOTAI = GISS(I) + GISP(I)	AVG3375
	PRINT16,ES(I),GISS(I),GISP(I),TOTAL	AVG3376
700	CONTINUÉ	AVG3377
	PRINT35	AVG3378
		AVG33/9
	TOTAL = GIGGS(1) + GIGGP(1)	AVG3381
	PRINT16, ES(I), GIGGS(I), GIGGP(I), TOTAL	AVG3382
700	CONTÍNUÉ	AVG3383
4	PRINT19 L FORMAT/14/04 NEUTRON ENERGY/EVA - S HAVE ELERION CROSS-SECTION -	AVG3384
1	1 PAWAVE NEUTRON CROSS-SECTION (RUSSESECTION)	AVG3386
	Do 7004 I=1,NE	AVG3387
	TOTAL=GIGFS(I)+GIGFP(I)	AVG3388
700	PRINT16,ES(I), CIGFS(I), GIGFP(I), TOTAL	AVG3389
100		AVG3390
8	B PRINT20	AVG3392
2	FORMAT(47H INPUT ERROR NUMBER OF L VALUES LARGER THAN TWO)	AVG3393
2:	FORMAT(62H AVERAGE CROSS-SECTIONS CALCULTED USING GREEBLER APPROX	IAVG3394
0	1MATION) Formation data for a non fifther nucleus	AVG3395
2	E FORMAT(SIH DATA FOR A NUN-FISSILE NUCLEUS)	AV63390
2	FORMAT(12H SHWAVE DATA)	AVG3398
С	CONTINUE	AVG3399
2	FORMAT(12H P-WAVE DATA)	AVG3400
2	FORMAT(20H ENEPGY LIMITS LOWERE20.6,7H UPPERE20.6,7H LRU=15,7H	AVG3401
2.	FORMAT(7H RUN NOI5.9H TITLE 744.4H FOE13.6.4H ENF13.6.7H EST	FAVG3402
-	1PE13.6)	AVG34031
21	FORMAT(12H TARGET SPINE11.4,18H SCATTERING LENGTHE11.4,54H NO OF	EAVG3404
~	INERGY VALUES AT WHICH FISSION WIDTHS ARE GIVENIS)	AVG3405
2	FORMATCPIH FISSION WIDTHS ARE GIVEN AT THE FULLOWING ENERGIES) FORMATZIOH MEAN LEVEL SPACINGE11, 4,11H LEVEL SPINE11, 4,22H REDUCE	A¥63400
0,	1 NEUTRON WIDTHE11.4,12H GAMMA GAMMAE11.4)	AVG3408
3	FORMAT(56H NO OF DEGREES OF FREEDOM FOR NEUTRON WIDTH DISTRIBUTIO	NAVG3409
-		AVG3410
32	FURMAL(26H NU OF DEGREES OF FREEDOM FOR FISSION WIDTH DISTRIBUTIO	NAVG3411
33	FORMAT(23H THE FISSION WIDTHS ARE)	AVG3412
34	FORMAT(14H ISOTOPIC MASSE11,4,17H ANGULAR MOMENTUMI5,18H NO OF SP	IAVG3414
	IN STATES15)	AVG3415

35 FORMAT(//) AVG3416 38 FORMAT(46H NUCLEAR RADIUS A=(1,23*MASS**1/3*0,8)*0,1 ==E11,4) AVG3417 39 FORMAT(80H1 PROGRAM AVRAGES, CALCULATES CROSS-SECTIONS IN THE UNREAVG3418 1SOLVED RESONANCE REGION,) AVG3419 40 FORMAT(59H ENDF/B VERSION II DATA WITH ENERGY INDEPENDENT PARAMETEÄVG3420 1RS.) AVG3421 880 GO TO 881 AVG3422 AVG3423 8800 RETURN END AVG3424 SUBROUTINE GCAP(GALPHA, GBETA, GAMMA, GGF, MU, SC) GCAP001 COMMON/XBAR/XX(4,10) GCAPØØ2 SC=0 0 GCAPØØ3 DO 100 J=1,10 GCAPØØ4 XJ=XX(MU,J) GCAPØØ5 VALUE=XJ/(GALPHA*XJ+GBETA*GGF+GAMMA) GCAP006 SC=SC+VALUE GCAPØØ7 100 CONTÍNUE GCAPØØ8 SC=SC/10.0 GCAPØØ9 RETURN GCAPØ10 END GCAPØ11 SUBROUTINE GFIS(GALPHA, GBETA, GAMMA, MU, NU, S) GFISØØ1 COMMON/XBAR/XX(4,10) GF15002 S=0.0 GFIS003 DO 100 J=1,10 GF15004 YJ=XX(NU,J) GF 15005 CALL GCAP (GALPHA, GBETA, GAMMA, YJ, MU, SC) GFISØØ6 S=S+YJ+SC GF15007 100 CONTINUE GFISØØ8 GF15009 S=S/10.0 RETURN GFISØ10 END GFISØ11 SUBROUTINE GSPE(GALPHA, GBETA, GAMMA, MU, NU, S) GSPE001 COMMON/XBAR/XX(4,10) GSPE002 S=0.0 GSPEØØ3 DO 100 J=1,10 GSPEØØ4 YJ=XX(NU,J) GSPEØØ5 CALL GCAP(GALPHA, GBETA, GAMMA, YJ, MU, SC) GSPE006 S=S+SC GSPEØØ7 100 CONTINUE **GSPEØØ8** S=S/10.0 GSPEØØ9 RETURN GSPE010 END GSPEØ11 SUBROUTINE GSCAT(GALPHA, GBETA, GAMMA, GGF, MU, SC) GSCTØØ1 COMMON/XBAR/XX(4,10) GSCTØØ2 SC=Ø.Ø GSCTØØ3 DO 100 J=1,10 GSCTØØ4 XJ=XX(MU,J) GSCT005 VALUE=(XJ*XJ)/(GALPHA*XJ+GBETA*GGF+GAMMA) GSCTØØ6 SC=SC+VALUE GSCTØØ7 100 CONTINUE GSCTØØ8 SC=SC/10,0 GSCTØØ9 RETURN GSCT010 END GSCTØ11 SUBROUTINE SCAF(GALPHA, GBETA, GAMMA, MU, NU, S) SCAF001 COMMON/XBAR/XX(4,10) SCAFØØ2 S=0,0 SCAFØØ3 DO 100 J=1,10 SCAF004 YJ=XX(NU,J) SCAF005 CALL GSCAT(GALPHA, GBETA, GAMMA, YJ, MU, SC) SCAF006 SCAF007 5=\$+\$0 100 CONTINUE SCAFØØ8

S=S/10.0 Return End SCAFØØ9 SCAFØ10 SCAFØ11

3.00000+2	VERAGE3 TES 1.00000+ 5	T,PU=239 DA 2	1	Ø	Ø1Ø51	2151 203
5.00000- 1	9.05000- 1	Ø	Ø	16	21051	2151 204
3.00000+ 2	6.00000+2	1.00000 + 3 1.30000 + 4	1.50000+3	2.50000+ 3	3,50000 + 31051 4.00000 + 41051	2151 205
5.000004 3	6.00000+ 4	8.00000+ 4	1.00000+ 5	0120000-	1051	2151 207
236,9985	Ø. +Ø	Ø	Ø	2	01051	2151 208
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2.80000+ 0	2.80000+ Ø	2.80000+ 0	2.80000+ 0	2.80000+ 0	2.80000+ 01051	2151 211
2.80000+ 0	2.80000+ 0	2.80000+ 0	2.80000+ 0	2.80000+ 0	2.80000+ 01051	2151 212
2.80000+ 0	2.80000+ 0	2.80000+ 0	2.80002 0	22	01051	2151 214
5.12000+ 0	1.00000+0	1.00000+ 0	3.34000- 4	3.87000-2	Ø. + Ø1Ø51	2151 215
5.52000- 2	5.59000- 2	5.68000- 2	5.78000- 2	5.93200- 2	6.23000- 21051	2151 216
6.57000-2	7.33000-2	8.72000= 2	1.10200 = 1	1.50200- 1	1.97500- 11051	2121 217
2.48000 - 1 236.9985	3.00000= 1 0.00000+00	3.000000 1	4.050000-1 Ø	3	01051	2151 219
e . + Ø	Ø. + Ø	1	2	22	01051	2151 220
8.78000+00	Ø. +Ø	1.00000+00	2.19500=03	3.87000-02	Ø, + Ø1Ø51	2151
.04000	•04000 .04000	.04000 04000	.04000 .04000	•04000 •04000	.04000	
.04000	.04000	04000	04000	.04000	.04000	
0.00000+00	0.00000+00	1	2	22	0 00000.00	
3.12000+00	1.00000+00	2.00000+00	7.80000-04	.04000-02	.04000+00	
.04000	.04000	04000	24000	.04000	.04000	
.04000	.04000	.04000	.04000	.04000	.04000	
0.00000+00	0.00000+00	1 00000+00	5 30000-04	3.87000-02	0 . 00000+00	
.94000	.04000	.04000	04000	.04000	.04000	
			10 4 V 10 V			
.04000	.04000	.04000	.04000	.04000	04000	
.Ø4000 .Ø4000	.04000 .04000	.04000 .04000	.04000 .04000 .04000	•04000 •04000 •04000	.04000 .04000 .04000	
.04000 .04000 24 3.92005+03	.04000 .04000 VERAGE3 TES 5.0000E+04	.04000 .04000 T.U-236DATA 2	.04000 .04000 .04000 0.10	.04000 .04000 00E+040.1000	.04000 .04000 ME+060.1000E+04	
.04000 .04000 2A 3.9200E+03 0.0	.04000 .04000 VERAGE3 TES 5.0000E+04 2.9184	.04000 .04000 T.U-238DATA 2	.04000 .04000 .04000 0.10 1 0	.04000 .04000 00E+040.1000 22	.04000 .04000 3E+060.1000E+04 01047	2151 226
.04000 .04000 24 3.9200E+03 0.0 236.0058	.04000 .04000 VERAGE3 TES 5.0000E+04 2.9184 0.0	.04000 .04000 T.U-238DATA 2 1	.04000 .04000 .04000 0.10 1 0 0	.04000 .04000 00E+040.100 2 6 24.6-3	.04000 .04000 3E+060.1000E+04 01047 11047 .01047	2151 226 2151 227 2151 228
.04000 .04000 24000 3.9200E+03 0.0 236.0058 18.5 236.0058	04000 .04000 VERAGE3 TES 5.0000E+04 0.0 0.5 0.0 0.5 0.0	.04000 .04000 T.U-238DATA 1 0 1.0 1.0 1.0	.04000 .04000 .04000 0.10 1 0 1.739-3 0	.04000 .04000 00E+040.1000 20E+040.1000 24.6=3	.04000 .04000 7E+060.1000E+04 01047 11047 0.01047 21047	2151 226 2151 227 2151 228 2151 228 2151 229
.04000 .04000 24000 23.9200E+03 0,0 236.0058 18.5 236.0058 18.5	04000 .04000 VERAGE3 TES 5.0000E+04 0.9184 0.0 0.5 0.0 0.5 0.0 0.5	.04000 .04000 T.U-236DATA 1 0 1.0 1.0	.04000 .04000 .04000 0.10 1 0 1.739-3 0 2.923-3	.04000 .04000 00E+040.1000 2 24.6=3 12 24.6=3	04000 04000 26+060.1000E+04 01047 11047 0.01047 21047 0.01047 0.01047	2151 226 2151 227 2151 228 2151 229 2151 230
.04000 .04000 .24000 3.9200E+03 0.0 236.0058 18.5 236.0058 18.5 9.25	04000 .04000 VERAGE3 TES 5.00000E+04 0.0 0.5 0.0 0.5 0.0 0.5 1.5	.04000 .04000 T.U-236DATA 1.0 1.0 1.0 1.0	.04000 .04000 .04000 0.10 1.739-3 0 2.923-3 1.4615-3	.04000 .04000 00E+040.1000 00E+040.1000 00E+040.1000 00E+040.1000 00E+040.1000 00E+040.1000 00E+040.1000 00E+040.1000 00E+04000 00E+04000	.04000 .04000 3E+060.1000E+04 01047 0.01047 21047 0.01047 0.01047 0.01047	2151 226 2151 227 2151 228 2151 229 2151 230 2151 23
.04000 .04000 .04000 23.9200E+03 236.0058 18.5 236.0058 18.5 9.25 3 6.4504F+03	04000 .04000 VERAGE3 TES 5.0000E+04 0.9184 0.0 0.5 0.5 0.5 1.5 AVERAGE3 TES 0.7 0.5 1.5 5.0F+04	.04000 .04000 T.U-238DATA 2 1 0 1.0 1.0 5T. U-235 D	.04000 .04000 .04000 0.10 1.739-3 0 2.923-3 1.4615-3 ATA	.04000 .04000 00E+040.1000 2 24.6=3 12 24.6=3 24.6=3 24.6=3	.04000 .04000 3E+060.1000E+04 01047 11047 0.01047 2.0047 0.01047 0.01047 0.01047 0.01047	2151 226 2151 227 2151 228 2151 230 2151 23 2151 186
.04000 .04000 .04000 236.0058 18.5 236.0058 18.5 9.25 6.4504E+01 3.5	04000 .04000 VERAGE3 TES 5.0000E+04 0.9184 0.0 0.5 0.7 0.5 0.5 0.5 1.5 1.5 1.5 0.0 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0	.04000 .04000 .04000 T.U-238DATA 1 0 1.0 1.0 1.0 5T. U-235 D 2 0	.04000 .04000 .04000 0.10 1.739-3 0 2.923-3 1.4615-3 ATA	.04000 .04000 00E+040.1005 24.6=3 24.6=3 24.6=3 24.6=3 24.6=3	.04000 .04000 3E+060.1000E+04 01047 11047 0.01047 2.01047 0.01047 0.01047 0.01047 0.01044 21044	2151 226 2151 227 2151 228 2151 230 2151 230 2151 230 2151 186 2151 187
.04000 .04000 .04000 236.0058 18.5 236.0058 18.5 9.25 6.4504E+01 3.5 6.4504E+01	.04000 .04000 VERAGE3 TES 5.0000E+04 0.0 0.5 0.5 0.5 1.5 AVERAGE3 TE 5.0E+04 8.3668E-01 8.2E+01	.04000 .04000 .04000 T.U-238DATA 1 1.0 1.0 ST. U-235 D 2 1.25E+02	.04000 .04000 .04000 0.10 1.739-3 0 2.923-3 1.4615-3 ATA 1.75E+02 8.5565402	.04000 .04000 00E+040.100 24.6-3 12 24.6-3 24.6-3 24.6-3 25 2.25E+02 125E+02	.04000 .04000 3E+060.1000E+04 01047 11047 0.01047 21047 0.01047 0.01044 21044 2.75E+021044 1.75E+021044	2151 226 2151 227 2151 228 2151 230 2151 230 2151 186 2151 187 2151 188
.04000 .04000 .04000 236.0058 18.5 236.0058 18.5 9.25 6.4504E+01 3.50E+02 2.50E+02	04000 .04000 VERAGE3 TES 5.0000E+04 0.5 0.5 0.5 1.5 AVERAGE3 TE 5.0E+04 8.3668E-01 8.2E+01 4.50E+02 3.50F+02	.04000 .04000 T.U-238DATA 1 1.0 1.0 ST.U-235 D 2 1.25E+02 6.00E+02 4.50E+02	.04000 .04000 .04000 1.739-3 0 1.739-3 0 2.923-3 1.4615-3 ATA 1.75E+02 8.50E+02 5.50F+02	.04000 .04000 00E+040.1000 24.6=3 12 24.6=3 24.6=3 24.6=3 24.6=3 25 2.25E+02 1.25E+02 1.25E+03 7.00E+03	.04000 .04000 3E+060.1000E+04 01047 11047 0.01047 0.01047 0.01047 0.01044 21044 21044 21044 21044 21044 21044 21044 21044 21044 21044	2151 226 2151 227 2151 228 2151 230 2151 230 2151 186 2151 186 2151 187 2151 189 2151 190
.04000 .04000 .04000 236.0058 236.0058 236.0058 18.5 9.25 6.4504E+01 3.50E+02 2.50E+03 1.25E+04	.04000 .04000 VERAGE3 TES 5.0000E+04 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	.04000 .04000 T.U-235DATA 1.0 1.0 5T.U-235D 2 1.25E+02 6.00E+02 4.50E+03 2.25E+04	.04000 .04000 .04000 1.739-3 2.923-3 1.4615-3 ATA 1.75E+02 8.50E+02 5.50E+03 2.75E+04	.04000 .04000 00E+040.100 24.6-3 24.6-3 24.6-3 24.6-3 24.6-3 25 2.25E+03 7.00E+03 3.50E+04	.04000 .04000 3E+060.1000E+04 01047 0.01047 0.01047 0.01047 0.01047 0.01044 21044 21044 21044 21044 21044 21044 21044 21044 21044 21044 2.75E+021044 1.75E+031044 9.00E+031044 4.50E+041044	2151 226 2151 227 2151 228 2151 230 2151 230 2151 186 2151 188 2151 188 2151 189 2151 190
.04000 .04000 .04000 236.005e 236.005e 236.005e 18.5 9.25 6.4504E+01 3.50E+01 3.50E+01 3.50E+04 2.50E+04	.04000 .04000 VERAGE3 TES 5.0000E+04 0.5 0.5 0.7 0.5 1.5 AVERAGE3 TE 5.0E+01 8.3668E+01 8.3668E+01 8.3668E+01 4.50E+73 1.75E+74	.04000 .04000 T.U-238DATA 1 1.0 1.0 5T.U-235D 1.25E+02 6.00E+02 4.50E+03 2.25E+04	.04000 .04000 .04000 .04000 1.739-3 0 2.923-3 1.4615-3 ATA 1.75E+02 8.50E+02 5.50E+03 2.75E+04	.04000 .04000 00E+040.100 24.6-3 24.6-3 24.6-3 24.6-3 25E+02 1.25E+02 1.25E+03 7.00E+04 3.50E+04	.04000 .04000 3E+060.1000E+04 01047 11047 0.01047 0.01047 0.01047 0.01044 21044 2.75E+021044 1.75E+031044 9.00E+031044 4.50E+041044 1044	2151 226 2151 227 2151 229 2151 230 2151 230 2151 186 2151 188 2151 189 2151 190 2151 191 2151 192
.04000 .04000 .24000 236.0058 18.5 236.0058 18.5 9.25 6.4504E+01 3.50E+01 3.50E+01 3.50E+01 3.50E+04 2.50E+04 233.0247	.04000 .04000 VERAGE3 TES 5.0000E+04 0.5 0.7 0.5 1.5 AVERAGE3 TE 5.0E+01 8.2E+01 4.50E+02 3.50E+03 1.75E+04 2.0 0.0	.04000 .04000 T.U=238DATA 2 1.0 1.0 ST.U=235 D 1.25E+02 6.00E+02 4.50E+03 2.25E+04	.04000 .04000 .04000 .04000 1.739-3 0 2.923-3 1.4615-3 ATA 1.75E+02 8.50E+02 5.50E+02 5.50E+03 2.75E+04	.04000 .04000 00E+040.1000 00E+040.000 00E+040.1000 00E+040.0000 00E+040.0000 00E+040.0000 00E+040.0000 00E+040.0000 00E+040.0000 00E+040.0000 00E+040.0000 00E+040.0000 00E+040.0000 00E+04000 00E+04000 00E+04000 00E+04000 00E+04000 00E+04000 00E+04000 00E+04000 00E+04000 00E+040000000000	.04000 .04000 3E+060.1000E+04 01047 11047 2.01047 0.01047 0.01047 0.01047 0.01044 21044 2.75E+021044 1.75E+031044 9.00E+031044 4.50E+041044 01044	2151 226 2151 227 2151 229 2151 230 2151 230 2151 186 2151 187 2151 188 2151 190 2151 191 2151 192 2151 194
.04000 .04000 .04000 24 3.9200E+03 236.0058 18.5 236.0058 18.5 236.0058 5.25 6.4504E+01 3.50E+02 2.50E+03 1.25E+04 5.00E+04 233.0247 .000	.04000 .04000 VERAGE3 TES 5.0000E+04 2.9184 0.5 0.5 0.5 1.5 AVERAGE3 TES 5.0E+04 8.3668E-01 8.2E+01 8.2E+01 4.50E+02 3.50E+73 1.75E+04 2.0 0.0 3.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	.04000 .04000 .04000 T.U=238DATA 1 .0 1.0 5T.U=235 0 1.25E+02 6.00E+02 4.50E+03 2.25E+04 0 0 1.0 0 1.25E+02 6.00E+02 4.50E+03 2.25E+04	.04000 .04000 .04000 0.10 1.739-3 0 2.923-3 1.4615-3 ATA 1.75E+02 8.50E+02 5.50E+03 2.75E+04 2.75E+04 2.75E+04	.04000 .04000 00E+040.1000 00E+040.1000 00E+040.1000 00E+040.1000 00E+040.1000 00E+040.1000 00E 24.6-3 24.6-3 24.6-3 25 2.25E+02 1.25E+03 7.00E+03 3.50E+04 231 0.035	.04000 .04000 3E+060.1000E+04 01047 11047 2.01047 2.01047 0.01047 0.01047 0.01044 21044 2.75E+021044 1.75E+031044 9.00E+031044 4.50E+041044 1.044 0.01044	2151 226 2151 228 2151 229 2151 230 2151 186 2151 187 2151 189 2151 191 2151 191 21551 191 21551 191 21551 191 21551 192 21551 192 21551 193 21551 194 21551 195
.04000 .04000 .04000 24 236.0058 236.0058 18.5 236.0058 18.5 9.25 6.4504E+01 3.50E+02 2.50E+03 1.25E+04 5.00E+04 233.0247 2.9474E=01	.04000 .04000 VERAGE3 TES 5.0000E+04 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	.04000 .04000 .04000 T.U-238DATA 1 1.0 1.0 5T.U-235D 1.25E+02 6.00E+02 4.50E+03 2.25E+04 0 0 2.4623E=01	.04000 .04000 .04000 .04000 1.739-3 .00 1.739-3 .2.923-3 .3 1.4615-3 1.4615-3 ATA 1.75E+02 8.50E+02 5.50E+03 2.75E+04 2.75E+04 2.4258E-01	.04000 .04000 00E+040.1000 00E+040.1000 24.6-3 24.6-3 24.6-3 24.6-3 24.6-3 25 2.25E+02 1.25E+02 1.25E+03 7.00E+04 3.50E+04 231 0.035 2.6413E-01	.04000 .04000 3E+060.1000E+04 01047 11047 2.01047 0.01047 0.01047 0.01047 0.01044 2.75E+021044 1.75E+031044 1.75E+031044 4.50E+031044 01044 01044 01044 0.01044	2151 226 2151 228 2151 230 2151 230 2151 230 2151 230 2151 186 2151 188 2151 189 2151 191 2151 192 2151 191 2151 192 21551 194 21551 195 21551 195 21551 195 21551 195 21551 195 21551 195 21551 195 21551 195
.04000 .04000 .04000 24 236.0058 236.0058 18.5 236.0058 3.925 3.9258 18.5 9.25 6.4504E+01 3.50E+02 2.50E+04 4.23.0247 2.500E+04 1.00 2.9474E-01 2.7310E-01	.04000 .04000 VERAGE3 TES 5.0000E+04 0.9184 0.0 0.5 0.5 1.5 AVERAGE3 TES 1.5 AVERAGE3 TES 1.5 AVERAGE3 TES 0.5 1.5 AVERAGE3 TES 0.5 0.5 1.5 AVERAGE3 TES 0.5 0.5 0.5 1.5 2.9264E+02 3.50E+020000000000000000000000	.04000 .04000 .04000 T.U-238DATA 1 1.0 1.0 5T.U-235D 1.25E+02 4.50E+03 2.25E+04 2.25E+04 0 0 2.4623E=01 4.4004E-01 3.21945-04	.04000 .04000 .04000 .04000 1.739-3 0 1.739-3 0 2.923-3 1.4615-3 ATA 1.75E+02 8.50E+02 5.50E+03 2.75E+03 2.75E+04 1.0E=04 2.4258E=01 2.3327E=01 3.2284E=01	.04000 .04000 00E+040.1000 00E+040.1000 00E+040.1000 00E+040.1000 00E+040.1000 00E+040 24.6-3 24.6-3 0225E+02 1.25E+03 3.50E+04 21 0.0035 2.6413E+01 3.0029E+01 3.0029F+01	.04000 .04000 3E+060.1000E+04 01047 11047 21047 0.01047 0.01047 0.01044 2.75E+021044 1.75E+031044 9.00E+031044 4.50E+041044 1044 0.01044 3.5300E-011044 3.3291E-011044	2151 226 2151 228 2151 229 2151 230 2151 230 2151 230 2151 230 2151 230 2151 230 2151 186 2151 188 2151 190 2151 191 2151 192 2151 193 2151 197 2151 197 2151 197 2151 197 2151 197 2151 197 2151 197 2151 197 2151 197 2151 198
.04000 .04000 .04000 24 236.0058 236.0058 236.0058 236.0058 18.5 9.25 6.4504E+01 3.50E+02 2.50E+04 3.50E+04 2.500E+04 2.500E+04 2.500E+04 2.500E+04 2.3.0247 2.9474E=01 2.7310E-01 4.249E-01 4.2837E-01	.04000 .04000 VERAGE3 TES 5.0000E+04 0.5 0.5 0.5 1.5 AVERAGE3 +01 8.3668E-01 4.50E+02 3.50E+02 3.50E+02 3.50E+02 3.50E+02 3.50E-01 4.5109E-01 3.2358E-01 4.3870E-01	.04000 .04000 .04000 T.U-238DATA 1 1.0 1.0 5T.U-235D 1.25E+02 4.55E+03 2.25E+03 2.25E+04 0 2.4623E=01 3.2196E=01 3.2196E=01 4.5035E=01	.04000 .04000 .04000 .04000 .04000 .0100 1.739-3 .000 1.4615-3 1.4615-3 .500±+02 5.500±+02 5.500±+02 2.755±04 .000 1.000 2.755±04 .000 2.755±04 .000 2.755±04 .0000 .0000 2.755±04 .00000 2.755±04 .0000 2.755±04 .00000 2.755±04 .00000 2.755±04 .00000 2.755±04 .00000000000000000000000000000000000	.04000 .04000 2000 24.6-3 24.6-3 24.6-3 24.6-3 24.6-3 24.6-3 24.6-3 24.6-3 24.6-3 24.6-3 24.6-3 255 2.255+02 1.255+03 7.005+03 3.505+04 21 3.505+04 3.505+04 3.505+01 3.0095-01 5.20785+01	.04000 .04000 3E+060.1000E+04 01047 11047 0.01047 0.01047 0.01047 0.01047 0.01044 21044 2.75E+021044 1.75E+021044 4.50E+041044 1044 01044 4.50E+041044 3.5300E-011044 3.3291E-011044	2151 226 2151 228 2151 229 2151 230 2151 230 2151 230 2151 230 2151 230 2151 230 2151 230 2151 186 2151 187 2151 190 2151 190 2151 190 2151 190 21551 197 2151 198 2151 198 2151 198 2151 198 2151 198
.04000 .04000 .04000 24 236.0058 236.0058 236.0058 236.0058 236.0058 236.0058 18.5 9.25 6.4504E+01 3.50E+02 250E+04 5.00E+04 233.0247 2.700 2.9474E-01 4.2449E-01 4.3837E-01 5.7033E-01	.04000 .04000 VERAGE3 TES 5.0000E+04 0.0 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	.04000 .04000 .04000 T.U-235DATA 1.0 1.0 5T.U-235D 1.25E+02 4.50E+02 2.25E+04 0 2.4623E=01 4.5035E=01 4.5035E=01	.04000 .04000 .04000 .04000 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.739-3 .00 1.4615-3 1.4615-3 1.4615-3 .50E+03 2.75E+0300000000000000000000000000000000000	.04000 .04000 24400 24.6-3 24.6-3 24.6-3 24.6-3 24.6-3 24.6-3 25 2.25E+02 1.25E+02 7.00E+03 3.50E+04 3.50E+04 3.50E+01 3.0029E+01 3.0029E+01 5.2078E+01	.04000 .04000 3E+060.1000E+04 01047 0.01047 0.01047 0.01047 0.01047 0.01044 21044 2.75E+021044 1.75E+031044 4.50E+041044 1.044 0.01044 4.9705E-011044 3.3291E-011044 5.9992E-011044	2151 228 2151 228 2151 230 21551 230 21551 230 21551 230 21551 230 21551 230 21551 230 21551 230 21551 230 21551 1889 21551 190 21551 190 21551 190 21551 190 21551 190 21551 190 21551 190 21551 190 21551 190 21551 190 21551 190 21551 190 21551 190 21551 190 21551 190 21551 21551 21551 21551 21551 21551 21551 21551 21551 21551 21551 190 21551 190 2
.04000 .04000 .04000 24 236.005 2505 2.005 2.005 2.005 2.005 2.0005	.04000 .04000 VERAGE3 TES 5.0000E+04 0.5 0.9184 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	.04000 .04000 .04000 T.U-238DATA 1.0 1.0 1.0 5T.U-235D 1.25E+02 6.00E+02 4.50E+03 2.25E+04 0.0 2.4623E=01 4.4004E=01 3.2196E=01 4.5035E=01	.04000 .04000 .04000 .04000 1.739-3 2.923-3 1.4615-3 ATA 1.75E+02 8.50E+03 2.75E+02 5.50E+03 2.75E+04 2.3327E+01 2.3327E+01 3.2284E=01 3.2284E=01 4.7280E=01	.04000 .04000 00E+040.1000 24.6-3 24.6-3 24.6-3 24.6-3 24.6-3 24.6-3 25E+03 7.00E+03 3.50E+04 21 0.035 2.6413E+01 3.0020E+01 3.0020E+01 3.3009E-01 5.2078E+01	.04000 .04000 3E+060.1000E+04 01047 21047 0.01047 0.01047 0.01047 0.01044 21044 2.75E+021044 1.75E+031044 9.00E+031044 4.50E+041044 1.044 01044 4.9705E-011044 3.3291E-011044 5.9992E-011044 01044	226 2151 2230 21551 221551 21551 221551 21551 21551 21551 21551 21551 221551 21551 221551 21551 221551 11888 221551 11993 221551 11997 221551 11997 221551 11997 222222222222222222222222222222222222
.04000 .04000 .04000 24 236.005 236.005 236.005 236.005 236.005 18.5 9.25 6.4504E+01 3.50E+01 2.50E+04 2.50E+04 2.50E+04 2.50E+04 2.50E+04 2.50E+04 2.7310E-01 4.3837E-01 5.7033E-01 1.00 1.4737E+01	.04000 .04000 VERAGE3 TES 5.0000E+04 0.5 0.9184 0.5 0.7 0.5 0.7 0.5 1.5 0.5 0.5 0.7 0.5 0.7 0.5 0.7 0.5 0.7 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	.04000 .04000 .04000 T.U-238DATA 1.0 1.0 5T.U-235D 1.25E+02 6.00E+02 4.50E+03 2.25E+04 0 2.4623E=01 4.4004E=01 3.2196E=01 4.5035E=01 4.5035E=01 0 1.0 0 1.2311E=01	.04000 .040000 .040000 .040000 .040000 .040000 .040000 .040000 .040000 .040000 .040000 .040000 .10 .040000 .10 .040000 .10 .04000 .040000 .10 .04000 .040000 .10 .040000 .10 .10 .10 .10 .10 .10 .10 .10 .10	.04000 .04000 00E+040.1000 24.6-3 24.6-3 24.6-3 24.6-3 24.6-3 25E+03 7.00E+03 3.50E+04 21 0.035 2.6413E-01 3.009E-01 5.2078E-01 3.1 0.035 1.3207E-01	.04000 .04000 .04000 .04000 .01047 .11047 0.01047 0.01047 0.01047 0.01044 21044 2.75E+021044 1.75E+031044 9.00E+031044 9.00E+031044 4.50E+041044 1.044 01044 3.5300E-011044 3.3291E-011044 3.3291E-011044 2.01044 2.4852E-011044	2267 2278 2272 2289 21551 221551 21551 21551 21551 211551 11888 2211551 11888 2211551 11188 2211551 111923 2211551 11993 2211551 11996 222222222222222222222222222222222222

