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ELMOE: AN IBM-704 PROGRAM TREATING ELASTIC SCATTERING RESONANCES IN FAST REACTORS

by

A. L. Rago and H. H. Hummel

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ABSTRACT

A description of the operations carried out by the ELMOE code is given. This code carries out MUFT-type calculations for dealing with the elastic scattering resonances of the light elements present in fast reactors. Sources of information for the cross-section library in current use with the program, input specification, and operating instructions are also given.

I. INTRODUCTION

Elastic scattering resonances in the light elements present in fast power reactors have always been troublesome since they cause rapid fluctuations in the scattering cross sections of these materials, whereas variations of cross sections of fissile and fertile materials in the fast region are comparatively slow. The change in the neutron leakage and flux caused by adding or removing the light materials is difficult to calculate exactly, because the elastic moderation introduced by these materials causes perturbation of the neutron energy spectrum in the vicinity of the resonances.

In order to deal more effectively with problems of this type, an IBM-704 code, ELMOE, has been prepared. This code calculates the Fourier transform of the neutron flux for a mixture of moderators heavier than hydrogen, with the moderator-scattering law rigorously taken into account. Approximations available in the flux calculations are the usual P-1 and "consistent" P-1 and B-1 [1-3]. This code thus performs approximately the same calculation for moderators heavier than hydrogen as that which the MUFT codes [4] carry out for hydrogen. Although designed specifically for fast-reactor calculations, it can also be applied to thermal and intermediate reactors. No special provisions have yet been incorporated for dealing with capture resonances, however. Applications of the program have been previously reported [5-7].

A feature of the code is that certain parameters which are slowly varying need be specified only for "coarse" groups which are much wider in energy than the "fine" groups used to take detailed account of elastic moderation. This greatly reduces the amount of input data required.

The coarse groups are those ordinarily used in fast-reactor calculations with a total of 10 to 20 groups spanning the fast region. A fine-group structure is superimposed over all or a part of the usual groups. Associated with each of the fine groups is a set of Legendre polynomial expansion coefficients of the scattering cross section of each element. The original intention was that the fine-group network be fine enough to trace out the detailed variation of each scattering cross section. This has proved practicable except for the high-resolution data of Hibdon [8-10] for scattering from sodium, which are being specially handled as described later. From the Legendre polynomial expansion coefficients, elastic-transfer, transport, and elastic-removal cross sections for the light elements are calculated for each fine group. Fission, capture, and inelastic-removal cross sections are normally kept constant for the fine groups corresponding to a given coarse group. Variable capture cross sections for the fine groups may be supplied if desired. Inelastic transfers entering the fine groups are distributed in proportion to the fine-group energy widths. The fission source has an energy dependence of the form $\sqrt{E}\, e^{-E/T}$ within the coarse groups. A variable fission source for the fine groups may be supplied if desired. No provision is made for inelastic transfers within coarse groups.

The fine groups all have the same lethargy width. Meshing of the coarse and fine groups is accomplished by a slight redefinition of the coarse-group energy limits. Although the fine-group lethargy width is arbitrary, in practice the labor involved in changing it except by integral multiples is such that only one width (and in some cases twice this width) has so far been used.

At least one coarse group at the top and bottom of the energy range must be handled in the usual way, i.e., not subdivided. Otherwise the fine-group region may cover any desired part of the energy spectrum. The groups not subdivided are calculated according to the usual equations for the Fourier transform.

II. CALCULATION OF CROSS SECTIONS

1. Elastic-scattering Cross Sections

It is assumed in the calculation that data on the angular dependence of the elastic-scattering cross sections in the center-of-mass system are presented in the form

$$\sigma_{sc}(\omega') = \sum_{\ell} B_{\ell} P_{\ell}(\mu'), \tag{II-1}$$

where

$\sigma_{sc}(\omega')$ = cross-section scattering into the solid angle element $d\omega'$,

μ' = cosine of the scattering angle in the center-of-mass system,

P_{ℓ} = ℓ^{th} Legendre polynomial.

Data in the laboratory system are converted to the center-of-mass system. In the laboratory system the fractional energy change per collision is related to μ' by [1].

$$\frac{E}{E_0} = \frac{1}{(1+A)^2} (A^2 + 1 + 2A\mu'),$$

or

$$\mu' = 1 - \frac{2}{\alpha}\left(1 - \frac{E}{E_0}\right), \tag{II-2}$$

where

$\alpha = 4A/(A+1)^2$,

A = moderator mass number,

E_0 = initial energy of the neutron.

Integrating the scattering cross section over azimuth angle, one obtains

$$2\pi\, \sigma_{sc}(\omega')\, d\mu' = \sigma_{sc}(E_0 \rightarrow E)\, dE. \tag{II-3}$$

Upon differentiating Eq. (II-2) and substituting this in Eq. (II-3) we obtain

$$\sigma_{sc}(E_0 \to E)\, dE = \frac{4\pi}{E_0 \alpha}\, dE \sum_{\ell} B_\ell P_\ell(\mu'). \tag{II-4}$$

Let

$$x = \frac{1}{\alpha}\left(1 - \frac{E}{E_0}\right).$$

Then, combining Eqs. (II-2) and (II-4), one may evaluate the Legendre polynomials in terms of:

$$P_1(\mu') = \mu' = 1 - 2x;$$

$$P_2(\mu') = \frac{1}{2}(3\mu'^2 - 1) = 1 - 6x + 6x^2;$$

$$P_3(\mu') = \frac{1}{2}(5\mu'^3 - 3\mu') = 1 - 12x + 30x^2 - 20x^3;$$

$$P_4(\mu') = \frac{1}{8}(35\mu'^4 - 30\mu'^2 + 3) = 1 - 20x + 90x^2 - 140x^3 + 70x^4.$$

Therefore, x varies from 0 to 1 as E varies from E_0, the initial energy, to $E = (1 - \alpha) E_0$, the minimum possible final energy. This range is divided into n intervals chosen so that the ratio r of lower to upper energy for the interval is the same for each interval, i.e.,

$$r = E_j / (E_{j-1}).$$

Therefore

$$x_0 = 0;$$

$$x_1 = \frac{1}{\alpha}(1 - r);$$

$$x_2 = \frac{1}{\alpha}(1 - r^2);$$

$$\vdots$$

$$x_n = \frac{1}{\alpha}(1 - r^n) = 1;$$

$$r = (1 - \alpha)^{1/n}.$$

If one now integrates Eq. (II-4) over the final energy interval $(E_\ell, E_{\ell-1})$ corresponding to the x-interval $(x_{\ell-1}, x_\ell)$,

$$\int_{E_\ell}^{E_{\ell-1}} \sigma_{sc}(E_0 \to E)\, dE = -4\pi \int_{x_{\ell-1}}^{x_\ell} dx \left[\sum_{\ell=0}^{4} B_\ell P_\ell(\mu') \right]. \qquad \text{(II-5)}$$

Collecting terms x_ℓ^{i+1} and denoting the coefficients as A_i,

$$\sigma_{eltr}^{E_0 \to \ell} = 4\pi \left[A_0^0 (x_\ell - x_{\ell-1}) + A_1^0 \frac{(x_\ell^2 - x_{\ell-1}^2)}{2} + A_2^0 \frac{(x_\ell^3 - x_{\ell-1}^3)}{3} + A_3^0 \frac{(x_\ell^4 - x_{\ell-1}^4)}{4} + A_4^0 \frac{(x_\ell^5 - x_{\ell-1}^5)}{5} \right], \qquad \text{(II-6)}$$

where

$\sigma_{eltr}^{E_0 \to \ell}$ = microscopic elastic-scattering cross section from energy E_0 to Group ℓ;

B_ℓ^0 = coefficients of the Legendre polynomial expansion at energy E_0;

$A_0^0 = B_0^0 + B_1^0 + B_2^0 + B_4^0$;

$A_1^0 = 2B_1^0 - 6B_2^0 - 12B_3^0 - 20B_4^0$;

$A_2^0 = 6B_2^0 + 30B_3^0 + 90B_4^0$;

$A_3^0 = -20B_3^0 - 140B_4^0$;

$A_4^0 = 70B_4^0$.

If one now lets E_0 range over E_j, $j = 0, \ldots, J$, the entire range under consideration, and ℓ range over the interval $k = 1, \ldots, J$, where

$$k = j + \ell,$$

and

E_j = lower energy limit of Group j,

then, for the general case,

$$\sigma_{eltr}^{E_j \to k} = 4\pi \left[A_0^j (x_{k-j} - x_{k-j-1}) + A_1^j \frac{(x_{k-j}^2 - x_{k-j-1}^2)}{2} + A_2^j \frac{(x_{k-j}^3 - x_{k-j-1}^3)}{3} + A_3^j \frac{(x_{k-j}^4 - x_{k-j-1}^4)}{4} + A_4^j \frac{(x_{k-j}^5 - x_{k-j-1}^5)}{5} \right].$$

The elastic-scattering cross section from Group j to Group k is calculated from

$$\sigma_{eltr}^{j\to k} = \frac{\sigma^{E_{j\to k}} + \sigma^{E_{j-\ell\to k}}}{2}.$$

2. Elastic-removal Cross Sections

The elastic-removal cross section from energy E_j to below E_{j+1} may be represented as

$$\sigma_{elr}^{E_j, E_{j+1}} = \sum_{k=j+2}^{j+n} \sigma_{eltr}^{E_j\to k}.$$

Substituting from Eq. II-6 we get

$$\sigma_{elr}^{E_j, E_{j+1}} = 4\pi\left[A_0^j(1 - x_1) + A_1^j \frac{(1 - x_1^2)}{2} + A_2^j \frac{(1 - x_1^3)}{3} + A_3^j \frac{(1 - x_1^4)}{4} + A_4^j \frac{(1 - x_1^5)}{5}\right]. \tag{II-7}$$

The elastic-removal cross section from Group j is calculated as

$$\sigma_{elr}^{j} = \frac{1}{2}\left(\sigma_{elr}^{E_{j-1}E_j} + 4\pi B_0^j\right).$$

3. Transport Cross Sections

The transport cross section is given by

$$3\sigma_{tr}^{E_j} = 3\sigma_{sc}^{E_j}(1 - \overline{\mu}) + 3\sigma_a, \tag{II-8}$$

where

μ = average scattering angle cosine in laboratory system,

σ_a = total removal cross section due to processes other than elastic scattering.

$$\sigma_{sc}^{E_j} = 4\pi B_0^j.$$

From Eq. (II-8),

$$3\sigma_{tr}^{E_j} = 12\pi B_0^j \left(1 - \frac{2}{3A} - u_{1,1}^{-1} \frac{B_1^j}{3B_0^j} - u_{1,2}^{-1} \frac{B_2^j}{3B_0^j} - u_{1,3}^{-1} \frac{B_3^j}{3B_0^j} - u_{1,4}^{-1} \frac{B_4^j}{3B_0^j}\right) + 3\sigma_a,$$

or

$$3\sigma_{tr}^{E_j} = 4\pi \left(3B_0^j - \frac{2B_0^j}{A} - u_{1,1}^{-1} B_1^j - u_{1,2}^{-1} B_2^j - u_{1,3}^{-1} B_3^j - u_{1,4}^{-1} B_4^j\right) + 3\sigma_a,$$

where $u_{1,1}^{-1}$, $u_{1,2}^{-1}$, $u_{1,3}^{-1}$ and $u_{1,4}^{-1}$ are elements of the transformation matrix U^{-1} [11] transforming the B_ℓ from the center-of-mass system to the laboratory system. As above, the cross section at Group j is calculated by

$$3\sigma_{tr}^{j} = \frac{3\sigma_{tr}^{E_j} + 3\sigma_{tr}^{E_{j-1}}}{2} + 3\sigma_a.$$

III. FLUX APPROXIMATIONS

There are four flux approximations available as options in ELMOE. The equations are given below.

1. P-1 Approximation

For the P-1 approximation, the equation for the flux in the kth group is

$$\phi_k^i = \frac{\beta_k + \psi_k}{\frac{B_i^2}{3\Sigma_{tr}^k} + \Sigma_a^k + \Sigma_{elr}^k}, \qquad \text{(III-1)}$$

where

ϕ_k^i = i^{th} iterate of the flux group k;

β_k = fraction of fission source in group k (assumed same for all isotopes);

$\psi_k = \sum_{j=1}^{k-1} (\Sigma_{eltr}^{j\to k} + \Sigma_{intr}^{j\to k})\phi_j^i$ = scattering source from higher energies;

$\Sigma_{eltr}^{j\to k}$ = elastic-scattering transfer cross section, group j to group k;

$\Sigma_{intr}^{j\to k}$ = inelastic-scattering transfer cross section, group j to group k;

Σ_a^k = absorption (total non-elastic removal) cross section for group k;

Σ_{elr}^k = elastic-removal cross section for group k;

Σ_{tr}^k = transport cross section for group k;

B_i^2 = the ith iterate of the buckling.

This equation is calculated by iteration until convergence on B^2, which is decided by

$$\left| \sum_{k=1}^{N} \nu_k \Sigma_k^f \phi_k^i - 1 \right| \leq \epsilon, \qquad \text{(III-2)}$$

where

$\nu_k \Sigma_k^f$ = neutrons per fission times fission cross section for group k, and

ϵ = convergence criterion for iterative s

In the further discussion, the superscript "i" is dropped as a convergence is assumed.

2. B-1 Approximation

If one now replaces Σ_{tr}^k in Eq. (III-1) by $\gamma_k \Sigma_{tr}^k$, where γ_k is defined as

$$\gamma_k = \frac{\alpha_k \tan^{-1} \alpha_k}{3\left(1 - \frac{\tan^{-1} \alpha_k}{\alpha_k}\right)}; \qquad \alpha_k = \frac{B}{\Sigma_{tr}^k},$$

one obtains the B-1 approximation [2]. Under this transformation, Eq. (III-1) becomes

$$\phi_k = \frac{\beta_k + \psi_k}{\frac{B^2}{3\gamma_k \Sigma_{tr}^k} + \Sigma_a^k + \Sigma_{elr}^k},$$

and the iterative procedure used in the P-1 approximation is used for solution.

3. "Consistent" P-1 Approximation

In the ordinary P-1 approximation, the angular distribution of the slowing-down source is not properly taken into account. The equations correctly taking it into account in the P-1 approximation are given in [1] as Eqs. (11.31a) and (11.31b). For simplicity, these are given here with spatial variation in the Z direction only assumed.

$$\frac{1}{4\pi}\frac{\partial J(E,Z)}{\partial Z} = \int_0^\infty \phi(E',Z) S_0(E' \to E) dE' - \frac{\Sigma_{tot}(E)\phi(E,Z)}{4\pi} + S_{00}(E,Z), \tag{III-3}$$

$$\frac{1}{4\pi}\frac{\partial \phi(E,Z)}{\partial Z} = \int_0^\infty J(E',Z) S_1(E' \to E) dE' - \frac{3\Sigma_{tot}(E) J(E,Z)}{4\pi}, \tag{III-4}$$

$J(E,Z)$ = current,

$\phi(E,Z)$ = flux,

$4\pi S_{00}(E,Z)$ = inelastic-scattering plus fission sources (assumed isotropic).

For the Fourier transform one can set

$$J(E,Z) = -iJ(E)e^{iBZ}, \tag{III-5a}$$

$$\phi(E, Z) = \Phi(E)e^{iBZ}, \tag{III-5b}$$

and

$$S_{00}(E, Z) = S_{00}(E)e^{iBZ}. \tag{III-5c}$$

In multigroup notation, with E' and E corresponding to groups j and k, respectively,

$$S_0(E' \to E) \to S_0^{j\to k} = \frac{1}{4\pi}\Sigma_{eltr}^{j\to k}$$

and

$$S_1(E' \to E) \to S_1^{j\to k} = \frac{1}{4\pi}\frac{3}{2}\left(\frac{E_k}{E_j}\right)^{1/2}\left[(A+1) - \frac{(A-1)}{E_k/E_j}\right]\Sigma_{eltr}^{j\to k}.$$

E_j and E_k may be taken as the lower group limits:

$$J(E) \to J_k,$$

$$\phi(E) \to \phi_k.$$

Writing Eq. (III-3) in multigroup form with the use of Eq. (III-5),

$$BJ_k = \sum_{j=k-n}^{k-1} \phi_j\left[\Sigma_{eltr}^{j\to k} + \Sigma_{intr}^{j\to k}\right] - (\Sigma_a^k + \Sigma_{elr}^k)\phi_k + \beta_k. \tag{III-6}$$

Equation (III-4) can be similarly rewritten as

$$\frac{J_k}{B} = \frac{\phi_k}{3\Sigma_{tot}^k} + \frac{1}{3\Sigma_{tot}^k}\sum_{j=k-n}^{k-1}\frac{J_j}{B}\frac{3}{2}\left(\frac{E_k}{E_j}\right)^{1/2}\left[(A+1) - \frac{(A-1)}{E_k/E_j}\right]\Sigma_{eltr}^{j\to k}, \tag{III-7}$$

and we define

$$\Sigma_{tot}^k = \Sigma_{tr}^k + \bar{\mu}_k\,\Sigma_{elr}^k.$$

Solving Eqs. (III-6) and (III-7) for the flux, one obtains

$$\phi_k = \frac{\beta_k + \sum_{j=k-n}^{k-1}\phi_j[\Sigma_{eltr}^{j\to k} + \Sigma_{intr}^{j\to k}] - \frac{1}{3\Sigma_{tot}^k}\sum_{j=k-n}^{k-1}\frac{3}{2}\left(\frac{E_k}{E_j}\right)^{1/2} BJ_j\left[(A+1) - (A-1)E_k/E_j\right]\Sigma_{eltr}^{j\to k}}{\frac{B^2}{3\Sigma_{tot}^k} + \Sigma_a^k + \Sigma_{elr}^k} \tag{III-8}$$

Equations (III-7) and (III-8) are a coupled set which are solved iteratively to obtain the group fluxes and currents, and the eigenvalue B^2.

4. "Consistent" B-1 Approximation[2, 3]

If one substitutes $\gamma_k \Sigma^k_{tot}$ for Σ^k_{tot}, where γ_k is defined as

$$\gamma_k = \frac{\alpha_k \tan^{-1}\alpha_k}{3\left(1 - \frac{\tan^{-1}\alpha_k}{\alpha_k}\right)}; \qquad \alpha_k = \frac{B}{\Sigma^k_{tot}}, \tag{III-9}$$

one obtains the "consistent" B-1 approximation, in which a rigorous solution for the Fourier transform is obtained except that only a P-1 expansion of the scattering cross sections in the laboratory system is used. For this case, Eqs. (III-7) and (III-8) are transformed to

$$\frac{J_k}{B} = \frac{\phi_k}{3\gamma_k \Sigma^k_{tot}} + \frac{1}{3\gamma_k \Sigma^k_{tot}} \sum_{j=k-n}^{k-1} \frac{J_j}{B} \frac{3}{2}\left(\frac{E_k}{E_j}\right)^{1/2} \left[(A+1) - (A-1)(E_k/E_j)\right] \Sigma^{j\to k}_{eltr} \tag{III-10}$$

and

$$\phi_k = \frac{\beta_k + \sum_{j=k-n}^{k-1} \phi_j \left[\Sigma^{j\to k}_{eltr} + \Sigma^{j\to k}_{intr}\right] - \frac{1}{3\gamma_k \Sigma^k_{tot}} \sum_{j=k-n}^{k-1} \frac{3}{2}\left(\frac{E_k}{E_j}\right)^{1/2} BJ_j \left[(A+1) - (A-1)(E_k/E_j)\right] \Sigma^{j\to k}_{eltr}}{\frac{B^2}{3\gamma_k \Sigma^k_{tot}} + \Sigma^k_a + \Sigma^k_{elr}} \tag{III-11}$$

Again, the solution involves coupling Eqs. (III-10) and (III-11), with iteration on B^2.

For each of these approximations when the convergence criterion is satisfied, the code calculates a flux-weighted average of the fine-group cross sections to get an average homogenized coarse-group cross-section set. The coarse-group transport cross section is averaged for each of the options as follows:

P-1

$$\overline{3\Sigma_{tr}} = \frac{\sum \phi/3\Sigma_{tr}}{\sum \phi},$$

B-1 and Consistent B-1

$$\overline{D} = \frac{\sum J/B}{\sum \phi},$$

$$\overline{3\Sigma}_{tr} = \frac{3B}{\tan \frac{\bar{D}B}{(1+\bar{D})}},$$

Consistent P-1

$$\bar{D} = \frac{1}{\overline{3\Sigma}_{tr}} = \frac{\sum J/B}{\sum \phi}.$$

These averaged cross sections are then used to do a normal fundamental mode calculation, using diffusion theory for the P-1 and Consistent P-1 cases, and the asymptotic solution to the transport equation for the B-1 and Consistent B-1 cases.

IV. TREATMENT OF NARROW RESONANCES

The ratio of final to initial fine-group energies thus far being used is 0.991 33, so that at 100 keV the group width is 0.87 keV and at 200 keV 1.74. Since many of the resonances in sodium reported by Hibdon [8] in this energy region have widths less than 1 keV, this group spacing cannot be used to describe such resonance shapes. The method of dealing with these very narrow resonances is as follows. First, a problem is run with the low-resolution data for sodium given in [12], which can be adequately traced out with the group spacing being used. The usual assumption of the narrow-resonance approximation is made: that over one of the fine groups the total source is constant and equal to that calculated with the low-resolution data. For the P-1 approximation the actual magnitude of the source for each group need not be known. In this case the assumption is made that the source S equals $\phi(E)\,\Sigma_{tot}(E)$ within the fine group. An average transport cross section for fine groups is obtained from

$$\frac{1}{\Sigma_{tr}^{j}} = \frac{\displaystyle\int_{E_{j-1}}^{E_j} \frac{dE}{\Sigma_{tot}(E)\,\Sigma_{tr}(E)}}{\displaystyle\int_{E_{j-1}}^{E_j} \frac{dE}{\Sigma_{tot}(E)}} .$$

$\Sigma_{tot}(E)$ and $\Sigma_{tr}(E)$ are obtained from the detailed sodium data, with the contributions of material other than sodium being held at the values for the original ELMOE claculation. Finally, the values of $1/\Sigma_{tr}^{j}$ are weighted with the fluxes from the ELMOE calculation to obtain a revised coarse-group value.

To obtain a corrected scattering cross section for elastic-removal calculation, the following integral is computed:

$$\sigma_{sNa}(j) = \frac{\displaystyle\int_{E_{j-1}}^{E_j} \frac{\sigma_{sNa}(E)dE}{\Sigma_{tot}(E)}}{\displaystyle\int_{E_{j-1}}^{E_j} \frac{dE}{\Sigma_{tot}(E)}}$$

These values of $\sigma_{sNa}(j)$ are used in conjunction with the original ELMOE fluxes to obtain a corrected elastic-removal cross section for sodium. A library tape containing $\sigma_{sNa}(E)$ is available for this calculation.

V. LIBRARY TAPE

As mentioned above, the elastic-scattering-matrix calculation uses the coefficients B_L in the expression

$$\sigma(\theta_c) = \sum_L B_L P_L(\cos \theta_c),$$

where $\sigma(\theta_c)$ is the differential scattering cross section per unit solid angle in the center-of-mass system. The coefficients B_L are supplied to the program by means of a library tape. The first file of the library tape contains the multigroup cross-section sets. The coefficients B_L comprise the second file. The multigroup cross-section sets are described below (Section VI).

The coefficients may be supplied in either laboratory or center-of-mass system, and the ratio of the coefficient to the L = 0 coefficient may be supplied if desired. All coefficients are converted to be stored in the center-of-mass system on the library tape.

The library currently contains coefficients for the following isotopes: carbon, oxygen, sodium, sodium-1, sodium-2, aluminum, vanadium, chromium, iron, Type 304 stainless steel, Hastelloy, nickel and niobium.

Sodium-1 coefficients were obtained by doing an ELMOE calculation for a typical metal core and then using the narrow-resonance option from 66 keV to 830 keV, and using the re-averaged total scattering cross section for sodium output from this procedure as the basis for new values of B_0 for sodium-1 in this range. The higher B_L in this range were kept at the same ratio as for sodium. Sodium-2 coefficients were obtained in the same manner except that the ELMOE calculation was for an oxide core. Type 304 stainless steel coefficients are simply linear combinations of those for iron, chromium, and nickel with volume fractions by weight of 0.72, 0.19, and 0.09 respectively. Hastelloy coefficients were constructed in a similar manner, with the composition assumed to be 0.22 iron, 0.24 chromium, and 0.54 nickel, molybdenum being neglected. Total cross-section data were taken [12] and [13]. Total cross sections of sodium for the detailed treatment by the narrow-resonance approximation (Section IV) were taken from [8-10]. Since high-resolution angular-distribution data are available for only a few isolated resonances, the procedure followed was to derive the coefficient of the isotropic term from total cross-section data and to take the ratio of coefficients corresponding to higher values of L to the L = 0 coefficient from the angular-distribution data. Sources of angular-distribution and inelastic-scattering data were as follows:

Sodium

In the energy range 200-800 keV the data of [14] were used. Outside this range up to 1400 keV, [15] was used. Above 1400 keV, ω_1 was based on $\overline{\mu} = \omega_1/3\omega_0$ given in Fig. 22 of [16], where the ω's are defined by

$$\sigma_s(\theta) = \frac{\sigma_s}{4\pi} \sum_L \omega_L P_L(\cos\theta),$$

in which

θ = scattering angle in the laboratory system,

σ_s = total scattering cross section.

The quantities ω_2 and ω_3 were obtained by linear extrapolation to 1.49 and 0.61, respectively, at 3.7 MeV. This was based on data in [17] for sulphur. Total scattering cross sections were obtained by subtracting the inelastic-scattering cross sections of [18] from the total cross-section data.

Aluminum

The same procedure was followed in this case as for sodium, except that the only angular-distribution data available below 1400 keV were, and are, those of [15]. Inelastic-scattering cross sections were taken from [19].

Iron, Nickel, Chromium

The data of [15] were used up to 1800 keV for ω_1, ω_2, ω_3, and ω_4. ω_1 to 3.7 MeV was obtained from $\overline{\mu}$ in [16]. ω_2, ω_3, and ω_4 were obtained by linear extrapolation to 2.02, 1.77, and 1.10, respectively, at 3.7 MeV, this point being based on the data in [17]. Inelastic-scattering cross sections were those of [19].

Carbon

In the energy range from 0 to 2.2 MeV the data of [20] were used, whereas in the range from 2.2 to 3.7 MeV the data of [21] were employed.

Oxygen

In the energy range from 0 to 1.7 MeV the data of [20] were used, where above this to 3.7 MeV the data in [22] were used.

Niobium and Vanadium

In the range from 0 to 1.35 MeV the data of [15] were used. Above 1.35 MeV, ω_1 was based on $\overline{\mu}$ given in [16]. Coefficients for higher values of L have not yet been supplied above 1.35 MeV.