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2.1225E-01	1.6179E-01	1.60985-01	1.61425-01	1.6505E-01	1.66465-011044	2151	205
2.85175-01	S-1A92F-N1	2.251/1=01	2.36406-01	4.0039E-01	2.99908-011044	2151	200
233,0247	0.0	1	Ø	4	01044	2151	208
3.0	0.2	1	5	31	Ø1044	2151	209
1.16	2,0	1.2	2.325-04	Ø,Ø35	0,01044	2151	210
3.32E-01	3,325-01	3.32E=01	3,32E+01	3,32E-01	3.32E-011044	2151	211
3,32E-01	3.32E-01	3.32E=01	3,32E•01	3.32E-Ø1	3.32E-011044	2151	212
3,32E-Ø1	3.32E-01	3,32E=01	3.32E-21	3.32E-Ø1	3.325-011044	2151	213
3,32E-Ø1	3.32E-71	3,325-01	3,326+Ø1	3.32E-01	3,32E-Ø11Ø44	2151	214
3,325-01					1044	2151	215
0 . Ø	0.0	1	1	31	Ø1Ø44	2151	216
1.00	3,2	2.0	2.00E-04	0.035	0,01044	2151	217
1.27E-01	1.275-21	1.27E=01	1.27E-Ø1	1.27E-01	1.27E-011044	2151	218
1.275-01	1.27E-01	1.27E=01	1.276-01	1.27E-Ø1	1.2/E-011044	2151	219
1.27E-01	1.275-01	1.27E=Ø1	1.275-01	1.275-01	1.27E-011044	2151	220
1.275-01	1.275-01	1.27E-01	1.27E-01	1.27E-01	1,27E-011244	2151	221
1.2/E-01			_		1044	2121	222
.0.0	0.0	1	2	31	01044	2121	223
1,00	4,0	2.0	2.005-04	0.037	0.01044	2121	224
2,005-01	2,805-01	2,00E=01	2.005-01	2.001-01	2.80E-011044	2121	223
2.805-01	2.865-91	2.86E=01	2.868-01	2,851-01	2.805-011044	2121	220
2,005-01	2,801-01	2,001-01	2,001-01	2.005-01		2121	22/
2,005-01	S'COF-NT	S'OOFERI	2.000-01	2.005-01	2,0004011044	2121	220
2.001-01	2 0	4	4	74	1044 01044	2121	229
1 1 1 2	5.0	1 0	2 245-04	01 035	01044 0 01044	2191	231
1 437 01	1 435-01	1 435-04	1 435-04	1 435-81	1 435 011044	2124	232
1 430 04	1 435-31	1 435-01	1 435-01	1 435.04	4 435 011044	2124	237
1 435-91	1 435-01	1 435-01	1 435-01	4 435-01	1 435-011044	2151	234
1 436-04	1 435-01	1 435-01	1 475-01	1 430-01	1 43E- 741044	2151	235
1 436-01	7.405-01	1.705601	1.705.701	1.405401	1044	2151	236
#1406#NT					7044 2044	C T 1 T	200

PROGRAM AVRAGE3. CALCULATES CROSS-SECTIONS IN THE UNRESOLVED RESONANCE REGION.

ENDF/B VERSION II DATA WITH ENERGY INDEPENDENT PARAMETERS.

RUN NO 1 TITLE AVERAGE3 TEST,PU-239 DATA EO 0,000000E+00 EN 0.0000000E+00 ESTEP 0,000000E+00 ENERGY LIMITS LOWER 3.000000E+02 UPPER 1.000000E+05 LRU= 2 LRF= 1 LFI= 0 TARGET SPIN 5.0000E-01 SCATTERING LENGTH 9.0500E-01 NO OF ENERGY VALUES AT WHICH FISSION WIDTHS ARE GIVEN DATA FOR A FISSILE NUCLEUS

S-WAVE DATA

 FISSION WIDTHS ARE GIVEN AT THE FOLLOWING ENERGIES

 3.0000E+02
 6.0000E+02
 1.0000E+03
 1.5000E+03
 2.5000E+03
 3.5000E+03

 5.0000E+03
 8.0000E+03
 1.3000E+04
 2.0000E+04
 3.0000E+04
 4.0000E+04

 5.0000E+24
 6.0000E+04
 1.0000E+04
 1.0000E+05
 1.0000E+04
 5.0000E+05

 5.0000E+24
 6.0000E+024
 2.0000E+04
 1.0000E+05
 1.0000E+05
 1.0000E+05

 5.0000E+03
 8.0000E+02
 ANGULAR MOMENTUM
 0.00 OF SPIN STATES
 2

MEAN LEVEL SPACING 8,7800E+00 LEVEL SPIN 0.000E+00 REDUCED NEUTRON WIDTH 9.4000E-04 GAMMA GAMMA 3.8700E+10 NO OF DEGREES OF FREFDOM FOR NEUTRON WIDTH DISTRIBUTION 1 NO OF DEGREES OF FREFDOM FOR FISSION WIDTH DISTRIBUTION 2 THE FISSION WIDTHS APE 2.8000E+00 2.8000E+00 2.8000E+00 2.8000E+00 2.8000E+00 2.8000E+00 2.8000E+00 2.8000E+00 2.8000E+00 2.8000E+00 2.8000E+00 2.8000E+00 2.8000E+00 2.8000E+00 2.8000E+00 2.8000E+00 2.8000E+00

MEAN LEVEL SPACING 3.1200E+00 LEVEL SPIN 1.0000E+00 REDUCED NEUTRON WIDTH 3.3400E+04 GAMMA GAMMA 3.8700E+0 NO OF DEGREES OF FREEDOM FOR NEUTRON WIDTH DISTRIBUTION 1 NO OF DEGREES OF FREEDOM FOR FISSION WIDTH DISTRIBUTION 1 THE FISSION WIDTHS APE 5.5200E-02 5.5900E=02 5.6800E=02 5.7800E=02 5.9320E=02 6.2300E=02 6.5700E=02 7.3300E=02 8.7200E=02 1.1020E=01 1.9020E=01 1.9750E=01 2.4800E=01 3.0000E=01 3.8600E=01 4.8500E=01

P-WAVE DATA

ISOTOPIC MASS 2.37005+02 ANGULAR MOMENTUM 1 NO OF SPIN STATES 3

MEAN LEVEL SPACING 8.7800E+00 LEVEL SPIN 0.000E+00 REDUCED NEUTRON WIDTH 2.1950E+03 GAMMA GAMMA 3.8700E+0 NO OF DEGREES OF FREFDOM FOR NEUTRON WIDTH DISTRIBUTION 1 NO OF DEGREES OF FREEDOM FOR FISSION WIDTH DISTRIBUTION 2 THE FISSION WIDTHS ARE 4.0000E+02 4.0000E+02 4.0000E=02 4.0000E=02 4.0000E+02 4.0000E+02 4.0000E+02 4.0000E=02 4.0000E=02 4.0000E=02 4.0000E=02