The available library of coefficients clearly leaves much to be desired. The energy resolution of the cross-section data, particularly of the angular-distribution data, is in general not nearly as good as one would like to have. The necessity of using angular-distribution data of resolution differing widely from the total cross-section data is not very satisfactory. In some cases, the total cross section obtained in the angular-distribution measurements is clearly inconsistent with the other total cross-section data from transmission measurements, even taking into account the difference of resolution. A better estimate of high-energy angular distribution than that made here could undoubtedly be obtained by means of the optical model of the nucleus. Since the library was prepared in 1960, it does not include data available later than that except for those of [9] and [10].

A library tape containing more detailed data for sodium due to Hibdon [8-10] is utilized by the narrow sodium-resonance routine. Energy vs. total scattering cross section for sodium are given for the range from 60 to 832 keV in increments of 0.1 and 0.2 keV.

VI. INPUT

The coarse-group cross sections are taken from one of a library of such sets available. These may be either in the form used in the REX code [23] or in that of the SNG code [24]. Elastic-removal cross sections for the light elements used in these sets must be supplied, as they are subtracted out. The Legendre polynomial expansion coefficients for the light elements may be supplied either in the center-of-mass or the laboratory system. The library of such coefficients currently available includes the following elements: Fe, Ni, Cr, Nb, V, Al, Na, Na-1, Na-2, C, O, stainless steel, and Hastelloy.

The number of fine groups that can be used is limited by the 32K-core storage. If more groups than this limit are desired, the problem is run in more than one pass, subdividing different energy regions with an overlap of at least one or two coarse groups to produce a proper elastic moderation source at the upper end of the subdivided region. The number of fine groups that can be used is a function of the maximum size of the elastic scattering matrix. The Legendre coefficient library currently in use corresponds to elastic-scattering matrices of order 20, 29, and 39 for sodium, oxygen, and carbon, respectively. When sodium, oxygen, or carbon is the lightest element present, the maximum number of fine groups that can be used in the ordinary P-1 calculation is 880, 682, and 535, respectively. With the consistent calculations, the corresponding values are 535, 393, and 303.

Materials in a problem that require Legendre coefficients for cross-section evaluation are referred to as "light" elements. Those that do not are referred to as "heavy." A feature of ELMOE allows problems to be done in "sets." A "set" is defined as a group of problems that differ only in composition (value of volume fraction). For the set only one calculation of the elastic-scattering matrix is executed, effecting a considerable time saving.

Description of the Input

ELMOE Calculation

Card Set No.	FORTRAN Symbol	Format	Definition
1	IDB	(13I4,E12.5)	Identification of Legendre coefficient set required from Library Tape.
	IDX		Identification of macroscopic cross section set required from Library Tape.

Card Set No.	FORTRAN Symbol	Format	Definition
	MEND		Number of heavy elements, ≤ 19.
	MTOT		Number of light elements, 1≤ MTOT ≤ 20, MTOT + MEND ≤ 20.
	JEND		Number of fine groups. For limit see NW1.
	MH		Order of Legendre expansion used for differential scattering cross section, ≤ 5.
	KM2		If Δ is lethargy increment of Legendre library, problem lethargy increment is (KM2)Δ.
	KMIN		Initial coarse group subdivided.
	KEND		Final coarse group subdivided.
	IT = 1		
	KT = 1		
	ITH = 1		
	NW1		Determines maximum size of scattering matrix (JEND x N) (See Card Set No. 5) NW1 = 1 IOPT = 1,2 (880 x 20) NW1 = 2 IOPT = 1,2 (682 x 29) NW1 = 3 IOPT = 1,2 (545 x 39) NW1 = 4 IOPT = 3,4 (535 x 20) NW1 = 5 IOPT = 3,4 (393 x 29) NW1 = 6 IOPT = 3,4 (303 x 39)
	EO		Energy in keV of the top of group KMIN.
2		(18I4)	
	KRSEC(1),KRSEC(2),..., KRSEC(MEND + MTOT)		Indicates position in cross-section set of materials used in problem.
3		(18I4)	
	KRSET(1),KBSET(2),..., KBSET(MTOT)		Indicates position in Legendre coefficient set of materials used in problem.
4		(12A6)	
	ID		Problem identification. Column 1 blank, 2-72, alphanumeric characters.

Card Set No.	FORTRAN Symbol	Format	Definition
5		(18I4)	
	IOPT		Flux approximation.
			IOPT = 1 P-1. IOPT = 2 B-1. IOPT = 3 "Consistent" P-1. IOPT = 4 "Consistent" B-1.
			Output options.
	IA		IA = 1 Normal.
			IA = 2 Fine-group elastic-removal cross section printed out for each light material.
			IA = 3 Fine-group elastic-scattering matrix and elastic-removal cross section printed out for each light material.
	IC		IC = 1 Fine-group output omitted. IC = 2 Fine-group output printed.
			Input options.
	ID		ID = 1 Fine-group capture cross section not supplied as input.
			ID = 2 Fine-group capture cross section supplied as input.
	IE		IE = 1 Fine fission source not supplied as input.
			IE = 2 Fine fission source supplied as input.
	IF		Preliminary sodium NR treatment option.
			IF = 1 Normal.
			IF = 2 Preliminary problems for sodium narrow-resonance treatment.
	NM		Position in problem of sodium.
	N		Maximum energy loss per collision of sodium (in groups).
	NTIMES		Number of problems in set.

Card Set No.	FORTRAN Symbol	Format	Definition
6		(18I4)	
	NUM(KMIN), ..., NUM(KEND)		Number of fine groups in standard groups subdivided.
7		(6E12.5)	
	A(1),AC(1), $U_{11}^{-1}(1)$,$U_{12}^{-1}(1)$, $U_{13}^{-1}(1)$,$U_{14}^{-1}(1)$, . . . ,		Atomic weight, atoms/cc, transformation vector [11] from CMS to LAB system for material 1.
	A(MTOT), AC(MTOT), $U_{11}^{-1}(MTOT)$, $U_{12}^{-1}(MTOT)$, $U_{13}^{-1}(MTOT)$, $U_{14}^{-1}(MTOT)$		Atomic weight, atoms/cc, transformation vector from CMS to LAB system for last light material.
	A(MTOT+1), AC(MTOT+1) . . . , A(MTOT+MEND), AC(MTOT+MEND)		Atomic weight and atoms/cc for first heavy material. Atomic weight and atoms/cc for last heavy material.
8		(6E12.5)	
	EPS,BBO,V(1), ..., V(MTOT+MEND)		Convergence criteria, initial buckling guess, volume fractions for material 1 through MTOT+MEND.
9	If IE = 2 KU,KL,β(KU), ..., β(KL)	(2I4/(6E12.5))	Fine-group limits of specification, followed by the fission source for these fine groups.
10	If ID = 2	(I4)	
	LL		Number of batches of cross-section input.
		(4I4/(6E12.5))	
	M^1,K^1,KU^1,KL^1, σ_c^1(KU), ..., σ_c^1(KL)		Material number (position in problem), coarse group, fine-group limits within coarse group, and capture cross sections for batch 1.

Card Set No.	FORTRAN Symbol	Format	Definition
10		(4I4/(6E12.5))	
	$M^{LL}, K^{LL}, KU^{LL}, KL^{LL}, \sigma_c^{LL}(KU), \ldots, \sigma_c^{LL}(KL)$		Material number, coarse group, fine-group limits within coarse group, and capture cross sections for batch LL.
11	If NTIMES > 1		Repeat card set numbers 4 and 8-10 for each problem in set.

Note: If attempting to iterate on the buckling with a non-multiplying medium, a negative input buckling guess must be given.

Treatment for Sodium Narrow Resonances

Card Set No.	FORTRAN Symbol	Format	Definition
1	blank card		Sentinel to tape-monitor routine.
2	ID	(72X)	Title card. Column 1 blank.
3		(3I4)	
	KMIN		First-group narrow-resonance treatment is performed.
	KEND		Last-group narrow-resonance treatment is performed.
	KD		Output option.
			KD = 1 Fine-group-averaged total scattering and transport cross section printed out.
			KD = 2 Fine-group-averaged total scattering and transport cross section not printed out.

Note: Problems run on the sodium narrow-resonance routine may be run only one at a time, i.e., not more than one to a set.

To Add Cross-section Sets to Library Tape

Card Set No.	FORTRAN Symbol	Format	Definition
1		(2I4)	
	IDB		=0
	IDX		non-zero
2		(I1,6I5)	
	KNUM		=0 Add to existing tape. =1 Start new tape.
	IDNUM		Cross-section set identification.
	ME		Number of materials in cross-section set, ≤ 20.
	KAN		Number of inelastic-scattering groups, ≤ 23.
	KMAX		Number of energy groups, ≤ 24.
	IRS		Cross-section format option =1 REX cross-section format. =2 SN cross-section format.
	KSET		Number of cross-section sets being added to tape at this time.
3	Cross-section deck		

The SN cross-section cards contain eight words per card with a blank column between words. Column one always contains a nine punch and the sign of the number is placed over the "one-tenth's" digit, thereby designating the position of the decimal point. The cross sections are written in the following order:

Col. 1	9 punch
Col. 2-9	$\nu\sigma_{f,j}$
Col. 11-18	$\sigma_{tr,j}$
Col. 20-27	$\sigma_{tr,j} - \sigma_{a,j}$
Col. 29-36	$\sigma_{in}(j-1 \rightarrow j)$
Col. 38-45	$\sigma_{in}(j-2 \rightarrow j)$
...	
	$\sigma_{in}(j-L \rightarrow j)$

where L = total number of inelastic-scattering groups for the cross-section set and j=1, 2, ..., J (the group index). The cards are arranged groupwise for each material and the fission spectrum (β_j) precedes the cross-section data.

Card Set No.	FORTRAN Symbol	Format	Definition
4		(9E8.6)	
	$\sigma^{1,1}_{elr}$, ..., $\sigma^{1,ME}_{elr}$		Elastic-removal cross section for group 1, material, through material ME.
	$\sigma^{KMAX,1}_{elr}$, ..., $\sigma^{KMAX,ME}_{elr}$		Elastic-removal cross section for group KMAX, material 1 through material ME. Each group starts a new card.
5	If KSET > 1	5I5	
	IDNUM		Cross-section set identification.
	ME		Number of materials in set, ≤ 20.
	KAN		Number of inelastic-scattering groups, ≤23.
	KMAX		Number of energy groups, ≤ 24.
	IRS		=1 REX cross-section format =2 SN cross-section format

Repeat card set numbers 3 and 4 with card set number 5 for each KSET-1 sets.

To Add Legendre Coefficient Set to Library Tape

Card Set No.	FORTRAN Symbol	Format	Definition
1		(I4)	
	IDB		Non-zero
2		(I5)	
	NTOT		Number of Legendre coefficient sets already on library tape.
3		(4I5,2E12.5)	
	KBNUM		Set identification (consecutive order).
	MAT1		Number of material.
	IGP1		Number of energy levels.

Card Set No.	FORTRAN Symbol	Format	Definition
3			
	MADP		=1 Add complete set. =2 Add MAT1 materials to set KBNUM. =3 Add IGP1 energy level following existing levels to set KBNUM. =4 Add IGP1 energy levels preceding existing levels of set KBNUM.
	EEO1		Energy of first level being added to set KBNUM.
	U1		Constant energy ratio of set, E_i/E_{i-1}.
4		(6E12.5)	
	A(1), ..., A(MAT1)		Atomic weight of materials, in order of increasing weight.
5		(18I4)	
	IB^1,$IW^1(1)$,$IG1^1(1)$,$IG2^1(1)$, ..., $IW^1(IB)$,$IG1^1(IB)$,$IG2^1(IB)$		Number of batches of coefficients of different format for material 1, followed by the batch format and batch energy-level limits.
		...	IW(1)=1 Coefficients in CMS
		...	IW(I)=2 Coefficients in CMS ratio, B_0, B_1/B_0, B_2/B_0, B_3/B_0, B_4/B_0.
			IW(I)=3 Coefficients in LAB ratio, A_0, A_1/A_0, A_2/A_0, A_3/A_0, A_4/A_0.
			IW(I)=4 Coefficients in LAB system.
	IB^{MAT1},$IW^{MAT1}(1)$, $IG1^{MAT1}(1)$,$IG2^{MAT1}(1)$, ..., $IW^{MAT1}(IB)$,$IG1^{MAT1}(IB)$, $IG2^{MAT1}(IB)$		Number of batches of coefficients of different format for material MAT1, followed by the batch format and batch energy-level limits. Each material starts a new card.

In addition, a BCD tape to be mounted on logical unit 4 containing the following information must be prepared.

Data	Remarks
$A_0(1,1), A_1(1,1), A_2(1,1), A_3(1,1), A_4(1,1)$	Legendre coefficients for material 1, energy level 1. FORMAT (5E12.5).
. . .	
$A_0(1,IGP1), A_1(1,IGP1), A_2(1,IGP1), A_3(1,IGP1), A_4(1,IGP1)$	Legendre coefficients for material 1, energy level IGP1. FORMAT (5E12.5).
. . .	
$A_0(MAT1,IGP1), A_1(MAT1,IGP1), A_2(MAT1,IGP1), A_3(MAT1,IGP1), A_4(MAT1,IGP1)$	Legendre coefficients for material MAT1, energy level IGP1. FORMAT (5E12.5).

VII. OUTPUT

On-line Output

The code prints out the iteration number, buckling, square root of the buckling, and K_{eff} at each iteration, both for the ELMOE and coarse-group fundamental-mode calculations.

Off-line

The off-line output consists of a summary of the input, initial, and final values of the buckling, and material-dependent-averaged coarse-group elastic-removal cross sections. Also, for each coarse group the flux, current/B, the diffusion coefficient, and elastic-removal cross section are listed. For each fine group the following quantities are normally written: flux, current/B (except for P_1), slowing-down density, inelastic source, and elastic source. The complete transfer matrix can be obtained on option. For further clarification of the output, the following comments hold.

Material-dependent elastic-removal cross sections are the partial contribution from material i to the homogenized-averaged coarse-group elastic-removal cross section.

Coarse-group Output

1/D - average value $3\sigma_{tr}$ homogenized for all materials
Elastic removal - sum of elastic transfers out of the coarse group divided by the total coarse-group flux
Absorption - averaged homogenized value of $(\sigma_{abs}-\sigma_{elr})$ for light elements and σ_{abs} for heavy elements.

Fine-group Output

Slowing-down density at E is the total number of neutrons slowing down below E because of elastic collisions above E. "A" denotes the source from higher energies due to elastic scattering. "B" denotes the source from higher energies due to inelastic scattering. "C" denotes the contribution from the current term in the "consistent" case.

Finally, a HOBO [25] equivalent is done; it is a coarse-group fundamental-mode calculation using averaged homogenized cross sections from the ELMOE calculation. The buckling obtained should be the same as for the main ELMOE calculation unless an error has occurred. The summary of macroscopic cross sections obtained has proven very useful. For the P-1 option the information summarized in the HOBO equivalent output is written on the output tape with a "Q" control character causing

the information to be punched on cards. These cards may then be used (preceded by a title card) for input to an independent routine that provides a calculation of the adjoint flux.

Code Tape

The code tape itself consists of the following records, each preceded by WBTSB 2 - Absolute Binary Tape Loaders:

1. Monitor
2. Cross-section tape-reading routine
3. Legendre coefficient tape-reading routine
4. Cross-section tape-writing routine
5. Legendre coefficient tape-writing routine
6. Sodium narrow-resonance treatment
7. Scattering-matrix calculation
8. Fundamental-mode calculation
9. Output routine

Routines 7, 8, 9 are repeated for each of the dimension limits mentioned above. The code tape is written with the WB-CTB 2 - Absolute Binary Card to tape routine. To make the code tape, READY the card deck in the card reader, CLEAR, and depress LOAD CARDS. The code tape is written on logical unit 1.

VIII. OPERATING INSTRUCTIONS

The code requires a 32K IBM 704 with 7 on-line tape units, an on-line printer, and an on-line card reader. The card reader uses the standard share 72 x 72 board, and the printer the SHARE number 2 board.

SENSE SWITCHES. All sense switches are to be in the "up" position.

Tape Units.

Tape 1 ELMOE Code
Tape 2 ELMOE Library
Tape 3 Scratch
Tape 4 Scratch, or BCD Input for Legendre coefficient writing routine.
Tape 5 Preliminary for sodium narrow resonance routine (used only for preliminary to sodium narrow resonance routine or narrow resonance routine)
Tape 7 Binary input for sodium narrow resonance routine (library supplied)
Tape 10 Output tape

Running procedure

1. Mount and ready tapes
2. Underflow switch on
3. All sense switches up
4. Ready cards in reader
5. Ready printer
6. Clear, depress LOAD TAPE.

Program stops on card reader select. Write EOF on tape 10, rewind and print on Program Control. STOPS: FORTRAN program stops.

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APPENDIX

Sample Problem

The following information is given for a sample problem:

1. Input sheets
2. List of materials in cross-section set
3. List of materials in Legendre coefficient set
4. On-line output
5. Off-line output.

704 INPUT DATA

FORM II

COST CODE _____

PROGRAM RE 196 PROBLEM ELMOE ORIGINATOR A. RAGO DATE 23 Aug PAGE 1 OF 3

1	2	3	4	5	6	7	8
1 2 3 4 5 6 7 8 9	0 1 2 3 4 5 6 7 8 9	0 1 2 3 4 5 6 7 8 9	0 1 2 3 4 5 6 7 8 9	0 1 2 3 4 5 6 7 8 9	0 1 2 3 4 5 6 7 8 9	0 1 2 3 4 5 6 7 8 9	0
1 1 1 1 1	9 9 1 1 1 6	1 1 4 1 6	0 4 1 1 1 5	1 2 1	2 1 1 1 7	1 1 1	1 1 1 1 1
1 1 8 1 1	7 1 1 1 1	1 2 1 1	1 3 1 1 1 7	1 1 4 1	1 8 1 1 5	1 6 1	
1 1 1 1 1	2 1 1 1 3	1 1 0 1 1					
S A M P L E	P R O B L	E M N O .	1 1				
1 1 1 1 1	1 1 1 1 2	1 2 1 1	1 1 1 1 1	1 3 1 1	1 0 1 1 2		
1 2 9 1 1	2 9 1 1 2 8	1 2 9 1 1	2 9 1 1 2 9	1 2 9 1 1	2 8 1 1 2 9	1 2 8 1 1	2 9 1 1 2 9
1 2 . 0 1 1	1 1 1 1 1	1 . 1 1 1 1	1 1 1 1 1	. 9 9 5 8 3	1 1 1 1 1	- . 3 3 1 1 4	9 1 1 1 - 1
1 6 . 1 1 1	1 1 1 1 1	1 . 1 1 1 1	1 1 1 1 1	. 9 9 7 6 5	1 1 1 1 1	- . 2 4 9 2 7	1 1 1 1 - 1
2 2 . 9 9 1	1 1 1 1 1	1 . 1 1 1 1	1 1 1 1 1	. 9 9 8 8 6	1 1 1 1 1	- . 1 7 3 7 1	1 1 1 1 - 1
5 6 . 4 6 1	1 1 1 1 1	1 . 1 1 1 1	1 1 1 1 1	. 9 9 9 7 5	1 1 1 1 1	- . 8 0 0 0 7	1 1 1 1 - 2
2 3 8 . 1 1	1 1 1 1 1	1 . 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1
2 3 9 . 1 1	1 1 1 1 1	1 . 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1
2 3 8 . 1 1	1 1 1 1 1	1 . 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1
2 3 9 . 1 1	1 1 1 1 1	1 . 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1
2 3 8 . 1 1	1 1 1 1 1	1 . 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1
2 3 8 . 1 1	1 1 1 1 1	1 . 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1
. 0 0 0 0 0	1 1 1 1 1	. 0 0 1 2 1	1 1 1 1 1	1 1 1 1 1	. 0 3 1 1 2	1 1 1 1 1	. 0 0 3 3 1
. 0 1 4 0 4	1 1 1 1 1	. 0 0 1 5 6	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1
1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1
1 1 3 1 1	1 5 3 9 3	4 7 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1
1 2 3 4 5 6 7 8 9	0 1 2 3 4 5 6 7 8 9	0 1 2 3 4 5 6 7 8 9	0 1 2 3 4 5 6 7 8 9	0 1 2 3 4 5 6 7 8 9	0 1 2 3 4 5 6 7 8 9	0 1 2 3 4 5 6 7 8 9	0
	1	2	3	4	5	6	7 8

AMD-9 (9-60)

704 INPUT DATA

FORM II

COST CODE _____

PROGRAM RE 196 PROBLEM ELMOE ORIGINATOR A. RAGO DATE 23 Aug PAGE 2 OF 3

.01184		.01197		.0212		.0226		
.5		.65		.79		.84		
1.23		1.48		1.67		2.4		
2.78		1.78		1.03		1.03		
.0214		.01159		.0127		.0098		
.00711		.00664		.006		.00556		
.00446		.0045		.0044		.0043		
.0039		.0038		.0037		.0036		
.0033		.0032		.0031		.0030		
.00285		.0028		.00278		.00276		
.0027		.00268		.00266		.00264		
.00258		.00256		.00254		.00252		
.00247		.00247		.00247		.00247		
.00247								
SAMPLE	PROBLEM NO.		2					
.00000	1	.002				.03112		
1				.01404		.00156		
3	15 393	471						
.01184		.01197		.0212		.0226		
.5		.65		.79		.84		

.03		.4						
.96		1.15						
3.2		4.						
.83		.4						
.0083		.0079						
.0051		.0048						
.0042		.0041						
.0035		.0034						
.00295		.0029						
.00274		.00272						
.00262		.00260						
.00250		.00248						
.00247		.00247						
.0033		.01525						
.03		4						
.96		1.15						

704 INPUT DATA

FORM II

COST CODE _____

PROGRAM RE 196 PROBLEM ELMOE ORIGINATOR A. RAGO DATE 23 Aug PAGE 3 OF 3

1	2	3	4	5	6	7	8
1.23	1.48	1.67	2.4	3.2	4.		
2.78	1.78	1.03	1.03	.83	.4		
.0214	.0159	.0127	.0098	.0083	.0079		
.0071	.0064	.0006	.0056	.0051	.0048		
.0046	.0045	.0044	.0043	.0042	.0041		
.0039	.0038	.0037	.0036	.0035	.0034		
.0033	.0032	.0031	.0030	.0029 5	.0029		
.0285	.0028	.0027 8	.0027 6	.0027 4	.0027 2		
.0027	.0026 8	.0026 6	.0026 4	.0026 2	.0026 0		
.0258	.0256	.0254	.0252	.0250	.0248		
.0247	.0247	.0247	.0247	.0247	.0247		
.0247							

CROSS-SECTION SET #199

Material			Group	Energy (keV)
1. Sodium			1	3668
2. Stainless Steel			2	2225
3. U-238	300°K		3	1350
4. Pu-239	300°K	σ_ρ = 370 b	4	825
5. U-238	2500°K		5	500
6. Pu-239	2500°K	σ_ρ = 370 b	6	300
7. Oxygen			7	180
8. Carbon			8	110
9. Pu-239	300°K	σ_ρ = 247 b	9	67
10. Pu-239	2500°K	σ_ρ = 247 b	10	40.7
11. Pu-239	750°K	σ_ρ = 247 b	11	25
12. Pu-239	1500°K	σ_ρ = 247 b	12	15
13. U-238	750°K		13	9.1
14. U-238	1500°K		14	4
15. U-235	300°K	σ_ρ = 126	15	1
16. U-235	2500°K	σ_ρ = 126	16	0.3
17. Pu-239	750°K	σ_ρ = 370	17	0.1
18. Pu-239	1500°K	σ_ρ = 370	18	0.03
19. Aluminum				

LEGENDRE COEFFICIENT SET

Material	Atomic Weight	Material	Atomic Weight
1. Carbon	12.011	8. Chromium	52.010
2. Oxygen	16.000	9. Iron	55.840
3. Sodium	22.991	10. Stainless Steel	56.460
4. Sodium-1	23.000	11. Hastelloy	56.500
5. Sodium-2	23.010	12. Nickel	58.690
6. Aluminum	26.980	13. Niobium	92.910
7. Vanadium	50.950		