4.0000E=02 4.0000E=02 4.0000E=02 4.0000E=02

MEAN LEVEL SPACING 3,1200E+00 LEVEL SPIN 1,0000E+00 REDUCED NEUTRON WIDTH 7,8000E=04 GAMMA GAMMA 3,8700E-02 NO OF DEGREES OF FREEDOM FOR NEUTRON WIDTH DISTRIBUTION NO OF DEGREES OF FREEDOM FOR FISSION WIDTH DISTRIBUTION 2 THE FISSION WIDTHS ARE 4.0000E-02 4.0000E-02 4.0000E-02 4.0000E-02 4.0000E-02 4.0000E-02 4.0000E=02 4.0000E=02 4.0000E=02 4.0000E=02 4.0000E=02 4.0000E=02 4.0000E-02 4.0000E-07 4.0000E-02 4.0000E-02 MEAN LEVEL SPACING 2.1200€+00 LEVEL SPIN 2.0000€+00 REDUCED NEUTRON WIDTH 5,3000€=04 GAMMA GAMMA 3,8700€=02 NO OF DEGREES OF FREEDOM FOR NEUTRON WIDTH DISTRIBUTION NO OF DEGREES OF FREEDOM FOR FISSION WIDTH DISTRIBUTION 1 THE FISSION WIDTHS ARE 4.0000E-02 4.0000E=02 4.0000E=02 4.0000E=02 4.0000E=02 4.0000E=02 4.0000E-02 4.0000E-02 4.0000E-02 4.0000E-02 4.0000E-02 4.0000E-02 4.0000E-02 4.0000E-02 NUCLEAR RADIUS A=(1,23*MASS**1/3*0,8)*0,1 = 8,4337E=01 AVERAGE SCATTERING CAPTURE AND FISSION CROSS=SECTIONS FOR A FISSILE NUCLEUS AVERAGES TEST PU=239 DATA TITLE TITLE AVERAGES TEST, PUT239 DATA AVERAGE CROSS-SECTIONS CALCULTED USING GREEBLER APPROXIMATION NEUTRON ENERGY(EV) S-WAVE SCATRNG CROSS-SECTION P-WAVE SCATRNG CROSS-SECTION 3,0000000E+02 1,383416E+01 1,296935E=04 5,145503E=04 TOTAL 1.383429E+Ø1 6.000000E+02 1.347005E+01 5,165503E-04 1.347056E+01 1,000000E+03 1,500000E+03 1.425274E=03 3.176370E=03 1.316930E+01 1.291372E+01 1.317073E+01 1,291690E+01 1.25747ØE+Ø1 2,500000E+03 8.631692E=03 1.258333E+01 1,232965E+01 3.500000E+03 1,650611E-02 1.234616E+Ø1 5,000000E+03 1,206458E+01 3,235447E-02 1.209694E+01 7.591461E-02 8,00000E+03 1,169198E+01 1,176790E+01 1.724855E-01 1.144583E+Ø1 1,300000E+04 1,127335E+01 1.119264E+Ø1 2,00000000+04 1.0859395+01 3,332512E-01 1,041848E+01 1,099523E+01 3.00000000+04 5.767438E=01 4,00000000+04 8,139086E-01 1.088080E+01 1,006689E+01 9.769172E+00 5,0000000E+04 1.036500E+00 1.080567E+01 1,242964E+00 6.000000F+04 9,506816E+00 1.074978E+01 1,611006E+00 8,00000000+04 9.057618E+00 1.066862E+01 1,000000000000 8.660133E+00 1.928741E+00 1.058887E+01 S+WAVE CAPTURE CROSS-SECTION P-WAVE CAPTURE CROSS-SECTION TOTAL NEUTRON ENERGY(EV) 9.295319E+00 1,070727E-01 3,000000E+02 9,402392E+00 6,000000E+02 6.096594E+00 1,510540E-01 6.247648E+00 1.942551E-01 4.609493E+00 1.000000E+03 4.415238E+ØØ 1,50000000+03 3.391673E+00 2.365860E=01 3.628259E+ØØ 2.410175E+00 2,500000E+03 3,014797E-01 2.711655E+ØØ 1.901494E+00 3,500000E+03 3.514680E-01 2.252962E+ØØ 5.000000F+03 1.472163E+00 4.098882E-01 1.882051E+00 1,035008E+02 4,9111235-01 8.000000E+03 1.526120E+00 1.30000000+04 7.044900E-01 5.685306E=01 1.273021E+00 2,00000000+04 4,887895E-01 6,162974E-01 1.105078E+00 6,302902E-01 9.675432E-01 3.00000000+04 3.37253ØE-01 4.000002E+04 2.546110E-01 6.18194ØE-01 8.728050E-01 2.032893E-01 5.963265E+Ø1 5,000000E+04 7,996159E-01 6,002000E+04 1,685889E-01 5.712251E-01 7,398140E-01 8,00000000000404 1.2672245-01 5.2100525-01 6,477276E-01

4.39656654 4.39656654 4.39656654 4.396565654 4.396565654 4.3965654 4.400 4.6000 4.6000 4.6000 4.6000 4.6000 4.6000 4.6000 4.6000 4.6000 4.6000 4.6000 4.6000 4.6000 4.6000 4.6000 4.60000 4.60000 4.60000 4.60000000000	4,8218775+01 4,6907905-01 4,6913765-01 4,0313765-01 4,0718835-01	9,14377955-01 8,5377985-01 7,56414455-01 6,9264875-01	୧୪୦୬୫୪୪ ୧୪୦୫୪୪ ୧୯୦୫୪୪ ୧୯୫୪୫ ୧୯୫୫ ୧୯୫୫ ୧୯୫ ୧୯୫
1.4850525+0	4.905240E101	9.9452805-01	DODE+04
1.6003345+0	4 884854E 01	1.1118485+00	Ø00E+04
1.786382E+0	4.635778E=01	1, 322805E+00	000E+04
2.041696E+0	4.168780E-01	1,62481,8E+00	1000E+04
2.440601E+0	3,529282E-01	2,087673E+00	0000E+03
2.979838E+0	2,910436E-01	2,688795E+00	0000E+03
3.520906E+0	2.481861E-Ø1	3,272720E+00	0000E+03
4.14316BE+0	2.121837E=Ø1	3,930985E+62	00000E+03
5.398047E+0	1.660404E-01	5,23200.6E+00	0000E+03
6.682141E+0	1.361744E=01	6,545967E+Øð	00000+03
8.762245E+0	1,058106E-01	9.656434E+00	r000e+02
1.2663Ø5E+0	7.497054E-02	1.258808E+01	0000E+02
5.761712E-0 7071	4.7578895-01 P-Wave Neutron Crossistion	1.003823E-01 S-Wave Fission Cross-Section	ZØØØE+Ø5 Energy(ev)

PROGRAM AVRAGES, CALCULATES CROSS-SECTIONS IN THE UNRESOLVED RESONANCE REGION.

ENDF/B VERSION II DATA WITH ENERGY INDEPENDENT PARAMETERS.

RUN NO 2 TITLE AVERAGE3 TEST.U-238DATA EO 1.000000E+03 EN 1.000000E+05 ESTEP 1.000000E+03 ENERGY LIMITS LOWER 3.920000E+03 UPPER 5.000000E+04 LRU= 2 LRF= 1 LFI= 0 TARGET SPIN 0.0000E+00 SCATTERING LENGTH 9.1840E-01 NO OF ENERGY VALUES AT WHICH FISSION WIDTHS ARE GIVEN DATA FOR A NON-FISSILE NUCLEUS

SHWAVE DATA

ISOTOPIC MASS 2,3601E+02 ANGULAR MOMENTUM 0 NO OF SPIN STATES 1 MEAN LEVEL SPACING 1.8500E+01 LEVEL SPIN 5.0000E-01 REDUCED NEUTRON WIDTH 1.7390E-03 GAMMA GAMMA 2,4600E-02 NO OF DEGREES OF FREEDOM FOR NEUTRON WIDTH DISTRIBUTION 1 PRWAVE DATA ISOTOPIC MASS 2.36015+02 ANGULAR MOMENTUM 1 NO OF SPIN STATES 2 MEAN LEVEL SPACING 1.8500€+01 LEVEL SPIN 5.0000E-01 REDUCED NEUTRON WIDTH 2.9230E-03 GAMMA GAMMA 2.4600E-02 NO OF DEGREES OF FREFOOM FOR NEUTRON WIDTH DISTRIBUTION 1 MEAN LEVEL SPACING 9.2500E+00 LEVEL SPIN 1.5000E+00 REDUCED NEUTRON WIDTH 1.4615E=03 GAMMA GAMMA 2.4600E=02 NO OF DEGREES OF FREEDOM FOR NEUTRON WIDTH DISTRIBUTION 1 NUCLEAR RADIUS A=(1.23+MASS++1/3+0.8)+0.1 = 8.423ØE+Ø1 AVERAGE SCATTERING AND CAPTURE CROSS-SECTIONS FOR A NON-FISSILE NUCLEUS TITLE AVERAGE3 TEST, U=2380ATA ENERGY LIMITS LOWER 1.0000E+03 UPPER 1.0000E+05 AVERAGE CROSS=SECTIONS CALCULTED USING GREEBLER APPROXIMATION NEUTRON ENERGY(EV) S-WAVE SCATRING CROSS-SECTION P-WAVE SCATRING CROSS-SECTION TOTAL 1,00000000+03 2,014256E+01 4.648Ø83E=Ø3 2.014721E+01 1,764954E+Ø1 1.744892E-02 1.766709E+01 2,000000E+03 1.644058E+01 3.647962E=02 3.000000E+03 1,647706E+01 1.573847E+Ø1 1,567848E+01 5.999283E-02 4.000000E+03 1.513575E+01 8.6593Ø3E+02 5.000000F+03 1.522235E+01 1,152270E=01 1.483574E+01 6.000000E+03 1.472052E+01 7.00000000+03 1.438738E+01 1.451215E=01 1.45325ØE+Ø1 1,411092E+01 1.428663E+Ø1 1.757174E=01 8,000000E+03 1.38756ØE+01 2.066137E-01 9.000000E+03 1,408222E+01 1.367133E+01 1,000000E+04 1,390886E+01 2,375251E-01 1.349119E+Ø1 1.100000F+04 2.682505E=01 1.375944E+01 1.333027E+01 1.2000005+04 2.986493E=01 1.362892E+01 1.300000E+04 3.286254E-01 1.318497E+Ø1 1.351359E+01 1.305258E+01 1.341069E+01 1.40000000+04 3.581147E=01 1.500000E+04 1.293100E+01 3.870764E=01 1.3318Ø8E+Ø1 1,281862E+01 4.154869E=01 1,600000E+04 1,323411E+01 1.700000E+04 1.271411E+01 4.433347E-01 1.315745E+Ø1 4.706171E-01 1.308705E+01 1,80000000+04 1.261643E+01 1.900000E+04 4.973383F=Ø1 1.252471E+01 1.302205E+01 5.235065E-01 2,000000E+04 1.243823E+01 1.296174E+01 1.235641E+01 2.10000000+04 5.491333E+01 1.290554E+01 1.227872E+01 5,742326E-01 1,285295E+01 2,20300005+04 1.220474E+01 2.300000E+04 5.988195E=Ø1 1.280356E+01 1.213411E+01 6.229101E-01 1.275702E+01 2.402000E+04 2.500000E+04 1.206650E+01 6,465207E=01 1.271302E+01 2.600000E+04 1.200164E+01 6.696681E=Ø1 1.267131E+01 1.193929E+01 6.923688F=Ø1 2.70000005+04 1.263166E+Ø1

2

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3.0000000+04	1.1765295+01	7.579516E=01	1.2523245+01
3,100000E+04	1.171108E+M1	7,790243E=01	1.249010E+01
3 • 2 0 0 0 0 0 E + 0 4	1,165854E+01	7,997275E=01	1.245826E+01
3 • 3 6 8 8 8 6 6 4 8 4	1,160754E+01	8,200751E-01	1.242761E+01
3.400000E+04	1.155798E+01	8.400803E=01	1.239806E+Ø1
3,5800001+04 * 4000001+04	1.1509776+01 	8.597562E=01 2 70.1405-01	1.236952E+Ø1 . 234403E+Ø1
0.000000000000000000000000000000000000			4 • 00
3 - 888888 - 84 3 - 86988 - 84	1.1372365+01	9.169274E-01	4.2289295401
3,900005+04	1.1329735+01	9.3540322-01	1.2264136+01
4.000000E+04	1.1286085+01	9.536058E-01	1.22396BE+Ø1
4,100000E+04	1.124435E+Ø1	9.715452E-01	1.221590E+01
4 . 2 3 9 9 9 9 E + 8 4	1.1203505+01	9,892306E=01	1.219273E+01
4 . 3000005+04	1.116348E+Ø1	1.006671E+00	1.217015E+01
4.4600005.404	1.1124245491	1,023875E+00	1.214812E+01
4 . 7000001 404 4 . 4000001 404	H ■ 1 120 0 / JE ■ 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10	1. 04000011400 1. 051750551400	1 • 7 4 7 0 0 8 F # 8 4 • 0 4 8 F F 7 F 4 8 4
	1 • 1 Ø 4 / V / D 1 Ø 1		
4.8888855584	1.074395+01	1.0/41405+00 1.0904845+00	1.2004845401 1.2004885401
4.900000-04	1.0038545+01	1.1066205+00	1.204516F+01
5.000006.004	1.0923285+01	1.1225655+00	1.2025846+01
5,10000E+04	1,0368576+01	1,138322E+ØØ	1.200689E+01
5 . 200000E+04	1,063439E+21	1.153900E+00	1.198829E+Ø1
5	1,0800745+01	1,169302E+00	1.197004E+01
5 40000E+04	1.076757E+01	1,184535E+00	1.195210E+01
5,500000E+04	1.073487E+Ø1	1,199604E+00	1.193448E+Ø1
5.600002 5 +04	1.070263E+01	1.214514E+00	1.191714E+01
5 - 7000000 + 04	1.067082E+01	1,229270E+00	1.1900095+01
5 . 800000E+04	1.063943E+01	1,243876E+00	1.1883315+01
5 • 90000005 • 04		1,258336E+00	1.1866785+01
0 . 88888885 * 84		1.272055E*00	1.1828585461
6.1000005+04 /		1,28683/E+20	1.1834406484
0 - 7808061 - 804 4 - 4626661 - 404	1.0517/05+01 . 0.00065401		1. 1010076+01 • • • • • • • • • • • • • • • • • • •
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0.0000001-01 6.7000001+04	- 077446740+	4 - 2 / / 0 - 1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2	4 * 4 ~ / ~ / 4 U ~ D
		1.382581E+20	
6,90000E+04	1.0317876+01	1,395794E+ØØ	1.1713676+01
7 . BB0000E + 04	1,029050E+01	1,408900E+00	1.169940E+01
7.10000E+04	1.026340E+01	1,421901E+00	1,168530E+01
7.2838885.84	1.823656E+01		1.107130E+01
/ . 300 200 E = 94 7 . 40 20 20 F = 94	1. 8787771551 1. 84876481	1. 442 NOV17 002	4 • 107/7/1 • 107/7/1 • 101
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7 7 9 9 9 9 9 5 4 9 4		1.497856E+00	1.160387E+01
7.8000005+04	1.0080595+01	1.510195E+00	1.159079E+01
7 .900000E+04	1,005538E+01	1,522447E+00	1.157783E+Ø1
8,00000E+04	1,0030395+01	1,534616E+00	1.156500E+01
3.1000005+04 2.222221-222	1.0005595+01	1,546702E+00	1.155229E+Ø1
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3.6000005404	9.884498F+86	1.605963E+00	1.140040E+01
3 .700000E+04	9 860824 E+ 00	1,617593E+00	1.147842E+Ø1
3,80000E+04	9 837322E+ØØ	1.629152E+00	1.146647E+01

8.900000E+04	9,813988E+ØØ	1,64Ø642E*ØØ	1.145463E+Ø1
9.000000E+04	9.79Ø817E+ØØ	1,652064E+00	1.144288E+Ø1
9,100000E+04	9,7678Ø8E+ØØ	1,663419E*00	1.143123E+Ø1
9,200000E+04	9.744955E+ØØ	1,674709E+00	1.141966E+Ø1
9.300000E+04	9,722257E+ØØ	1,685936E+ØØ	1.140819E+01
9,400000E+04	9.699708E+00	1,697100E+00	1.139681E+Ø1
9,500000E+04	9.677307E+00	1,708202E+00	1.138551E+01
9,600000E+04	9,655050E+00	1.719244E+00	1.137429E+01
9,7ØØØØØE+04	9,632934E+ØØ	1.730226E+00	1.136316E+Ø1
9.800000E+04	9.610957E+00	1,741150E+00	1,135211E+Ø1
9,900000E+04	9.589115E+0Ø	1.752017E+00	1.134113E+Ø1
1,00000E+05	9,5674Ē7E+0E	1.762828E+00	1.133023E+01
NEUTRON ENERGY(EV)	S-WAVE CAPTURE CROSS-SECTION	P-WAVE CAPTURE CROSS-SECTION	TOTAL
1,000000E+03	2.602705E+00	2.045669E=01	2.807272E+00
2,000000E+03	1 450008E+00	2,775752g=01	1,727583E+ØØ
3,000000E+03	1.022994E+00	3,238675E=Ø1	1.346861E+00
4,000000E+03	7.964915E-01	3.550220E-01	1.151513E+ØØ
5,000000E+03	6.549666E-Ø1	3.762565E=Ø1	1.031223E+00
6,ØØØØØØE+Ø3	5,576891E-01	3,905912E+01	9.4828ø3E-ø1
7,ØØØØØØE+Ø3	4.864937E-Ø1	3,999717E=01	8.864654E-01
8,000000E+03	4.320128E-01	4.Ø57238E=01	8.377366 <u>e</u> -ø <u>1</u>
9,000000E+03	3.889101E-01	4.087823E=01	7.976924E-01
1.000000E*04	3,539154E-01	4.098224E=01	7.637378E-01
1.100000E+04	3,249098E-01	4,093407E=01	7.342505E-01
1,200000E+04	3.004580E-01	4.077075E-01	7.081655E-01
1.300000E+04	2.795524E-01	4.052024E-01	6.847548E-Ø1
1.400000E+04	2.614641E-01	4,020384E-01	6.635024E-01
1.502000E+04	2.456523E-01	3.983793E+01	6.440310E-01
1,50000000404	2,317074E-01	3.9435202401	6.260594E-01
1.7000000 + 04	2.193130E-01	3.9005522=01	6.093682E-01
1,800000E+04	2,0822976-01	3,000025=01	5,9378728-01
	1.982330E-01	3,0094001-01	5.791/97E~01 5.4547785-01
2.000000000404	1.0919101-01	3,702422E#01 7,744027c=04	2.024000E-01
2 2000005-04	1 224124E 01 1 004000Em01	0 1 / 1 4 7 2 / L 4 9 1 / L 4 7 2 / L 4 9 2 / L 4 2 / L	5.52+5/9E-01
21200000t=04 0 300000t=04	1.4454055.01	3 640607E-04	5.401/47E~01
	1.0004901-01	7 570784=-04	
	1 5430645-01	7 5054805-04	2.1/301E401 E 0487445-04
	1 4888415-01	3.47000E+01	2.000/41E-01 4.047079E-04
2 70000002.04	1 4780405-01	7 4777276=04	4.90/90/2-01
2.8000000000	1 3010895-01	3.3882346=01	4 7793035-01
2.900000000	1 3470205-01	3,3438685=01	4.6908885-01
3.0009005+04	1 3057435-01	3 3002685=01	4 6060115-01
3.100000F+04	1.2669995-01	3,2574575=01	4.5244575-01
3.2000000 + 04	1.230558F-01	3.2154555 ₩01	4.446013F=01
3.3000005+04	1,1962195-01	3.1742695=01	4.3704885-01
3.400000E+04	1,163802E-01	3.1339Ø3F=01	4.297705F-01
3.50000000+04	1,133149E-01	3.094358E-01	4.2275075-01
3.6000000+04	1.104117E-01	3.055628F-01	4.159745F-01
3,700000E+04	1.076580E-01	3.017705E-01	4.094285E-01
3,800000E+04	1.050424E-01	2.980579E-01	4.031004E-01
3,900000E+04	1.025547E-01	2.944239E-01	3.9697868-01
4,000000E+04	1,001855E-01	2,9086705-01	3,910526E-01
4,100000E+04	9.792659E-02	2.873859E=01	3.853125E-01
4,200000E+04	9.577024E-02	2.83979ØE=01	3,797492E-Ø1
4,300000E+04	9.3709565-02	2.806446E=01	3.743542E-Ø1
4,400000E+04	9,1738275-02	2.773512E-01	3.691195E-01
4,500000E+04	8.985Ø6ØE+Ø2	2.741871E-01	3.64Ø377E-Ø1