ON-LINE OUTPUT

```
RE 196      ELMOE
S A M P L E   P R O B L E M   N O .  1
        IT. NO.  1    B SQUARE=  0.00200000   B=  0.04472136   SUM=  1.03785206

        IT. NO.  2    B SQUARE=  0.00241999   B=  0.04919349   SUM=  0.99872560

        IT. NO.  3    B SQUARE=  0.00240569   B=  0.04904783   SUM=  1.00001706

        IT. NO.  4    B SQUARE=  0.00240587   B=  0.04904975   SUM=  0.99999997


HOBO EQUIVALENT
        IT. NO.  1    B SQUARE=  0.00200000   B=  0.04472136   SUM=  1.03794806

        IT. NO.  2    B SQUARE=  0.00241999   B=  0.04919349   SUM=  0.99872561

        IT. NO.  3    B SQUARE=  0.00240572   B=  0.04904819   SUM=  1.00001651

        IT. NO.  4    B SQUARE=  0.00240590   B=  0.04905004   SUM=  1.00000000


RE 196      ELMOE
S A M P L E   P R O B L E M   N O .  2
        IT. NO.  1    B SQUARE=  0.00200000   B=  0.04472136   SUM=  1.03354345

        IT. NO.  2    B SQUARE=  0.00241999   B=  0.04919349   SUM=  0.99482176

        IT. NO.  3    B SQUARE=  0.00236151   B=  0.04859544   SUM=  1.00006440

        IT. NO.  4    B SQUARE=  0.00236223   B=  0.04860278   SUM=  1.00000012


HOBO EQUIVALENT
        IT. NO.  1    B SQUARE=  0.00200000   B=  0.04472136   SUM=  1.03364480

        IT. NO.  2    B SQUARE=  0.00241999   B=  0.04919349   SUM=  0.99481191

        IT. NO.  3    B SQUARE=  0.00236157   B=  0.04859601   SUM=  1.00006203

        IT. NO.  4    B SQUARE=  0.00236226   B=  0.04860307   SUM=  1.00000010
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OFF-LINE OUTPUT

RE 196 ELMOE
S A M P L E P R O B L E M N O . 1

MATERIAL CONSTANTS

MATERIAL	AT.WT	ATOMS/CC(E-24)	VOL.FRAC.	MATRIX FOR TRANSFORMING LEGENDRE EXPS. COEFF.-CMS TO LAB (1,1)	(1,2)	(1,3)	(1,4)
1	12.011000	1.00000000	-0.	0.99583E 00	-0.33149E-01	0.17588E-02	-0.11722E-03
2	16.000000	1.00000000	0.03120000	0.99765E 00	-0.24927E-01	0.98550E-03	-0.52205E-04
3	22.991000	1.00000000	0.00330000	0.99886E 00	-0.17371E-01	0.46996E-03	-0.19865E-04
4	56.460000	1.00000000	0.01525000	0.99975E 00	-0.80007E-02	0.87558E-04	-0.34335E-05
5	238.000000	1.00000000	0.01403999				
6	239.000000	1.00000000	0.00156000				
7	238.000000	1.00000000	-0.				
8	239.000000	1.00000000	-0.				
9	238.000000	1.00000000	-0.				
10	239.000000	1.00000000	-0.				

R= 0.98274157

OPTION 1

MATERIAL	CALCULATED ALPHA
1	0.2816316E-00
2	0.2162987E-00
3	0.1597795E-00
4	0.6726708E-01

MATERIAL DEPENDENT ELASTIC REMOVAL CROSS SECTION

GROUP	MATERIAL 1	2	3	4
2	-0.	0.7827E-02	0.1056E-02	0.1500E-02
3	-0.	0.1759E-01	0.9204E-03	0.1558E-02
4	-0.	0.3532E-01	0.2038E-02	0.3404E-02
5	-0.	0.2114E-01	0.1651E-02	0.2704E-02
6	-0.	0.4344E-01	0.2417E-02	0.2512E-02
7	-0.	0.2775E-01	0.2568E-02	0.3431E-02
8	-0.	0.2521E-01	0.1766E-02	0.3555E-02
9	-0.	0.2495E-01	0.2141E-02	0.3462E-02
10	-0.	0.2491E-01	0.2022E-02	0.4772E-02
11	-0.	0.2782E-01	0.2907E-02	0.4895E-02
12	-0.	0.2020E-01	0.1896E-02	0.8291E-02
13	-0.	0.2263E-01	0.2744E-02	0.6788E-02
14	-0.	0.1381E-01	0.4840E-02	0.5664E-02
15	-0.	0.6703E-02	0.4087E-03	0.2311E-02
16	-0.	0.5482E-02	0.3335E-03	0.2241E-02
17	-0.	0.4009E-02	0.2410E-03	0.1647E-02

BUCKLING

INITIAL VALUE 0.2000000E-02

FINAL VALUE 0.2405878E-02

COARSE GROUP DATA

GROUP	FINE GROUP CORRESPONDENCE	FLUX	CURRENT/B	1/D	ELASTIC REMOVAL	ABSORPTION
1	0- 0	0.147416E 01	0.	0.39255E-00		0.
2	1- 29	0.299984E 01	0.	0.43178E-00	0.10383E-01	0.64480E-01
3	30- 58	0.433799E 01	0.	0.50863E 00	0.20070E-01	0.48890E-01
4	59- 86	0.564262E 01	0.	0.70405E 00	0.40758E-01	0.24633E-01
5	87-115	0.123874E 02	0.	0.64267E 00	0.25496E-01	0.13707E-01
6	116-144	0.894581E 01	0.	0.97859E 00	0.48365E-01	0.12802E-01
7	145-173	0.115149E 02	0.	0.94079E 00	0.33751E-01	0.14007E-01
8	174-202	0.111647E 02	0.	0.10140E 01	0.30528E-01	0.14613E-01
9	203-230	0.859068E 01	0.	0.11142E 01	0.30551E-01	0.15775E-01
10	231-259	0.731513E 01	0.	0.11639E 01	0.31708E-01	0.13817E-01
11	260-287	0.512522E 01	0.	0.13713E 01	0.35618E-01	0.12710E-01
12	288-316	0.428785E 01	0.	0.12465E 01	0.30383E-01	0.16420E-01
13	317-345	0.285616E 01	0.	0.14256E 01	0.32166E-01	0.16621E-01
14	346-392	0.243306E 01	0.	0.17734E 01	0.24311E-01	0.15216E-01
15	393-471	0.183030E 01	0.	0.16978E 01	0.94224E-02	0.25014E-01
16	472-540	0.475049E-00	0.	0.17987E 01	0.80564E-02	0.36893E-01
17	541-604	0.631634E-01	0.	0.20865E 01	0.58966E-02	0.71235E-01
18	0- 0	0.558255E-02	0.	0.40654E 01		0.

FINE GROUP DATA

GROUP	ENERGY	FLUX	CURRENT/B	3SIGMA (TRANSPORT)	SLOWING DOWN DENSITY	A	B	C
1	3621.0587158	0.381869E-01	0.	0.578167E 00	0.451121E-02	0.	0.12317E-02	0.
2	3558.5649109	0.461638E-01	0.	0.579073E 00	0.858492E-02	0.12611E-02	0.12105E-02	0.
3	3497.1496887	0.512004E-01	0.	0.583585E 00	0.124225E-01	0.20458E-02	0.11896E-02	0.
4	3436.7943420	0.551196E-01	0.	0.585475E 00	0.160978E-01	0.26601E-02	0.11690E-02	0.
5	3377.4806519	0.605298E-01	0.	0.565383E 00	0.194970E-01	0.31473E-02	0.11489E-02	0.
6	3319.1906738	0.630217E-01	0.	0.560325E 00	0.228237E-01	0.35397E-02	0.11290E-02	0.
7	3261.9066162	0.652949E-01	0.	0.562987E 00	0.260943E-01	0.39142E-02	0.11096E-02	0.
8	3205.6112366	0.727598E-01	0.	0.524412E 00	0.289249E-01	0.42738E-02	0.10904E-02	0.
9	3150.2874146	0.836085E-01	0.	0.475361E-00	0.310600E-01	0.46322E-02	0.10716E-02	0.
10	3095.9183960	0.927708E-01	0.	0.441149E-00	0.326120E-01	0.49186E-02	0.10531E-02	0.
11	3042.4877014	0.997940E-01	0.	0.423608E-00	0.337375E-01	0.52011E-02	0.10349E-02	0.
12	2989.9791260	0.104242E-00	0.	0.417609E-00	0.346267E-01	0.54857E-02	0.10171E-02	0.
13	2938.3767700	0.108212E-00	0.	0.417736E-00	0.353179E-01	0.58746E-02	0.99950E-03	0.
14	2887.6650391	0.113019E-00	0.	0.418482E-00	0.357501E-01	0.64093E-02	0.98225E-03	0.
15	2837.8284302	0.118208E-00	0.	0.418607E-00	0.358919E-01	0.69481E-02	0.96530E-03	0.
16	2788.8519592	0.120698E-00	0.	0.418965E-00	0.359298E-01	0.72040E-02	0.94864E-03	0.
17	2740.7207642	0.121731E-00	0.	0.423487E-00	0.359692E-01	0.74600E-02	0.93227E-03	0.
18	2693.4202271	0.123555E-00	0.	0.423092E-00	0.359429E-01	0.75738E-02	0.91618E-03	0.
19	2646.9360046	0.124180E-00	0.	0.425408E-00	0.359356E-01	0.76450E-02	0.90037E-03	0.
20	2601.2540283	0.124003E-00	0.	0.429421E-00	0.360025E-01	0.77281E-02	0.88483E-03	0.
21	2556.3604736	0.123661E-00	0.	0.434596E-00	0.361529E-01	0.77565E-02	0.86956E-03	0.
22	2512.2416992	0.123183E-00	0.	0.441315E-00	0.363944E-01	0.77529E-02	0.85455E-03	0.
23	2468.8843384	0.125760E-00	0.	0.429546E-00	0.364804E-01	0.75990E-02	0.83980E-03	0.
24	2426.2752686	0.132864E-00	0.	0.411907E-00	0.360761E-01	0.76691E-02	0.82531E-03	0.
25	2384.4015503	0.139190E-00	0.	0.390903E-00	0.352185E-01	0.76172E-02	0.81107E-03	0.
26	2343.2505493	0.158060E-00	0.	0.358699E-00	0.329721E-01	0.77915E-02	0.79707E-03	0.
27	2302.8096924	0.147534E-00	0.	0.366410E-00	0.315233E-01	0.74457E-02	0.78331E-03	0.
28	2263.0668030	0.134008E-00	0.	0.406397E-00	0.311453E-01	0.74926E-02	0.76979E-03	0.
29	2224.0098267	0.129280E-00	0.	0.421828E-00	0.311475E-01	0.74044E-02	0.75651E-03	0.
30	2185.6269226	0.152123E-00	0.	0.427543E-00	0.334403E-01	0.70491E-02	0.24606E-02	0.
31	2147.9064331	0.153985E-00	0.	0.436533E-00	0.356306E-01	0.76554E-02	0.24181E-02	0.
32	2110.8369141	0.150900E-00	0.	0.448328E-00	0.379884E-01	0.79491E-02	0.23764E-02	0.
33	2074.4071655	0.150297E-00	0.	0.460356E-00	0.403747E-01	0.82683E-02	0.23353E-02	0.
34	2038.6061707	0.148434E-00	0.	0.464506E-00	0.428400E-01	0.83817E-02	0.22950E-02	0.
35	2003.4230194	0.150083E-00	0.	0.467432E-00	0.451892E-01	0.86055E-02	0.22554E-02	0.
36	1968.8470612	0.146062E-00	0.	0.476897E-00	0.477356E-01	0.86582E-02	0.22165E-02	0.
37	1934.8678436	0.137442E-00	0.	0.502198E 00	0.507439E-01	0.87629E-02	0.21783E-02	0.
38	1901.4750824	0.131472E-00	0.	0.535287E 00	0.540704E-01	0.92250E-02	0.21407E-02	0.
39	1868.6585999	0.132607E-00	0.	0.539848E 00	0.572974E-01	0.95327E-02	0.21037E-02	0.
40	1836.4084930	0.141134E-00	0.	0.523965E 00	0.600033E-01	0.10078E-01	0.20674E-02	0.
41	1804.7149506	0.153679E-00	0.	0.497812E-00	0.619515E-01	0.10574E-01	0.20317E-02	0.
42	1773.5684204	0.166355E-00	0.	0.469285E-00	0.631171E-01	0.10879E-01	0.19967E-02	0.
43	1742.9594116	0.166429E-00	0.	0.472146E-00	0.642285E-01	0.11225E-01	0.19622E-02	0.
44	1712.8786621	0.166455E-00	0.	0.482025E-00	0.652979E-01	0.11601E-01	0.19283E-02	0.
45	1683.3170471	0.156929E-00	0.	0.500742E 00	0.668491E-01	0.11718E-01	0.18951E-02	0.
46	1654.2656555	0.134142E-00	0.	0.599282E 00	0.696669E-01	0.12291E-01	0.18624E-02	0.
47	1625.7156067	0.135357E-00	0.	0.624003E 00	0.723763E-01	0.12706E-01	0.18302E-02	0.
48	1597.6583099	0.149669E-00	0.	0.552703E 00	0.741886E-01	0.12196E-01	0.17986E-02	0.
49	1570.0852203	0.154555E-00	0.	0.534671E 00	0.756480E-01	0.12156E-01	0.17676E-02	0.
50	1542.9880219	0.147203E-00	0.	0.547726E 00	0.774434E-01	0.12033E-01	0.17371E-02	0.
51	1516.3584747	0.149151E-00	0.	0.558200E 00	0.790730E-01	0.12593E-01	0.17071E-02	0.
52	1490.1885071	0.154201E-00	0.	0.544152E 00	0.803404E-01	0.12987E-01	0.16776E-02	0.

53	1464.4701843	0.149773E-00	0.	0.550596E 00	0.817735E-01	0.13152E-01	0.16487E-02	0.
54	1439.1957245	0.147212E-00	0.	0.573963E 00	0.832890E-01	0.13947E-01	0.16202E-02	0.
55	1414.3574677	0.148471E-00	0.	0.571312E 00	0.846531E-01	0.14258E-01	0.15923E-02	0.
56	1389.9478607	0.152961E-00	0.	0.548014E 00	0.856678E-01	0.14745E-01	0.15648E-02	0.
57	1365.9595337	0.160877E-00	0.	0.514728E 00	0.861302E-01	0.15709E-01	0.15378E-02	0.
58	1342.3852386	0.150036E-00	0.	0.497405E-00	0.870623E-01	0.16695E-01	0.15112E-02	0.
59	1319.2177582	0.160474E-00	0.	0.592429E 00	0.953011E-01	0.18117E-01	0.54662E-02	0.
60	1296.4501343	0.155950E-00	0.	0.733206E 00	0.103634E-00	0.21439E-01	0.53719E-02	0.
61	1274.0754242	0.178792E-00	0.	0.739039E 00	0.111176E-00	0.22000E-01	0.52792E-02	0.
62	1252.0868988	0.213520E-00	0.	0.677383E 00	0.117529E-00	0.22051E-01	0.51881E-02	0.
63	1230.4778442	0.236925E-00	0.	0.643746E 00	0.123020E-00	0.22633E-01	0.50985E-02	0.
64	1209.2417145	0.245602E-00	0.	0.622764E 00	0.128078E-00	0.22562E-01	0.50106E-02	0.
65	1188.3721008	0.242065E-00	0.	0.611033E 00	0.133061E-00	0.21900E-01	0.49241E-02	0.
66	1167.8626556	0.241249E-00	0.	0.617106E 00	0.137921E-00	0.22535E-01	0.48391E-02	0.
67	1147.7071838	0.209763E-00	0.	0.683196E 00	0.143601E-00	0.22690E-01	0.47556E-02	0.
68	1127.8995514	0.206962E-00	0.	0.688828E 00	0.149210E-00	0.22331E-01	0.46735E-02	0.
69	1108.4337616	0.218024E-00	0.	0.653334E 00	0.154311E-00	0.22467E-01	0.45929E-02	0.
70	1089.3039551	0.199708E-00	0.	0.696769E 00	0.159822E-00	0.22626E-01	0.45136E-02	0.
71	1070.5042572	0.189478E-00	0.	0.729429E 00	0.165495E-00	0.23050E-01	0.44357E-02	0.
72	1052.0290527	0.184989E-00	0.	0.760902E 00	0.171165E-00	0.24239E-01	0.43591E-02	0.
73	1033.8726654	0.162708E-00	0.	0.881805E 00	0.177371E-00	0.26643E-01	0.42839E-02	0.
74	1016.0296555	0.137631E-00	0.	0.104099E 01	0.184169E-00	0.28032E-01	0.42100E-02	0.
75	998.4945755	0.129907E-00	0.	0.107594E 01	0.191032E-00	0.28380E-01	0.41373E-02	0.
76	981.2621231	0.135246E-00	0.	0.102161E 01	0.197586E-00	0.28363E-01	0.40659E-02	0.
77	964.3270798	0.145193E-00	0.	0.972137E 00	0.203703E-00	0.28175E-01	0.39957E-02	0.
78	947.6843262	0.155205E-00	0.	0.914432E 00	0.209376E-00	0.27360E-01	0.39268E-02	0.
79	931.3287659	0.173077E-00	0.	0.822282E 00	0.214363E-00	0.26940E-01	0.38590E-02	0.
80	915.2554932	0.192364E-00	0.	0.739510E 00	0.218607E-00	0.27040E-01	0.37924E-02	0.
81	899.4596176	0.208266E-00	0.	0.702524E 00	0.222227E-00	0.28186E-01	0.37270E-02	0.
82	883.9363556	0.220544E-00	0.	0.678386E 00	0.225330E-00	0.28974E-01	0.36626E-02	0.
83	868.6810074	0.240920E-00	0.	0.652287E 00	0.227681E-00	0.31136E-01	0.35994E-02	0.
84	853.6889267	0.267480E-00	0.	0.642509E 00	0.229122E-00	0.34822E-01	0.35373E-02	0.
85	838.9555893	0.288473E-00	0.	0.639438E 00	0.229820E-00	0.38244E-01	0.34763E-02	0.
86	824.4765396	0.302102E-00	0.	0.635051E 00	0.229983E-00	0.40431E-01	0.34163E-02	0.
87	810.2473679	0.372074E-00	0.	0.647413E 00	0.236609E-00	0.43336E-01	0.80981E-02	0.
88	796.2637634	0.378878E-00	0.	0.653574E 00	0.242914E-00	0.45916E-01	0.79584E-02	0.
89	782.5214920	0.378099E-00	0.	0.667403E 00	0.249047E-00	0.47687E-01	0.78210E-02	0.
90	769.0164108	0.379792E-00	0.	0.679891E 00	0.254966E-00	0.49752E-01	0.76860E-02	0.
91	755.7443924	0.393187E-00	0.	0.679220E 00	0.260444E-00	0.51650E-01	0.75534E-02	0.
92	742.7014236	0.411263E-00	0.	0.661661E 00	0.265367E-00	0.52534E-01	0.74230E-02	0.
93	729.8835602	0.418143E-00	0.	0.649880E 00	0.269940E-00	0.52898E-01	0.72949E-02	0.
94	717.2869263	0.415760E-00	0.	0.653434E 00	0.274362E-00	0.53673E-01	0.71690E-02	0.
95	704.9076767	0.415521E-00	0.	0.658563E 00	0.278603E-00	0.54602E-01	0.70453E-02	0.
96	692.7420654	0.418841E-00	0.	0.659002E 00	0.282593E-00	0.55373E-01	0.69237E-02	0.
97	680.7864227	0.424102E-00	0.	0.657840E 00	0.286296E-00	0.55992E-01	0.68042E-02	0.
98	669.0371246	0.432499E-00	0.	0.653190E 00	0.289652E-00	0.56705E-01	0.66868E-02	0.
99	657.4905853	0.438735E-00	0.	0.646517E 00	0.292697E-00	0.56871E-01	0.65714E-02	0.
100	646.1433258	0.442366E-00	0.	0.640590E 00	0.295478E-00	0.56984E-01	0.64580E-02	0.
101	634.9919052	0.445550E-00	0.	0.635620E 00	0.298010E-00	0.57260E-01	0.63465E-02	0.
102	624.0329437	0.450770E-00	0.	0.631819E 00	0.300260E-00	0.58023E-01	0.62370E-02	0.
103	613.2631149	0.453139E-00	0.	0.629593E 00	0.302286E-00	0.59005E-01	0.61293E-02	0.
104	602.6791534	0.454468E-00	0.	0.630407E 00	0.304116E-00	0.60288E-01	0.60236E-02	0.
105	592.2778549	0.453914E-00	0.	0.633423E 00	0.305793E-00	0.61441E-01	0.59196E-02	0.
106	582.0560684	0.451807E-00	0.	0.637090E 00	0.307348E-00	0.62404E-01	0.58174E-02	0.
107	572.0106964	0.451125E-00	0.	0.635485E 00	0.308744E-00	0.63123E-01	0.57170E-02	0.
108	562.1386948	0.445378E-00	0.	0.632586E 00	0.310068E-00	0.63384E-01	0.56184E-02	0.
109	552.4370499	0.437064E-00	0.	0.632623E 00	0.311376E-00	0.63973E-01	0.55214E-02	0.

110	542.9028625	0.432950E-00	0.	0.632724E 00	0.312597E-00	0.65250E-01	0.54261E-02	0.
111	533.5332031	0.433490E-00	0.	0.630652E 00	0.313647E-00	0.66918E-01	0.53325E-02	0.
112	524.3252563	0.439089E-00	0.	0.623568E 00	0.314425E-00	0.69056E-01	0.52404E-02	0.
113	515.2762222	0.442510E-00	0.	0.620465E 00	0.314982E-00	0.71504E-01	0.51500E-02	0.
114	506.3833733	0.440906E-00	0.	0.625259E 00	0.315431E-00	0.74193E-01	0.50611E-02	0.
115	497.6439857	0.435982E-00	0.	0.629305E 00	0.315829E-00	0.77005E-01	0.49738E-02	0.
116	489.0554314	0.440543E-00	0.	0.728101E 00	0.319880E-00	0.79879E-01	0.81134E-02	0.
117	480.6151085	0.411922E-00	0.	0.778910E 00	0.324281E-00	0.82516E-01	0.79734E-02	0.
118	472.3204422	0.357644E-00	0.	0.870464E 00	0.329466E-00	0.84510E-01	0.78358E-02	0.
119	464.1689262	0.297682E-00	0.	0.101218E 01	0.335506E-00	0.86077E-01	0.77006E-02	0.
120	456.1581039	0.243552E-00	0.	0.118725E 01	0.342264E-00	0.86537E-01	0.75677E-02	0.
121	448.2855225	0.199000E-00	0.	0.142574E 01	0.349564E-00	0.85466E-01	0.74371E-02	0.
122	440.5488243	0.181351E-00	0.	0.158786E 01	0.356968E-00	0.83027E-01	0.73087E-02	0.
123	432.9456444	0.174832E-00	0.	0.165908E 01	0.364296E-00	0.79524E-01	0.71826E-02	0.
124	425.4736786	0.180299E-00	0.	0.162203E 01	0.371363E-00	0.75339E-01	0.70586E-02	0.
125	418.1306686	0.203610E-00	0.	0.143882E 01	0.377885E-00	0.70670E-01	0.69368E-02	0.
126	410.9143906	0.223810E-00	0.	0.130573E 01	0.383905E-00	0.66335E-01	0.68171E-02	0.
127	403.8226547	0.229823E-00	0.	0.128331E 01	0.389661E-00	0.62381E-01	0.66994E-02	0.
128	396.8533058	0.242169E-00	0.	0.124158E 01	0.395055E-00	0.59097E-01	0.65838E-02	0.
129	390.0042381	0.251917E-00	0.	0.117964E 01	0.400117E-00	0.56405E-01	0.64702E-02	0.
130	383.2733803	0.265768E-00	0.	0.112364E 01	0.404787E-00	0.55549E-01	0.63585E-02	0.
131	376.6586838	0.290353E-00	0.	0.104914E 01	0.408887E-00	0.54792E-01	0.62488E-02	0.
132	370.1581421	0.316016E-00	0.	0.990107E 00	0.412403E-00	0.55106E-01	0.61409E-02	0.
133	363.7697945	0.314636E-00	0.	0.983768E 00	0.415783E-00	0.55110E-01	0.60349E-02	0.
134	357.4916992	0.328296E-00	0.	0.969852E 00	0.418793E-00	0.56013E-01	0.59308E-02	0.
135	351.3219528	0.362918E-00	0.	0.918065E 00	0.421077E-00	0.57087E-01	0.58284E-02	0.
136	345.2586861	0.343667E-00	0.	0.954132E 00	0.423548E-00	0.57294E-01	0.57278E-02	0.
137	339.3000641	0.341439E-00	0.	0.953038E 00	0.425911E-00	0.57334E-01	0.56290E-02	0.
138	333.4442787	0.357929E-00	0.	0.900474E 00	0.427829E-00	0.56272E-01	0.55318E-02	0.
139	327.6895561	0.342244E-00	0.	0.924634E 00	0.429876E-00	0.56592E-01	0.54364E-02	0.
140	322.0341454	0.350911E-00	0.	0.936889E 00	0.431668E-00	0.59776E-01	0.53426E-02	0.
141	316.4763374	0.375676E-00	0.	0.924169E 00	0.432933E-00	0.63309E-01	0.52504E-02	0.
142	311.0144577	0.422946E-00	0.	0.871955E 00	0.433275E-00	0.65302E-01	0.51597E-02	0.
143	305.6468315	0.452886E-00	0.	0.824467E 00	0.432952E-00	0.65127E-01	0.50707E-02	0.
144	300.3718491	0.441973E-00	0.	0.819912E 00	0.432668E-00	0.63341E-01	0.49832E-02	0.
145	295.1879005	0.420839E-00	0.	0.900632E 00	0.432138E-00	0.61626E-01	0.49070E-02	0.
146	290.0934181	0.399542E-00	0.	0.912533E 00	0.431858E-00	0.60080E-01	0.48223E-02	0.
147	285.0868607	0.394269E-00	0.	0.925669E 00	0.431564E-00	0.60918E-01	0.47391E-02	0.
148	280.1667099	0.396354E-00	0.	0.936920E 00	0.431132E-00	0.62843E-01	0.46573E-02	0.
149	275.3314705	0.383934E-00	0.	0.966229E 00	0.430822E-00	0.64683E-01	0.45769E-02	0.
150	270.5796852	0.395527E-00	0.	0.973042E 00	0.430217E-00	0.66991E-01	0.44979E-02	0.
151	265.9099007	0.444330E-00	0.	0.913050E 00	0.428627E-00	0.67438E-01	0.44203E-02	0.
152	261.3207130	0.453028E-00	0.	0.884426E 00	0.426745E-00	0.67042E-01	0.43440E-02	0.
153	256.8107224	0.421413E-00	0.	0.910831E 00	0.425321E-00	0.65741E-01	0.42690E-02	0.