4.600000F+04	8.8041285-02	2.710607E-01
4.7000005+04	8 6305486-02	2.6800015-01
	8 4479745-02	2 6600305-01
4.00000000000	0.4600/02-02	2.0000372.01
4,90000E+04	8.303701E-02	2.620703E-01
5,000000E+04	8.149648E-02	2.591977E-01
5.1000000+04	8 2013695-02	2.563846F=Ø1
5 2000005+04	7 8585405-02	0.5362935=01
	7,0909462482	
5,300000E+04	7.720804L-02	2.209303E-01
5,40000E+04	7.588064E-02	2.482861E-01
5,500000E+04	7.459881E-02	2,456952E-01
5.60000000+04	7.336078F=02	2.431563F=Ø1
5 7000000000	7 2464305-02	2 4066785-01
- PARAMETOT	7 4 4 4 4 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 7800865-04
5,00000000000	1.100/291-02	2.302209E-01
5,90000E+04	6,988782E-02	2.358370E-01
6,000000E+04	6.880407E-02	2.334921E-01
6.100000F+04	6,7754335+02	2.311924E-01
6.2000005+04	6.6737015-02	2.289369F=01
6 300000=+04		0 0670400-01
01000000E+04		
6,400000000404	0.479374L-02	2.2455336-01
6,500000E*04	6,386507E-02	2,224231E=Ø1
6.600000E+04	6,296335E-02	2.2033255-01
6.700000 +04	6.2087431-02	2.1828055-01
6 800000c+04	6 103619-02	2.1626605-01
0,9000000000		2.1420005~01
7,000006+04	5,960367E-02	2,123457E=01
7,100000E+04	5.882049E-02	2.104381E-01
7.200000E+04	5.8058156-02	2.085644E-01
7.3000005+04	5 7315855-02	2.0672365-01
7 40000000000	5 6500785-02	2 0401405-01
7,4000000000		2,04,14,101
7,50000E+04	2,588821E-02	2,0313/0E=01
7.60000E+04	5.520143E-02	2.013908E-01
7,700000;+04	5,453176E-02	1.996738E=01
7.800000E+04	5.3878565-02	1.979858E-01
7.9000005+00	5 3041035-02	1 9432425-01
P 0000000-04	5 044040E-02	1 9449425-01
	2.201919EPUK	1.9709722-01
8,100000E+04	5,201190E-02	1,930892E-01
8.200000E+04	5.141882E-02	1.915106E-01
8.300000E+04	5.Ø83946E-Ø2	1,899576E=Ø1
8.400000F+04	5.0073351-02	1.884297E=Ø1
8 500000000	A 0720025-02	1 8602645=01
		1 9544695-04
C.ONDODET04	4.91/9082-02	1,0944096401
8,700000E+04	4,865003E-02	1.839908E=01
8,800000E+04	4.813256E-02	1.825576E-01
8.900000E+04	4.762626E-02	1.811466E=01
9.000005+04	4 7130765-02	1.797574F=01
9 1000000000	A 444E735_00	1 7838945-01
2 DAAAAAE 44		1 7704050-01
7.2000001 404	01/000L-02	1.//04225-01
9,302NØØE+04	4, 07%57DE-02	1./57158E=01
9.400000E+04	4,5250185-02	1.744090E-01
9,500000E+04	4.480382E-02	1.731217E=01
9.6000005+04	4 4366405-02	1.7185345=01
	A 303744E_00	4 7060375-04
		1.1000015-01
9.800000E+04	4,351732E-02	1,093722E=01
9.900000E+04	4,310516E-02	1,681585E-Ø1
1.000000E+05	4.270091E-02	1,669623E-Ø1

7 5010000-01
3.3710201-01
3.9400900000
3.49042/2-01
3.451073E-01
3.406942E-01
3.363983E-01
3.3221475-01
3.0813895-01
3 2416675-01
3.5470016-01
3.2029401-01
3.100170E-01
3.128321E-Ø1
3.092358E-01
3.057248E-01
3.022961E-01
2.9894675-01
0.0567395-04
2 004748=-01
2.924/408-01
2.8934/11-01
2.802882E-01
2.832959E-01
2.803679E-01
2.775021E-01
2.746966E-Ø1
2 7194946-01
2.4925865-01
2 4460255-01
0 440704E-01
2.0400941-01
2.0100//1-01
2.590258E-01
2.565922E-01
2,542055 <u>E</u> =01
2.518644E-Ø1
2.495674E-01
2.473134E-01
2 4510115-01
2 4092045-01
C+4C/C/75-01
2.40/7/10-01
2.38/0311-01
2.366464E-Ø1
2.346260E-01
2.326409E-01
2.306901E-01
2.287729E-01
2.268882E-01
2.250353F=01
2.2321345-01
0 04404AE_04
5 1048025-M4
C.1703761-01
2.1792022-01
2.162198E-01
2.145413E-01
2.1288956-01
2.112637E-01
2.096633E-01

PROGRAM AVRAGE3, CALCULATES CROSS-SECTIONS IN THE UNRESOLVED RESONANCE REGION.

ENDF/B VERSION II DATA WITH ENERGY INDEPENDENT PARAMETERS,

RUN NO 3 TITLE AVERAGE3 TEST, U-235 DATA EO Ø,ØØØØØE+00 EN Ø,ØØØØØE+00 ESTEP Ø,ØØØØØØE+00 ENERGY LIMITS LOWER 6,4504ØØE+01 UPPER 5,000000E+04 LRU= 2 LRF= 1 LFI= Ø TARGET SPIN 3.5000E+00 SCATTERING LENGTH 8,3668E-01 NO OF ENERGY VALUES AT. WHICH FISSION WIDTHS ARE GIVEN 25 DATA FOR A FISSILE NUCLEUS

S-WAVE DATA

 FISSION WIDTHS ARE GIVEN AT THE FOLLOWING ENERGIES

 6.4504E+01
 8.2000E+01
 1.2500E+02
 1.7500E+02
 2.2500E+02
 2.7500E+02

 3.5000E+02
 4.5000E+02
 6.0000E+02
 8.5000E+02
 1.2500E+03
 1.7500E+03

 2.5000E+03
 3.5000E+03
 4.5000E+02
 5.5000E+03
 7.0000E+03
 9.0000E+03

 1.2500E+04
 1.7500E+04
 2.2500E+04
 2.7500E+04
 3.5000E+04
 4.5000E+04

 5.0000E+04
 1.7500E+04
 2.2500E+04
 2.7500E+04
 3.5000E+04
 4.5000E+04

 5.0000E+05
 1.35000E+04
 2.3302E+02
 ANGULAR MOMENTUM
 0 NO OF SPIN STATES
 2

MEAN LEVEL SPACING 1.0000E+00 LEVEL SPIN 3.0002E+00 REDUCED NEUTRON WIDTH 1.0000E=04 GAMMA GAMMA 3,5000E=02 NO OF DEGREES OF FREEDOM FOR NEUTRON WIDTH DISTRIBUTION 1 NO OF DEGREES OF FREEDOM FOR FISSION WIDTH DISTRIBUTION 2 THE FISSION WIDTHS ARE 2.9474E-01 2.9264E=01 2.4623E=01 2.4258E=01 2.6413E=01 4.9705E=01 2.7310E=01 4.5109E=01 4.4004E=01 2.3327E=01 3.0220E=01 3.5300E=01 4.2449E=01 3.2358E=01 3.2196E=01 3.2284E=01 3.3009E=01 3.3291E=01 4.3837E=01 4.3870E=01 4.5035E=01 4.7280E=01 5.2078E=01 5.9992E=01 5.7033E=01

MEAN LEVEL SPACING 1.0000E+00 LEVEL SPIN 4.0000E+00 REDUCED NEUTRON WIDTH 1.0000E+04 GAMMA GAMMA 3.5000E+02 NO OF DEGREES OF FREEDOM FOR NEUTRON WIDTH DISTRIBUTION 1 NO OF DEGREES OF FREEDOM FOR FISSION WIDTH DISTRIBUTION 1 THE FISSION WIDTHS APE 1.4737E-01 1.4632E-01 1.2311E-01 1.2129E-01 1.3207E-01 2.4852E-01 1.3655E-01 2.2554E-01 2.2002E=01 1.1663E-01 1.5110E+01 1.7650E-01 2.1225E-01 1.6179E=01 1.6098E=01 1.6142E-01 1.6505E-01 1.6646E=01 2.1918E-01 2.1935E=01 2.2517E=01 2.3640E-01 2.6039E-01 2.9996E-01

P-WAVE DATA

ISOTOPIC MASS 2,3302F+02 ANGULAR MOMENTUM 1 NO OF SPIN STATES 4

3,5000E-02	3,5000E-02	3,5000E=02	5.5020E-02	00000000000000000000000000000000000000
G A M A	G A M M A	GAMMA	S A A A A A A A A A A A A A A A A A A A	
GAMMA	G A MM A	G A M A	д ама Ма	z
1014 2.3200F-04	. 07Н 2, 0000E-04	ртн 2. <i>000</i> 6 Е.04	DTH 2.2400E-04	CC E US CC E US CG C C R OS CG C C R OS CG C C R OS
2 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Н К. С. К. С. К. С. К. С. К. С. К. С. К. С. К. С. К. К. К. К. К. К. К. К. К. К. К. К. К.		н х х х л л л л л л л л л л л л л л л л	S S S S S S S S S S S S S S S S S S S
E+00 LEVEL SPIN 2,0000E+00 REDUCED NE FOR NEUTRON WIDTH DISTRIBUTION 70r FISSION WIDTH DISTRIBUTION 2005=01 3,3200E+01 3,3200E+01 3,32200E 2005=01 3,3200E+01 3,3200E+01 3,32200E 2005=01 3,3200E+01 3,3200E+01 3,3200E 2005=01 3,3200E+01 3,3200E+01 3,3200E 2005=01 3,3200E+01 3,3200E+01 3,3200E	E+00 LEVEL SPIN 3.0000E+00 REDUCED NE FOR NEUTRON WIDTH DISTRIBUTION 2 FOR FISSION WIDTH DISTRIBUTION 1 700E=01 1.2700E-01 1.2700E 700E=01 1.2700E-01 1.2700E 700E=01 1.2700E-01 1.2700E 700E=01 1.2700E-01 1.2700E	<pre>E+g@ LEVEL SPIN 4. @@@@E+@@ REDUCED NE For Neutron width distribution For Fission width distribution 6@@E-@1 2,86@@E-@1 2,86@@E-@1 2,86@@E 6@@E-@1 2,86@@E-@1 2,86@@E-@1 2,86@@E 6@@E-@1 2,86@@E-@1 2,86@@E-@1 2,86@@E 6@@E-@1 2,86@@E-@1 2,86@@E-@1 2,86@@E</pre>	E+00 LEVEL SPIN 5.0000E+00 REDUCED NE FOR NEUTRON WIDTH DISTRIAUTION FOR FISSION WIDTH DISTRIAUTION 300E-01 1.4300E-01 1.4300E 300E-01 1.4300E-01 1.4300E 300E-01 1.4300E-01 1.4300E 300E-01 1.4300E-01 1.4300E	55**1/3+0.5)*0.1 = AND FISSION GROSS_SECTIONS FOR A FIG = 255 DATA = 255 DATA = 255 DATA = 255 DATA = 255 DATA = 255 SEC EREERER = 27887646:00 = 27887646:00 = 27887646:00 = 27887646:00 = 278376:00 = 275326:00 = 2556726:00 = 2556756:00 = 2556726:00 = 255672726:00 = 25577777777777777777777777777777777777
MEAN LEVEL SPACING 1,1500 NO OF DEGREES OF FREFDOM NO OF DEGREES OF FREFDOM 14 5 FISSION WIDTHS AFFDOM 3.322005+01 3,32005=01 3,3 3.322065+01 3,32005=01 3,3 3.32005+01 3,32005=01 3,3 3.32005+01 3,32005=01 3,3 3.32005+01 3,32005=01 3,3 3.32005=01 3,32005=01 3,3	MEAN LEVEL SPACING 1.0000 NO OF DEGREES OF FREFDOM NO OF DEGREES OF FREFDOM THE FISSION WIDTHS ARE 1.27006-01 1.27006-01 1.2 1.27006-01 1.27006-01 1.27006-01 1.2 1.27006-01 1.27006-01 1.27006-01 1.27006-01 1.27006-01 1.27006-01 1.27006-01 1.27006-01 1.27006-01 1.27006-01 1.27006-01 1.27006-01 1.27006-01 1.27006-01 1.27006-01 1.27006-01 1.27006-01 1.27006-01 1.27006-01 1.27006-0000000000000000000000000000000000	MEAN LEVEL SPACING 1.0000 NO OF DEGREES OF FREEDOM NO OF DEGREES OF FREEDOM NO OF DEGREES OF FREEDOM 14E FISSION WIDTHS ARE 2.8600E=01 2.8600E=01 2.8 2.8600E=01 2.8600E=01 2.8 2.8600E=01 2.8600E=01 2.8 2.8600E=01 2.8600E=01 2.8 2.8600E=01 2.8600E=01 2.8 2.8600E=01 2.8600E=01 2.8 2.8600E=01 2.8600E=01 2.8	MEAN LEVEL SPACING 1,1200 NO OF DEGREES OF FREEDOM NO OF DEGREES OF FREEDOM The fission widths refoom 1,4300[=01 1,4300[=01 1,4, 1,4300[=01 1,4300[=01 1,4, 1,4300[=01 1,4300[=01 1,4, 1,4300[=01 1,4300[=01 1,4,4]	AVERAGE SCATTERING CAPTUM AVERAGE SCATTERING CAPTUM TITLE AVERAGES TESTUM AVERAGE CROSS=SECTIONS C 6.2000005+01 1.2500005+01 1.2500005+01 1.7500005+02 1.7500005+02 2.2500005+02 3.5000005+02 4.5000005+02 4.5000005+02 4.250005 4.2500005 4.25005 4.250005 4.250005 4.25005 4.250005 4.25005 4.2

1,750000E+03	9,467040E+00	6,697206E=04	9.4677102+00
2:50000000+03	9.354842F+00	1.357264E=Ø3	9.3561972+00
3.500000F+03	9.3768335+02	2.6342455=03	9.379467F+00
4.50000000+03	9 3050375+00	4.3100025-03	9.3293475+00
5.50000000+03	9 2769475+00	6 3700525-03	0 2833175+00
7.00000000000	0 0077075+00	1 // 486/5=//2	0 0178565+00
	9.20//0/L+00	1,0140002-02	9,21,0000000
4.000000E+03	9.13140DE+00	1,0394902-02	9.14/001E+00
1.25000000-04	8.953983E+00	3.0324156-02	8.9843122+00
1./5000000404	8.821273E+20	5,588043E=02	8.877153E+00
2.250000E+04	8,698854E+ØØ	8,676379E=02	8,785617E+ØØ
2.750000E+04	8,582843E+00	1.217690E=01	8.7Ø4612E+ØØ
3,500000E+04	8.419337E+00	1,799386E-01	8,599276E+ØØ
4.500000E+04	8.219320E+ØØ	2.644437E-Ø1	8.483764E+ØØ
5,000000E+04	8.144976E+00	3.085493E-01	8,453526E+ØØ
NEUTRON ENERGY(EV)	SHWAVE CAPTURE CROSS-SECTION	P-WAVE CAPTURE CROSS-SECTION	TOTAL
6.450400E*01	1.670961E+01	2.245335E-02	1.673206E+01
8,200000E+01	1,480249E+01	2,531427E-02	1.48278ØE+Ø1
1.250000E+02	1,275553E+Ø1	3.124925E-Ø2	1.278678E+Ø1
1,750000E+02	1.075604E+01	3.6967Ø8E=02	1.079301E+01
2.25000000+02	9.102775E+00	4.190795E-02	9.144683E+00
2.750000F+02	6.249314F+00	4.6321065-02	6.295635F+00
3.50000000+02	7.0992185+00	5.2240005=02	7.4514585+00
A. 500000E+02	5 0170E0E+00	5 0007815#M0	
		5 974977E=00	2+0//10/E+00
	A 6700400.00	0.0017205-02	4 7540055.00
0,000000E=02	7 404004E+60	0,1210295402	4,/0120/E+00 7 5000475+00
1.25000000-03	3.401934E+60	9.0203/42502	3.5002072+00
1.7500002-03	2.042902E+00	1,1590/52-01	2./209292+00
2.5000000000	1,997828E+00	1.3/98885-01	2.132810E+00
3.500000E+03	1.841602E+00	1.622263E-01	2.003828E+00
4,500000E+03	1,592930E+02	1,826941E=01	1.775625E+ØØ
5.500000E*03	1,413095E+00	2.005299E=01	1.613625E+ØØ
7,ØØØØØØE*Ø3	1,212624E+00	2.236819E-Ø1	1,436306E+00
9.ØØØØØØE+Ø3	1,038101E+00	2.496294E=Ø1	1.287730E+00
1,250000E+04	7.600101E-01	2.856517E-01	1.045662E+00
1.750000E+04	6.166210E-01	3.233384E-Ø1	9.399593E-01
2.250000F+04	5.208346F-01	3.5028745+01	8.711220F-01
2.750000F+04	4 4947795-01	3.698578F#Ø1	8.193356F-01
3.50000000+04	3 7016785-01	3.8964645=01	7.5981435-01
4.50000000000	0 0477765-01	4 0425755=01	7 0100005-01
	2,7077025-01	4 0814605-01	4 01016266E-01
NEHTRON ENGROVIEVA	CICZODUVELVI S Wive Ficcion Odoss station	A DOTODICAT	0.9101005-01
	SHWAVE FISSION URUSS-SECTION	A AAOISTE-02	101AL 7 747554-104
0,400400 <u>2</u> +01		F 04 (0700-00	3.30/334285.01
0,2000000000	2,9/3084E+01	2.0100/9EP02	2.9/04002+01
1,250000E+02	2.306274E+01	6,1922006+02	2.312460E+Ø1
1,/50000E+02	1,935532E+01	7,325386E=02	1.94285/E+Ø1
2,250000E+02	1.73723ØE+Ø1	8,3Ø4681E-Ø2	1.745534E+Ø1
2,750000E+02	1,784734E+01	9.179468E-02	1.793913E+Ø1
3,500000E+02	1.395819E+Ø1	1.035292E-01	1.406172E+01
4,500000E+02	1,363367E+Ø1	1.173465E=01	1.375102E+01
6,000000E+02	1,170601E+01	1.354217E-Ø1	1.184143E+01
8,500000E+02	8,476841E+ØØ	1.610252E-01	8,6378665+00
1.250000F+03	7 3855525+00	1.949551F=01	7.5805075+00
1.750000F+03	6.413942F+20	2.3019185-01	6.6441345+00
2.500000F+03	5.531043F+00	2.7423955-01	5,8052825-00
3.50000000+03	4 353070F+00	3.2302845=01	A A760085100
4 5000000-000 4 500000F+03	3 7080005400	3 6457995-01	A 1634798±00
5 500000C+03		A 011337=_01	7 0110435.44
	0,910530E+60 7,00040EF-00	4 001457-04 4 01100/F401	3.811403E+00
1.000000L+03	3.000407E+00	4.4921102=01	3.45761/E+ØØ