154	252.3785801	0.397593E-00	0.	0.930947E 00	0.424213E-00	0.64413E-01	0.41954E-02	0.
155	248.0229168	0.386121E-00	0.	0.943843E 00	0.423207E-00	0.64070E-01	0.41230E-02	0.
156	243.7424316	0.382382E-00	0.	0.962691E 00	0.422182E-00	0.66140E-01	0.40518E-02	0.
157	239.5358181	0.389930E-00	0.	0.964461E 00	0.420937E-00	0.67377E-01	0.39819E-02	0.
158	235.4018097	0.405516E-00	0.	0.943787E 00	0.419316E-00	0.68009E-01	0.39131E-02	0.
159	231.3391418	0.399103E-00	0.	0.947204E 00	0.417710E-00	0.67721E-01	0.38456E-02	0.
160	227.3465881	0.396054E-00	0.	0.952505E 00	0.416069E-00	0.67558E-01	0.37792E-02	0.
161	223.4229450	0.396583E-00	0.	0.945988E 00	0.414320E-00	0.67045E-01	0.37140E-02	0.
162	219.5670147	0.405627E-00	0.	0.933445E 00	0.412319E-00	0.67242E-01	0.36499E-02	0.
163	215.7776318	0.427905E-00	0.	0.904231E 00	0.409825E-00	0.67699E-01	0.35869E-02	0.
164	212.0536461	0.430182E-00	0.	0.889755E 00	0.407188E-00	0.66909E-01	0.35250E-02	0.
165	208.3939323	0.409888E-00	0.	0.901539E 00	0.404820E-00	0.65321E-01	0.34642E-02	0.
166	204.7973824	0.381413E-00	0.	0.926095E 00	0.402872E-00	0.63621E-01	0.34044E-02	0.

167	201.2629013	0.347790E-00	0.	0.973364E 00	0.401444E-00	0.63161E-01	0.33456E-02	0.
168	197.7894192	0.325785E-00	0.	0.102511E 01	0.400339E-00	0.64339E-01	0.32879E-02	0.
169	194.3758831	0.314269E-00	0.	0.107511E 01	0.399379E-00	0.66865E-01	0.32312E-02	0.
170	191.0212612	0.306026E-00	0.	0.112691E 01	0.398507E-00	0.69771E-01	0.31754E-02	0.
171	187.7245350	0.355381E-00	0.	0.106844E 01	0.396721E-00	0.73458E-01	0.31206E-02	0.
172	184.4847031	0.453723E-00	0.	0.925222E 00	0.393103E-00	0.75818E-01	0.30667E-02	0.
173	181.3007851	0.494359E-00	0.	0.857347E 00	0.388637E-00	0.74549E-01	0.30138E-02	0.
174	178.1718197	0.474304E-00	0.	0.935955E 00	0.386726E-00	0.70017E-01	0.54352E-02	0.
175	175.0968513	0.406255E-00	0.	0.971274E 00	0.385910E-00	0.64021E-01	0.53414E-02	0.
176	172.0749550	0.325604E-00	0.	0.107758E 01	0.386442E-00	0.61641E-01	0.52493E-02	0.
177	169.1052113	0.339713E-00	0.	0.109584E 01	0.386640E-00	0.64315E-01	0.51587E-02	0.
178	166.1867199	0.317906E-00	0.	0.114393E 01	0.387126E-00	0.67385E-01	0.50696E-02	0.
179	163.3185978	0.373272E-00	0.	0.110581E 01	0.386556E-00	0.71026E-01	0.49821E-02	0.
180	160.4999752	0.462601E-00	0.	0.966878E 00	0.384238E-00	0.73895E-01	0.48962E-02	0.
181	157.7299976	0.430516E-00	0.	0.979774E 00	0.382382E-00	0.70265E-01	0.48117E-02	0.
182	155.0078239	0.420424E-00	0.	0.993792E 00	0.380614E-00	0.70665E-01	0.47286E-02	0.
183	152.3326340	0.376536E-00	0.	0.101609E 01	0.379516E-00	0.65580E-01	0.46470E-02	0.
184	149.7036114	0.358474E-00	0.	0.105942E 01	0.378664E-00	0.67451E-01	0.45668E-02	0.
185	147.1199589	0.338197E-00	0.	0.111663E 01	0.378099E-00	0.69343E-01	0.44880E-02	0.
186	144.5809021	0.310072E-00	0.	0.119619E 01	0.377958E-00	0.71667E-01	0.44105E-02	0.
187	142.0856609	0.270053E-00	0.	0.134234E 01	0.378451E-00	0.74500E-01	0.43344E-02	0.
188	139.6334839	0.316422E-00	0.	0.128264E 01	0.378069E-00	0.78710E-01	0.42596E-02	0.
189	137.2236290	0.435704E-00	0.	0.105501E 01	0.375455E-00	0.82183E-01	0.41861E-02	0.
190	134.8553677	0.528954E 00	0.	0.932686E 00	0.371023E-00	0.82203E-01	0.41138E-02	0.
191	132.5279732	0.495786E-00	0.	0.925531E 00	0.367066E-00	0.77911E-01	0.40429E-02	0.
192	130.2407494	0.326865E-00	0.	0.110806E 01	0.366075E-00	0.69321E-01	0.39731E-02	0.
193	127.9929972	0.328457E-00	0.	0.113153E 01	0.364990E-00	0.67904E-01	0.39045E-02	0.
194	125.7840385	0.426528E-00	0.	0.960810E 00	0.362024E-00	0.69169E-01	0.38371E-02	0.
195	123.6132050	0.437724E-00	0.	0.940968E 00	0.358764E-00	0.70384E-01	0.37709E-02	0.
196	121.4798336	0.424090E-00	0.	0.958150E 00	0.355680E-00	0.69339E-01	0.37058E-02	0.
197	119.3832817	0.399458E-00	0.	0.938164E 00	0.352922E-00	0.62951E-01	0.36419E-02	0.
198	117.3229141	0.393703E-00	0.	0.928442E 00	0.350178E-00	0.60896E-01	0.35790E-02	0.
199	115.2981033	0.388630E-00	0.	0.934382E 00	0.347455E-00	0.61110E-01	0.35172E-02	0.
200	113.3082409	0.363678E-00	0.	0.957248E 00	0.345112E-00	0.59493E-01	0.34565E-02	0.
201	111.3527174	0.349649E-00	0.	0.983003E 00	0.342962E-00	0.59823E-01	0.33969E-02	0.
202	109.4309454	0.345137E-00	0.	0.100427E 01	0.340839E-00	0.61155E-01	0.33383E-02	0.
203	107.5423384	0.349137E-00	0.	0.107339E 01	0.337976E-00	0.62819E-01	0.29379E-02	0.
204	105.6863251	0.352448E-00	0.	0.107104E 01	0.334990E-00	0.63343E-01	0.28872E-02	0.
205	103.8623457	0.343133E-00	0.	0.108360E 01	0.332118E-00	0.63099E-01	0.28374E-02	0.
206	102.0698462	0.328533E-00	0.	0.111084E 01	0.329468E-00	0.63054E-01	0.27884E-02	0.
207	100.3082790	0.316887E-00	0.	0.114108E 01	0.326985E-00	0.63588E-01	0.27403E-02	0.
208	98.5771151	0.313772E-00	0.	0.115810E 01	0.324509E-00	0.64402E-01	0.26930E-02	0.
209	96.8758287	0.322409E-00	0.	0.114837E 01	0.321816E-00	0.65140E-01	0.26465E-02	0.
210	95.2039042	0.344699E-00	0.	0.110746E 01	0.318642E-00	0.65426E-01	0.26008E-02	0.
211	93.5608349	0.358343E-00	0.	0.107139E 01	0.315143E-00	0.64682E-01	0.25560E-02	0.
212	91.9461203	0.350983E-00	0.	0.106525E 01	0.311717E-00	0.62811E-01	0.25118E-02	0.
213	90.3592749	0.335737E-00	0.	0.106918E 01	0.308516E-00	0.60414E-01	0.24685E-02	0.
214	88.7998161	0.318459E-00	0.	0.107925E 01	0.305581E-00	0.58250E-01	0.24259E-02	0.
215	87.2672701	0.290902E-00	0.	0.112584E 01	0.303118E-00	0.57476E-01	0.23840E-02	0.
216	85.7611732	0.257533E-00	0.	0.121551E 01	0.301244E-00	0.57610E-01	0.23429E-02	0.
217	84.2810688	0.219845E-00	0.	0.136167E 01	0.300036E-00	0.58831E-01	0.23024E-02	0.
218	82.8265114	0.193253E-00	0.	0.153843E 01	0.299285E-00	0.61465E-01	0.22627E-02	0.
219	81.3970556	0.237648E-00	0.	0.143045E 01	0.297689E-00	0.65604E-01	0.22237E-02	0.
220	79.9922695	0.369731E-00	0.	0.110711E 01	0.293559E-00	0.68973E-01	0.21853E-02	0.
221	78.6117287	0.432446E-00	0.	0.982752E 00	0.288140E-00	0.68123E-01	0.21476E-02	0.
222	77.2550144	0.370539E-00	0.	0.102010E 01	0.283836E-00	0.62458E-01	0.21105E-02	0.
223	75.9217129	0.287936E-00	0.	0.108967E 01	0.281030E-00	0.54168E-01	0.20741E-02	0.

224	74.6114225	0.188007E-00	0.	0.134003E 01	0.280055E-00	0.49988E-01	0.20383E-02	0.
225	73.3237467	0.169818E-00	0.	0.153403E 01	0.279396E-00	0.52999E-01	0.20031E-02	0.
226	72.0582943	0.252813E-00	0.	0.126609E 01	0.277173E-00	0.57159E-01	0.19685E-02	0.
227	70.8146811	0.366666E-00	0.	0.100521E 01	0.272715E-00	0.59799E-01	0.19346E-02	0.
228	69.5925303	0.355153E-00	0.	0.100881E 01	0.268429E-00	0.58566E-01	0.19012E-02	0.
229	68.3914719	0.306721E-00	0.	0.103621E 01	0.265003E-00	0.52879E-01	0.18684E-02	0.
230	67.2111425	0.257132E-00	0.	0.106514E 01	0.262451E-00	0.46161E-01	0.18361E-02	0.
231	66.0511837	0.259815E-00	0.	0.114127E 01	0.262044E-00	0.46684E-01	0.37304E-02	0.
232	64.9112444	0.259794E-00	0.	0.116027E 01	0.261582E-00	0.48046E-01	0.36660E-02	0.
233	63.7909780	0.265731E-00	0.	0.116339E 01	0.260964E-00	0.49495E-01	0.36028E-02	0.
234	62.6900458	0.272610E-00	0.	0.115788E 01	0.260172E-00	0.50418E-01	0.35406E-02	0.
235	61.6081142	0.281380E-00	0.	0.113911E 01	0.259169E-00	0.50569E-01	0.34795E-02	0.
236	60.5448551	0.287985E-00	0.	0.111378E 01	0.257987E-00	0.49775E-01	0.34194E-02	0.
237	59.4999452	0.289996E-00	0.	0.109504E 01	0.256704E-00	0.48720E-01	0.33604E-02	0.
238	58.4730701	0.281452E-00	0.	0.109754E 01	0.255501E-00	0.47674E-01	0.33024E-02	0.
239	57.4639158	0.267570E-00	0.	0.111910E 01	0.254474E-00	0.47007E-01	0.32454E-02	0.
240	56.4721789	0.253773E-00	0.	0.114806E 01	0.253625E-00	0.46747E-01	0.31894E-02	0.
241	55.4975576	0.238836E-00	0.	0.118365E 01	0.252974E-00	0.46535E-01	0.31344E-02	0.
242	54.5397573	0.197595E-00	0.	0.131233E 01	0.252962E-00	0.46466E-01	0.30803E-02	0.
243	53.5984859	0.179462E-00	0.	0.139816E 01	0.253201E-00	0.46398E-01	0.30271E-02	0.
244	52.6734605	0.187435E-00	0.	0.137494E 01	0.253258E-00	0.46923E-01	0.29749E-02	0.
245	51.7643995	0.199920E-00	0.	0.135894E 01	0.253065E-00	0.48636E-01	0.29235E-02	0.
246	50.8710270	0.218536E-00	0.	0.132599E 01	0.252523E-00	0.51247E-01	0.28731E-02	0.
247	49.9930725	0.252958E-00	0.	0.125688E 01	0.251367E-00	0.54166E-01	0.28235E-02	0.
248	49.1302705	0.294371E-00	0.	0.116584E 01	0.249467E-00	0.55783E-01	0.27748E-02	0.
249	48.2823586	0.308821E-00	0.	0.111708E 01	0.247262E-00	0.54632E-01	0.27269E-02	0.
250	47.4490814	0.299836E-00	0.	0.110747E 01	0.245147E-00	0.52301E-01	0.26798E-02	0.
251	46.6301847	0.280684E-00	0.	0.111117E 01	0.243295E-00	0.49154E-01	0.26336E-02	0.
252	45.8254209	0.265327E-00	0.	0.111758E 01	0.241646E-00	0.46873E-01	0.25881E-02	0.
253	45.0345454	0.250699E-00	0.	0.112401E 01	0.240189E-00	0.44656E-01	0.25434E-02	0.
254	44.2573204	0.242580E-00	0.	0.112966E 01	0.238820E-00	0.43566E-01	0.24995E-02	0.
255	43.4935083	0.238354E-00	0.	0.113527E 01	0.237478E-00	0.43198E-01	0.24564E-02	0.
256	42.7428784	0.236035E-00	0.	0.114141E 01	0.236134E-00	0.43227E-01	0.24140E-02	0.
257	42.0052032	0.235084E-00	0.	0.114884E 01	0.234766E-00	0.43595E-01	0.23724E-02	0.
258	41.2802596	0.234420E-00	0.	0.115745E 01	0.233371E-00	0.44106E-01	0.23314E-02	0.
259	40.5678272	0.234073E-00	0.	0.116582E 01	0.231945E-00	0.44643E-01	0.22912E-02	0.
260	39.8676901	0.229104E-00	0.	0.122653E 01	0.229690E-00	0.45173E-01	0.11066E-02	0.
261	39.1796360	0.226565E-00	0.	0.123789E 01	0.227458E-00	0.45446E-01	0.10875E-02	0.
262	38.5034575	0.223294E-00	0.	0.124880E 01	0.225259E-00	0.45484E-01	0.10688E-02	0.
263	37.8389478	0.219732E-00	0.	0.125727E 01	0.223096E-00	0.45299E-01	0.10503E-02	0.
264	37.1859069	0.217578E-00	0.	0.126092E 01	0.220947E-00	0.45060E-01	0.10322E-02	0.
265	36.5441360	0.215560E-00	0.	0.126292E 01	0.218811E-00	0.44798E-01	0.10144E-02	0.
266	35.9134417	0.211734E-00	0.	0.126972E 01	0.216716E-00	0.44445E-01	0.99687E-03	0.
267	35.2936325	0.206720E-00	0.	0.128137E 01	0.214680E-00	0.44114E-01	0.97966E-03	0.
268	34.6845193	0.201213E-00	0.	0.129682E 01	0.212712E-00	0.43856E-01	0.96276E-03	0.
269	34.0859189	0.196254E-00	0.	0.131393E 01	0.210804E-00	0.43765E-01	0.94614E-03	0.
270	33.4976497	0.190523E-00	0.	0.133667E 01	0.208970E-00	0.43794E-01	0.92981E-03	0.
271	32.9195323	0.184575E-00	0.	0.136470E 01	0.207212E-00	0.43936E-01	0.91377E-03	0.
272	32.3513927	0.179638E-00	0.	0.139194E 01	0.205517E-00	0.44182E-01	0.89800E-03	0.
273	31.7930586	0.172524E-00	0.	0.143138E 01	0.203916E-00	0.44516E-01	0.88250E-03	0.
274	31.2443604	0.163030E-00	0.	0.149188E 01	0.202449E-00	0.44996E-01	0.86727E-03	0.
275	30.7051320	0.149694E-00	0.	0.158694E 01	0.201171E-00	0.45624E-01	0.85230E-03	0.
276	30.1752093	0.134110E-00	0.	0.172899E 01	0.200118E-00	0.46536E-01	0.83759E-03	0.
277	29.6544325	0.105455E-00	0.	0.207225E 01	0.199478E-00	0.47951E-01	0.82313E-03	0.
278	29.1426437	0.783384E-01	0.	0.268763E 01	0.199221E-00	0.49970E-01	0.80893E-03	0.
279	28.6396875	0.643822E-01	0.	0.332675E 01	0.199151E-00	0.52891E-01	0.79497E-03	0.
280	28.1454113	0.632993E-01	0.	0.360395E 01	0.199086E-00	0.56356E-01	0.78125E-03	0.

281	27.6596653	0.683854E-01	0.	0.358816E 01	0.198939E-00	0.60647E-01	0.76777E-03	0.
282	27.1823034	0.981148E-01	0.	0.288457E 01	0.198364E-00	0.63959E-01	0.75451E-03	0.
283	26.7131793	0.179209E-00	0.	0.186191E 01	0.196596E-00	0.66320E-01	0.74149E-03	0.
284	26.2521515	0.264369E-00	0.	0.140843E 01	0.193514E-00	0.65215E-01	0.72870E-03	0.
285	25.7990806	0.313209E-00	0.	0.121825E 01	0.189630E-00	0.60783E-01	0.71612E-03	0.
286	25.3538291	0.303747E-00	0.	0.111605E 01	0.185819E-00	0.50142E-01	0.70376E-03	0.
287	24.9162617	0.264866E-00	0.	0.107415E 01	0.182551E-00	0.40815E-01	0.69162E-03	0.
288	24.4862459	0.212268E-00	0.	0.111719E 01	0.179758E-00	0.33660E-01	0.11498E-02	0.
289	24.0636516	0.177788E-00	0.	0.113656E 01	0.177592E-00	0.28993E-01	0.11300E-02	0.
290	23.6483510	0.161688E-00	0.	0.114871E 01	0.175709E-00	0.26853E-01	0.11105E-02	0.
291	23.2402172	0.161080E-00	0.	0.115183E 01	0.173819E-00	0.26857E-01	0.10913E-02	0.
292	22.8391273	0.164932E-00	0.	0.115009E 01	0.171838E-00	0.27485E-01	0.10725E-02	0.
293	22.4449599	0.166911E-00	0.	0.115547E 01	0.169804E-00	0.28135E-01	0.10540E-02	0.
294	22.0575955	0.168297E-00	0.	0.116519E 01	0.167729E-00	0.28878E-01	0.10358E-02	0.
295	21.6769159	0.169577E-00	0.	0.117513E 01	0.165615E-00	0.29613E-01	0.10179E-02	0.
296	21.3028061	0.171456E-00	0.	0.118414E 01	0.163452E-00	0.30418E-01	0.10003E-02	0.
297	20.9351532	0.171904E-00	0.	0.119352E 01	0.161266E-00	0.30990E-01	0.98308E-03	0.
298	20.5738454	0.169697E-00	0.	0.120296E 01	0.159106E-00	0.31059E-01	0.96611E-03	0.
299	20.2187731	0.165578E-00	0.	0.121044E 01	0.157008E-00	0.30652E-01	0.94944E-03	0.
300	19.8698287	0.160494E-00	0.	0.121690E 01	0.154988E-00	0.30002E-01	0.93305E-03	0.
301	19.5269065	0.155558E-00	0.	0.122317E 01	0.153045E-00	0.29351E-01	0.91695E-03	0.
302	19.1899028	0.150913E-00	0.	0.123138E 01	0.151173E-00	0.28840E-01	0.90112E-03	0.
303	18.8587151	0.146615E-00	0.	0.124333E 01	0.149368E-00	0.28531E-01	0.88557E-03	0.
304	18.5332432	0.143156E-00	0.	0.125670E 01	0.147613E-00	0.28412E-01	0.87029E-03	0.
305	18.2133887	0.139830E-00	0.	0.127248E 01	0.145908E-00	0.28408E-01	0.85527E-03	0.
306	17.8990541	0.136434E-00	0.	0.129158E 01	0.144254E-00	0.28481E-01	0.84051E-03	0.
307	17.5901444	0.132905E-00	0.	0.131333E 01	0.142654E-00	0.28594E-01	0.82600E-03	0.
308	17.2865663	0.129387E-00	0.	0.133736E 01	0.141109E-00	0.28739E-01	0.81175E-03	0.
309	16.9882271	0.126218E-00	0.	0.136185E 01	0.139611E-00	0.28934E-01	0.79774E-03	0.
310	16.6950369	0.122501E-00	0.	0.139078E 01	0.138172E-00	0.29134E-01	0.78397E-03	0.
311	16.4069068	0.118648E-00	0.	0.142370E 01	0.136793E-00	0.29349E-01	0.77044E-03	0.
312	16.1237493	0.115134E-00	0.	0.145621E 01	0.135470E-00	0.29567E-01	0.75714E-03	0.
313	15.8454785	0.112165E-00	0.	0.148703E 01	0.134191E-00	0.29802E-01	0.74408E-03	0.
314	15.5720106	0.110771E-00	0.	0.150783E 01	0.132926E-00	0.30071E-01	0.73123E-03	0.
315	15.3032621	0.111562E-00	0.	0.150889E 01	0.131635E-00	0.30284E-01	0.71861E-03	0.
316	15.0391518	0.114380E-00	0.	0.148947E 01	0.130279E-00	0.30385E-01	0.70621E-03	0.
317	14.7795994	0.118005E-00	0.	0.148778E 01	0.128731E-00	0.30281E-01	0.60456E-03	0.
318	14.5245271	0.122632E-00	0.	0.144271E 01	0.127082E-00	0.29858E-01	0.59412E-03	0.
319	14.2738564	0.124854E-00	0.	0.140493E 01	0.125377E-00	0.29110E-01	0.58387E-03	0.
320	14.0275121	0.122122E-00	0.	0.139286E 01	0.123710E-00	0.28112E-01	0.57379E-03	0.
321	13.7854191	0.116855E-00	0.	0.139756E 01	0.122130E-00	0.27067E-01	0.56389E-03	0.
322	13.5475044	0.111293E-00	0.	0.140890E 01	0.120645E-00	0.26152E-01	0.55416E-03	0.
323	13.3136957	0.107010E-00	0.	0.142242E 01	0.119230E-00	0.25558E-01	0.54459E-03	0.
324	13.0839221	0.104583E-00	0.	0.143063E 01	0.117851E-00	0.25214E-01	0.53519E-03	0.
325	12.8581141	0.103177E-00	0.	0.143381E 01	0.116488E-00	0.24971E-01	0.52596E-03	0.
326	12.6362034	0.102792E-00	0.	0.143138E 01	0.115124E-00	0.24799E-01	0.51688E-03	0.
327	12.4181222	0.102862E-00	0.	0.142420E 01	0.113748E-00	0.24615E-01	0.50796E-03	0.
328	12.2038051	0.102390E-00	0.	0.141926E 01	0.112372E-00	0.24376E-01	0.49919E-03	0.
329	11.9931865	0.101361E-00	0.	0.141740E 01	0.111006E-00	0.24089E-01	0.49058E-03	0.
330	11.7862029	0.100326E-00	0.	0.141430E 01	0.109650E-00	0.23753E-01	0.48211E-03	0.
331	11.5827914	0.995157E-01	0.	0.140871E 01	0.108300E-00	0.23407E-01	0.47379E-03	0.
332	11.3828907	0.983829E-01	0.	0.140440E 01	0.106961E-00	0.23032E-01	0.46561E-03	0.
333	11.1864399	0.968340E-01	0.	0.140213E 01	0.105643E-00	0.22613E-01	0.45758E-03	0.
334	10.9933795	0.948594E-01	0.	0.140231E 01	0.104354E-00	0.22169E-01	0.44968E-03	0.
335	10.8036509	0.928281E-01	0.	0.140469E 01	0.103094E-00	0.21763E-01	0.44192E-03	0.
336	10.6171968	0.904102E-01	0.	0.141215E 01	0.101871E-00	0.21414E-01	0.43429E-03	0.
337	10.4339607	0.868752E-01	0.	0.143272E 01	0.100708E-00	0.21128E-01	0.42680E-03	0.

338	10.2538869	0.856702E-01	0.	0.143999E 01	0.995603E-01	0.20944E-01	0.41943E-03	0.
339	10.0769210	0.860824E-01	0.	0.142968E 01	0.983968E-01	0.20815E-01	0.41219E-03	0.
340	9.9030089	0.854415E-01	0.	0.142907E 01	0.972379E-01	0.20676E-01	0.40508E-03	0.
341	9.7320986	0.838762E-01	0.	0.143677E 01	0.961014E-01	0.20500E-01	0.39809E-03	0.
342	9.5641379	0.815143E-01	0.	0.144765E 01	0.950022E-01	0.20186E-01	0.39122E-03	0.
343	9.3990759	0.795424E-01	0.	0.145948E 01	0.939335E-01	0.19977E-01	0.38447E-03	0.
344	9.2368625	0.778367E-01	0.	0.147167E 01	0.928903E-01	0.19830E-01	0.37783E-03	0.
345	9.0774486	0.762287E-01	0.	0.148395E 01	0.918710E-01	0.19698E-01	0.37131E-03	0.
346	8.9207863	0.721728E-01	0.	0.152294E 01	0.908935E-01	0.19575E-01	0.23477E-03	0.
347	8.7668275	0.692058E-01	0.	0.156364E 01	0.899648E-01	0.19518E-01	0.23072E-03	0.
348	8.6155257	0.672684E-01	0.	0.159162E 01	0.890663E-01	0.19557E-01	0.22674E-03	0.
349	8.4668353	0.656014E-01	0.	0.162301E 01	0.881937E-01	0.19651E-01	0.22282E-03	0.
350	8.3207110	0.634663E-01	0.	0.166583E 01	0.873553E-01	0.19862E-01	0.21898E-03	0.
351	8.1771085	0.608706E-01	0.	0.171760E 01	0.865590E-01	0.19941E-01	0.21520E-03	0.
352	8.0359843	0.591442E-01	0.	0.176193E 01	0.857898E-01	0.20153E-01	0.21148E-03	0.
353	7.8972959	0.567949E-01	0.	0.181958E 01	0.850584E-01	0.20333E-01	0.20783E-03	0.
354	7.7610010	0.544327E-01	0.	0.188892E 01	0.843651E-01	0.20596E-01	0.20425E-03	0.
355	7.6270582	0.520275E-01	0.	0.196209E 01	0.837103E-01	0.20803E-01	0.20072E-03	0.
356	7.4954272	0.499325E-01	0.	0.203749E 01	0.830889E-01	0.21068E-01	0.19726E-03	0.
357	7.3660678	0.489441E-01	0.	0.209093E 01	0.824817E-01	0.21373E-01	0.19385E-03	0.
358	7.2389411	0.490624E-01	0.	0.210814E 01	0.818697E-01	0.21649E-01	0.19051E-03	0.
359	7.1140084	0.493288E-01	0.	0.211345E 01	0.812502E-01	0.21853E-01	0.18722E-03	0.