9.000000E+03	2.6273828+00	5.042107E-01	3.131593E+00
1.250000E+04	2,345241E+00	5,53368ØE-01	2.928609E+00
1,750000E+04	1,947829E+00	6.716611E=01	2.619490E+00
2,250000E+04	1,703901E+00	7,4Ø5824E-Ø1	2.444483E+00
2,750000E+04	1,540581E+00	7,958978E-01	2,336479E+00
3,500000E+04	1.376495E+00	8.604654E-01	2.23696ØE+ØØ
4,500000E+04	1,2345702+00	9,222714E-01	2.156841E+00
5,00000000+04	1.149153E+ØØ	9.455514E-01	2.0947055+00

AVG4021 PROGRAM AVRAGE4(INPUT, CUTPUT) C C-----THIS PROGRAM CALCULATES AVERAGE CAPTURE, FISSION AND SCATTERING AVG4002 C-----CROSS-SECTIONS FROM THE ENDF/B DATA. NEW FORMAT FOR INPUT. THIS AVG4003 C----FORMAT GIVES THE NEUTRON, CAPTURE AND FISSION WIDTHS AS A FUNCTION AVG4004 C----OF ENERGY.THIS IS FORMAT MODIFICATION NO.69-6 OF SEPT. 1969. AVG4005 C----ENDF/B VERSION II DATA, RUNS ON CDC-6600 AND PDP-10. AVG4006 C-----LIMITATIONS----- 1. CALCULATES S.P AND D-WAVE CONTRIBUTIONS ONLY. AVG4007 ALLOWED FOR, 3. WIDTH FLUCTUATIONS OF UPTO AVG4008 C---=-2. INFLASTIC EFFECTS C---WIDTHS. AVG4Ø1Ø DIMENSION RUN(7), BLA(20), E(3,6, 75), D(3,6, 75), GX(3,6, 75), AVG4011 1GN0(3,6, 75),GG(3,6, 75),GF(3,6, 75),AMUX(3,6),AMUN(3,6),AMUG(3,6)AVG4Ø12 2, AMUF(3,6), AJ(3,6), NE(3,6), NJS(3), L(3), INTS(3,6), SIGC(3,6, 75), AVG4013 3SIGS(3,6, 75), SIGF(3,6, 75), SIGCT(3, 75), SIGST(3, 75), SIGFT(3, 75) AVG4014 4, SIGPT(3, 75), ATC(3,6, 75) AVG4015 COMMON/XBAR/XX(4,10) AVG4Ø16 DATA XX/0.005252,0.051755,0.112925,0.169150,0.037171,0.163095, AVG4017 10.265600,0.340780,0.103126,0.288421,0.404385,0.480571,0.207836, AVG4Ø18 20.431766,0.547724,0.617825,0.359852,0.599210,0.704048,0.762381, AVG4019 30,574283,0,800560,0,882440,0,922696,0,879334,1,053224,1,096835, AVG4020 41,111387,1,334810,1,393010,1,374373,1,350285,2,105227,1,916230, AVG4021 51,786357,1,697511,4,390800,3,301643,2.824583,2,546602/ AVG4022 881 READ1, IRUN, (RUN(I), I=1,7) AVG4024 IF(IRUN.EQ.0)G0 TO 8800 AVG4025 AVG40251 GO TO 882 882 PPINT43 AVG4026 PRINT25 AVG4027 PRINT44 AVG4028 PPINT25 AVG4Ø29 PRINT27.IRUN, (RUN(I), I=1,7) AVG4030 PPINT25 AVG4031 C----IF IRUN EQUALS ZERC THE PROGRAM EXITS. WITH IRUN NON-ZERO ONE CAN AVG4032 C----Stack any number of different nuclei one behind another. Run(1) toavg4033 C----RUN(7) ANY TITLE IN COLUMNS 11 TO 38, AVG4034 READ 2, EN1, EN2, LRU, LRF AVG4036 PRINT26, EN1, EN2, LRU, LRF AVG4037 PRINT25 AVG4038 C----EN1=LOWER ENERGY LIMIT OF A RANGE, EN2=UPPER LIMIT, LRU=1 IMPLIES AVG4039 C----RESOLVED PARAMFTERS, LRU=2 UNRESOLVED PARAMETERS, AVG4040 READ2, SPIN, A, BLA(2), BLA(3), NLS, BLA(4) AVG4042 PRINT28; SPIN, A, NLS AVG4043 C----SPIN=NUCLEAR SPIN. ASSCATTERING LENGTH IN UNITS OF 1.0E=12CM. AVG4044 C----NLS=NUMBER OF L-STATES, AVG4045 DO 200 I=1.NLS AVG4046 AVG4Ø48 READ2, AWRI, BLA(5), L(1), BLA(6), NUS(1) ASS=AWRI#1,008665 AVG4049 CRT≈ASS##(1,0/3,0) AVG4050 TERM#(0.123+CRT+0.08) AVG4051 AVG4052 APEN=TERM PRINT25 AVG4053 PPINT23, APEN AVG4054 PPINT25 AVG4055 PRINT29, AWRI, L(I), NUS(I) AVG4056 C---=-AWRI=NUCLEAR MASS IN UNITS OF NEUTRON MASS,L(I)=L-VALUE OF THE I- AVG4057 C----=TH PARTIAL WAVE.NJS(I)=NUMBER OF J-VALUES OF THE CORRESPONDING STAAVG4058 C----TE. AVG4059 AVG4Ø6Ø NJST=NJS(I)

DO 201 J=1.NJST AVG4061 READ2, AJ(1, J), BLA(7), INTS(1, J), BLA(8), NEX6, NE(1, J) AVG4063 PPINT25 AVG4064 AVG4065 PRINT30, AJ(1, J), INTS(1, J), NE(1, J) C-----AJ(I,J)=J=VALUF,INTS(I,J)=INTERPOLATION CODE, NE(I,J)=NUMBER OF AVG4066 C----ENERGY POINTS AT WHICH THE WIDTHS ARE GIVEN. AVG4067 RFAD3, BLA(9), ELA(10), AMUX(1, J), AMUN(1, J), AMUG(1, J), AVG4069 AMUF(I,J) AVG4070 PRINT31, AMUX(I,J), AMUN(I,J), AMUG(I,J), AMUF(I,J) AVG4071 C----AMUX(I,J)=NUMBER OF DEGREES OF FREEDOM FOR ANY COMPETING INELASTICAVG4072 C----PROCESSES. AVG4073 C----AMUN(I,J)=NUMBER OF DEGREES OF FREEDOM FOR NEUTRON WIDTH DISTRBN, AVG4074 C-----AMUG(I,J)=NUMBER OF DEGREES OF FREEDOM FOR GAMMA WIDTH DISTRON. **A**VG4Ø75 C----AMUF(I,J)=NUMBER OF DEGREES OF FREEDOM FOR FISSION WIDTH DISTRON, AVG4076 NEIJ=NE(I,J) AVG4077 AVG4078 DO 202 K=1, NEIJ READ3, E(I, J, K), D(I, J, K), GX(I, J, K), GNO(I, J, K), AVG4080 Gr(I,J,K), GF(I,J,K)AVG4081 1 202 CONTINUE AVG4082 C----E(I,J,K)=ENERGY IN EV .D(I,J,K)=SPACING. GX(I,J,K)=WIDTH FOR ANY AVG4ØB3 C----COMPETING INELASTIC PROCESSES. AVG4084 C-----GNO(I,J,K)=RED"CED NEUTRON WIDTH. GG(I,J,K)=GAMMA WIDTH. AVG4085 C----GF(I,J,K)=FISSION WIDTH, AVG4086 PPINT32 AVG4087 PPINT33, (E(I,J,KK), D(I,J,KK), GX(I,J,KK), GNO(I,J,KK), AVG4088 Gr(I,J,KK),GF(I,J,KK),KK=1,NEIJ) AVG4089 1 201 CONTINUE AVG4090 200 CONTINUE AVG4091 1 FORMAT(I10,7A4) AVG4092 2 FORMAT(2E11,4,4111) AVG4093 3 FORMAT(6E11.4) AVG4094 22 FORMAT(106H ENERGY(EV) SPACING GAMMA INELAS GAMMAAVG4Ø95 GAMMA GAMMA GAMMA FISS) GAMMA N NOT AVG4096 1 TOTAL 23 FORMAT(72H NUCLEAR RADIUS'A' AS CALCULATED FROM A=(1,23*(MASS**(1/AVG4097 =E11.4) 13)+0.8)+0.1 AVG4098 24 FORMAT(2x,5E25.6) AVG4099 25 FORMAT(///) AVG4100 26 FORMAT(20H ENERGY LIMITS LOWERE20,6,7H UPPERE20,6,7H LRU=15,7H AVG4101 1 (RF=15) AVG4102 27 FORMAT(7H RUN NOI5,9H TITLE 7A4) AVG4103 28 FORMAT(12H TARGET SPINE11.4,18H SCATTERING LENGTHE11.4,19H NUMBER AVG4104 AVG4105 10F L-STATESI10) 29 FORMAT (26H NUCLEAR MASS/NEUTRON MASSE11.4,18H ANGULAR MOMENTUM 15,AVG4106 136H NUMBER OF U-STATES FOR THIS L-VALUEI5) AVG4107 30 FORMAT(5H SPIN-11.4,19H INTERPOLATION CODE15,24H NUMBER OF ENERGY AVG4108 AVG4109 1POINTSI5) 31 FORMAT(37H DEGREES OF FREEDOM. NU INELASTICE11.4.16H NU NAVG4110 NU GAMMAE11.4,16H 1EUTRONE11.4.144 NU FISSIONE11.4) AVG4111 GAMMAAVG4112 32 FORMAT(120H ENERGY(EV) SPACING GAMMA N NOT 1 INELAS GAMMA GAMMA GAMMAFISS) AVG4113 33 FORMAT(2x,6E20,6) AVG4114 34 FORMAT(124H NEUTRON ENERGY(EV) S-WAVE SIGMANN AVG4115 PEWAVE SIGMANN D-WAVE SIGMANN TOTAL SIGMAVG4116 1 2ANN) AVG4117 35 FORMAT(127H NEUTRON ENERGY(EV) S-WAVE SIGMANGAMMA AVG4118 TOTAL SIGMAAVG4119 D-WAVE SIGMANGAMMA P-WAVE SIGMANGAMMA 1 2NGAMMA) AVG4120 NEUTRON ENERGY(EV) 36 FORMAT(125H S-WAVE SIGMAFISS AVG4121

1	P-WAVE SIGMAFISS	D-WAVE S	SIGMAFISS	TOTAL SIGMAAVG4122
2	FISS)			AVG4123
37	FORMAT(33H AVERAGE SCATTERI	NG CROSS-SE	CTION)	AVG4124
38	FORMAT (30H AVERAGE CAPTURE	CROSS-SECTI	LON)	AVG4125
39	FORMAT(30H AVEPAGE FISSION	CROSS-SECTI	(ON)	AVG4126
40	FORMAT(2X,7E15,6)			AVG4127
41	FORMAT(45H INPHT PARAMETERS	WITH CALCU	JLATED TOTAL WIDTH	AVG4128
42	FORMAT(10H L-VALUE=15.10H	J-STATE=F5	5.2)	AVG4129
43	FORMAT(79H1 PROGRAM AVRAGEA	. CALCULATE	S CROSS-SECTIONS	IN THE UNREAVG4130
1	SOLVED RESONANCE REGIONS			AVG4131
44	FORMAT(56H ENDE/B VERSION I		HENERGY DEPENDENT	PARAMETERSAVG4132
1)	T Profession Train		AVG4133
300	T=2.196771F=03+(AWRI/(AWRI+	1.0))		AVG4134
0-2	CONSTE19 7392088/(T#T)	1.0.1		AVG41341
	PHIEOUR#12,566371			AVG4135
	CRENE2.196771F=03#(AWR1/(AW	81+1.011445	FN	AVG4136
	C=2 196771 $C=03 + (AWR1/(AWR1))$	1.0))***		AVG4137
	nn 403 1=1.3			AVG4138
	DO 405 Kal. 75			AVG4139
	00 404 .1=1.6			AVG4140
	SIGC(I.J.K)=0.0			AVG4141
	SICS(I.J.K)=0.0			AVG4142
	SIGE(I.J.K)=0.0			AVG4143
	GTC/1.J.K)=Ø.Ø			AVG4144
4014	CONTINUE			AVG4145
-0-	SIGCT(I.K)=0.0			AVG4146
	SICST(I,K) = 0			AVG4147
	SIGET(1.K)=0.0			AVG4148
	STOPT(1,K)=0 0			AVG4149
495	CONTINUE			AV64150
407	CONTINUE			AVG4151
тра				AVG4152
				AVG4153
				AVG4154
				AVG4155
				AVG4156
	DO 401 Int NIST			AVG4157
				AVG4158
				AVC4150
	PLIDENENIJUZ Plaza dat itila ANZZA dacotu	+2 01		AVC4160
	AMINA LAVANIN'A AV	+2.0)		AVC4161
				AVC4162
				AVC4163
				AVG4164
	NULTNICAMUETIN			AVG4165
	I AMDDAWINI (AMUFID)			AVG4166
	00 402 K=1.NFL			AVG4167
				AVE4168
	E10N=E(1104N/			AVG4169
	WAVE=2.196771F=Ø3#/Aup1//Au	01+1.0))#F2		AVG4170
	RUAECOE2		-	AVG4171
	RUDPENSCRENØE2			AVG4172
	GO TO(500.501/502).1 IT			AVG 4173
500	VL=F2#AMUN(T.J)			AVG4174
	PS=RHO			AVG4175
	60 TO 503			AVG4176
501	VI = F2*(RHOPEN**2/(1.0+RHOPE	N##2))#4MUN	(L+I)	AVG4177
	PS=RHO_ATAN(RHO)		· · · · ·	AVG4178
	GO TO 503			AVG4179
502	VL=E2*(RHOPEN**4/(RHOPEN**4	+3.Ø#RHOPEN	+RHOPEN+9.0) +AMU	IN(1, J) AVG4180
	PS=RHD-ATAN(3,0+RHD/(3,0=RH	0*+2))		AVG4181

5ø3	SIGPOT=(SIN(PS)/WAVE)**2	AVG4182
	SIGPOT=SIGPOT*PHIFOUR*(2.0*FIL+1.0)	AVG4183
	GN=GNO(I.J.K)*VL	AVG4184
	GAMMA=GG(T,J,K)	AVG4185
	GAL PHA=GN	AVG4186
		AVC4187
		A404107
		AVG4100
752	TEDCICONSTACLACHACHALIST WARKING VIN	AVG4109
122	TERSE (CONSTAC ACHACHACHACA / ELEMANDILLA)	AVG4190
		AV64191
	TERF = (CONSTRAGE) AND AND AND AND AND AND AND AND AND AND	AVG4192
	CALL CNDLIGAL MAJUDEIA, GAMMA, MU, NU, LAMBDA, GO, DIFF, I)	AV64193
	CALL GNREIGALFMA, GBETA, GAMMA, MU, NU, LAMBUA, GC, DIFF, 2)	AVG4194
	CALL UNRE(GALFTA, GBETA, GAMMA, MU, NU, LAMBUA, GFF, DIFF, S)	AVG4195
		AVG4196
		AVG4197
	GFF=GFF+TERF	AVG4198
	CORR=(CONST*GU*2,0*GN*SIN(PS)*SIN(PS))/(EIJK*D(I,J,K))	AVG41981
	GS=GS-CURR	AVG41982
	SIGC(I,J,K)=GC	AVG4199
	SIGS(I,J,K)=GS	AVG4200
	SIGF(I,J,K)=GFF	AVG4201
	SIGPT(1,K)=SIGPCT	AVG4202
4Ø2	CONTINUE	AVG42Ø3
401	CONTINUE	AVG4204
400	CONTINUE	AVG4205
	PRINT25	AVG4206
	PRINT41	AVG4207
	PRINT25	AVG4208
	DO 8000 I=1,NLS	AVG4209
		AVG4210
	(I) SLM=ISLN	AV64211
	DC 8001 J=1,NJSI	AVG4212
		AV64213
	NETJENE(T.J)	AVC4014
		AVC4215
	PRINT25	AVC4016
		AVG4210
	PRINTED (F(T.) KK) DIT. EKVI.CV(T.) KVI.CTO(T.) VVI. CNO(T.) VVI.	AVG421/
	CONTRACTOR CONTRACTOR AND CALLED RATES CALLED RATES CALLED RATES CONTRACTOR CALLED RATES CALED RATES CALLED RATES CALLED RATES CALLED R	AVG4210
8001	Contract Con	AVG4219
80001 		AVG4220
0000		AV64221
		AVG4222
		AVG4223
		AVG4224
		AVG4225
	SIGST(1, K) = SIGS((1, K) + SIGS(1, J, K))	AVG4226
0.00	SIGF1(1,K)=SIGF1(1,K)+SIGF(1,J,K)	AVG4227
0112	CONTINUE	AVG4228
9.04	SIGST(1)K)=SIGS((1)K)+SIGPT(1,K)	AVG4229
001 900	CONTINUE	AVG4230
000	CONTINUE	AVG4231
	NNTNE(1,1)	AVG4232
		AVG4233
	PRINTS7	AVG4234
	PRINT25	AVG4235
	PRINT34	AVG4236
	CO 900 K=1,NN	AVG4237
	TERM=0,0	AVG4238
	DO 901 l=1,3	AVG4239
	TERM=TERM+SIGST(1,K)	AVG4240

9Ø1	CONTINUE	AVG4241
	PRINT 24,E(1,1,K),SIGST(1,K),SIGST(2,K),SIGST(3,K),TERM	AVG4242
900	CONTINUE	AVG4243
	PRINT25	AVG4244
	PRINT38	AVG4245
	PRINT25	AVG4246
	PRINT35	AVG4247
		AVG4248
		AVG4249
		AVG4250
	JU /JU IIIU	AVG4251
007		AV64252
105	DOINT 24 F/1.1 KASSICCT/1.VASSICCT/2.KASICCT/3.KASTERM	AVG4253
030	PRINT ZHIELIJINNISIGERLINNISIGERLINNISIGERCENNIK, FERR	AVG4254
702		AVG4255
		AVG4256
		AVC4257
		AVC4258
		AVC4259
		AVC4260
		AVC4261
	DO 905 1=1,5	AVGACAC
	TERMETERM+SIGFT(I)K)	AV64202
9Ø5	CONTINUE	AV64200
_	PRINT 24, E(1,1,K), SIGFT(1,K), SIGFT(2,K), SIGFT(3,K), FRM	AV64204
904	CONTINUE	AV64265
		AVG4200
8800	CALL EXIT	AVG4207
	END	AV64200
	SUBROUTINE GNRI (GALPHA, GBETA, GAMMA, MU, NU, LAMBDA, S, UF, 10)	GNRLØØI
	COMMON/XBAR/XX(4,10)	GNRLØØ2
	S=Ø.Ø	GNRLØØS
	IF(GALPHA)1000.1000.1001	GNRLØØ4
1001	IF (GAMMA) 1000, 1000, 1002	GNRLØØS
1002	IF(GBETA)1000,1003,1004	GNRL000
1003	IF(DF)1000,1005,1006	GNRL007
1005	DO 100 J=1,10	GNRLØ08
	X J=XX(MU) X J=XX(MU)	GNRLØØ9
	GO TO(200,201,202),ID	GNRLØ10
200	S=S+((XJ+XJ)/(GALPHA+XJ+GAMMA))	GNRL011
	GO TO 100	GNRLØ12
201	S=S+(XJ/(GALPHA*XJ+GAMMA))	GNRLØ13
202	CONTINUE	GNRLØ14
100	CONTINUE	GNRLØ15
	S=S/10,0	GNRLØ16
	GO TO 1000	GNRLØ17
1006	DO 101 $J=1.10$	GNRLØ18
	(LeUM)XX=LX	GNRL019
	DO 102 K=1,10	GNRLØ20
	XK=XX(LAMBDA,K)	GNRLØ21
	GO TO(300,301,302),IO	GNRLØ22
300	S=S+((XJ#XJ)/(GALPHA#XJ+GAMMA+DF#XK))	GNRLØ23
	GO TO 102	GNRLØ24
301	S=S+(XJ/(GALPH#*XJ+GAMMA+DF*XK))	GNRLØ25
302	CONTINUE	GNRLØ26
102	CONTINUE	GNRLØ27
101	CONTINUE	GNRLØ28
-	S=S/100.0	GNRLØ29
	GO TO 1000	GNRLØ30
1004	IF(DF)1000,1007,1008	GNRLØ31
1007	DO 103 J=1,10	GNRL032
	XJ=XX(MU,J)	GNRLØ33