360	6.9912317	0.493650E-01	0.	0.211976E 01	0.806270E-01	0.21964E-01	0.18399E-03	0.
361	6.8705740	0.493842E-01	0.	0.211835E 01	0.800003E-01	0.21942E-01	0.18081E-03	0.
362	6.7519987	0.512150E-01	0.	0.206402E 01	0.793390E-01	0.21849E-01	0.17769E-03	0.
363	6.6354699	0.527290E-01	0.	0.200473E 01	0.786480E-01	0.21683E-01	0.17463E-03	0.
364	6.5209521	0.585505E-01	0.	0.186371E 01	0.778532E-01	0.21369E-01	0.17161E-03	0.
365	6.4084105	0.626198E-01	0.	0.173410E 01	0.769821E-01	0.20856E-01	0.16865E-03	0.
366	6.2978116	0.594238E-01	0.	0.174259E 01	0.761617E-01	0.19947E-01	0.16574E-03	0.
367	6.1891211	0.568865E-01	0.	0.174948E 01	0.753807E-01	0.19196E-01	0.16288E-03	0.
368	6.0823066	0.529413E-01	0.	0.176673E 01	0.746632E-01	0.18163E-01	0.16007E-03	0.
369	5.9773355	0.512984E-01	0.	0.179020E 01	0.739710E-01	0.17931E-01	0.15731E-03	0.
370	5.8741761	0.500861E-01	0.	0.180134E 01	0.732966E-01	0.17670E-01	0.15459E-03	0.
371	5.7727970	0.496963E-01	0.	0.179855E 01	0.726258E-01	0.17471E-01	0.15192E-03	0.
372	5.6731676	0.494015E-01	0.	0.179828E 01	0.719574E-01	0.17397E-01	0.14930E-03	0.
373	5.5752577	0.492722E-01	0.	0.179642E 01	0.712884E-01	0.17296E-01	0.14672E-03	0.
374	5.4790374	0.497708E-01	0.	0.177751E 01	0.706079E-01	0.17197E-01	0.14419E-03	0.
375	5.3844778	0.504695E-01	0.	0.175165E 01	0.699124E-01	0.17050E-01	0.14170E-03	0.
376	5.2915502	0.509514E-01	0.	0.172941E 01	0.692055E-01	0.16906E-01	0.13926E-03	0.
377	5.2002262	0.504576E-01	0.	0.172205E 01	0.685041E-01	0.16650E-01	0.13685E-03	0.
378	5.1104786	0.502916E-01	0.	0.170838E 01	0.678025E-01	0.16372E-01	0.13449E-03	0.
379	5.0222797	0.499624E-01	0.	0.169186E 01	0.671034E-01	0.16050E-01	0.13217E-03	0.
380	4.9356031	0.492952E-01	0.	0.168324E 01	0.664128E-01	0.15723E-01	0.12989E-03	0.
381	4.8504223	0.482785E-01	0.	0.168119E 01	0.657367E-01	0.15391E-01	0.12765E-03	0.
382	4.7667116	0.473396E-01	0.	0.167809E 01	0.650740E-01	0.15039E-01	0.12545E-03	0.
383	4.6844457	0.464693E-01	0.	0.167631E 01	0.644235E-01	0.14762E-01	0.12328E-03	0.
384	4.6035995	0.449679E-01	0.	0.169279E 01	0.637965E-01	0.14525E-01	0.12115E-03	0.
385	4.5241485	0.437669E-01	0.	0.170961E 01	0.631881E-01	0.14345E-01	0.11906E-03	0.
386	4.4460689	0.435255E-01	0.	0.170501E 01	0.625814E-01	0.14191E-01	0.11701E-03	0.
387	4.3693367	0.434515E-01	0.	0.169636E 01	0.619736E-01	0.14084E-01	0.11499E-03	0.
388	4.2939287	0.427972E-01	0.	0.170288E 01	0.613749E-01	0.13970E-01	0.11300E-03	0.
389	4.2198223	0.413658E-01	0.	0.172571E 01	0.607989E-01	0.13809E-01	0.11105E-03	0.
390	4.1469948	0.401129E-01	0.	0.174731E 01	0.602425E-01	0.13633E-01	0.10914E-03	0.
391	4.0754241	0.396095E-01	0.	0.175320E 01	0.596927E-01	0.13533E-01	0.10725E-03	0.
392	4.0050887	0.390562E-01	0.	0.175918E 01	0.591504E-01	0.13431E-01	0.10540E-03	0.
393	3.9359672	0.372333E-01	0.	0.183898E 01	0.583396E-01	0.13329E-01	0.14947E-03	0.
394	3.8680386	0.359817E-01	0.	0.186061E 01	0.575589E-01	0.13119E-01	0.14689E-03	0.

395	3.8012823	0.349252E-01	0.	0.187574E 01	0.568030E-01	0.12903E-01	0.14435E-03	0.
396	3.7356781	0.341432E-01	0.	0.188227E 01	0.560649E-01	0.12686E-01	0.14186E-03	0.
397	3.6712062	0.324645E-01	0.	0.191816E 01	0.553675E-01	0.12476E-01	0.13941E-03	0.
398	3.6078469	0.294733E-01	0.	0.201060E 01	0.547106E-01	0.12223E-01	0.13701E-03	0.
399	3.5455811	0.265097E-01	0.	0.211693E 01	0.541239E-01	0.11910E-01	0.13464E-03	0.
400	3.4843900	0.233300E-01	0.	0.225538E 01	0.536116E-01	0.11539E-01	0.13232E-03	0.
401	3.4242549	0.203934E-01	0.	0.241824E 01	0.531701E-01	0.11156E-01	0.13003E-03	0.
402	3.3651576	0.186324E-01	0.	0.252199E 01	0.527734E-01	0.10800E-01	0.12779E-03	0.
403	3.3070802	0.172263E-01	0.	0.261658E 01	0.524079E-01	0.10525E-01	0.12558E-03	0.
404	3.2500052	0.154272E-01	0.	0.279692E 01	0.520828E-01	0.10334E-01	0.12342E-03	0.
405	3.1939152	0.142148E-01	0.	0.295334E 01	0.517876E-01	0.10222E-01	0.12129E-03	0.
406	3.1387933	0.129804E-01	0.	0.314822E 01	0.515165E-01	0.10175E-01	0.11919E-03	0.
407	3.0846226	0.117177E-01	0.	0.340995E 01	0.512746E-01	0.10165E-01	0.11714E-03	0.
408	3.0313869	0.963392E-02	0.	0.396873E 01	0.510723E-01	0.10147E-01	0.11512E-03	0.
409	2.9790698	0.745644E-02	0.	0.489745E 01	0.509209E-01	0.10084E-01	0.11313E-03	0.
410	2.9276558	0.600245E-02	0.	0.586901E 01	0.508038E-01	0.99922E-02	0.11118E-03	0.
411	2.8771290	0.633606E-02	0.	0.560142E 01	0.506975E-01	0.98617E-02	0.10926E-03	0.
412	2.8274743	0.868405E-02	0.	0.424895E 01	0.505369E-01	0.97666E-02	0.10737E-03	0.
413	2.7786765	0.124737E-01	0.	0.318330E 01	0.502859E-01	0.97979E-02	0.10552E-03	0.
414	2.7307209	0.153275E-01	0.	0.272991E 01	0.499497E-01	0.99397E-02	0.10370E-03	0.
415	2.6835930	0.166555E-01	0.	0.260695E 01	0.495839E-01	0.10110E-01	0.10191E-03	0.
416	2.6372783	0.214431E-01	0.	0.222108E 01	0.491088E-01	0.10307E-01	0.10015E-03	0.
417	2.5917630	0.288175E-01	0.	0.184501E 01	0.484638E-01	0.10455E-01	0.98421E-04	0.
418	2.5470333	0.334819E-01	0.	0.170010E 01	0.476937E-01	0.10641E-01	0.96722E-04	0.
419	2.5030755	0.356898E-01	0.	0.164729E 01	0.468636E-01	0.10749E-01	0.95053E-04	0.
420	2.4598763	0.372370E-01	0.	0.161012E 01	0.459907E-01	0.10774E-01	0.93412E-04	0.
421	2.4174227	0.375131E-01	0.	0.158314E 01	0.451084E-01	0.10535E-01	0.91800E-04	0.
422	2.3757018	0.369569E-01	0.	0.157166E 01	0.442385E-01	0.10247E-01	0.90216E-04	0.
423	2.3347009	0.360362E-01	0.	0.156528E 01	0.433909E-01	0.99143E-02	0.88659E-04	0.
424	2.2944076	0.354834E-01	0.	0.155714E 01	0.425559E-01	0.96679E-02	0.87129E-04	0.
425	2.2548098	0.343457E-01	0.	0.155101E 01	0.417488E-01	0.92888E-02	0.85625E-04	0.
426	2.2158953	0.330027E-01	0.	0.154694E 01	0.409750E-01	0.88801E-02	0.84147E-04	0.
427	2.1776524	0.322587E-01	0.	0.154236E 01	0.402190E-01	0.86300E-02	0.82695E-04	0.
428	2.1400695	0.318214E-01	0.	0.153804E 01	0.394729E-01	0.84689E-02	0.81268E-04	0.
429	2.1031353	0.314282E-01	0.	0.153553E 01	0.387355E-01	0.83390E-02	0.79865E-04	0.
430	2.0668385	0.310650E-01	0.	0.153504E 01	0.380062E-01	0.82383E-02	0.78487E-04	0.
431	2.0311681	0.307141E-01	0.	0.153515E 01	0.372846E-01	0.81445E-02	0.77132E-04	0.
432	1.9961133	0.303145E-01	0.	0.153455E 01	0.365721E-01	0.80325E-02	0.75801E-04	0.
433	1.9616635	0.298073E-01	0.	0.153466E 01	0.358715E-01	0.78989E-02	0.74493E-04	0.
434	1.9278083	0.292741E-01	0.	0.153477E 01	0.351835E-01	0.77566E-02	0.73207E-04	0.
435	1.8945373	0.287472E-01	0.	0.153366E 01	0.345080E-01	0.76056E-02	0.71944E-04	0.
436	1.8618406	0.282091E-01	0.	0.153261E 01	0.338451E-01	0.74533E-02	0.70702E-04	0.
437	1.8297082	0.276642E-01	0.	0.153220E 01	0.331952E-01	0.73048E-02	0.69482E-04	0.
438	1.7981303	0.271253E-01	0.	0.153196E 01	0.325581E-01	0.71596E-02	0.68283E-04	0.
439	1.7670974	0.265657E-01	0.	0.153295E 01	0.319345E-01	0.70197E-02	0.67104E-04	0.
440	1.7366000	0.260412E-01	0.	0.153417E 01	0.313233E-01	0.68883E-02	0.65946E-04	0.
441	1.7066290	0.255768E-01	0.	0.153426E 01	0.307231E-01	0.67648E-02	0.64808E-04	0.
442	1.6771753	0.251008E-01	0.	0.153516E 01	0.301342E-01	0.66457E-02	0.63690E-04	0.
443	1.6482299	0.246492E-01	0.	0.153605E 01	0.295559E-01	0.65305E-02	0.62591E-04	0.
444	1.6197840	0.242278E-01	0.	0.153568E 01	0.289876E-01	0.64151E-02	0.61510E-04	0.
445	1.5918291	0.237881E-01	0.	0.153593E 01	0.284296E-01	0.63004E-02	0.60449E-04	0.
446	1.5643566	0.233534E-01	0.	0.153649E 01	0.278819E-01	0.61881E-02	0.59405E-04	0.
447	1.5373583	0.229201E-01	0.	0.153659E 01	0.273444E-01	0.60735E-02	0.58380E-04	0.
448	1.5108259	0.224780E-01	0.	0.153715E 01	0.268174E-01	0.59599E-02	0.57373E-04	0.
449	1.4847514	0.220420E-01	0.	0.153789E 01	0.263008E-01	0.58483E-02	0.56383E-04	0.
450	1.4591269	0.216018E-01	0.	0.153881E 01	0.257947E-01	0.57374E-02	0.55410E-04	0.
451	1.4339447	0.211623E-01	0.	0.154019E 01	0.252991E-01	0.56289E-02	0.54453E-04	0.

452	1.4091970	0.207148E-01	0.	0.154238E 01	0.248142E-01	0.55236E-02	0.53513E-04	0.
453	1.3848765	0.202844E-01	0.	0.154457E 01	0.243397E-01	0.54207E-02	0.52590E-04	0.
454	1.3609757	0.198879E-01	0.	0.154595E 01	0.238745E-01	0.53226E-02	0.51682E-04	0.
455	1.3374874	0.195028E-01	0.	0.154733E 01	0.234185E-01	0.52271E-02	0.50790E-04	0.
456	1.3144045	0.191286E-01	0.	0.154870E 01	0.229714E-01	0.51343E-02	0.49914E-04	0.
457	1.2917199	0.187564E-01	0.	0.155008E 01	0.225331E-01	0.50418E-02	0.49052E-04	0.
458	1.2694268	0.183928E-01	0.	0.155146E 01	0.221035E-01	0.49512E-02	0.48206E-04	0.
459	1.2475185	0.180362E-01	0.	0.155284E 01	0.216823E-01	0.48623E-02	0.47374E-04	0.
460	1.2259883	0.176723E-01	0.	0.155483E 01	0.212697E-01	0.47746E-02	0.46556E-04	0.
461	1.2048297	0.173193E-01	0.	0.155682E 01	0.208656E-01	0.46887E-02	0.45753E-04	0.
462	1.1840362	0.169674E-01	0.	0.155901E 01	0.204699E-01	0.46046E-02	0.44963E-04	0.
463	1.1636016	0.166285E-01	0.	0.156120E 01	0.200822E-01	0.45225E-02	0.44187E-04	0.
464	1.1435197	0.163121E-01	0.	0.156257E 01	0.19702CE-01	0.44428E-02	0.43424E-04	0.
465	1.1237843	0.159972E-01	0.	0.156401E 01	0.193293E-01	0.43636E-02	0.42675E-04	0.
466	1.1043895	0.156889E-01	0.	0.156557E 01	0.189638E-01	0.42866E-02	0.41939E-04	0.
467	1.0853295	0.153655E-01	0.	0.156801E 01	0.186061E-01	0.42096E-02	0.41215E-04	0.
468	1.0665984	0.150545E-01	0.	0.157044E 01	0.182558E-01	0.41345E-02	0.40503E-04	0.
469	1.0481906	0.147622E-01	0.	0.157206E 01	0.179123E-01	0.40611E-02	0.39804E-04	0.
470	1.0301005	0.144756E-01	0.	0.157368E 01	0.175757E-01	0.39891E-02	0.39117E-04	0.
471	1.0123226	0.141883E-01	0.	0.157576E 01	0.172458E-01	0.39187E-02	0.38442E-04	0.
472	0.9948515	0.135935E-01	0.	0.176017E 01	0.168428E-01	0.38486E-02	0.11707E-03	0.
473	0.9776819	0.132771E-01	0.	0.176179E 01	0.164499E-01	0.37648E-02	0.11505E-03	0.
474	0.9608086	0.129514E-01	0.	0.176407E 01	0.160675E-01	0.36805E-02	0.11306E-03	0.
475	0.9442266	0.126296E-01	0.	0.176615E 01	0.156955E-01	0.35956E-02	0.11111E-03	0.
476	0.9279307	0.123268E-01	0.	0.176778E 01	0.153331E-01	0.35145E-02	0.10919E-03	0.
477	0.9119161	0.120457E-01	0.	0.176940E 01	0.149796E-01	0.34395E-02	0.10731E-03	0.
478	0.8961778	0.117637E-01	0.	0.177148E 01	0.146351E-01	0.33657E-02	0.10546E-03	0.
479	0.8807112	0.114884E-01	0.	0.177356E 01	0.142993E-01	0.32931E-02	0.10364E-03	0.
480	0.8655115	0.112251E-01	0.	0.177518E 01	0.139718E-01	0.32224E-02	0.10185E-03	0.
481	0.8505741	0.109615E-01	0.	0.177726E 01	0.136527E-01	0.31530E-02	0.10009E-03	0.
482	0.8358946	0.107056E-01	0.	0.177934E 01	0.133416E-01	0.30851E-02	0.98362E-04	0.
483	0.8214683	0.104520E-01	0.	0.178142E 01	0.130386E-01	0.30179E-02	0.96664E-04	0.
484	0.8072911	0.102049E-01	0.	0.178350E 01	0.127433E-01	0.29520E-02	0.94996E-04	0.
485	0.7933585	0.997587E-02	0.	0.178431E 01	0.124552E-01	0.28873E-02	0.93356E-04	0.
486	0.7796664	0.975281E-02	0.	0.178477E 01	0.121740E-01	0.28237E-02	0.91745E-04	0.
487	0.7662106	0.952919E-02	0.	0.178603E 01	0.118997E-01	0.27622E-02	0.90162E-04	0.
488	0.7529870	0.931422E-02	0.	0.178684E 01	0.116322E-01	0.27013E-02	0.88606E-04	0.
489	0.7399916	0.910527E-02	0.	0.178725E 01	0.113711E-01	0.26414E-02	0.87077E-04	0.
490	0.7272205	0.888757E-02	0.	0.178927E 01	0.111168E-01	0.25834E-02	0.85574E-04	0.
491	0.7146698	0.868316E-02	0.	0.179089E 01	0.108689E-01	0.25270E-02	0.84097E-04	0.
492	0.7023357	0.847485E-02	0.	0.179297E 01	0.106275E-01	0.24718E-02	0.82645E-04	0.
493	0.6902145	0.827971E-02	0.	0.179505E 01	0.103922E-01	0.24187E-02	0.81219E-04	0.
494	0.6783025	0.808746E-02	0.	0.179713E 01	0.101628E-01	0.23677E-02	0.79817E-04	0.
495	0.6665961	0.788776E-02	0.	0.180083E 01	0.993967E-02	0.23171E-02	0.78440E-04	0.
496	0.6550917	0.771637E-02	0.	0.180245E 01	0.972178E-02	0.22695E-02	0.77086E-04	0.
497	0.6437858	0.753814E-02	0.	0.180453E 01	0.950938E-02	0.22219E-02	0.75756E-04	0.
498	0.6326751	0.737308E-02	0.	0.180661E 01	0.930200E-02	0.21767E-02	0.74448E-04	0.
499	0.6217561	0.722188E-02	0.	0.180661E 01	0.909911E-02	0.21318E-02	0.73163E-04	0.
500	0.6110256	0.705422E-02	0.	0.180869E 01	0.890138E-02	0.20869E-02	0.71901E-04	0.
501	0.6004802	0.689780E-02	0.	0.181077E 01	0.870839E-02	0.20438E-02	0.70660E-04	0.
502	0.5901169	0.674925E-02	0.	0.181123E 01	0.851987E-02	0.20005E-02	0.69440E-04	0.
503	0.5799324	0.660229E-02	0.	0.181215E 01	0.833577E-02	0.19584E-02	0.68242E-04	0.
504	0.5699237	0.646389E-02	0.	0.181261E 01	0.815578E-02	0.19179E-02	0.67064E-04	0.
505	0.5600877	0.632300E-02	0.	0.181306E 01	0.798002E-02	0.18768E-02	0.65907E-04	0.
506	0.5504214	0.617629E-02	0.	0.181514E 01	0.780875E-02	0.18369E-02	0.64769E-04	0.
507	0.5409220	0.603570E-02	0.	0.181722E 01	0.764173E-02	0.17981E-02	0.63651E-04	0.
508	0.5315866	0.590766E-02	0.	0.181768E 01	0.747852E-02	0.17604E-02	0.62553E-04	0.

509	0.5224122	0.578301E-02	0.	0.181814E 01	0.731898E-02	0.17239E-02	0.61473E-04	0.
510	0.5133962	0.566255E-02	0.	0.181860E 01	0.716300E-02	0.16884E-02	0.60412E-04	0.
511	0.5045358	0.553175E-02	0.	0.182068E 01	0.701098E-02	0.16529E-02	0.59370E-04	0.
512	0.4958283	0.540795E-02	0.	0.182276E 01	0.686267E-02	0.16184E-02	0.58345E-04	0.
513	0.4872711	0.528845E-02	0.	0.182438E 01	0.671793E-02	0.15853E-02	0.57338E-04	0.
514	0.4788615	0.517407E-02	0.	0.182600E 01	0.657657E-02	0.15529E-02	0.56349E-04	0.
515	0.4705971	0.507151E-02	0.	0.182600E 01	0.643816E-02	0.15219E-02	0.55376E-04	0.
516	0.4624754	0.496512E-02	0.	0.182646E 01	0.630287E-02	0.14906E-02	0.54421E-04	0.
517	0.4544938	0.485583E-02	0.	0.182834E 01	0.617081E-02	0.14604E-02	0.53481E-04	0.
518	0.4466499	0.475053E-02	0.	0.182976E 01	0.604187E-02	0.14301E-02	0.52558E-04	0.
519	0.4389414	0.465395E-02	0.	0.182976E 01	0.591570E-02	0.14009E-02	0.51651E-04	0.
520	0.4313660	0.455745E-02	0.	0.183021E 01	0.579233E-02	0.13724E-02	0.50760E-04	0.
521	0.4239213	0.446380E-02	0.	0.183067E 01	0.567167E-02	0.13445E-02	0.49884E-04	0.
522	0.4166051	0.437181E-02	0.	0.183067E 01	0.555366E-02	0.13167E-02	0.49023E-04	0.
523	0.4094151	0.428207E-02	0.	0.183067E 01	0.543823E-02	0.12895E-02	0.48177E-04	0.
524	0.4023493	0.419219E-02	0.	0.183113E 01	0.532540E-02	0.12629E-02	0.47345E-04	0.
525	0.3954053	0.410410E-02	0.	0.183159E 01	0.521513E-02	0.12366E-02	0.46528E-04	0.
526	0.3885813	0.401982E-02	0.	0.183159E 01	0.510727E-02	0.12111E-02	0.45725E-04	0.
527	0.3818750	0.393066E-02	0.	0.183321E 01	0.500203E-02	0.11861E-02	0.44936E-04	0.
528	0.3752844	0.384613E-02	0.	0.183483E 01	0.489926E-02	0.11620E-02	0.44161E-04	0.
529	0.3688076	0.376864E-02	0.	0.183483E 01	0.479868E-02	0.11385E-02	0.43398E-04	0.
530	0.3624425	0.369126E-02	0.	0.183529E 01	0.470031E-02	0.11155E-02	0.42649E-04	0.
531	0.3561874	0.361696E-02	0.	0.183575E 01	0.460404E-02	0.10933E-02	0.41913E-04	0.
532	0.3500401	0.354377E-02	0.	0.183575E 01	0.450985E-02	0.10711E-02	0.41190E-04	0.
533	0.3439990	0.347246E-02	0.	0.183575E 01	0.441767E-02	0.10494E-02	0.40479E-04	0.
534	0.3380621	0.340275E-02	0.	0.183575E 01	0.432745E-02	0.10282E-02	0.39780E-04	0.
535	0.3322277	0.333214E-02	0.	0.183621E 01	0.423925E-02	0.10073E-02	0.39094E-04	0.
536	0.3264939	0.326354E-02	0.	0.183667E 01	0.415299E-02	0.98679E-03	0.38419E-04	0.
537	0.3208592	0.319220E-02	0.	0.183829E 01	0.406880E-02	0.96679E-03	0.37756E-04	0.
538	0.3153216	0.312432E-02	0.	0.183991E 01	0.398655E-02	0.94734E-03	0.37105E-04	0.
539	0.3098797	0.306277E-02	0.	0.183991E 01	0.390602E-02	0.92859E-03	0.36464E-04	0.
540	0.3045316	0.300222E-02	0.	0.183991E 01	0.382717E-02	0.91014E-03	0.35835E-04	0.
541	0.2992759	0.263156E-02	0.	0.207491E 01	0.366537E-02	0.89230E-03	0.28709E-04	0.
542	0.2941109	0.252320E-02	0.	0.207861E 01	0.351092E-02	0.85757E-03	0.28213E-04	0.
543	0.2890350	0.241662E-02	0.	0.208023E 01	0.336370E-02	0.82162E-03	0.27726E-04	0.
544	0.2840467	0.230792E-02	0.	0.208023E 01	0.322388E-02	0.78389E-03	0.27248E-04	0.
545	0.2791445	0.220802E-02	0.	0.208185E 01	0.309082E-02	0.75045E-03	0.26778E-04	0.
546	0.2743269	0.212387E-02	0.	0.208347E 01	0.296339E-02	0.72216E-03	0.26315E-04	0.
547	0.2695924	0.204396E-02	0.	0.208347E 01	0.284129E-02	0.69445E-03	0.25861E-04	0.
548	0.2649397	0.196740E-02	0.	0.208347E 01	0.272428E-02	0.66792E-03	0.25415E-04	0.
549	0.2603673	0.189426E-02	0.	0.208347E 01	0.261214E-02	0.64258E-03	0.24976E-04	0.
550	0.2558737	0.182190E-02	0.	0.208347E 01	0.250479E-02	0.61751E-03	0.24545E-04	0.
551	0.2514577	0.174860E-02	0.	0.208509E 01	0.240234E-02	0.59306E-03	0.24122E-04	0.
552	0.2471180	0.167805E-02	0.	0.208671E 01	0.230457E-02	0.56925E-03	0.23705E-04	0.
553	0.2428531	0.161086E-02	0.	0.208671E 01	0.221126E-02	0.54592E-03	0.23296E-04	0.
554	0.2386618	0.154331E-02	0.	0.208753E 01	0.212244E-02	0.52287E-03	0.22894E-04	0.
555	0.2345429	0.147933E-02	0.	0.208915E 01	0.203786E-02	0.50135E-03	0.22499E-04	0.
556	0.2304951	0.142077E-02	0.	0.208996E 01	0.195712E-02	0.48129E-03	0.22111E-04	0.
557	0.2265171	0.136583E-02	0.	0.208996E 01	0.187999E-02	0.46220E-03	0.21729E-04	0.
558	0.2226078	0.131372E-02	0.	0.208996E 01	0.180625E-02	0.44412E-03	0.21354E-04	0.
559	0.2187659	0.126403E-02	0.	0.208996E 01	0.173573E-02	0.42688E-03	0.20986E-04	0.
560	0.2149903	0.121631E-02	0.	0.208996E 01	0.166831E-02	0.41033E-03	0.20623E-04	0.
561	0.2112799	0.117065E-02	0.	0.208996E 01	0.160384E-02	0.39451E-03	0.20268E-04	0.
562	0.2076336	0.112688E-02	0.	0.208996E 01	0.154219E-02	0.37935E-03	0.19918E-04	0.
563	0.2040502	0.108484E-02	0.	0.208996E 01	0.148324E-02	0.36480E-03	0.19574E-04	0.
564	0.2005286	0.104449E-02	0.	0.208996E 01	0.142687E-02	0.35084E-03	0.19236E-04	0.
565	0.1970678	0.100580E-02	0.	0.208996E 01	0.137297E-02	0.33746E-03	0.18904E-04	0.

566	0.1936667	0.968735E-03	0.	0.208996E 01	0.132142E-02	0.32466E-03	0.18578E-04	0.
567	0.1903243	0.933240E-03	0.	0.208996E 01	0.127213E-02	0.31240E-03	0.18257E-04	0.
568	0.1870396	0.899282E-03	0.	0.208996E 01	0.122497E-02	0.30069E-03	0.17942E-04	0.
569	0.1838116	0.866838E-03	0.	0.208996E 01	0.117986E-02	0.28950E-03	0.17633E-04	0.