	DO 104 K=1,10	GNRLØ34
	XK=XX(NU,K)	GNRLØ35
	GO TO(400,401,402),ID	GNRLØ36
400	S=S+((XJ+XJ)/(CALPHA+XJ+GBETA+XK+GAMMA))	GNRLØ37
	GO TO 104	GNRLØ38
401	S=S+(XJ/(GALPHA#XJ+GBETA*XK+GAMMA))	GNRLØ39
	GO TO 104	GNRLØ4Ø
402	S=S+((XJ+XK)/(GALPHA+XJ+GBETA+XK+GAMMA))	GNRLØ41
104	CONTINUE	GNRLØ42
103	CONTÍNUE	GNRLØ43
	S=S/100.0	GNRLØ44
	GO TO 1000	GNRLØ45
1008	Do 105 J=1,10	GNRLØ46
	XJ=XX(MU,J)	GNRLØ47
	DO 106 K=1,10	GNRLØ48
	XK=XX(NU,K)	GNRLØ49
	DO 107 L=1,10	GNRLØ5Ø
	XL=XX(LAMBDA,L)	GNRLØ51
	GO TO(500,501,502),ID	GNRLØ52
5ØØ	S=S+((XJ*XJ)/(SALPHA*XJ+GBETA*XK+GAMMA+DF*XL))	GNRLØ53
	GO TO 107	GNRLØ54
501	S=S+(XJ/(GALPHA*XJ+GBETA*XK+GAMMA+DF*XL))	GNRLØ55
	GO TO 107	GNRLØ56
5Ø2	S=S+((XJ*XK)/(GALPHA+XJ+GBETA*XK+GAMMA+DF*XL))	GNRLØ57
107	CONTINUE	GNRLØ58
106	CONTINUE	GNRLØ59
105	CONTINUE	GNRLØ60
	S=5/1000,2	GNRLØ61
1000	RETURN	GNRLØ62
	END	GNRLØ63

100 A	VERAGE4 TE	ST. U-235	DA	TA	4	a11 a2	2451
64,504	24788,0		2	2	Ø	01102	2191
3.5	Ø.926		Ø	Ø	2	01102	2121
233,025	0.0		ø	2	2	21102	2121
3.0000E+00	ø.		5	Ø	156	251102	2171
ø.	ø.	ø.		1,0070E+00	0.	2.000000001102	2191
6.4504E+01	1.00002E+00	ø.		7.1807E-05	3.5000E=02	2.9347E-01	
8.2902E+01	1.00002E+00	0.		8,1753E-Ø5	3,5000E-02	2.9133E-21	
1.1569E+Ø2	1.00000 + 70	Ø.		9.0472E-05	3.5000E-02	2,4665E-01	
1.4855E+Ø2	1.0000E+00	ø.		1.0486E-04	3,5000E-02	2,1766E-01	
1.9074E+02	1.00002 +00	ø.		1.0389E-04	3,5000E-02	2,6593E-01	
2.44915+02	1.0000E+00	ø.		1.3175E-04	3,5000E-02	3,8029E-01	
3.14475+02	1.0000E+00	ø.		9.6060E=05	3,5000E=02	3.5141E-01	
4.03795+02	1.0000F+00	Ø		8.8629E-05	3,5000E-02	3.73445-01	
5.18485+02	1.0000F+00	0		1.14555-04	3.50005-02	5,139ØE-01	
6 65745+02	1 000000+00	a'.		1.11265-04	3.5000E-02	3.4713E-01	
8 54805+02	1.0000000+00	a •		1 04795-04	3.50005-02	2.5096E-01	
0.04026402	1.0000000.00	a		1 10675-04	3.50005-02	2.5373E-01	
1.09702+03	1.00002+00	μ. α		0 00000-05	3.50005-02	3.4813F=01	
1.40932+03	1.000000-+00	<i>a</i> .		1 01 605-04	3.50005-02	3.70835-01	
1.8090E+03	1.00002+00	2. 1		0 94075-05	3.50005-02	4.3610F-01	
2.32302+03	1.000000-00	2.		9.002/1-02	3.50005-00	4.33485-01	
2.98365+03	1.000000+000	Ø.		9.90291-02	3 5000000000	4 24758-01	
3.8310E+Ø3	1.00000+00	0.		1.0/291-04	3.50002-02	4 30555-01	
4.9191E+Ø3	1.000000+00	0,		9,9004L=00	3,50001-02	4 750572-01	
6.3163E+Ø3	1.0000E+00	0.		9.04195-05	3.50001-02	4,35000001	
8.1103E+03	1.0000E+00	Ø.		9.4417E-05	3.5000E=02	4 433767-04	
1.0414E+04	1.0000E+00	ø.		9,7638E+05	3.5000E=02	4,43221.01	
1.3372E+Ø4	1.0000E+00	Ø.		9.9719E-05	3,5000E-02	4,45302-01	
1.7169E+Ø4	1.0000E+00	ø.		9,8693E-05	3,5000E-02	4,5640E=01	
2.20465+04	1.0000E+00	ø.		9,5268E-05	3,5000E-02	4,7366E=01	
2.4788E+Ø4	1.0000E+00	ø.		1.0075E-04	3,5000E-02	4,6219E-01	
2.4788E+Ø4 4.0000E+ØØ	1.0000E+00 0.	ø.	5	1.0075E-04 0	3,5000E-02 156	4.6219E-01 251102	2151
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2.4788E+04 4.0000E+00 0. 6.4504E+01 8.2902F+01	1.0000E+00 0. 1.0000E+00 1.0000E+00	Ø. Ø. Ø.	5	1.0075E-04 0 1.0000E+00 7.1807E-05 8.1753E-05	3,5000E-02 156 0, 3,5000E-02 3,5000E-02	4,6219E-01 251102 1,0000E+001102 1,4673E-01 1,4567E-01	2151 2151
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2.4788E+04 4.0000E+00 0. 6.4504E+01 8.2902E+01 1.1569E+02 1.4855E+02	1.0000E+00 0. 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00	Ø. Ø. Ø. Ø. Ø.	5	1.0075E-04 0 1.0000E+00 7.1807E-05 8.1753E-05 9.0472E-05 1.0486E-04	3,5000E-02 156 0, 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02	4.6219E-01 251102 1.0000E+001102 1.4673E-01 1.4567E-01 1.233E-01 1.0883E-01	2151 2151
2.4788E+04 4.0000E+00 0. 6.4504E+01 8.2902E+01 1.1569E+02 1.4855E+02 1.9074E+02	1.0000E+00 0. 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00	Ø. Ø. Ø. Ø. Ø.	5	1.0075E-04 0 1.0000E+00 7.1807E-05 8.1753E-05 9.0472E-05 1.0486E-04 1.0389E-04	3,5000E-02 156 0, 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02	4.6219E-01 251102 1.0000E+001102 1.4673E-01 1.4567E-01 1.2333E-01 1.0883E-01 1.3297E-01	2151 2151
2.4788E+04 4.000CE+00 0. 6.4504E+01 8.2902E+01 1.1569E+02 1.4855E+02 1.9074E+02 2.44015+02	1.0000E+00 0. 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00	0. 0. 0. 0. 0. 0.	5	1.0075E-04 0 1.0000E+00 7.1807E-05 8.1753E-05 9.0472E-05 1.0486E-04 1.0389E-04 1.3175E-04	3,5000E-02 156 0, 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02	4.6219E-01 251102 1.0000E+001102 1.4673E-01 1.4567E-01 1.233F-01 1.0883E-01 1.3297E-01 1.9015E-01	2151 2151
2.4788E+04 4.000C+00 0. 6.4504E+01 8.2902E+01 1.1569E+02 1.4855E+02 1.9074E+02 2.4497E+02	1.0000E+00 0. 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00	0. 0. 0. 0. 0. 0. 0. 0.	5	1.0075E-04 0 1.0000E+00 7.1807E-05 8.1753E-05 9.0472E-05 1.0486E-04 1.0389E-04 1.3175E-04 9.6606F+05	3,5000E-02 156 0, 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02	4.6219E-01 251102 1.0000E+001102 1.4673E-01 1.4567E-01 1.2333E-01 1.0883E-01 1.3297E-01 1.3297E-01 1.9015E-01 1.7571E-01	2151 2151
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2.4788E+04 4.0000E+00 0. 6.4504E+01 8.2902E+01 1.1569E+02 1.9074E+02 2.4491E+02 3.1447E+02 4.0379E+02 5.1848E+02	1.0000E+000.1.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+00	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0	5	1.0075E=04 0 1.0000E=005 8.1753E=05 9.0486E=04 1.0389E=04 1.3175E=04 9.6060E=05 8.8629E=04 1.455E=04 1.455E=04	3,5000E-02 156 0, 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02 3,5000E-02	4.6219E-01 251102 1.0000E+001102 1.4673E-01 1.4567E-01 1.2335E-01 1.3297E-01 1.9015E-01 1.7571E-01 1.8672E-01 2.5695E-01 1.757F-01	2151 2151
2.4788E+04 4.0000E+00 0. 6.4504E+01 8.2902E+01 1.1569E+02 1.9074E+02 2.4491E+02 3.1447E+02 4.0379E+02 5.1848E+02 6.6574E+02	1.0000E+000.1.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+00		5	1.0075E-04 0 1.0000E+00 7.1807E-05 8.1753E-05 9.0478E-05 1.0486E-04 1.3175E-04 9.6060E+05 8.8629E+05 1.1455E-04 1.126E-04 1.1276E-04	3,5000E-02 156 0, 3,5000E-02 3,5000E-0	4.6219E-01 251102 1.0000E+001102 1.4673E-01 1.2335-01 1.0883E-01 1.3297E-01 1.9015E-01 1.7571E-01 1.8672E-01 1.8672E-01 1.7357E-01 1.2548E-01	2151 2151
2.4788E+04 4.0000E+00 0. 6.4504E+01 8.2902E+01 1.1569E+02 1.4855E+02 1.4855E+02 2.4491E+02 3.1447E+02 3.1447E+02 5.1848E+02 6.6574E+02 8.5482E+02	1.0000E+000.1.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+00		5	1.0075E-04 0 1.0000E+00 7.1807E-05 8.1753E-05 9.0472E-05 1.0486E-04 1.3175E-04 9.6060E=05 8.8629E=05 1.1455E-04 1.1126E=04 1.1126E=04 1.0479E-04	3,5000E-02 156 0, 3,5000E-02 3,5000E-0	4.6219E-01 251102 1.0000E+001102 1.4673E-01 1.2335F-01 1.2335F-01 1.3297E-01 1.3297E-01 1.9015E-01 1.7571E-01 1.8672E-01 2.5695E-01 1.7357E-01 1.2548E-01 1.2687E-01	2151 2151
2.4788E+04 4.000C+00 0. 6.4504E+01 8.2902E+01 1.1569E+02 1.4855E+02 1.9074E+02 2.4491E+02 3.1447E+02 4.0379E+02 5.1848E+02 6.6574E+02 8.5482E+02 1.0976E+03	1.0000E+000.1.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+001.0000E+00		5	1.0075E=04 0 1.0000E+00 7.1807E=05 8.1753E=05 9.0472E=05 1.0486E=04 1.0389E=04 1.0389E=04 9.60600E=05 8.8629E=05 1.1455E=04 1.126E=04 1.0479E=04 1.0478E=04 1.0	3,5000E-02 156 0, 3,5000E-02 3,5000E-0	4.6219E-01 251102 1.0000E+001102 1.4673E-01 1.4567E-01 1.2335E-01 1.0883E-01 1.3297E-01 1.3297E-01 1.7571E-01 1.8672E-01 1.7557E-01 1.2548E-01 1.2687E-01 1.2687E-01	2151 2151
2.4788E+04 4.000C+00 0. 6.4504E+01 8.2902E+01 1.1569E+02 1.4855E+02 1.9074E+02 2.4491E+02 3.1447E+02 4.0379E+02 5.1848E+02 6.5574E+02 8.5482E+02 1.0976E+03 1.4093E+02	1.0000E+00 0. 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00		5	1.0075E=P4 0 1.000E+20 7.1807E=05 8.1753E=05 9.0472E=05 1.0486E=04 1.0389E=04 1.0389E=04 3.6060E=05 8.8629E=05 1.1455E=04 1.126E=04 1.0479E=04 1.0479E=04 1.0479E=04 9.9890E=05	3,5000E-02 156 0, 3,5000E-02 3,5000E-0	4.6219E-01 251102 1.0000E+001102 1.4673E-01 1.2333E-01 1.3297E-01 1.3297E-01 1.9015E-01 1.9015E-01 1.7571E-01 1.8672E-01 1.2548E-01 1.2548E-01 1.2687E-01 1.7406E-01 1.8672E-01	2151 2151
2.4788E+04 4.000CE+00 0. 6.4504E+01 8.2902E+01 1.1569E+02 1.4855E+02 1.9074E+02 2.4491E+02 3.1447E+02 4.0379E+02 5.18492E+02 6.6574E+02 8.5482E+02 1.0976E+03 1.4093E+03 1.8096E+03	1.0000E+00 $0.$ $1.0000E+00$		5	1.0075E=04 0 1.0000E=05 8.1753E=05 1.0486E=04 1.3175E=04 9.6060E=05 1.1455E=04 1.1479E=04 1.1479E=04 1.1267E=04 1.1267E=04 1.0	3,5000E-02 156 0, 3,5000E-02 3,5000E-0	4.6219E-01 251102 1.0000E+001102 1.4673E-01 1.4567E-01 1.233E-01 1.0883E-01 1.3297E-01 1.9015E-01 1.7571E-01 1.7575E-01 1.7595E-01 1.2548E-01 1.2548E-01 1.2687E-01 1.7406E-01 1.8542E-01 2.565E-01	2151 2151
2.4788E+04 4.000CE+00 0. 6.4504E+01 8.2902E+01 1.1569E+02 1.9074E+02 2.4491E+02 3.1447E+02 4.0379E+02 5.1848E+02 6.6574E+02 5.482E+02 1.0976E+03 1.4093E+03 1.8096E+03 2.3236E+03	1.0000E+00 $0.000E+00$ $1.0000E+00$		5	1.0075E=04 1.0000E=005 8.1753E=05 9.0486E=04 1.0389E=04 1.3175E=04 9.6060E=05 1.1455E=04 1.1267E=04 1.0267E=05 1.026	3,5000E-02 156 0, 3,5000E-02 3,5000E-0	4.6219E-01 251102 1.0000E+001102 1.4673E-01 1.4567E-01 1.2333E-01 1.0883E-01 1.3297E-01 1.9015E-01 1.7571E-01 1.8672E-01 1.2548E-01 1.2687E-01 1.2687E-01 1.8542E-01 2.1805E-01	2151 2151
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3 144700	1 16000-100	a		2 3000
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1.40936+03	1.100000-000	Ø.		2.0220
1.00Y0E+03	1.10000+00	0.		2.3200
2.3236E+Ø3	1.1600E+00	ø.		2.32001
2.9836E+Ø3	1.1600E+00	ø.		2.32001
3.8310F+03	1.1600F+00	Ø.		2 3220
4.91915103	1.16005+00	ã		2 3200
4 7467E - 03	1.10000.000	a		2.0200
0.31032+03	1.100005400	<i>.</i>		2.3290
8.1103E+03	1.10006+00	μ.		2.3200
1.0414E+04	1.1600E+00	ø.		2.3200
1.3372E+Ø4	1.1600E+00	ø.		2.32201
1.7169F+04	1.1600F+00	Ø.		2.3200
2 20465+04	1 16005+00	ã.		2 32200
2 · 20 · 0 [· 0 ·	1.10000.00	a.'		2.3200
2.4/001+04	1.10065+00	<i>и</i> .	_	2.0200
3.00K0E+00	ø.		5	
Ø.	ø.	Ø,		2.00001
6.4504E+01	1.0000E+00	ø.		2.0000
8.2902F+01	1.0000F+00	Ø.		2 0000
1.15695+02	1 00005+00	ดี		2 0000
1 10555 00	1.0000001.00	<i>v</i> .		2,0000
1.48001+02	1.000000+00	۷.		2,0000
1.90/4E+02	1.0000E+00	Ø,		2.0000
2.4491E+Ø2	1.0000E+00	Ø.		2.0000
3.1447E+02	1.000000+00	ø.		2.0000
4.0379F+02	1.0000E+00	ø.		2.0000
5.1848F+Ø2	1.0000F+00	Ø		2 0000
6 6574C 02	1 000000-00	ä		2 0000
0.00746402	1.0000000000	Ø.		2.0000
0,2402E+02	1.0000F+00	Ø.		5.0000
1.0976E+03	1.0000E+00	ø.		2.0000
1.4093E+03	1.0000E+00	Ø.		2.0000
1.8096E+03	1.0000E+00	0.		2.00001
2.32365+03	1.00005+00	ด้		2 0000
2 00745.07	1 0000E 00	a .		2 0000
2.90000000	1.000000400	<i>v</i> .		2.0000
3.8310E+03	1.00005+00	0.		2.0000
4.9191E+Ø3	1.0000E+00	Ø.		2,00001
6.3 163E+Ø3	1.0000E+00	ø.		2.0000
8.1103E+03	1.0000E+00	ø.		2,00001
1.0414E+04	1.0000E+00	0.		2.00001
1.33725+04	1.000000+00	a'.		2 0000
1.74600104	1 000000.00	ä		2 00000
T • 1 T • 1 T • 1 E • 6 4	1.000000.00	<i>u</i> •		2.00000
2.20405+04	1.000000-000	Ø.		2.00000
2.4788E+Ø4	1.0000E+00	Ø.		5.00001
4.0000E+00	ø.		5	
ø.	ø.	ø.		2.00001
6.4504E+01	1-0000E+00	ø.		2.00001
8.20025-04	1.000005+00	a.		2 0000
1 15605.00	1 000000000	a		2 00000
1 1025- 7-	1.000000-000	х. а		5. KOKO
1.4022E+12	1.0000F+00	μ.		2,0000
1.9074E+02	1,0000E+00	ø.		2,00001
2.4491E+Ø2	1.0000E+00	Ø.		2.00001
3.1447F+02	1,00000E+00	ø.		2.0000