570	0.1806393	0.835820E-03	0.	0.208996E 01	0.113669E-02	0.27881E-03	0.17328E-04	0.
571	0.1775217	0.806137E-03	0.	0.208996E 01	0.109536E-02	0.26860E-03	0.17029E-04	0.
572	0.1744580	0.777715E-03	0.	0.208996E 01	0.105580E-02	0.25882E-03	0.16735E-04	0.
573	0.1714471	0.750489E-03	0.	0.208996E 01	0.101792E-02	0.24946E-03	0.16446E-04	0.
574	0.1684882	0.724397E-03	0.	0.208996E 01	0.981650E-03	0.24050E-03	0.16163E-04	0.
575	0.1655804	0.699387E-03	0.	0.208996E 01	0.946908E-03	0.23192E-03	0.15884E-04	0.
576	0.1627227	0.675406E-03	0.	0.208996E 01	0.913628E-03	0.22370E-03	0.15610E-04	0.
577	0.1599144	0.652410E-03	0.	0.208996E 01	0.881743E-03	0.21582E-03	0.15340E-04	0.
578	0.1571545	0.630357E-03	0.	0.208996E 01	0.851190E-03	0.20827E-03	0.15075E-04	0.
579	0.1544423	0.609205E-03	0.	0.208996E 01	0.821907E-03	0.20103E-03	0.14815E-04	0.
580	0.1517768	0.588915E-03	0.	0.208996E 01	0.793838E-03	0.19410E-03	0.14560E-04	0.
581	0.1491574	0.569451E-03	0.	0.208996E 01	0.766926E-03	0.18746E-03	0.14308E-04	0.
582	0.1465832	0.550775E-03	0.	0.208996E 01	0.741119E-03	0.18109E-03	0.14061E-04	0.
583	0.1440534	0.532853E-03	0.	0.208996E 01	0.716366E-03	0.17498E-03	0.13819E-04	0.
584	0.1415672	0.515648E-03	0.	0.208996E 01	0.692621E-03	0.16912E-03	0.13580E-04	0.
585	0.1391240	0.499129E-03	0.	0.208996E 01	0.669837E-03	0.16350E-03	0.13346E-04	0.
586	0.1367230	0.483265E-03	0.	0.208996E 01	0.647971E-03	0.15811E-03	0.13115E-04	0.
587	0.1343633	0.468026E-03	0.	0.208996E 01	0.626982E-03	0.15294E-03	0.12889E-04	0.
588	0.1320444	0.453384E-03	0.	0.208996E 01	0.606830E-03	0.14797E-03	0.12667E-04	0.
589	0.1297655	0.439312E-03	0.	0.208996E 01	0.587478E-03	0.14321E-03	0.12448E-04	0.
590	0.1275260	0.425786E-03	0.	0.208996E 01	0.568890E-03	0.13863E-03	0.12233E-04	0.
591	0.1253251	0.412781E-03	0.	0.208996E 01	0.551033E-03	0.13423E-03	0.12022E-04	0.
592	0.1231622	0.400274E-03	0.	0.208996E 01	0.533874E-03	0.13001E-03	0.11815E-04	0.
593	0.1210366	0.388244E-03	0.	0.208996E 01	0.517381E-03	0.12595E-03	0.11611E-04	0.
594	0.1189477	0.376670E-03	0.	0.208996E 01	0.501526E-03	0.12205E-03	0.11410E-04	0.
595	0.1168948	0.365532E-03	0.	0.208996E 01	0.486280E-03	0.11830E-03	0.11213E-04	0.
596	0.1148774	0.354811E-03	0.	0.208996E 01	0.471616E-03	0.11469E-03	0.11020E-04	0.
597	0.1128948	0.344489E-03	0.	0.208996E 01	0.457510E-03	0.11123E-03	0.10830E-04	0.
598	0.1109464	0.334549E-03	0.	0.208996E 01	0.443936E-03	0.10789E-03	0.10643E-04	0.
599	0.1090317	0.324974E-03	0.	0.208996E 01	0.430872E-03	0.10468E-03	0.10459E-04	0.
600	0.1071500	0.315748E-03	0.	0.208996E 01	0.418295E-03	0.10160E-03	0.10279E-04	0.
601	0.1053007	0.306857E-03	0.	0.208996E 01	0.406184E-03	0.98622E-04	0.10101E-04	0.
602	0.1034834	0.298286E-03	0.	0.208996E 01	0.394519E-03	0.95760E-04	0.99269E-05	0.
603	0.1016974	0.290022E-03	0.	0.208996E 01	0.383281E-03	0.93003E-04	0.97556E-05	0.
604	0.0999423	0.282051E-03	0.	0.208996E 01	0.372452E-03	0.90347E-04	0.95872E-05	0.

HCBC EQUIVALENT

BUCKLING= 0.002406

GP	FLUX	FISSION SPECTRUM	NU SIGMA FISSION	3 SIGMA ABSORPTION	TRANSPORT	J TO J+1	INELASTICS 2	3	4	5	6
1	1.474159	0.132000	0.037210	0.083414	0.392549	0.019192	0.012683	0.014027	0.011521	0.006949	0.005720
2	2.999833	0.213000	0.033407	0.074863	0.431780	0.022990	0.010711	0.011885	0.008947	0.004764	0.003852
3	4.337990	0.232000	0.025658	0.068959	0.508626	0.036066	0.016850	0.003768	0.000635	0.001376	0.000189
4	5.642611	0.179000	0.009390	0.065391	0.704050	0.051440	0.005227	0.002350	0.000790	0.000395	-0.
5	12.387383	0.116000	0.007876	0.039203	0.642674	0.033846	0.000263	0.000136	0.000040	0.000036	-0.
6	8.945796	0.067000	0.007797	0.061168	0.978586	0.056270	0.000051	0.000019	0.000011	0.000006	0.000005
7	11.514845	0.034000	0.007653	0.047758	0.940791	0.042497	0.000008	0.000000	0.000000	0.000000	0.000002
8	11.164691	0.017000	0.007854	0.045141	1.014025	0.036071	0.002816	0.000002	0.000000	0.000000	-0.
9	8.590661	0.010000	0.008171	0.046325	1.114185	0.036802	0.000899	0.000618	0.000000	-0.	-0.
10	7.315114	0.	0.009048	0.045524	1.163945	0.034024	0.001067	0.000407	-0.	-0.	-0.
11	5.125207	0.	0.009048	0.048328	1.371260	0.038205	0.000000	-0.	-0.	-0.	-0.
12	4.287832	0.	0.010179	0.046803	1.246458	0.032923	-0.	-0.	-0.	-0.	-0.
13	2.856148	0.	0.010179	0.048787	1.425600	0.034827	-0.	-0.	-0.	-0.	-0.
14	2.433053	0.	0.011672	0.039527	1.773406	0.026971	-0.	-0.	-0.	-0.	-0.
15	1.830296	0.	0.017598	0.034436	1.697826	0.012014	-0.	-0.	-0.	-0.	-0.
16	0.475047	0.	0.034382	0.044949	1.798730	0.010409	-0.	-0.	-0.	-0.	-0.
17	0.063163	0.	0.074646	0.077131	2.086463	0.008109	-0.	-0.	-0.	-0.	-0.
18	0.005583	0.	0.069670	0.091154	4.065413	0.	0.	0.	0.	0.	0.

RE 196 ELMOE

S A M P L E P R O B L E M N O . 2

MATERIAL CONSTANTS

MATERIAL	AT.WT	ATOMS/CC(E-24)	VOL.FRAC.	MATRIX FOR TRANSFORMING LEGENDRE EXPS. COEFF.-CMS TO LAB (1,1)	(1,2)	(1,3)	(1,4)
1	12.011000	1.00000000	-0.	0.99583E 00	-0.33149E-01	0.17588E-02	-0.11722E-03
2	16.000000	1.00000000	0.03120000	0.99765E 00	-0.24927E-01	0.98550E-03	-0.52205E-04
3	22.991000	1.00000000	0.00330000	0.99886E 00	-0.17371E-01	0.46996E-03	-0.19865E-04
4	56.460000	1.00000000	0.01525000	0.99975E 00	-0.80007E-02	0.87558E-04	-0.34335E-05
5	238.000000	1.00000000	-0.				
6	239.000000	1.00000000	-0.				
7	238.000000	1.00000000	0.01403999				
8	239.000000	1.00000000	0.00156000				
9	238.000000	1.00000000	-0.				
10	239.000000	1.00000000	-0.				

R= 0.98274157

OPTION 1

MATERIAL	CALCULATED ALPHA
1	0.2816316E-00
2	0.2162987E-00
3	0.1597795E-00
4	0.6726708E-01

MATERIAL DEPENDENT ELASTIC REMOVAL CROSS SECTION

MATERIAL

GROUP	1	2	3	4
2	-0.	0.7829E-02	0.1056E-02	0.1501E-02
3	-0.	0.1759E-01	0.9204E-03	0.1558E-02
4	-0.	0.3532E-01	0.2039E-02	0.3405E-02
5	-0.	0.2115E-01	0.1652E-02	0.2705E-02
6	-0.	0.4344E-01	0.2417E-02	0.2512E-02
7	-0.	0.2776E-01	0.2569E-02	0.3432E-02
8	-0.	0.2521E-01	0.1766E-02	0.3556E-02
9	-0.	0.2495E-01	0.2142E-02	0.3463E-02
10	-0.	0.2492E-01	0.2022E-02	0.4773E-02
11	-0.	0.2782E-01	0.2907E-02	0.4896E-02
12	-0.	0.2019E-01	0.1895E-02	0.8288E-02
13	-0.	0.2263E-01	0.2743E-02	0.6785E-02
14	-0.	0.1374E-01	0.4817E-02	0.5635E-02
15	-0.	0.6497E-02	0.3957E-03	0.2234E-02
16	-0.	0.5218E-02	0.3170E-03	0.2126E-02
17	-0.	0.3792E-02	0.2279E-03	0.1557E-02

BUCKLING

INITIAL VALUE 0.2000000E-02

FINAL VALUE 0.2362230E-02

COARSE GROUP DATA

GROUP	FINE GROUP CORRESPONDENCE	FLUX	CURRENT/B	1/D	ELASTIC REMOVAL	ABSORPTION
1	0- 0	0.147599E 01	0.	0.39255E-00		0.
2	1- 29	0.300395E 01	0.	0.43176E-00	0.10385E-01	0.64480E-01
3	30- 58	0.434479E 01	0.	0.50862E 00	0.20069E-01	0.48890E-01
4	59- 86	0.565207E 01	0.	0.70404E 00	0.40760E-01	0.24633E-01
5	87-115	0.124196E 02	0.	0.64267E 00	0.25508E-01	0.13707E-01
6	116-144	0.897294E 01	0.	0.97857E 00	0.48369E-01	0.12802E-01
7	145-173	0.115559E 02	0.	0.94079E 00	0.33759E-01	0.14007E-01
8	174-202	0.112124E 02	0.	0.10140E 01	0.30537E-01	0.14613E-01
9	203-230	0.863374E 01	0.	0.11142E 01	0.30559E-01	0.15775E-01
10	231-259	0.735728E 01	0.	0.11639E 01	0.31716E-01	0.13817E-01
11	260-287	0.515829E 01	0.	0.13713E 01	0.35626E-01	0.12710E-01
12	288-316	0.431398E 01	0.	0.12464E 01	0.30372E-01	0.16490E-01
13	317-345	0.287096E 01	0.	0.14256E 01	0.32155E-01	0.16692E-01
14	346-392	0.243074E 01	0.	0.17735E 01	0.24195E-01	0.15595E-01
15	393-471	0.177067E 01	0.	0.17010E 01	0.91263E-02	0.26351E-01
16	472-540	0.424069E-00	0.	0.17981E 01	0.76611E-02	0.39950E-01
17	541-604	0.502290E-01	0.	0.20863E 01	0.55761E-02	0.77833E-01
18	0- 0	0.391853E-02	0.	0.40654E 01		0.

FINE GROUP DATA

GROUP	ENERGY	FLUX	CURRENT/B	3SIGMA (TRANSPORT)	SLOWING DOWN DENSITY	A	B	C
1	3621.0587158	0.382105E-01	0.	0.578167E 00	0.451400E-02	0.	0.12333E-02	0.
2	3558.5649109	0.461951E-01	0.	0.579073E 00	0.859055E-02	0.12619E-02	0.12120E-02	0.
3	3497.1496887	0.512367E-01	0.	0.583585E 00	0.124310E-01	0.20472E-02	0.11911E-02	0.
4	3436.7943420	0.551599E-01	0.	0.585475E 00	0.161091E-01	0.26620E-02	0.11705E-02	0.
5	3377.4806519	0.605770E-01	0.	0.565383E 00	0.195111E-01	0.31495E-02	0.11503E-02	0.
6	3319.1906738	0.630720E-01	0.	0.560325E 00	0.228407E-01	0.35423E-02	0.11304E-02	0.
7	3261.9066162	0.653477E-01	0.	0.562987E 00	0.261141E-01	0.39172E-02	0.11109E-02	0.
8	3205.6112366	0.728243E-01	0.	0.524412E 00	0.289477E-01	0.42771E-02	0.10918E-02	0.
9	3150.2874146	0.836936E-01	0.	0.475361E-00	0.310859E-01	0.46360E-02	0.10729E-02	0.
10	3095.9183960	0.928773E-01	0.	0.441149E-00	0.326409E-01	0.49230E-02	0.10544E-02	0.
11	3042.4877014	0.999186E-01	0.	0.423608E-00	0.337693E-01	0.52061E-02	0.10362E-02	0.
12	2989.9791260	0.104378E-00	0.	0.417609E-00	0.346610E-01	0.54914E-02	0.10183E-02	0.
13	2938.3767700	0.108357E-00	0.	0.417736E-00	0.353547E-01	0.58809E-02	0.10007E-02	0.
14	2887.6650391	0.113173E-00	0.	0.418482E-00	0.357891E-01	0.64163E-02	0.98348E-03	0.
15	2837.8284302	0.118372E-00	0.	0.418607E-00	0.359330E-01	0.69559E-02	0.96650E-03	0.
16	2788.8519592	0.120867E-00	0.	0.418965E-00	0.359728E-01	0.72122E-02	0.94982E-03	0.
17	2740.7207642	0.121902E-00	0.	0.423487E-00	0.360139E-01	0.74687E-02	0.93343E-03	0.
18	2693.4202271	0.123730E-00	0.	0.423092E-00	0.359892E-01	0.75829E-02	0.91732E-03	0.
19	2646.9360046	0.124358E-00	0.	0.425408E-00	0.359833E-01	0.76544E-02	0.90149E-03	0.
20	2601.2540283	0.124180E-00	0.	0.429421E-00	0.360515E-01	0.77379E-02	0.88593E-03	0.
21	2556.3604736	0.123838E-00	0.	0.434596E-00	0.362030E-01	0.77667E-02	0.87064E-03	0.
22	2512.2416992	0.123360E-00	0.	0.441315E-00	0.364455E-01	0.77634E-02	0.85561E-03	0.
23	2468.8843384	0.125945E-00	0.	0.429546E-00	0.365323E-01	0.76095E-02	0.84085E-03	0.
24	2426.2752686	0.133071E-00	0.	0.411907E-00	0.361285E-01	0.76800E-02	0.82634E-03	0.
25	2384.4015503	0.139422E-00	0.	0.390903E-00	0.352711E-01	0.76283E-02	0.81208E-03	0.
26	2343.2505493	0.158361E-00	0.	0.358699E-00	0.330236E-01	0.78033E-02	0.79806E-03	0.
27	2302.8096924	0.147806E-00	0.	0.366410E-00	0.315739E-01	0.74576E-02	0.78429E-03	0.
28	2263.0668030	0.134231E-00	0.	0.406397E-00	0.311955E-01	0.75049E-02	0.77075E-03	0.
29	2224.0098267	0.129487E-00	0.	0.421828E-00	0.311975E-01	0.74165E-02	0.75745E-03	0.
30	2185.6269226	0.152382E-00	0.	0.427543E-00	0.334950E-01	0.70604E-02	0.24638E-02	0.
31	2147.9064331	0.154247E-00	0.	0.436533E-00	0.356896E-01	0.76678E-02	0.24213E-02	0.
32	2110.8369141	0.151152E-00	0.	0.448328E-00	0.380517E-01	0.79621E-02	0.23795E-02	0.
33	2074.4071655	0.150545E-00	0.	0.460356E-00	0.404419E-01	0.82819E-02	0.23384E-02	0.
34	2038.6061707	0.148677E-00	0.	0.464506E-00	0.429111E-01	0.83956E-02	0.22981E-02	0.
35	2003.4230194	0.150329E-00	0.	0.467432E-00	0.452641E-01	0.86197E-02	0.22584E-02	0.
36	1968.8470612	0.146296E-00	0.	0.476897E-00	0.478142E-01	0.86724E-02	0.22195E-02	0.
37	1934.8678436	0.137652E-00	0.	0.502198E 00	0.508261E-01	0.87773E-02	0.21811E-02	0.
38	1901.4750824	0.131663E-00	0.	0.535287E 00	0.541560E-01	0.92399E-02	0.21435E-02	0.
39	1868.6585999	0.132798E-00	0.	0.539848E 00	0.573863E-01	0.95477E-02	0.21065E-02	0.
40	1836.4084930	0.141344E-00	0.	0.523965E 00	0.600956E-01	0.10093E-01	0.20702E-02	0.
41	1804.7149506	0.153919E-00	0.	0.497812E-00	0.620470E-01	0.10590E-01	0.20344E-02	0.
42	1773.5684204	0.166632E-00	0.	0.469285E-00	0.632158E-01	0.10896E-01	0.19993E-02	0.
43	1742.9594116	0.166708E-00	0.	0.472146E-00	0.643301E-01	0.11242E-01	0.19648E-02	0.
44	1712.8786621	0.166734E-00	0.	0.482025E-00	0.654021E-01	0.11620E-01	0.19309E-02	0.
45	1683.3170471	0.157184E-00	0.	0.500742E 00	0.669559E-01	0.11737E-01	0.18976E-02	0.
46	1654.2656555	0.134336E-00	0.	0.599282E 00	0.697757E-01	0.12311E-01	0.18648E-02	0.
47	1625.7156067	0.135548E-00	0.	0.624003E 00	0.724870E-01	0.12726E-01	0.18326E-02	0.
48	1597.6583099	0.149893E-00	0.	0.552703E 00	0.743016E-01	0.12214E-01	0.18010E-02	0.
49	1570.0852203	0.154792E-00	0.	0.534671E 00	0.757633E-01	0.12174E-01	0.17699E-02	0.
50	1542.9880219	0.147423E-00	0.	0.547726E 00	0.775611E-01	0.12052E-01	0.17394E-02	0.
51	1516.3584747	0.149373E-00	0.	0.558200E 00	0.791928E-01	0.12612E-01	0.17094E-02	0.
52	1490.1885071	0.154437E-00	0.	0.544152E 00	0.804623E-01	0.13007E-01	0.16799E-02	0.

53	1464.4701843	0.150000E-00	0.	0.550596E 00	0.818973E-01	0.13172E-01	0.16509E-02	0.
54	1439.1957245	0.147431E-00	0.	0.573963E 00	0.834146E-01	0.13968E-01	0.16224E-02	0.
55	1414.3574677	0.148693E-00	0.	0.571312E 00	0.847803E-01	0.14279E-01	0.15944E-02	0.
56	1389.9478607	0.153196E-00	0.	0.548014E 00	0.857969E-01	0.14768E-01	0.15669E-02	0.
57	1365.9595337	0.161133E-00	0.	0.514728E 00	0.862612E-01	0.15733E-01	0.15398E-02	0.
58	1342.3852386	0.150273E-00	0.	0.497405E-00	0.871958E-01	0.16720E-01	0.15132E-02	0.
59	1319.2177582	0.160721E-00	0.	0.592429E 00	0.954472E-01	0.18145E-01	0.54742E-02	0.
60	1296.4501343	0.156179E-00	0.	0.733206E 00	0.103791E-00	0.21471E-01	0.53798E-02	0.
61	1274.0754242	0.179059E-00	0.	0.739039E 00	0.111344E-00	0.22033E-01	0.52869E-02	0.
62	1252.0868988	0.213859E-00	0.	0.677383E 00	0.117708E-00	0.22084E-01	0.51957E-02	0.
63	1230.4778442	0.237320E-00	0.	0.643746E 00	0.123212E-00	0.22668E-01	0.51060E-02	0.
64	1209.2417145	0.246025E-00	0.	0.622764E 00	0.128282E-00	0.22597E-01	0.50179E-02	0.
65	1188.3721008	0.242490E-00	0.	0.611033E 00	0.133278E-00	0.21935E-01	0.49313E-02	0.
66	1167.8626556	0.241677E-00	0.	0.617106E 00	0.138149E-00	0.22572E-01	0.48462E-02	0.
67	1147.7071838	0.210117E-00	0.	0.683196E 00	0.143840E-00	0.22728E-01	0.47625E-02	0.
68	1127.8995514	0.207312E-00	0.	0.688828E 00	0.149459E-00	0.22368E-01	0.46803E-02	0.
69	1108.4337616	0.218404E-00	0.	0.653334E 00	0.154571E-00	0.22504E-01	0.45996E-02	0.
70	1089.3039551	0.200047E-00	0.	0.696769E 00	0.160091E-00	0.22664E-01	0.45202E-02	0.
71	1070.5042572	0.189792E-00	0.	0.729429E 00	0.165773E-00	0.23089E-01	0.44422E-02	0.
72	1052.0290527	0.185291E-00	0.	0.760902E 00	0.171452E-00	0.24279E-01	0.43655E-02	0.
73	1033.8726654	0.162961E-00	0.	0.881805E 00	0.177665E-00	0.26687E-01	0.42902E-02	0.
74	1016.0296555	0.137836E-00	0.	0.104099E 01	0.184469E-00	0.28077E-01	0.42161E-02	0.
75	998.4945755	0.130097E-00	0.	0.107594E 01	0.191339E-00	0.28425E-01	0.41434E-02	0.
76	981.2621231	0.135445E-00	0.	0.102161E 01	0.197899E-00	0.28408E-01	0.40718E-02	0.
77	964.3270798	0.145409E-00	0.	0.972137E 00	0.204023E-00	0.28220E-01	0.40016E-02	0.
78	947.6843262	0.155439E-00	0.	0.914432E 00	0.209703E-00	0.27403E-01	0.39325E-02	0.
79	931.3287659	0.173349E-00	0.	0.822282E 00	0.214697E-00	0.26983E-01	0.38646E-02	0.
80	915.2554932	0.192679E-00	0.	0.739510E 00	0.218950E-00	0.27083E-01	0.37979E-02	0.
81	899.4596176	0.208618E-00	0.	0.702524E 00	0.222578E-00	0.28231E-01	0.37324E-02	0.
82	883.9363556	0.220927E-00	0.	0.678386E 00	0.225690E-00	0.29021E-01	0.36680E-02	0.
83	868.6810074	0.241353E-00	0.	0.652287E 00	0.228050E-00	0.31187E-01	0.36047E-02	0.
84	853.6889267	0.267972E-00	0.	0.642509E 00	0.229500E-00	0.34879E-01	0.35425E-02	0.
85	838.9555893	0.289014E-00	0.	0.639438E 00	0.230208E-00	0.38307E-01	0.34813E-02	0.
86	824.4765396	0.302676E-00	0.	0.635051E 00	0.230380E-00	0.40499E-01	0.34212E-02	0.
87	810.2473679	0.372806E-00	0.	0.647413E 00	0.237031E-00	0.43410E-01	0.81106E-02	0.
88	796.2637634	0.379635E-00	0.	0.653574E 00	0.243360E-00	0.45995E-01	0.79706E-02	0.
89	782.5214920	0.378865E-00	0.	0.667403E 00	0.249517E-00	0.47773E-01	0.78330E-02	0.
90	769.0164108	0.380573E-00	0.	0.679891E 00	0.255459E-00	0.49844E-01	0.76978E-02	0.
91	755.7443924	0.394015E-00	0.	0.679220E 00	0.260960E-00	0.51747E-01	0.75650E-02	0.
92	742.7014236	0.412159E-00	0.	0.661661E 00	0.265905E-00	0.52636E-01	0.74344E-02	0.
93	729.8835602	0.419082E-00	0.	0.649880E 00	0.270501E-00	0.53004E-01	0.73061E-02	0.
94	717.2869263	0.416710E-00	0.	0.653434E 00	0.274945E-00	0.53784E-01	0.71800E-02	0.
95	704.9076767	0.416486E-00	0.	0.658563E 00	0.279208E-00	0.54717E-01	0.70561E-02	0.
96	692.7420654	0.419831E-00	0.	0.659002E 00	0.283219E-00	0.55492E-01	0.69343E-02	0.
97	680.7864227	0.425122E-00	0.	0.657840E 00	0.286943E-00	0.56115E-01	0.68147E-02	0.
98	669.0371246	0.433560E-00	0.	0.653190E 00	0.290321E-00	0.56832E-01	0.66970E-02	0.
99	657.4905853	0.439834E-00	0.	0.646517E 00	0.293386E-00	0.57000E-01	0.65815E-02	0.
100	646.1433258	0.443496E-00	0.	0.640590E 00	0.296188E-00	0.57117E-01	0.64679E-02	0.
101	634.9919052	0.446710E-00	0.	0.635620E 00	0.298739E-00	0.57396E-01	0.63563E-02	0.
102	624.0329437	0.451966E-00	0.	0.631819E 00	0.301009E-00	0.58164E-01	0.62466E-02	0.
103	613.2631149	0.454363E-00	0.	0.629593E 00	0.303054E-00	0.59150E-01	0.61387E-02	0.
104	602.6791534	0.455713E-00	0.	0.630407E 00	0.304904E-00	0.60439E-01	0.60328E-02	0.
105	592.2778549	0.455176E-00	0.	0.633423E 00	0.306599E-00	0.61598E-01	0.59287E-02	0.
106	582.0560684	0.453080E-00	0.	0.637090E 00	0.308172E-00	0.62567E-01	0.58264E-02	0.
107	572.0106964	0.452415E-00	0.	0.635485E 00	0.309585E-00	0.63290E-01	0.57258E-02	0.
108	562.1386948	0.446670E-00	0.	0.632586E 00	0.310926E-00	0.63554E-01	0.56270E-02	0.
109	552.4370499	0.438346E-00	0.	0.632623E 00	0.312250E-00	0.64148E-01	0.55299E-02	0.

110	542.9028625	0.434235E-00	0.	0.632724E 00	0.313487E-00	0.65431E-01	0.54344E-02	0.
111	533.5332031	0.434794E-00	0.	0.630652E 00	0.314552E-00	0.67107E-01	0.53407E-02	0.
112	524.3252563	0.440430E-00	0.	0.623568E 00	0.315345E-00	0.69254E-01	0.52485E-02	0.
113	515.2762222	0.443880E-00	0.	0.620465E 00	0.315918E-00	0.71712E-01	0.51579E-02	0.
114	506.3833733	0.442285E-00	0.	0.625259E 00	0.316381E-00	0.74412E-01	0.50689E-02	0.
115	497.6439857	0.437360E-00	0.	0.629305E 00	0.316793E-00	0.77236E-01	0.49814E-02	0.
116	489.0554314	0.441929E-00	0.	0.728101E 00	0.320865E-00	0.80121E-01	0.81306E-02	0.
117	480.6151085	0.413213E-00	0.	0.778910E 00	0.325286E-00	0.82769E-01	0.79902E-02	0.