5	$\begin{array}{c} 2 & 3 & 2 & 0 & 0 & 0 & 0 \\ 2 & 3 & 3 & 2 & 0 & 0 & 0 & 0 \\ 2 & 0 & 0 & 0 & 0 & 0 & 0 \\ 2 & 0 & 0 & 0 & 0 & 0 & 0 \\ 2 & 0 & 0 & 0 & 0 & 0 & 0 \\ 2 & 0 & 0 & 0 & 0 & 0 & 0 \\ 2 & 0 & 0 &$	$\begin{array}{c} 3 & . & . & . & . & . & . & . & . & . &$	$\begin{array}{c} 3,3200 \ E - 01 \\ 3,320$	2151 2151
5	2.0000E = 04 2.0000E $\begin{array}{c} 3 \\ 5 \\ 5 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	1.2700E-01 1.28600E-01 2.860	2151 2151	

4,0379E+02	1.0000E+00	ø.
5 1848E+03	1 00005+00	Ø
2.10-06-62	1.000000.000	
6.6574E+02	1.0000E+90	Ø.
8 54825+00	1 00005+00	Ø
0.14026482	T. BRARE + BR	ψ.
1.0976E+03	1.0000E+00	ø.
1.40935-03	1 . 00005+00	a
1.40.05400	1.000000000	
1.80965+03	1.0000E+00	ø.
2.32365+03	1.0000F+00	0
2.02002+00	1.000000000	
2.9836E+03	1.0000E+00	ø.
3.83105+0%	1.0000F+00	Ø
0.00102+00	1.000000.00	
4.9191E+03	1.0000E+00	Ø.
6.31635+03	1.0000F+00	αĽ
0.0100[+00	1.000000	ä.
8.1103E+03	1.00005+00	ΰ.
1.0414F+04	1.0000F+00	0
1 77700 04		ă.
1.33/2E+04	1.009065+00	<i>v</i> .
1.7169F+Ø4	1.000000+00	Ø.
3 30465+04	1 00305+00	a
2.20401+04	1.000000 +000	<i>v</i> .
2,4788E+Ø4	1.0000E+00	ø.
5 00005.00	a	
3.00701+00	U •	
ø.	Ø.	2.
6.45045+01	1.12005+00	Ø
0,00000.01	1.10000.00	
0.29026+01	1.15005+00	<i>i</i> 0.
1.1569F+02	1.1200E+00	ø.
4 40555.00	1 10005.00	<u>a</u> .
1.4000E+02	1-12006-00	μ,
1.9074F+02	1.1200E+00	ø.
2 44045.40	4 40005+00	a
2 VIE+02	1.15005+06	<i>w</i> .
3.1447E+Ø2	1.12000+00	ø.
4 03705+02	1 12005+00	17
4.00/72402	1.12006-00	2.
5.1848E+Ø2	1.1200E+00	ø.
6.65745+02	1.120015+00	Ø
	1.12000.00	<u>.</u>
8.2482E+02	1.12006+00	ø.
1.0976F+03	1.12005+00	ø.
1 40075.07	1 10005+00	2
1.40935403	1.15005-06	0.
1.8096E+03	1-1200E+00	ø.
2 32365+03	1 12005+00	ര്
2.02002+03	1.12001.00	
2.9836E+03	1.1200E+00	ø.
3.93105-03	1 12005+00	¢۲.
0.00105-00	T-TCDDC-06	~
4.9191E+Ø3	1.1200E+00	μ.
6.3153F+03	1.1200F+00	σ.
	1.10000.00	~.
8.1103E+03	1.12001+90	υ.
1.04145+04	1.120000+20	ø.
4 77705.04	1 1000F100	
1.33/25+04	1.15000+400	K ³ •
1.7169E+04	1.1200E+90	ø,
2.28465+84	1.12005+00	ø
2.60702794	T • 1506 C + 016	**
2.4788E+Ø4	1.1200E+20	0.

$\begin{array}{c} 2 & 0 & 0 & 0 & 0 \\ 2 & 0 & 0 & 0 \\ 2 & 0 & 0 & 0 \\ 2 & 0 & 0 & 0 \\ 2 & 0 & 0 &$	$\begin{array}{c} 3 \\ 5 \\ 5 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	2.8600E-01 1.4300E-01 1.430	2151 2151
2,00000=04	3.5000E-02	2,8600E-01	
2.0000E=04	3.5000E-02	2.8600E-01	
2.0000E=04	3,5000E-02	2.8600E-01	04 54
5 1 0000E+00	120	1 00005+001102	2121
2.2400F-04	3.5000E-02	1.4300E-01	C T > F
2.2400E-04	3,5000E-02	1.4300E-01	
2.2400E-04	3,5000E-02	1.4300E-01	
2.2400E+04	3,5000E-02	1.4300E-01	
2,2400E+04	3.5000E-02	1.4300E-01	
2.2400E+04	3,5000E-02	1,4300E-01	
2.24001-04	3.7000E=02	1.43005-01	
2.24001-04	3.500000-02	1.43005-01	
2.2400E+04	3.5000E+02	1.43002-01	
2.2400E-04	3,5000E-02	1.4300E-21	
2.2400E-04	3.5000E-02	1.4300E-01	
2.240ØE-04	3.5000E-02	1.4300E-01	
2.24002-04	3,2000E-02	1.4300E=01 1.4300E=01	
2 24305+04	3.5000E=02	1.4300E=01	
2.2400E-04	3.5000E-02	1,4300E-01	
2.240ØE-04	3,5000E-02	1.4300E-01	
2.240ØE-04	3.5000E-02	1.4300E-01	
2.2400E=04	3.5000E-02	1.4300E-01	
2,2400E=04	3.5000E=02	1,4500E-01	
2.24001-04	3.5000L=02	1.43000-01	
2.2400L=04	3.5000F=02	1.4300F=01	
2.2400E=04	3.5000E-02	1.4300E-01	

PROGRAM AVRAGE4, CALCULATES CROSS-SECTIONS IN THE UNRESOLVED RESONANCE REGION

ENDF/B VERSION II DATA WITH ENERGY DEPENDENT PARAMETERS

RUN NO 100 TITLE AVERAGE4 TEST. U-235 DATA

≡ L R F ≡ N LRU= 2.478800E+04 6.450400E+01 UPPER ENERGY LIMITS LOWER

N

TARGET SPIN 3.5000E+00 SCATTERING LENGTH 9.2600E-01 NUMBER OF L-STATES

N

■ 8,39Ø8E-Ø1 NUCLEAR RADIUS'A' AS CALCULATED FROM A=(1.23+(MASS++(1/3)+0.8)+0.1

~ & NUMBER OF J-STATES FOR THIS L-VALUE NUCLEAR MASS/NEUTRON MASS 2.3302E+02 ANGULAR MOMENTUM

	NU FISSION 2. 0000E+00	GAMMAF I SS	2,934700E-01	2,913300E-01	2,466500E-Ø1	2,176600E-01	2,659300E=01	3,802900E-01	3.514100E-01	3,734400E-01	5,13900E-01	3,471300E-01	2,509600E-01	2,537300E-01	3,481300E-01	3,708300E-01	4.361000E-01	4.3348ØØE-01	4.247500E-01	4,305500E=01	4,350600E-01	4,433400E-01	4.432500E-01	4.4530005-01	4 . 564600E-01
	0,00005+00	GAMMA GAMMA	3,500006-02	3,5000006-02	3,5000005-02	3,5000005-02	3,500000E-02	3,500000E-02	3,500000E-02	3 . 500000E-02	3,500000E-02	3,5000005-02	3,500000E-02	3,500000E-02	3,500000E-02	3,500000E-02	3 , 500000E - 02	3,500000E-02	3,500000E-02	3,500000E-02	3,5000005-02	3,500000E-02	3 , 500000E-02	3.500000E-02	3,50000E-02
25	1.0000E+00 NU GAMMA	GAMMA N NOT	7,180700E-05	8,175300E-05	9 Ø472ØØE=Ø5	1.048600E-04	1,038900E-04	1.317500E-04	9.606000E-05	8,8629ØØE-Ø5	1,145500E-04	1.112600E+04	1.047900E-04	1.126700E=04	9,989000E-05	1,016000E-04	9.8627ØØE-Ø5	9,902902E-05	1,072900E-04	9,966400E=05	9,641900E-05	9.441700E-05	9.763800E-05	9.971900E-05	9.869300E-05
F ENERGY POINTS	NU NEUTRON	GAMMA INELAS	Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø	Z, ZZZZZZYE+32	0.300000E+00	Z, J200032E+00	2 000000E+00	0,00000CE+00	0, 200000E+00	0,000030E+00	9. 606966E+00	2.000000E+00	0 0000005 + 00	0.000002E+00	Ø, 200000E+00	0, 200003E+00	0,00000E+00	9,000002E+00	9, 828894E+26	0.000207E+20	0, 200007E+90	0.300000E+00	3 . 000000E+20	ଓ , ଅମସହାହ E + ଅନ	0, CDCUCAE+00
LATION CODE 5 NUMBER O	NU INELASTIC 0.000E+00	SPACING	1.020000E+32	1.80000E+CO	1 , 2230000E+00	1.00000000	1.000000E+00	1.000000E+00	1.000200E+03	1.00000E+00	1.00000E+05	1. 000000E+00	1.000005+00	1.0000005+00	1.000025+00	1.0000005+00	1,002000E+86	1,000000E+00	1.000008E+00	1.820005+00	1.00000E+02	1. 666636E+66	1.00000E+00	1.0220055+00	1,3000005+00
SPIN 3. 3000E+80 INTEPPOL	DEGREES OF FREEDOM.	ENERGY(EV)	6 . 450 402E+01	8,290200E+01	1.156900E+02	1.485500E+02	1.907400E+02	2,449100E+07	3,14470GE+02	4,037900E+02	5,184800E+02	6 657400E+07	8 548200E+02	1 097600E+03	1,409300E+03	1,809600E+03	2,323600E+03	2,9836005+03	3 ,831000E+©3	4,919100E+B7	6,316300E+Ø3	8,110300E+03	1,041400E+04	1,337230E+Ø4	1,7169885+04

4,7366006-01 4,6219006-01	Z C AS C A
3,500000E+02 3,500000E+02	0 0
9,526800E=05 1,307500E=04	CS 25 26 26 26 26 26 26 26 26 26 26
3, 900000E + 00 3, 600000E + 00	$ \begin{array}{c} A \\ \mathsf$
1,0000000000 1,0000000000	С 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
2.204600E+04 2.478800E+04	RD IC NX A A A C A C

■ 8,3908E-01 NUCLEAR RADIUS'A' AS CALCULATED FROM A=(1,23*(MASS**(1/3)+2,8)*0.1

4 1 NUMBER OF J-STATES FOR THIS L-VALUE NUCLEAR MASS/NEUTRON MASS 2.3302E+02 ANGULAR MOMENTUM

E+ØØ NU FISSION 2.0000E+00 Camaa Camaares	00E-02 3.320000E-01	ØØE-Ø2 3.32ØØØØE-Ø1	00E-02 3.320000E-01	00E-02 3.320000E-01	00E-02 3.320000E-01	ØØE-Ø2 3,320000E-01	ØØE-Ø2 3.32ØØØØE-Ø1	00E-02 3.320000E-01	ØØE+Ø2 3,32ØØØØE-Ø1	00E-02 3.320000E-01	
02000 02000 00000	3,5000	3,5000	3,5000	3,5000	3,5000	3,5000	3,5000	3,5000	3,5000	3,5000	
25 1.0000E+00 NU GAMM/ CAMMA N NOT	2.320000504	2 320000E - 04	2 . 320200E - 04	2,320000E-04	2,320000E-04	2,320000E-04	2,320000E-04	2,320000E-04	2 , 320000E-04	2.320000E-04	
F ENERGY POINTS NU NEUTRON GAMMA THELAS	2.000000E+00	Ø, Ø3ØØØØÆ+ØØ	0,000000E+00	0.3220000E+00	0, 000000E+00	2,200000E+20	0.00000E+00	ସ ,	0.0000055+00	ଡ. ଌଌଌଷଉଛE + ଉଉ	
LATION CODE 5 NUMBER O. NU INELASTIC Ø,ØØØE+ØØ S8Åring	1.160076E+00	1.160000E+00	1.160032E+00	1.160000E+00	1.160000E+00	1.160000E+00	1.160000E+00	1.160000E+20	1.1600000000000000000000000000000000000	1,1600025+00	
SPIN 2,0000E+00 INTEFFOL Degrees of Freedom, Enforventer	6.450400E+81	8,290200E+01	1.1569ØØE+Ø2	1.485500E+02	1.907400E+02	2,449100E+D2	3,144700E+02	4 . 037900E+02	5.184800E+02	6.657420E+02	

11.1560666 11.1560666 11.15606667 11.1560687 11.1560687 14.15607 14.1560687 14.1560687 14.15607 14.1577 14.15777 14.157777 14.1577777777777777777777777777777777777
1,160033 1,160033 1,160083 1,1160086 1,1160086 1,116008 1,16008 1,16008 1,1600 1,1600 1,1600 1,1600 1,1600 1,1600 1,1600 1,1600 1,1600 1,1600 1,1600 1,1600 1,17000 1,17000 1,170000000000

SPIN 3,0000E+00 INTERPOLATI	CON CODE 5 NUMBER OF	C ENERGY POINTS	25 c adadt tod will c.u	500 - LL 5000 50 50 4 5	2010-2011 - 2020-211 - 2020-211 - 2020-211 - 2020-2020-
	INFLACIIC B.BORNETER				ALL LIGGION TINGRADINAN JIMPILIAN
		0,00000001.000 0,00000001.000			
	+				- 010000010+
	H = 800000000 - 000000000000000000000000000	0.000000F+00	2.00000E=24		1.2700005-01
1.9074025+02	1.000000000000	0.00000E-00	2.2000005-04	3.5000000-02	1.27000E-01
2 449100E+02	1.000000E+00	0.00000E+00	2.000000E-04	3.500000E-02	1,270000E-01
3 1447005+02	1.0000005+00	0 00000E+00	2 . 000000E • 04	3.50000E-02	1.270000E-01
4 . Ø37900E+02	1.00000E+00	0,000000E+00	2,00000E-04	3 . 500000E - 02	1,270000E-01
5.184800E+02	1.00000E+00	0,00000E+00	2.000000E-04	3 . 500000E-02	1.270000E-01
6.657400E+02	1 . Ø Ø Ø Ø Ø Ø E + Ø Ø	0.000000E+00	2.0000005-04	3 . 500000E-02	1,270000E-01
8,548200E+0>	1,000000E+00	0,000000E+00	2 . 000000E - 04	3, 500000E-02	1,270000E-01
1.097600E+03	1.000005±00	0.000000E+00	2 . 600000E - 04	3 . 500000E - 02	1.270000E-01
1.409300E+03	1.0000005+00	0, 600000E+00	2 0000005-04	3 . 500000E-02	1.270000E-01
1,809600E+03	1.00000E+00	Ø,ØØØØØØE+ØØ	2 , 000000E • 04	3 500000E 02	1,270000E-01
2,323600E+03	1, 000000E+00	0,000000E+00	2 . 000000E - 04	3 5 00000E - 02	1,270000E-01
2,983600E+Ø3	1.00000E+30	9 000000E+00	2 . 00000E - 04	3,500000E-02	1,270000E-01
3 831060E+03	1.000000E+00	0,000000E+00	2,00000E=04	3.50000E-02	1.270000E-01
4,919100E+03	1.000000E+00	Ø. 000000E+00	2 . 000000E - 04	3 5 88888 6 -82	1,270000E-01
6 ² 316300E+03	1.000000E+00	Ø, ØØØØØØ€ + ØØ	2 . 000000E • 04	3,5000005-02	1,270000E-01
81110300E+03	1.0000005+00	0.00000E+00	2.200000E-04	3 500000E-0 2	1,270000E-01
1.041400E+04	1.0000005+00	Ø. ØØØØØØE+ØØ	2.00000E-04	3.50000E-02	1.270000E-01
1.337200E+04	1.0000005+00	0.000000E+00	2.00000E=04	3, 500000E-02	1.27000E-01
1.716900E+04	1.00000E+00	Ø ØØØØØ¢E+ØØ	2.00000E-04	3 50000E-02	1.27000E-01
2.2046005+04	1.0000005 +00	0.000000E+00	2.00000E-04	3.500000E-02	1.270000E~01
2.478800E+Ø4	1. 200030E+00	0,000000E+00	2 . 000000E - 04	3 . 500000E-02	1.270000E-01
SPIN 4.0000E+00 INTERPOLATÌ	DN CDDF 5 NUMBER DF	· FNFRGY POINTS	25		
DEGREES OF FREEDOM NU	INELASTIC 0.0000E+00	NU NEUTRON	2.0000E+00 NU GAM	MA 0.0000E+00 Camma camma	NU FISSION 2.0000E+00 Cammafics
		0011157 (11110)			
8.2902005+01	1.0000005+00	8.00000E +00	2 0000000		Z, 360000E101
1,156900E+02	1.00000E+00	0.000000E+00	2 . 300000E - 04	3.5000005-02	2 • 860000E - 01
1,485500E+02	1,00000E+00	0 . 0000000E + 00	2.0000005-04	3.5000005-02	2.86000E-01
1.907400E+02	1.3000065+00	0.000000E+00	2.000005-04	3.500000E-02	2 * 860000E + 01
2,4491005+02	1.00000E+00	Ø, ØØØØØØE+ØØ	2 . 000000E - 04	3,500000E-02	2,860000E-01
3 144700E+02	1.000005+00	0,000000E+00	2 . 000000E=04	3,5000005-02	2,860000E-01

4,037900E+02	1.000000E+00	Ø. 000000E + 00	2.000000E-04	3,50000005-02	2,860000E-
5.184800E+02	1,000000000+00	0.000000E+00	2.000000E-04	3,50000000-02	2.86000E-
6,6574005+02	1,000000E+00	0.000000E+00	2,000000E=04	3,500000E-02	2,8600000-
8,548200E+02	1.0000000 +00	0,00000E+00	2,000000E-04	3,500000E-02	2.860000E-
1,097600E+03	1,00000000+00	0,00000E+00	2,000000E=04	3,50000000-02	2.86000E-1
1,409302E+03	1,000000000000	0,00000E+00	2.000000E-04	3.50000000-02	2,860000E-
1.809600E+03	1.000000E+00	0,00000E+00	2.000000E=04	3,50000000-02	2,860000E-
2.323600E+03	1,000000E+00	0.00000E+00	2,000000E=04	3,500000E-02	2.860000E-
2.983600E+03	1.20000000+00	0,000000E+00	2.000000E-04	3.500000E-02	2.86000E-
3.831000E+03	1.0000026+00	0,000000E+00	2.000000E=04	3,500000E-02	2.860000E-
4,919100E+03	1.00000E+00	0,00000E+00	2.000000E-04	3.500000E-02	2.860000E-
6,316300E+03	1.000000E+00	0.000000E+00	2.000000E=04	3.500000E-02	2,86000E-
8.110300E+03	1.00000000000	0.000030E+00	2,000000E=04	3.500000E-02	2.860000E-
1.041400E+04	1.000028E+00	0,000000E•00	2:000000E=04	3.500000E-02	2,86000E-
1.337200E+04	1,000000E+00	Ø,000000E+00	2.000000E=04	3,500000E-02	2,860000E-
1.716900E+04	1.00000000000	0,000000E+00	2.000000E-04	3.500000E-02	2.860000E-
2.204600E+04	1.00000000+00	Ø,000000E+00	2.000000E-04	3,500000E-02	2,860000E-
2.478800E+04	1.000000E+00	Ø,ØØØØØØE+ØØ	2.ØØØØØØE-Ø4	3,500000E-02	2.860000E-