118	472.3204422	0.358752E-00	0.	0.870464E 00	0.330487E-00	0.84771E-01	0.78523E-02	0.
119	464.1689262	0.298592E-00	0.	0.101218E 01	0.336543E-00	0.86343E-01	0.77168E-02	0.
120	456.1581039	0.244285E-00	0.	0.118725E 01	0.343315E-00	0.86804E-01	0.75836E-02	0.
121	448.2855225	0.199591E-00	0.	0.142574E 01	0.350629E-00	0.85728E-01	0.74528E-02	0.
122	440.5488243	0.181884E-00	0.	0.158786E 01	0.358045E-00	0.83280E-01	0.73241E-02	0.
123	432.9456444	0.175341E-00	0.	0.165908E 01	0.365386E-00	0.79764E-01	0.71977E-02	0.
124	425.4736786	0.180821E-00	0.	0.162203E 01	0.372466E-00	0.75566E-01	0.70735E-02	0.
125	418.1306686	0.204198E-00	0.	0.143882E 01	0.379000E-00	0.70881E-01	0.69514E-02	0.
126	410.9143906	0.224456E-00	0.	0.130573E 01	0.385032E-00	0.66532E-01	0.68315E-02	0.
127	403.8226547	0.230485E-00	0.	0.128331E 01	0.390800E-00	0.62565E-01	0.67136E-02	0.
128	396.8533058	0.242866E-00	0.	0.124158E 01	0.396206E-00	0.59271E-01	0.65977E-02	0.
129	390.0042381	0.252644E-00	0.	0.117964E 01	0.401281E-00	0.56570E-01	0.64838E-02	0.
130	383.2733803	0.266539E-00	0.	0.112364E 01	0.405962E-00	0.55711E-01	0.63719E-02	0.
131	376.6586838	0.291203E-00	0.	0.104914E 01	0.410076E-00	0.54952E-01	0.62620E-02	0.
132	370.1581421	0.316953E-00	0.	0.990107E 00	0.413604E-00	0.55267E-01	0.61539E-02	0.
133	363.7697945	0.315570E-00	0.	0.983768E 00	0.416996E-00	0.55271E-01	0.60477E-02	0.
134	357.4916992	0.329277E-00	0.	0.969852E 00	0.420019E-00	0.56177E-01	0.59433E-02	0.
135	351.3219528	0.364017E-00	0.	0.918065E 00	0.422316E-00	0.57255E-01	0.58407E-02	0.
136	345.2586861	0.344702E-00	0.	0.954132E 00	0.424799E-00	0.57462E-01	0.57399E-02	0.
137	339.3000641	0.342468E-00	0.	0.953038E 00	0.427173E-00	0.57502E-01	0.56409E-02	0.
138	333.4442787	0.359021E-00	0.	0.900474E 00	0.429103E-00	0.56437E-01	0.55435E-02	0.
139	327.6895561	0.343286E-00	0.	0.924634E 00	0.431162E-00	0.56759E-01	0.54478E-02	0.
140	322.0341454	0.351984E-00	0.	0.936889E 00	0.432965E-00	0.59953E-01	0.53538E-02	0.
141	316.4763374	0.376836E-00	0.	0.924169E 00	0.434242E-00	0.63497E-01	0.52614E-02	0.
142	311.0144577	0.424280E-00	0.	0.871955E 00	0.434595E-00	0.65497E-01	0.51706E-02	0.
143	305.6468315	0.454342E-00	0.	0.824467E 00	0.434283E-00	0.65323E-01	0.50814E-02	0.
144	300.3718491	0.443404E-00	0.	0.819912E 00	0.434011E-00	0.63534E-01	0.49937E-02	0.
145	295.1879005	0.422207E-00	0.	0.900632E 00	0.433491E-00	0.61815E-01	0.49192E-02	0.
146	290.0934181	0.400845E-00	0.	0.912533E 00	0.433221E-00	0.60266E-01	0.48343E-02	0.
147	285.0868607	0.395560E-00	0.	0.925669E 00	0.432935E-00	0.61108E-01	0.47508E-02	0.
148	280.1667099	0.397659E-00	0.	0.936920E 00	0.432511E-00	0.63039E-01	0.46688E-02	0.
149	275.3314705	0.385198E-00	0.	0.966229E 00	0.432210E-00	0.64887E-01	0.45883E-02	0.
150	270.5796852	0.396840E-00	0.	0.973042E 00	0.431612E-00	0.67204E-01	0.45091E-02	0.
151	265.9099007	0.445838E-00	0.	0.913050E 00	0.430029E-00	0.67655E-01	0.44313E-02	0.
152	261.3207130	0.454584E-00	0.	0.884426E 00	0.428155E-00	0.67259E-01	0.43548E-02	0.
153	256.8107224	0.422861E-00	0.	0.910831E 00	0.426737E-00	0.65955E-01	0.42796E-02	0.
154	252.3785801	0.398963E-00	0.	0.930947E 00	0.425635E-00	0.64625E-01	0.42058E-02	0.
155	248.0229168	0.387458E-00	0.	0.943843E 00	0.424635E-00	0.64283E-01	0.41332E-02	0.
156	243.7424316	0.383712E-00	0.	0.962691E 00	0.423616E-00	0.66361E-01	0.40618E-02	0.
157	239.5358181	0.391297E-00	0.	0.964461E 00	0.422376E-00	0.67603E-01	0.39917E-02	0.
158	235.4018097	0.406953E-00	0.	0.943787E 00	0.420759E-00	0.68239E-01	0.39228E-02	0.
159	231.3391418	0.400525E-00	0.	0.947204E 00	0.419159E-00	0.67953E-01	0.38552E-02	0.
160	227.3465881	0.397473E-00	0.	0.952505E 00	0.417521E-00	0.67790E-01	0.37886E-02	0.
161	223.4229450	0.398015E-00	0.	0.945988E 00	0.415776E-00	0.67277E-01	0.37232E-02	0.
162	219.5670147	0.407106E-00	0.	0.933445E 00	0.413778E-00	0.67476E-01	0.36590E-02	0.
163	215.7776318	0.429485E-00	0.	0.904231E 00	0.411288E-00	0.67937E-01	0.35958E-02	0.
164	212.0536461	0.431787E-00	0.	0.889755E 00	0.408654E-00	0.67146E-01	0.35338E-02	0.
165	208.3939323	0.411423E-00	0.	0.901539E 00	0.406289E-00	0.65554E-01	0.34728E-02	0.
166	204.7973824	0.382843E-00	0.	0.926095E 00	0.404343E-00	0.63850E-01	0.34128E-02	0.

167	201.2629013	0.349090E-00	0.	0.973364E 00	0.402918E-00	0.63389E-01	0.33539E-02	0.
168	197.7894192	0.327002E-00	0.	0.102511E 01	0.401815E-00	0.64573E-01	0.32961E-02	0.
169	194.3758831	0.315443E-00	0.	0.107511E 01	0.400857E-00	0.67110E-01	0.32392E-02	0.
170	191.0212612	0.307171E-00	0.	0.112691E 01	0.399986E-00	0.70028E-01	0.31833E-02	0.
171	187.7245350	0.356728E-00	0.	0.106844E 01	0.398201E-00	0.73729E-01	0.31283E-02	0.
172	184.4847031	0.455490E-00	0.	0.925222E 00	0.394583E-00	0.76099E-01	0.30743E-02	0.
173	181.3007851	0.496324E-00	0.	0.857347E 00	0.390116E-00	0.74828E-01	0.30213E-02	0.
174	178.1718197	0.476194E-00	0.	0.935955E 00	0.388213E-00	0.70282E-01	0.54525E-02	0.
175	175.0968513	0.407872E-00	0.	0.971274E 00	0.387405E-00	0.64265E-01	0.53584E-02	0.
176	172.0749550	0.326886E-00	0.	0.107758E 01	0.387944E-00	0.61877E-01	0.52660E-02	0.
177	169.1052113	0.341059E-00	0.	0.109584E 01	0.388149E-00	0.64563E-01	0.51751E-02	0.
178	166.1867199	0.319164E-00	0.	0.114393E 01	0.388644E-00	0.67647E-01	0.50858E-02	0.
179	163.3185978	0.374767E-00	0.	0.110581E 01	0.388079E-00	0.71303E-01	0.49980E-02	0.
180	160.4999752	0.464498E-00	0.	0.966878E 00	0.385765E-00	0.74184E-01	0.49117E-02	0.
181	157.7299976	0.432288E-00	0.	0.979774E 00	0.383913E-00	0.70542E-01	0.48270E-02	0.
182	155.0078239	0.422163E-00	0.	0.993792E 00	0.382149E-00	0.70946E-01	0.47437E-02	0.
183	152.3326340	0.378097E-00	0.	0.101609E 01	0.381055E-00	0.65842E-01	0.46618E-02	0.
184	149.7036114	0.359962E-00	0.	0.105942E 01	0.380207E-00	0.67723E-01	0.45813E-02	0.
185	147.1199589	0.339600E-00	0.	0.111663E 01	0.379647E-00	0.69625E-01	0.45023E-02	0.
186	144.5809021	0.311356E-00	0.	0.119619E 01	0.379510E-00	0.71959E-01	0.44246E-02	0.
187	142.0856609	0.271166E-00	0.	0.134234E 01	0.380008E-00	0.74805E-01	0.43482E-02	0.
188	139.6334839	0.317736E-00	0.	0.128264E 01	0.379628E-00	0.79033E-01	0.42732E-02	0.
189	137.2236290	0.437555E-00	0.	0.105501E 01	0.377014E-00	0.82521E-01	0.41994E-02	0.
190	134.8553677	0.531255E 00	0.	0.932686E 00	0.372580E-00	0.82543E-01	0.41269E-02	0.
191	132.5279732	0.497958E-00	0.	0.925531E 00	0.368623E-00	0.78236E-01	0.40557E-02	0.
192	130.2407494	0.328272E-00	0.	0.110806E 01	0.367633E-00	0.69613E-01	0.39857E-02	0.
193	127.9929972	0.329879E-00	0.	0.113153E 01	0.366550E-00	0.68192E-01	0.39169E-02	0.
194	125.7840385	0.428421E-00	0.	0.960810E 00	0.363582E-00	0.69463E-01	0.38493E-02	0.
195	123.6132050	0.439683E-00	0.	0.940968E 00	0.360321E-00	0.70686E-01	0.37829E-02	0.
196	121.4798336	0.425995E-00	0.	0.958150E 00	0.357237E-00	0.69638E-01	0.37176E-02	0.
197	119.3832817	0.401269E-00	0.	0.938164E 00	0.354478E-00	0.63225E-01	0.36534E-02	0.
198	117.3229141	0.395501E-00	0.	0.928442E 00	0.351733E-00	0.61162E-01	0.35904E-02	0.
199	115.2981033	0.390415E-00	0.	0.934382E 00	0.349009E-00	0.61379E-01	0.35284E-02	0.
200	113.3082409	0.365352E-00	0.	0.957248E 00	0.346664E-00	0.59757E-01	0.34675E-02	0.
201	111.3527174	0.351262E-00	0.	0.983003E 00	0.344513E-00	0.60090E-01	0.34077E-02	0.
202	109.4309454	0.346735E-00	0.	0.100427E 01	0.342388E-00	0.61430E-01	0.33489E-02	0.
203	107.5423384	0.350772E-00	0.	0.107339E 01	0.339523E-00	0.63103E-01	0.29500E-02	0.
204	105.6863251	0.354110E-00	0.	0.107104E 01	0.336533E-00	0.63631E-01	0.28991E-02	0.
205	103.8623457	0.344758E-00	0.	0.108360E 01	0.333658E-00	0.63388E-01	0.28491E-02	0.
206	102.0698462	0.330095E-00	0.	0.111084E 01	0.331003E-00	0.63345E-01	0.27999E-02	0.
207	100.3082790	0.318399E-00	0.	0.114108E 01	0.328517E-00	0.63883E-01	0.27516E-02	0.
208	98.5771151	0.315276E-00	0.	0.115810E 01	0.326037E-00	0.64702E-01	0.27041E-02	0.
209	96.8758287	0.323963E-00	0.	0.114837E 01	0.323340E-00	0.65445E-01	0.26574E-02	0.
210	95.2039042	0.346376E-00	0.	0.110746E 01	0.320161E-00	0.65735E-01	0.26116E-02	0.
211	93.5608349	0.360103E-00	0.	0.107139E 01	0.316654E-00	0.64989E-01	0.25665E-02	0.
212	91.9461203	0.352718E-00	0.	0.106525E 01	0.313222E-00	0.63111E-01	0.25222E-02	0.
213	90.3592749	0.337406E-00	0.	0.106918E 01	0.310015E-00	0.60705E-01	0.24787E-02	0.
214	88.7998161	0.320049E-00	0.	0.107925E 01	0.307075E-00	0.58532E-01	0.24359E-02	0.
215	87.2672701	0.292355E-00	0.	0.112584E 01	0.304607E-00	0.57756E-01	0.23939E-02	0.
216	85.7611732	0.258817E-00	0.	0.121551E 01	0.302728E-00	0.57892E-01	0.23526E-02	0.
217	84.2810688	0.220938E-00	0.	0.136167E 01	0.301518E-00	0.59120E-01	0.23120E-02	0.
218	82.8265114	0.194211E-00	0.	0.153843E 01	0.300765E-00	0.61767E-01	0.22720E-02	0.
219	81.3970556	0.238834E-00	0.	0.143045E 01	0.299165E-00	0.65928E-01	0.22328E-02	0.
220	79.9922695	0.371619E-00	0.	0.110711E 01	0.295025E-00	0.69315E-01	0.21943E-02	0.
221	78.6117287	0.434695E-00	0.	0.982752E 00	0.289593E-00	0.68462E-01	0.21564E-02	0.
222	77.2550144	0.372467E-00	0.	0.102010E 01	0.285279E-00	0.62771E-01	0.21192E-02	0.
223	75.9217129	0.289433E-00	0.	0.108967E 01	0.282466E-00	0.54442E-01	0.20826E-02	0.

224	74.6114225	0.188974E-00	0.	0.134003E 01	0.281489E-00	0.50242E-01	0.20467E-02	0.
225	73.3237467	0.170689E-00	0.	0.153403E 01	0.280828E-00	0.53270E-01	0.20114E-02	0.
226	72.0582943	0.254128E-00	0.	0.126609E 01	0.278598E-00	0.57452E-01	0.19767E-02	0.
227	70.8146811	0.368620E-00	0.	0.100521E 01	0.274128E-00	0.60106E-01	0.19425E-02	0.
228	69.5925303	0.357055E-00	0.	0.100881E 01	0.269832E-00	0.58868E-01	0.19090E-02	0.
229	68.3914719	0.308367E-00	0.	0.103621E 01	0.266396E-00	0.53153E-01	0.18761E-02	0.
230	67.2111425	0.258516E-00	0.	0.106514E 01	0.263838E-00	0.46402E-01	0.18437E-02	0.
231	66.0511837	0.261222E-00	0.	0.114127E 01	0.263436E-00	0.46930E-01	0.37480E-02	0.
232	64.9112444	0.261207E-00	0.	0.116027E 01	0.262979E-00	0.48300E-01	0.36834E-02	0.
233	63.7909780	0.267183E-00	0.	0.116339E 01	0.262365E-00	0.49758E-01	0.36198E-02	0.
234	62.6900458	0.274108E-00	0.	0.115788E 01	0.261575E-00	0.50688E-01	0.35573E-02	0.
235	61.6081142	0.282938E-00	0.	0.113911E 01	0.260575E-00	0.50841E-01	0.34959E-02	0.
236	60.5448551	0.289591E-00	0.	0.111378E 01	0.259396E-00	0.50044E-01	0.34356E-02	0.
237	59.4999452	0.291624E-00	0.	0.109504E 01	0.258113E-00	0.48984E-01	0.33763E-02	0.
238	58.4730701	0.283039E-00	0.	0.109754E 01	0.256912E-00	0.47935E-01	0.33180E-02	0.
239	57.4639158	0.269083E-00	0.	0.111910E 01	0.255887E-00	0.47266E-01	0.32608E-02	0.
240	56.4721789	0.255211E-00	0.	0.114806E 01	0.255040E-00	0.47006E-01	0.32045E-02	0.
241	55.4975576	0.240192E-00	0.	0.118365E 01	0.254391E-00	0.46793E-01	0.31492E-02	0.
242	54.5397573	0.198713E-00	0.	0.131233E 01	0.254383E-00	0.46726E-01	0.30948E-02	0.
243	53.5984859	0.180477E-00	0.	0.139816E 01	0.254625E-00	0.46658E-01	0.30414E-02	0.
244	52.6734605	0.188498E-00	0.	0.137494E 01	0.254686E-00	0.47186E-01	0.29889E-02	0.
245	51.7643995	0.201059E-00	0.	0.135894E 01	0.254496E-00	0.48909E-01	0.29373E-02	0.
246	50.8710270	0.219787E-00	0.	0.132599E 01	0.253954E-00	0.51536E-01	0.28866E-02	0.
247	49.9930725	0.254417E-00	0.	0.125688E 01	0.252798E-00	0.54472E-01	0.28368E-02	0.
248	49.1302705	0.296087E-00	0.	0.116584E 01	0.250895E-00	0.56100E-01	0.27879E-02	0.
249	48.2823586	0.310636E-00	0.	0.111708E 01	0.248686E-00	0.54944E-01	0.27398E-02	0.
250	47.4490814	0.301608E-00	0.	0.110747E 01	0.246568E-00	0.52602E-01	0.26925E-02	0.
251	46.6301847	0.282350E-00	0.	0.111117E 01	0.244712E-00	0.49438E-01	0.26460E-02	0.
252	45.8254209	0.266908E-00	0.	0.111758E 01	0.243061E-00	0.47145E-01	0.26003E-02	0.
253	45.0345454	0.252198E-00	0.	0.112401E 01	0.241602E-00	0.44917E-01	0.25555E-02	0.
254	44.2573204	0.244037E-00	0.	0.112966E 01	0.240231E-00	0.43821E-01	0.25114E-02	0.
255	43.4935083	0.239790E-00	0.	0.113527E 01	0.238887E-00	0.43452E-01	0.24680E-02	0.
256	42.7428784	0.237462E-00	0.	0.114141E 01	0.237540E-00	0.43482E-01	0.24254E-02	0.
257	42.0052032	0.236510E-00	0.	0.114884E 01	0.236169E-00	0.43854E-01	0.23836E-02	0.
258	41.2802596	0.235847E-00	0.	0.115745E 01	0.234772E-00	0.44369E-01	0.23424E-02	0.
259	40.5678272	0.235503E-00	0.	0.116582E 01	0.233343E-00	0.44910E-01	0.23020E-02	0.
260	39.8676901	0.230518E-00	0.	0.122653E 01	0.231082E-00	0.45445E-01	0.11127E-02	0.
261	39.1796360	0.227969E-00	0.	0.123789E 01	0.228843E-00	0.45720E-01	0.10935E-02	0.
262	38.5034575	0.224684E-00	0.	0.124880E 01	0.226637E-00	0.45760E-01	0.10747E-02	0.
263	37.8389478	0.221106E-00	0.	0.125727E 01	0.224467E-00	0.45576E-01	0.10561E-02	0.
264	37.1859069	0.218945E-00	0.	0.126092E 01	0.222312E-00	0.45336E-01	0.10379E-02	0.
265	36.5441360	0.216920E-00	0.	0.126292E 01	0.220169E-00	0.45074E-01	0.10200E-02	0.
266	35.9134417	0.213076E-00	0.	0.126972E 01	0.218067E-00	0.44720E-01	0.10024E-02	0.
267	35.2936325	0.208036E-00	0.	0.128137E 01	0.216025E-00	0.44389E-01	0.98507E-03	0.
268	34.6845193	0.202497E-00	0.	0.129682E 01	0.214050E-00	0.44130E-01	0.96807E-03	0.
269	34.0859189	0.197511E-00	0.	0.131393E 01	0.212136E-00	0.44039E-01	0.95137E-03	0.
270	33.4976497	0.191747E-00	0.	0.133667E 01	0.210295E-00	0.44070E-01	0.93495E-03	0.
271	32.9195323	0.185764E-00	0.	0.136470E 01	0.208531E-00	0.44214E-01	0.91881E-03	0.
272	32.3513927	0.180798E-00	0.	0.139194E 01	0.206830E-00	0.44463E-01	0.90295E-03	0.
273	31.7930586	0.173641E-00	0.	0.143138E 01	0.205223E-00	0.44800E-01	0.88737E-03	0.
274	31.2443604	0.164088E-00	0.	0.149188E 01	0.203750E-00	0.45284E-01	0.87206E-03	0.
275	30.7051320	0.150666E-00	0.	0.158694E 01	0.202468E-00	0.45917E-01	0.85701E-03	0.
276	30.1752093	0.134981E-00	0.	0.172899E 01	0.201410E-00	0.46836E-01	0.84222E-03	0.
277	29.6544325	0.106139E-00	0.	0.207225E 01	0.200768E-00	0.48260E-01	0.82768E-03	0.
278	29.1426437	0.788453E-01	0.	0.268763E 01	0.200510E-00	0.50293E-01	0.81339E-03	0.
279	28.6396875	0.647985E-01	0.	0.332675E 01	0.200439E-00	0.53232E-01	0.79936E-03	0.
280	28.1454113	0.637086E-01	0.	0.360395E 01	0.200374E-00	0.56721E-01	0.78556E-03	0.

281	27.6596653	0.688276E-01	0.	0.358816E 01	0.200225E-00	0.61039E-01	0.77200E-03	0.
282	27.1823034	0.987503E-01	0.	0.288457E 01	0.199648E-00	0.64372E-01	0.75868E-03	0.
283	26.7131793	0.180378E-00	0.	0.186191E 01	0.197872E-00	0.66749E-01	0.74559E-03	0.
284	26.2521515	0.266113E-00	0.	0.140843E 01	0.194776E-00	0.65638E-01	0.73272E-03	0.
285	25.7990806	0.315302E-00	0.	0.121825E 01	0.190878E-00	0.61179E-01	0.72007E-03	0.
286	25.3538291	0.305805E-00	0.	0.111605E 01	0.187051E-00	0.50471E-01	0.70765E-03	0.
287	24.9162617	0.266681E-00	0.	0.107415E 01	0.183771E-00	0.41085E-01	0.69543E-03	0.
288	24.4862459	0.213636E-00	0.	0.111719E 01	0.180953E-00	0.33884E-01	0.11567E-02	0.
289	24.0636516	0.178931E-00	0.	0.113656E 01	0.178767E-00	0.29186E-01	0.11367E-02	0.
290	23.6483510	0.162722E-00	0.	0.114871E 01	0.176866E-00	0.27031E-01	0.11171E-02	0.
291	23.2402172	0.162104E-00	0.	0.115183E 01	0.174958E-00	0.27033E-01	0.10978E-02	0.
292	22.8391273	0.165977E-00	0.	0.115009E 01	0.172959E-00	0.27665E-01	0.10789E-02	0.
293	22.4449599	0.167966E-00	0.	0.115547E 01	0.170907E-00	0.28319E-01	0.10603E-02	0.
294	22.0575955	0.169357E-00	0.	0.116519E 01	0.168812E-00	0.29066E-01	0.10420E-02	0.
295	21.6769159	0.170642E-00	0.	0.117513E 01	0.166679E-00	0.29805E-01	0.10240E-02	0.
296	21.3028061	0.172530E-00	0.	0.118414E 01	0.164496E-00	0.30614E-01	0.10063E-02	0.
297	20.9351532	0.172977E-00	0.	0.119352E 01	0.162291E-00	0.31190E-01	0.98893E-03	0.
298	20.5738454	0.170753E-00	0.	0.120296E 01	0.160111E-00	0.31258E-01	0.97186E-03	0.
299	20.2187731	0.166603E-00	0.	0.121044E 01	0.157994E-00	0.30848E-01	0.95509E-03	0.
300	19.8698287	0.161480E-00	0.	0.121690E 01	0.155956E-00	0.30192E-01	0.93861E-03	0.
301	19.5269065	0.156506E-00	0.	0.122317E 01	0.153996E-00	0.29535E-01	0.92241E-03	0.
302	19.1899028	0.151826E-00	0.	0.123138E 01	0.152107E-00	0.29020E-01	0.90649E-03	0.
303	18.8587151	0.147497E-00	0.	0.124333E 01	0.150286E-00	0.28708E-01	0.89084E-03	0.
304	18.5332432	0.144013E-00	0.	0.125670E 01	0.148516E-00	0.28587E-01	0.87547E-03	0.
305	18.2133887	0.140662E-00	0.	0.127248E 01	0.146795E-00	0.28582E-01	0.86036E-03	0.
306	17.8990541	0.137243E-00	0.	0.129158E 01	0.145127E-00	0.28655E-01	0.84551E-03	0.
307	17.5901444	0.133689E-00	0.	0.131333E 01	0.143513E-00	0.28768E-01	0.83092E-03	0.
308	17.2865663	0.130146E-00	0.	0.133736E 01	0.141953E-00	0.28912E-01	0.81658E-03	0.
309	16.9882271	0.126955E-00	0.	0.136185E 01	0.140442E-00	0.29108E-01	0.80249E-03	0.
310	16.6950369	0.123213E-00	0.	0.139078E 01	0.138989E-00	0.29308E-01	0.78864E-03	0.
311	16.4069068	0.119334E-00	0.	0.142370E 01	0.137599E-00	0.29523E-01	0.77503E-03	0.
312	16.1237493	0.115796E-00	0.	0.145621E 01	0.136263E-00	0.29741E-01	0.76165E-03	0.
313	15.8454785	0.112807E-00	0.	0.148703E 01	0.134972E-00	0.29977E-01	0.74851E-03	0.
314	15.5720106	0.111401E-00	0.	0.150783E 01	0.133696E-00	0.30247E-01	0.73559E-03	0.
315	15.3032621	0.112193E-00	0.	0.150889E 01	0.132393E-00	0.30460E-01	0.72289E-03	0.
316	15.0391518	0.115023E-00	0.	0.148947E 01	0.131024E-00	0.30560E-01	0.71042E-03	0.
317	14.7795994	0.118664E-00	0.	0.148778E 01	0.129464E-00	0.30454E-01	0.60820E-03	0.
318	14.5245271	0.123312E-00	0.	0.144271E 01	0.127801E-00	0.30029E-01	0.59770E-03	0.
319	14.2738564	0.125542E-00	0.	0.140493E 01	0.126082E-00	0.29275E-01	0.58738E-03	0.
320	14.0275121	0.122790E-00	0.	0.139286E 01	0.124401E-00	0.28271E-01	0.57725E-03	0.
321	13.7854191	0.117491E-00	0.	0.139756E 01	0.122809E-00	0.27219E-01	0.56728E-03	0.
322	13.5475044	0.111895E-00	0.	0.140890E 01	0.121311E-00	0.26297E-01	0.55749E-03	0.
323	13.3136957	0.107586E-00	0.	0.142242E 01	0.119884E-00	0.25700E-01	0.54787E-03	0.