SPIN 5,0000E+00 INTERPO	DLATION CODE 5 NUMBER	OF ENERGY POINTS	25		
DEGREES OF FREEDOM,	NU INELASTIC Ø ØØØDE+DE	NUNEDIRON	1,00002+00 NO (AMMA 0.00000-00	NO FISSION 1.0
ENERGY(EV)	SPACING	GAMMA INELAS	GAMMA N NOT	GAMMA GAMMA	GAMMAFISS
6.450400L+01	1.120000E+00	0.00000E+00	2.240000L-04	3.500000E-02	1.430000E-
8,290200E+01	1.120002E+00	Ø,ØØØØØØE+00	2,240000E=04	3.500000E+02	1,430000E-
1,156900E+02	1.120000E+00	0,00000E+00	2.240000E-04	3,500000E-02	1.430000E-
1,485500E+02	1,120000E+00	0.000000E+00	2.240000E-04	3,500000E-02	1.430000E-
1,907400E+02	1.120000E+00	0,00000E+00	2.240000E-04	3,500000E-02	1,430000E-
2,449100E+02	1,120000E+00	0,00000E+00	2.240000E-04	3,500000E-02	1.430000E-
3,1447ØØE+Ø2	1.120000E+00	0,000000E+00	2,240000E-04	3,500000E=02	1.430000E-
4.037900E+02	1.120000E+00	0,00000E+00	2,240000E-04	3,500000E-02	1,430000E-
5 . 184800E+02	1.120000E+00	Ø,ØØØØØØE+ØØ	2.240000E-04	3,500000E-02	1.430000E-
6,657400E+02	1,120000E+00	0,000000E+00	2.240000E-04	3,500000E-02	1.430000E-
8,5482ØØE+Ø2	1.120002E+00	0,00000000000	2.240000E-04	3,500000E-02	1,430000E-
1.097600E+03	1.12000000+00	0,00000000+00	2.240000E-04	3,500000E-02	1.430000E-
1,409300E+03	1.120000E+00	Ø,000002E+00	2.240000E=04	3,500000E-02	1.430000E-
1,809600E+03	1,120000E+00	0,000000E+00	2:240000E-04	3,500000E-02	1.430000E-
2,323600E+03	1,120000E+00	0,000000E+00	2.240000E-04	3,500000E-02	1,430000E=
2,983600E+03	1.12000000+00	0,0000000000	2.240000E-04	3,500000E-02	1,430000E-
3,831000E+03	1,120000E+00	Ø,ØØØØØØE+ØØ	2,240000E-04	3,500000E-02	1.430000E-
4,919100E+03	1,1200005+00	0,00000E+00	2,240000E-04	3,500000E=02	1,430000E-
6,316300E+03	1,1200005+00	0,00000E+00	2.240000E-04	3,500000E-02	1,430000E-
8,110300E+03	1.120000E+00	0,000000E+00	2.240000E-04	3,50000000-02	1,430000E-
1.041400E+04	1,120000E+00	0.000000E+00	2,240000E-04	3,500000E-02	1,430000E-
1.337200E+04	1,1200005+00	0,000000E+00	2,240000E-04	3,500000E-02	1,430000E-
1,716900E+04	1,1200000 +00	0,000000E+00	2,240000E-04	3,50000000-02	1,430000E-
2.204600E+04	1.120000E+00	0,000000E+00	2,240000E=04	3,500000E-02	1,430000E-
2.4788ØØE+Ø4	1.120000E+00	0.000000E+00	2,240000E=04	3,500000E-02	1,430000E-

INPUT PARAMETERS WITH CALCULATED TOTAL WIDTH

L-VALUE= Ø J-STATE= 3.00

2,7030005-03	T.0000005-00	C. 0000000 - 00	41/30072C-PL	7,7027002-03	3.900000000002	410040005-01
3,831000E+03	1,000000E+00	0,000000E+00	4,663907E=01	1.072900E-04	3,500000E-02	4,247500E-01
4.9191000+03	1.000000E+00	0.000000E+00	4.725401E=01	9.966400E-05	3.500000E-02	4.305500E-01
6.3163005+03	1.000000E+00	0.0000000+00	4.777229E-Ø1	9.641900E-05	3.500000E-02	4.3506002-01
8.110300F+03	1.000000E+00	0,000000F+00	4.868429E=01	9.441700F-05	3.500000F-02	4.4334005-01
1.041400E+04	1.000000F+00	0 00000F+00	4.882139F=01	9.763800F-05	3 500000F-02	4.4325005-01
1.3372005+04	1.000000F+00	0 0000005+00	4.918312F=01	9.9719005-05	3 5000005-02	4.4530005-01
1.7169005+04	1 00000000000	0 0000000-00	5.0439185-01	9.8693005-05	3 500000E-02	4.5646000-01
2 2046005+04	1 0000005+00	0.000000000000	5 2280535-01	9 5268005-05	3 50000005-02	4.7366005-01
2 479800E+04	1 0000000000000	0 00000000+00	5 1705035-01	1 0075005-04	3 50000000000000	4.62400000-01
		0.0000000,+00		1.00/0005-04	S. JOUDDDEHDZ	410513005-01
L=VALUE= Ø J	TAILE 4,00					
	SPACINC					
	1 00000045+00	C CORCORE + CC	4 807067E-01	7 190700E-05	T EGGGGGGE-GO	4 447700E-04
8 300300E+01	1 6663665565406			9 176700E-05	5.500000E=02	1 4547000-01
0.290200L=01	1 000000000000	0.0000000000000000000000000000000000000	1 6070345-01		5.500000E=02	1 0333605-01
1.1009000002		0.000000E+00	1.9990316-01	9.04/200E-00	3.50000000000	1.233300E-01
1.48550000002	1.000000000000	0 000000E+00	1.4010000001	1.0480001-04	3.500000E-02	1.0083001-01
1.90/4000002	1.0000000000000	0,000000E+00	1.094040E-01	1.03890000-04	3.50000000002	1.3297002-01
2.4491002+02	1.000000000	0.000000E+00	2.2721181-01	1.31750NE=04	3.500000E=02	1.901500E-01
3,144700E+02	1.000000E+00	0.000000E+20	2.124135E=01	9.606000E-05	3.500000E-02	1.757100E-01
4,037900E+02	1.000000E+00	0,000000E+00	2.235010E-01	8.862900E-05	3,500000E-02	1.867200E-01
5.184800E+02	1.000000E+00	0.002000E+00	2,945583E=01	1.145500E-04	3.500000E-02	2,569500E-01
6,6574ØØE+Ø2	1,000000E+00	0,0000005+00	2.114407E-01	1.112600E-04	3,500000E-02	1.7357000-01
8,5482ØØE+Ø2	1.000000E+03	0,000000E+00	1.635438E=Ø1	1.047900E-04	3.500000E-02	<u>1.254800E-01</u>
1.097600E+03	1.000000E+00	0,000000E+00	1,656028E-01	1.126700E-04	3,500000E-02	1.2687ØØE-Ø1
1.409300E+03	1.000000E+00	0.000000£+00	2,128099E=01	9.989000E=05	3,500000E-02	1,740600E-01
1.809600E+03	1.000000E+02	0,000000E+00	2.247420E-01	1.016000E-04	3,500000E-02	1.854200E-01
2,3236005+03	1.000000E+00	0,00000000000	2,578042E-01	9.862702E-05	3.500000E-02	2.180500E-01
2,983600E+03	1.0000000E+00	0.0020005+00	2,571492E-Ø1	9.902900E-05	3.500000E-02	2.167400E-01
3.831000E+03	1.000000E+00	0.000000E+00	2.540207E+01	1.072900E-04	3,500000E-02	2,123800E-01
4.919100E+03	1.000002E+00	0.200000E+30	2.572701E-01	9.966400E-05	3.50000000-02	2,1528002-01
6.316300E+03	1.000000E+00	0.200000E+20	2.601929E-01	9.641900E-05	3.500000E-02	2.175300E-01
8.1103005+03	1.000000F+00	0.000000F+00	2,651729E-01	9.441700F-05	3.500000F-02	2.216700E-01
1.041400F+04	1.000000F+00	2 000000F+00	2.665939E-01	9.763800F-05	3.500000F-02	2.216300F-01
1.337200F+04	1.000000F+00	6 . 868.68.0F + 20	2.691812E-01	9.971900F+05	3.500000F-02	2.226500E-01
1.7169005+04	1 0000005+00	0 0000000C+00	2 761618F+01	9.8693005-05	3 50000000-02	2.2823006-01
2.20/6005-04	1 000000000000000	00000000000000000000000000000000000000	2 8507635-01	9.5268005-05	3 50000000-02	2.3683000-01
2.4788005+04	1 000000000000	0 000000000000000000000000000000000000	2.810623F=01	1.0075005-04	3 50000000-02	2.314000F-04
	1, FOUDDUCTUD	5.0000000C+00	FIGTADECC-NT	1.00/2010.04	0.0000000000	CIOTTNACC_NT
	TOTALLE C.UU					

ENERGY(FV)	SPACING	GAMMA INELAS	GAMMA TOTAL	GAMMA N NOT	GAMMA GAMMA
6,450400E+01	1,000000E+00	0 0000005+00	3,29Ø467E#Ø1	7.180700E-05	3.500000E-02
8.290200E+01	1,000000E+00	0.000000E+00	3.270744E-01	8.175300E-05	3.50000000-02
1.156900F+02	1.000000E+00	0.000000F+00	2.826231E=Ø1	9.047200F-05	3.5000005-02
1.485500E+02	1.000000E+00	0.000000E+00	2.53938ØE=Ø1	1.048600E-04	3.500000F-02
1.907400E+02	1.000000E+00	0.000000E+00	3.023648E=01	1.038900E-04	3.500000E-02
2.449100E+02	1.000000E+00	0.000000E+00	4.173518E-Ø1	1.317500E-04	3.500000E+02
3.144700E+02	1.000000E+00	0.000000E+00	3.881135E=Ø1	9.606000E-05	3.5000000-02
4.037900E+02	1,000000E+00	0.000000E+00	4.102210E-01	8.862900E-05	3.500000E-02
5,1848005+02	1.000000E+00	0.000000E+00	5.515083E+01	1.145500E-04	3.500000E-02
6,6574ØØE+Ø2	1.00000gE+00	0.00000000+00	3.850007E=01	1.112600E-04	3.500000E-02
8.548200E+02	1.000000E+00	0.000000E+00	2.890238E=01	1.047900E-04	3.500000E-02
1.097600E+03	1.000000E+00	0.000000E+00	2.924628E-01	1.126700E-04	3.500000E-02
1.409300E+03	1.000000E+00	0,000000E+00	3,868799E-01	9.989000E-05	3,500000E-02
1,809600E+03	1,00000000+00	0,00000E+00	4.1015205-01	1.016000E-04	3.50000000-02
2.3236ØØE+Ø3	1,000000E+00	0.000000E+00	4.7585426-01	9.862700E-05	3.500000E+02
2,983600E+03	1.000000E+00	0.000000E+00	4.738892E=Ø1	9,902900E-05	3.500000E-02
3,831000E+03	1.000000E+00	0,000000E+00	4,663907E=01	1.072900E-04	3,500000E-02
4,919100E+03	1,000000E+00	0.000000E+00	4.7254Ø1E=01	9,966400E-05	3.500000E-02
6,316300E+03	1,000000E+00	0,00000000000	4,777229E=Ø1	9,641900E-05	3,500000E-02
8.110300E+03	1.000000E+00	0.00000E+00	4,868429E=01	9,441700E-05	3,500000E-02
1.0414005+04	1.000000F+00	0 000000 -00	4.882139F=01	9.763800F=05	3 5000005-02

GAMMA FISS 2.934700E-01

2.913300E-01 2.466500E-01

2.176600E-01 2.659300E-01 3.802900E-01

3.5141ØØE-Ø1 3.7344ØØE-Ø1

5.139000E-01 3.471300E-01 2.509600E-01

2.537300E-01 3.481300E-01 3.708300E-01

4.361000E-01 4.334800E-01 4.247500E-01 4.305500E-01

000 00 00 00 00 00 00 00 00 00 00 00 00	0.000000000000000000000000000000000000	44444444444444444444444444444444444444	
$\begin{array}{c} W W W W W W W W$	00000000000000000000000000000000000000	$\begin{array}{c} WWWWWWWWWW$	
0000000000000000000000000000000000000	VN N N N N N N N N N N N N N N N N N N	 NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN	
GAMMA TOTAL 3.6570004E-01 3.6570004E-01 3.65700106E-01 3.65700014E-01 4.65700014E-01 3.65700014E-01 4.65700046-01 5.700040E-01 5.700040E-01 6.70040E-01 5.700040E-01 5.700040E-01	00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Онинининининининининининининининининини	
6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	0 0	$\begin{array}{c} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 $	
S S S S S S S S S S S S S S S S S S S	S	 Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-state Non-	
ENERGY(EV) 6.4504000E+01 8.2502000E+01 1.4555900E+01 1.4855900E+02 1.48455000E+02 1.4447000E+02 3.1444700E+02 3.1444700E+02 3.1444700E+02 0.47500E+02 0.47500E+02 0.47500E+02	Г 5. 148 80 5. 557 4800 8. 557 4800 8. 557 4800 1. 997 800 1. 997 800 1. 997 8000 1. 997 8000 1. 997 800 1. 900 1. 100 1.	$\begin{array}{c} 0 \\ $	
GAMMA FISS 2.860000E-01 2.86000E-01 2.86000E-01 2.86000E-01	2.8668886 2.8668886 2.8668886 2.8668886 2.8668886 2.8668886 2.8668886 2.8668886 2.8668886 2.9868886 2.9868886 2.9868886 2.9868886 2.9868886 2.9868886 2.9868886 2.9868886 2.9868886 2.9868886 2.9868886 2.9918 2.991	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	44444444444444444444444444444444444444
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GAMMA CAMMA G. 500000000000 J. 5000000000000 J. 5000000000000000000000000000000000000	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	00000000000000000000000000000000000000	$\begin{array}{c} A A A A A A A A$
GAMAA N NOT 2.0000000000000 2.00000000000000000000	2. 6000000000000000000000000000000000000	2 2 2 2 2 2 2 2 2 2 2 2 2 2	0 N N N N N N N N N N N N N N N N N N N
GAMMA TOTAL 3.2100075401 3.2100105401 3.2100105401 3.2100175401 3.21002175401	2215 2215 2215 2215 2215 2215 2215 2215	ы а а а а а а а а а а а а а	С
GAMMA INELAS C. 802000E + 40 D. 202020E + 20 D. 20000E + 200E + 200E + 200E + 200E + 200E + 200E + 200E + 200E + 200E + 200		00000000000000000000000000000000000000	A 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
SPACING 1.000000555400 1.000000555400 1.000000555400 1.000000555400			00000000000000000000000000000000000000
ENERGY(EV) 6.450400E+01 8.290200E+01 1.156900E+01 1.456900E+02	4111 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	L 2.323688 2.9836888 3.49818888 5.321691888 5.321691888 5.321691888 5.32169188 5.32169188 5.32169388 5.32169388 5.32169388 5.32169388 5.32169388 5.32169388 5.32169388 5.3216938 5.32169	 Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction Marking Construction <

3.500000E-02 1.43000E-01 2.4788005+04 1.1200005+00 0.2000005+00 1.8071795m01 2.2400005-04

AVERAGE SCATTERING CROSS+SECTION

S = W A < C 1 - C 1 - C 1 - C 1 - C 1 - C 2 -
1,120400 1,130400 1,130400 1,120400 1,12040 1,1204000 1,12040000000000000000000000000000000000
1.1719576+01 1.1817366+01 1.1448096+01
1.141025E+81 1.128002E+01
1.1236796+01 1.1276806+01
1.113067E+21 1.102949E+81
1.093151E+01 1.086333E+01
1,076806E+01 1.063184E+01
1.8466475+81 1.8413265+81
1,213740E+01 1,205822F+24
1.2801406+01
1 - 2268905+81 0 - 5787305+83
5.519591E+00
5.157914E+00
4.972499E+00
5.886695F+88 4 717785F+88
2.9989755+38
2.576139E+00
2.034650E+00

FISSION CROSS-SECTION				
NEUTRON ENERGY(EV)	S-WAVE SIGMAFISS	P-WAVE SIGMAFISS	D-WAVE SIGMAFISS	TOTAL SIG
6.450400E+01	2.42125%E+Ø1	4.449103E-02	0,00000E+00	2,42
8,290200E+01	2,421285E+01	5,043514E-02	Ø,000000E+00	2,42
1.156900E+02	2.175032E+01	5,957274E-Ø2	0,00000E + 00	2,18
1,485500E+02	2,145637E+01	6,749699E-Ø2	0,00000E+00	2,15
1.907400E+02	1,965362E+Ø1	7,647193E-Ø2	0,0000000+00	1,97
2,44910ØE+02	2.356960E+01	8.663586E-Ø2	0,00000E+00	2,36
3,144700E+02	1.499316E+01	9.814573E-02	0,00000E+00	1,50
4,037900E+02	1.234818E+21	1.111765E=01	0,00000000+00	1,24
5.184800E+02	1.481730E+01	1.259246E-01	Ø,ØØØØØE+ØØ	1,49
6,657400E+02	1,171999E+01	1.426094E-01	0,0000000+00	1,18
8.548200E+02	9,004881E+00	1.614760E-01	Ø,000000E+00	9,16
1,097600E+03	8,484518E+ØØ	1.827964E-01	0,00000E+00	8,66
1.409300E+03	7,155726E+0Ø	2,068663E-01	Ø,ØØØØØE+ØØ	7,36
1.809600E+03	6,467422E+0Ø	2.340166E-01	0,00000E+00	6,70;
2.323670E+03	5,705139E+ØØ	2.645890E-01	Ø,000000E+00	5,96
2.983600E+03	5.013612E+00	2.98944ØE-Ø1	Ø,000000E+00	5,31
3,831000E+03	4.712044E+00	3.374391E-01	Ø,000000E+00	5,04
4,919100E+03	3,860386E+00	3.804160E-01	0,00000E+00	4,24
6.316300E+03	3,281264E+ØØ	4.281555E-01	Ø,000000E+00	3,70
8.110300E+03	2.824327E+ØØ	4.808212E-01	Ø,000000E+00	3,30
1.041400E+04	2,542653E+00	5,383927E+01	0,00000E+00	3,08
1.337200E+04	2,262384E+00	6.005414E-01	0,000000E+00	2.86
1.716900E+04	1.963987E+00	6,664918E-01	0,00000E+00	2.63
2.204600E+04	1.671071E+00	7.349421E-01	0.000000E+00	2.40
2,47880ØE+Ø4	1,634810E+00	7,673340E-01	0,00000E+00	2,40

AVERAGE FI

2.983600E+03	1,774552E+00	1.502853E-01	0,00000000+00	1.924
3.831000E+03	1.656170E+00	1.6934562-01	0.000000E+00	1.82
4.919100E+03	1.338019E+00	1.904431E-01	0,000000E+00	1,520
6.316300E+03	1.118628E+00	2.135899E-01	0,00000000000	1.33
8.110300E+03	9.401374E-01	2.386737E-01	0.000000E+00	1.170
1.041400E+04	8.303611E-01	2.654006E-01	0,000000E+00	1.09
1.3372005+04	7.2283425-01	2.932136E-Ø1	0,000000E+00	1.01
1.7169005+04	6. 079728E-01	3.2122036-01	0.00000E+00	9.29
2.204600F+04	4.986953F-01	3.4817956-01	0.0000000 + 00	8.46
2.473800E+04	4,873076E-01	3.600111E-01	0,0000000+00	8,47

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