324	13.0839221	0.105143E-00	0.	0.143063E 01	0.118494E-00	0.25352E-01	0.53842E-03	0.
325	12.8581141	0.103726E-00	0.	0.143381E 01	0.117121E-00	0.25108E-01	0.52912E-03	0.
326	12.6362034	0.103336E-00	0.	0.143138E 01	0.115746E-00	0.24934E-01	0.51999E-03	0.
327	12.4181222	0.103403E-00	0.	0.142420E 01	0.114359E-00	0.24749E-01	0.51102E-03	0.
328	12.2038051	0.102925E-00	0.	0.141926E 01	0.112972E-00	0.24507E-01	0.50220E-03	0.
329	11.9931865	0.101888E-00	0.	0.141740E 01	0.111595E-00	0.24218E-01	0.49353E-03	0.
330	11.7862029	0.100844E-00	0.	0.141430E 01	0.110228E-00	0.23879E-01	0.48501E-03	0.
331	11.5827914	0.100027E-00	0.	0.140871E 01	0.108868E-00	0.23531E-01	0.47664E-03	0.
332	11.3828907	0.988859E-01	0.	0.140440E 01	0.107519E-00	0.23153E-01	0.46842E-03	0.
333	11.1864399	0.973262E-01	0.	0.140213E 01	0.106191E-00	0.22731E-01	0.46033E-03	0.
334	10.9933795	0.953387E-01	0.	0.140231E 01	0.104891E-00	0.22284E-01	0.45239E-03	0.
335	10.8036509	0.932944E-01	0.	0.140469E 01	0.103622E-00	0.21875E-01	0.44458E-03	0.
336	10.6171968	0.908618E-01	0.	0.141215E 01	0.102390E-00	0.21525E-01	0.43691E-03	0.
337	10.4339607	0.873069E-01	0.	0.143272E 01	0.101218E-00	0.21236E-01	0.42937E-03	0.

338	10.2538869	0.860935E-01	0.	0.143999E 01	0.100062E-00	0.21050E-01	0.42196E-03	0.
339	10.0769210	0.865052E-01	0.	0.142968E 01	0.988898E-01	0.20920E-01	0.41468E-03	0.
340	9.9030089	0.858588E-01	0.	0.142907E 01	0.977223E-01	0.20780E-01	0.40752E-03	0.
341	9.7320986	0.842835E-01	0.	0.143677E 01	0.965774E-01	0.20602E-01	0.40049E-03	0.
342	9.5641379	0.819079E-01	0.	0.144765E 01	0.954701E-01	0.20286E-01	0.39357E-03	0.
343	9.3990759	0.799245E-01	0.	0.145948E 01	0.943935E-01	0.20075E-01	0.38678E-03	0.
344	9.2368625	0.782084E-01	0.	0.147167E 01	0.933426E-01	0.19927E-01	0.38011E-03	0.
345	9.0774486	0.765908E-01	0.	0.148395E 01	0.923158E-01	0.19794E-01	0.37355E-03	0.
346	8.9207863	0.724311E-01	0.	0.152294E 01	0.913099E-01	0.19670E-01	0.23599E-03	0.
347	8.7668275	0.694410E-01	0.	0.156364E 01	0.903540E-01	0.19609E-01	0.23191E-03	0.
348	8.6155257	0.674822E-01	0.	0.159162E 01	0.894294E-01	0.19643E-01	0.22791E-03	0.
349	8.4668353	0.657932E-01	0.	0.162301E 01	0.885315E-01	0.19731E-01	0.22398E-03	0.
350	8.3207110	0.636383E-01	0.	0.166583E 01	0.876690E-01	0.19937E-01	0.22011E-03	0.
351	8.1771085	0.610256E-01	0.	0.171760E 01	0.868497E-01	0.20012E-01	0.21631E-03	0.
352	8.0359843	0.592845E-01	0.	0.176193E 01	0.860582E-01	0.20221E-01	0.21258E-03	0.
353	7.8972959	0.569204E-01	0.	0.181958E 01	0.853056E-01	0.20398E-01	0.20891E-03	0.
354	7.7610010	0.545444E-01	0.	0.188892E 01	0.845920E-01	0.20657E-01	0.20531E-03	0.
355	7.6270582	0.521260E-01	0.	0.196209E 01	0.839182E-01	0.20860E-01	0.20176E-03	0.
356	7.4954272	0.500189E-01	0.	0.203749E 01	0.832784E-01	0.21122E-01	0.19828E-03	0.
357	7.3660678	0.490202E-01	0.	0.209093E 01	0.826534E-01	0.21423E-01	0.19486E-03	0.
358	7.2389411	0.491289E-01	0.	0.210814E 01	0.820237E-01	0.21695E-01	0.19150E-03	0.
359	7.1140084	0.493851E-01	0.	0.211345E 01	0.813865E-01	0.21895E-01	0.18819E-03	0.
360	6.9912317	0.494109E-01	0.	0.211976E 01	0.807459E-01	0.22001E-01	0.18494E-03	0.
361	6.8705740	0.494200E-01	0.	0.211835E 01	0.801018E-01	0.21975E-01	0.18175E-03	0.
362	6.7519987	0.512398E-01	0.	0.206402E 01	0.794227E-01	0.21878E-01	0.17861E-03	0.
363	6.6354699	0.527417E-01	0.	0.200473E 01	0.787136E-01	0.21706E-01	0.17553E-03	0.
364	6.5209521	0.585458E-01	0.	0.186371E 01	0.778988E-01	0.21387E-01	0.17250E-03	0.
365	6.4084105	0.625944E-01	0.	0.173410E 01	0.770070E-01	0.20868E-01	0.16953E-03	0.
366	6.2978116	0.593855E-01	0.	0.174259E 01	0.761669E-01	0.19954E-01	0.16660E-03	0.
367	6.1891211	0.568359E-01	0.	0.174948E 01	0.753676E-01	0.19198E-01	0.16372E-03	0.
368	6.0823066	0.528821E-01	0.	0.176673E 01	0.746331E-01	0.18161E-01	0.16090E-03	0.
369	5.9773355	0.512302E-01	0.	0.179020E 01	0.739247E-01	0.17924E-01	0.15812E-03	0.
370	5.8741761	0.500089E-01	0.	0.180134E 01	0.732346E-01	0.17659E-01	0.15539E-03	0.
371	5.7727970	0.496089E-01	0.	0.179855E 01	0.725485E-01	0.17457E-01	0.15271E-03	0.
372	5.6731676	0.493041E-01	0.	0.179828E 01	0.718649E-01	0.17379E-01	0.15008E-03	0.
373	5.5752577	0.491643E-01	0.	0.179642E 01	0.711810E-01	0.17274E-01	0.14748E-03	0.
374	5.4790374	0.496504E-01	0.	0.177751E 01	0.704857E-01	0.17172E-01	0.14494E-03	0.
375	5.3844778	0.503353E-01	0.	0.175165E 01	0.697753E-01	0.17022E-01	0.14244E-03	0.
376	5.2915502	0.508037E-01	0.	0.172941E 01	0.690536E-01	0.16874E-01	0.13998E-03	0.
377	5.2002262	0.502997E-01	0.	0.172205E 01	0.683377E-01	0.16614E-01	0.13756E-03	0.
378	5.1104786	0.501221E-01	0.	0.170838E 01	0.676220E-01	0.16334E-01	0.13519E-03	0.
379	5.0222797	0.497817E-01	0.	0.169186E 01	0.669090E-01	0.16008E-01	0.13286E-03	0.
380	4.9356031	0.491051E-01	0.	0.168324E 01	0.662048E-01	0.15679E-01	0.13056E-03	0.
381	4.8504223	0.480812E-01	0.	0.168119E 01	0.655158E-01	0.15344E-01	0.12831E-03	0.
382	4.7667116	0.471352E-01	0.	0.167809E 01	0.648404E-01	0.14990E-01	0.12610E-03	0.
383	4.6844457	0.462583E-01	0.	0.167631E 01	0.641778E-01	0.14710E-01	0.12392E-03	0.
384	4.6035995	0.447546E-01	0.	0.169279E 01	0.635392E-01	0.14471E-01	0.12178E-03	0.
385	4.5241485	0.435505E-01	0.	0.170961E 01	0.629195E-01	0.14288E-01	0.11968E-03	0.
386	4.4460689	0.433008E-01	0.	0.170501E 01	0.623019E-01	0.14132E-01	0.11761E-03	0.
387	4.3693367	0.432177E-01	0.	0.169636E 01	0.616833E-01	0.14022E-01	0.11558E-03	0.
388	4.2939287	0.425582E-01	0.	0.170288E 01	0.610741E-01	0.13906E-01	0.11359E-03	0.
389	4.2198223	0.411270E-01	0.	0.172571E 01	0.604881E-01	0.13743E-01	0.11163E-03	0.
390	4.1469948	0.398737E-01	0.	0.174731E 01	0.599221E-01	0.13565E-01	0.10970E-03	0.
391	4.0754241	0.393652E-01	0.	0.175320E 01	0.593629E-01	0.13462E-01	0.10781E-03	0.
392	4.0050887	0.388076E-01	0.	0.175918E 01	0.588116E-01	0.13358E-01	0.10595E-03	0.
393	3.9359672	0.368927E-01	0.	0.183898E 01	0.579614E-01	0.13254E-01	0.14932E-03	0.
394	3.8680386	0.356316E-01	0.	0.186061E 01	0.571431E-01	0.13036E-01	0.14675E-03	0.

395	3.8012823	0.345622E-01	0.	0.187574E 01	0.563515E-01	0.12812E-01	0.14421E-03	0.
396	3.7356781	0.337622E-01	0.	0.188227E 01	0.555790E-01	0.12587E-01	0.14173E-03	0.
397	3.6712062	0.320827E-01	0.	0.191816E 01	0.548496E-01	0.12369E-01	0.13928E-03	0.
398	3.6078469	0.291166E-01	0.	0.201060E 01	0.541641E-01	0.12112E-01	0.13688E-03	0.
399	3.5455811	0.261808E-01	0.	0.211693E 01	0.535521E-01	0.11795E-01	0.13451E-03	0.
400	3.4843900	0.230351E-01	0.	0.225538E 01	0.530177E-01	0.11422E-01	0.13219E-03	0.
401	3.4242549	0.201317E-01	0.	0.241824E 01	0.525571E-01	0.11037E-01	0.12991E-03	0.
402	3.3651576	0.183878E-01	0.	0.252199E 01	0.521431E-01	0.10681E-01	0.12767E-03	0.
403	3.3070802	0.169951E-01	0.	0.261658E 01	0.517618E-01	0.10404E-01	0.12546E-03	0.
404	3.2500052	0.152169E-01	0.	0.279692E 01	0.514227E-01	0.10212E-01	0.12330E-03	0.
405	3.1939152	0.140173E-01	0.	0.295334E 01	0.511149E-01	0.10097E-01	0.12117E-03	0.
406	3.1387933	0.127970E-01	0.	0.314822E 01	0.508324E-01	0.10046E-01	0.11908E-03	0.
407	3.0846226	0.115502E-01	0.	0.340995E 01	0.505804E-01	0.10034E-01	0.11703E-03	0.
408	3.0313869	0.949605E-02	0.	0.396873E 01	0.503700E-01	0.10012E-01	0.11501E-03	0.
409	2.9790698	0.734998E-02	0.	0.489745E 01	0.502126E-01	0.99485E-02	0.11302E-03	0.
410	2.9276558	0.591668E-02	0.	0.586901E 01	0.500909E-01	0.98558E-02	0.11107E-03	0.
411	2.8771290	0.624417E-02	0.	0.560142E 01	0.499793E-01	0.97254E-02	0.10915E-03	0.
412	2.8274743	0.855397E-02	0.	0.424895E 01	0.498113E-01	0.96301E-02	0.10727E-03	0.
413	2.7786765	0.122783E-01	0.	0.318330E 01	0.495498E-01	0.96590E-02	0.10542E-03	0.
414	2.7307209	0.150782E-01	0.	0.272991E 01	0.492008E-01	0.97962E-02	0.10360E-03	0.
415	2.6835930	0.163771E-01	0.	0.260695E 01	0.488213E-01	0.99607E-02	0.10181E-03	0.
416	2.6372783	0.210660E-01	0.	0.222108E 01	0.483287E-01	0.10152E-01	0.10005E-03	0.
417	2.5917630	0.282741E-01	0.	0.184501E 01	0.476609E-01	0.10293E-01	0.98327E-04	0.
418	2.5470333	0.328151E-01	0.	0.170010E 01	0.468653E-01	0.10469E-01	0.96630E-04	0.
419	2.5030755	0.349457E-01	0.	0.164729E 01	0.460089E-01	0.10568E-01	0.94962E-04	0.
420	2.4598763	0.364238E-01	0.	0.161012E 01	0.451098E-01	0.10584E-01	0.93323E-04	0.
421	2.4174227	0.366538E-01	0.	0.158314E 01	0.442020E-01	0.10339E-01	0.91713E-04	0.
422	2.3757018	0.360733E-01	0.	0.157166E 01	0.433082E-01	0.10047E-01	0.90130E-04	0.
423	2.3347009	0.351391E-01	0.	0.156528E 01	0.424382E-01	0.97110E-02	0.88574E-04	0.
424	2.2944076	0.345666E-01	0.	0.155714E 01	0.415820E-01	0.94608E-02	0.87046E-04	0.
425	2.2548098	0.334236E-01	0.	0.155101E 01	0.407554E-01	0.90806E-02	0.85543E-04	0.
426	2.2158953	0.320828E-01	0.	0.154694E 01	0.399639E-01	0.86720E-02	0.84067E-04	0.
427	2.1776524	0.313295E-01	0.	0.154236E 01	0.391913E-01	0.84197E-02	0.82616E-04	0.
428	2.1400695	0.308770E-01	0.	0.153804E 01	0.384296E-01	0.82553E-02	0.81190E-04	0.
429	2.1031353	0.304688E-01	0.	0.153553E 01	0.376775E-01	0.81216E-02	0.79789E-04	0.
430	2.0668385	0.300911E-01	0.	0.153504E 01	0.369344E-01	0.80167E-02	0.78412E-04	0.
431	2.0311681	0.297257E-01	0.	0.153515E 01	0.361999E-01	0.79186E-02	0.77059E-04	0.
432	1.9961133	0.293130E-01	0.	0.153455E 01	0.354754E-01	0.78028E-02	0.75729E-04	0.
433	1.9616635	0.287966E-01	0.	0.153466E 01	0.347636E-01	0.76659E-02	0.74422E-04	0.
434	1.9278083	0.282554E-01	0.	0.153477E 01	0.340654E-01	0.75209E-02	0.73138E-04	0.
435	1.8945373	0.277209E-01	0.	0.153366E 01	0.333805E-01	0.73676E-02	0.71875E-04	0.
436	1.8618406	0.271766E-01	0.	0.153261E 01	0.327091E-01	0.72132E-02	0.70635E-04	0.
437	1.8297082	0.266268E-01	0.	0.153220E 01	0.320516E-01	0.70629E-02	0.69416E-04	0.
438	1.7981303	0.260838E-01	0.	0.153196E 01	0.314077E-01	0.69160E-02	0.68218E-04	0.
439	1.7670974	0.255223E-01	0.	0.153295E 01	0.307780E-01	0.67745E-02	0.67040E-04	0.
440	1.7366000	0.249957E-01	0.	0.153417E 01	0.301615E-01	0.66416E-02	0.65883E-04	0.
441	1.7066290	0.245278E-01	0.	0.153426E 01	0.295567E-01	0.65166E-02	0.64746E-04	0.
442	1.6771753	0.240499E-01	0.	0.153516E 01	0.289638E-01	0.63961E-02	0.63629E-04	0.
443	1.6482299	0.235961E-01	0.	0.153605E 01	0.283823E-01	0.62795E-02	0.62531E-04	0.
444	1.6197840	0.231720E-01	0.	0.153568E 01	0.278112E-01	0.61630E-02	0.61452E-04	0.
445	1.5918291	0.227310E-01	0.	0.153593E 01	0.272512E-01	0.60473E-02	0.60391E-04	0.
446	1.5643566	0.222956E-01	0.	0.153649E 01	0.267020E-01	0.59341E-02	0.59349E-04	0.
447	1.5373583	0.218623E-01	0.	0.153659E 01	0.261636E-01	0.58189E-02	0.58325E-04	0.
448	1.5108259	0.214214E-01	0.	0.153715E 01	0.256362E-01	0.57049E-02	0.57318E-04	0.
449	1.4847514	0.209871E-01	0.	0.153789E 01	0.251198E-01	0.55930E-02	0.56329E-04	0.
450	1.4591269	0.205497E-01	0.	0.153881E 01	0.246143E-01	0.54820E-02	0.55357E-04	0.
451	1.4339447	0.201137E-01	0.	0.154019E 01	0.241198E-01	0.53735E-02	0.54401E-04	0.

452	1.4091970	0.196711E-01	0.	0.154238E 01	0.236364E-01	0.52681E-02	0.53462E-04	0.
453	1.3848765	0.192455E-01	0.	0.154457E 01	0.231639E-01	0.51655E-02	0.52540E-04	0.
454	1.3609757	0.188529E-01	0.	0.154595E 01	0.227011E-01	0.50674E-02	0.51633E-04	0.
455	1.3374874	0.184717E-01	0.	0.154733E 01	0.222479E-01	0.49721E-02	0.50742E-04	0.
456	1.3144045	0.181016E-01	0.	0.154870E 01	0.218039E-01	0.48795E-02	0.49866E-04	0.
457	1.2917199	0.177340E-01	0.	0.155008E 01	0.213691E-01	0.47873E-02	0.49006E-04	0.
458	1.2694268	0.173752E-01	0.	0.155146E 01	0.209433E-01	0.46972E-02	0.48160E-04	0.
459	1.2475185	0.170236E-01	0.	0.155284E 01	0.205263E-01	0.46088E-02	0.47329E-04	0.
460	1.2259883	0.166658E-01	0.	0.155483E 01	0.201182E-01	0.45217E-02	0.46512E-04	0.
461	1.2048297	0.163190E-01	0.	0.155682E 01	0.197188E-01	0.44364E-02	0.45709E-04	0.
462	1.1840362	0.159738E-01	0.	0.155901E 01	0.193281E-01	0.43531E-02	0.44920E-04	0.
463	1.1636016	0.156415E-01	0.	0.156120E 01	0.189458E-01	0.42718E-02	0.44145E-04	0.
464	1.1435197	0.153308E-01	0.	0.156257E 01	0.185711E-01	0.41929E-02	0.43383E-04	0.
465	1.1237843	0.150220E-01	0.	0.156401E 01	0.182042E-01	0.41146E-02	0.42634E-04	0.
466	1.1043895	0.147201E-01	0.	0.156557E 01	0.178447E-01	0.40385E-02	0.41899E-04	0.
467	1.0853295	0.144047E-01	0.	0.156801E 01	0.174932E-01	0.39625E-02	0.41175E-04	0.
468	1.0665984	0.141013E-01	0.	0.157044E 01	0.171492E-01	0.38885E-02	0.40465E-04	0.
469	1.0481906	0.138159E-01	0.	0.157206E 01	0.168124E-01	0.38162E-02	0.39766E-04	0.
470	1.0301005	0.135365E-01	0.	0.157368E 01	0.164825E-01	0.37454E-02	0.39080E-04	0.
471	1.0123226	0.132568E-01	0.	0.157576E 01	0.161596E-01	0.36762E-02	0.38406E-04	0.
472	0.9948515	0.126222E-01	0.	0.176017E 01	0.157517E-01	0.36073E-02	0.11325E-03	0.
473	0.9776819	0.123076E-01	0.	0.176179E 01	0.153548E-01	0.35226E-02	0.11130E-03	0.
474	0.9608086	0.119837E-01	0.	0.176407E 01	0.149693E-01	0.34370E-02	0.10938E-03	0.
475	0.9442266	0.116623E-01	0.	0.176615E 01	0.145953E-01	0.33507E-02	0.10749E-03	0.
476	0.9279307	0.113614E-01	0.	0.176778E 01	0.142319E-01	0.32687E-02	0.10563E-03	0.
477	0.9119161	0.110843E-01	0.	0.176940E 01	0.138781E-01	0.31935E-02	0.10381E-03	0.
478	0.8961778	0.108071E-01	0.	0.177148E 01	0.135339E-01	0.31196E-02	0.10202E-03	0.
479	0.8807112	0.105369E-01	0.	0.177356E 01	0.131992E-01	0.30471E-02	0.10026E-03	0.
480	0.8655115	0.102786E-01	0.	0.177518E 01	0.128734E-01	0.29765E-02	0.98529E-04	0.
481	0.8505741	0.100207E-01	0.	0.177726E 01	0.125566E-01	0.29074E-02	0.96828E-04	0.
482	0.8358946	0.977046E-02	0.	0.177934E 01	0.122485E-01	0.28398E-02	0.95157E-04	0.
483	0.8214683	0.952285E-02	0.	0.178142E 01	0.119489E-01	0.27731E-02	0.93515E-04	0.
484	0.8072911	0.928153E-02	0.	0.178350E 01	0.116577E-01	0.27075E-02	0.91901E-04	0.
485	0.7933585	0.905687E-02	0.	0.178431E 01	0.113742E-01	0.26432E-02	0.90315E-04	0.
486	0.7796664	0.883882E-02	0.	0.178477E 01	0.110981E-01	0.25803E-02	0.88756E-04	0.
487	0.7662106	0.862173E-02	0.	0.178603E 01	0.108295E-01	0.25196E-02	0.87224E-04	0.
488	0.7529870	0.841319E-02	0.	0.178684E 01	0.105680E-01	0.24598E-02	0.85719E-04	0.
489	0.7399916	0.821093E-02	0.	0.178725E 01	0.103134E-01	0.24012E-02	0.84240E-04	0.
490	0.7272205	0.800181E-02	0.	0.178927E 01	0.100659E-01	0.23445E-02	0.82786E-04	0.
491	0.7146698	0.780539E-02	0.	0.179089E 01	0.982515E-02	0.22895E-02	0.81357E-04	0.
492	0.7023357	0.760625E-02	0.	0.179297E 01	0.959121E-02	0.22357E-02	0.79953E-04	0.
493	0.6902145	0.741957E-02	0.	0.179505E 01	0.936360E-02	0.21841E-02	0.78573E-04	0.
494	0.6783025	0.723617E-02	0.	0.179713E 01	0.914222E-02	0.21346E-02	0.77217E-04	0.
495	0.6665961	0.704683E-02	0.	0.180083E 01	0.892733E-02	0.20856E-02	0.75884E-04	0.
496	0.6550917	0.688324E-02	0.	0.180245E 01	0.871790E-02	0.20395E-02	0.74575E-04	0.
497	0.6437858	0.671418E-02	0.	0.180453E 01	0.851416E-02	0.19936E-02	0.73288E-04	0.
498	0.6326751	0.655737E-02	0.	0.180661E 01	0.831564E-02	0.19500E-02	0.72023E-04	0.
499	0.6217561	0.641332E-02	0.	0.180661E 01	0.812182E-02	0.19068E-02	0.70780E-04	0.
500	0.6110256	0.625534E-02	0.	0.180869E 01	0.793331E-02	0.18637E-02	0.69558E-04	0.
501	0.6004802	0.610781E-02	0.	0.181077E 01	0.774969E-02	0.18225E-02	0.68358E-04	0.
502	0.5901169	0.596769E-02	0.	0.181123E 01	0.757067E-02	0.17812E-02	0.67178E-04	0.
503	0.5799324	0.582947E-02	0.	0.181215E 01	0.739620E-02	0.17411E-02	0.66019E-04	0.
504	0.5699237	0.569924E-02	0.	0.181261E 01	0.722596E-02	0.17025E-02	0.64879E-04	0.
505	0.5600877	0.556726E-02	0.	0.181306E 01	0.706006E-02	0.16636E-02	0.63760E-04	0.
506	0.5504214	0.543069E-02	0.	0.181514E 01	0.689869E-02	0.16259E-02	0.62659E-04	0.
507	0.5409220	0.529992E-02	0.	0.181722E 01	0.674164E-02	0.15893E-02	0.61578E-04	0.
508	0.5315866	0.518050E-02	0.	0.181768E 01	0.658846E-02	0.15538E-02	0.60515E-04	0.

509	0.5224122	0.506445E-02	0.	0.181814E 01	0.643903E-02	0.15194E-02	0.59471E-04	0.
510	0.5133962	0.495242E-02	0.	0.181860E 01	0.629319E-02	0.14861E-02	0.58444E-04	0.
511	0.5045358	0.483180E-02	0.	0.182068E 01	0.615132E-02	0.14529E-02	0.57436E-04	0.
512	0.4958283	0.471765E-02	0.	0.182276E 01	0.601318E-02	0.14206E-02	0.56444E-04	0.
513	0.4872711	0.460759E-02	0.	0.182438E 01	0.587861E-02	0.13897E-02	0.55470E-04	0.
514	0.4788615	0.450231E-02	0.	0.182600E 01	0.574743E-02	0.13594E-02	0.54513E-04	0.
515	0.4705971	0.440756E-02	0.	0.182600E 01	0.561921E-02	0.13306E-02	0.53572E-04	0.
516	0.4624754	0.430980E-02	0.	0.182646E 01	0.549411E-02	0.13015E-02	0.52648E-04	0.
517	0.4544938	0.420987E-02	0.	0.182834E 01	0.537222E-02	0.12735E-02	0.51739E-04	0.
518	0.4466499	0.411366E-02	0.	0.182976E 01	0.525341E-02	0.12456E-02	0.50846E-04	0.
519	0.4389414	0.402523E-02	0.	0.182976E 01	0.513738E-02	0.12186E-02	0.49968E-04	0.
520	0.4313660	0.393715E-02	0.	0.183021E 01	0.502411E-02	0.11923E-02	0.49106E-04	0.
521	0.4239213	0.385177E-02	0.	0.183067E 01	0.491352E-02	0.11667E-02	0.48259E-04	0.
522	0.4166051	0.376806E-02	0.	0.183067E 01	0.480555E-02	0.11411E-02	0.47426E-04	0.
523	0.4094151	0.368652E-02	0.	0.183067E 01	0.470012E-02	0.11162E-02	0.46607E-04	0.
524	0.4023493	0.360511E-02	0.	0.183113E 01	0.459725E-02	0.10919E-02	0.45803E-04	0.
525	0.3954053	0.352546E-02	0.	0.183159E 01	0.449687E-02	0.10679E-02	0.45012E-04	0.
526	0.3885813	0.344928E-02	0.	0.183159E 01	0.439885E-02	0.10447E-02	0.44235E-04	0.
527	0.3818750	0.336919E-02	0.	0.183321E 01	0.430338E-02	0.10220E-02	0.43472E-04	0.
528	0.3752844	0.329326E-02	0.	0.183483E 01	0.421030E-02	0.10000E-02	0.42722E-04	0.
529	0.3688076	0.322351E-02	0.	0.183483E 01	0.411935E-02	0.97869E-03	0.41984E-04	0.
530	0.3624425	0.315405E-02	0.	0.183529E 01	0.403055E-02	0.95792E-03	0.41260E-04	0.
531	0.3561874	0.308740E-02	0.	0.183575E 01	0.394378E-02	0.93787E-03	0.40548E-04	0.
532	0.3500401	0.302186E-02	0.	0.183575E 01	0.385901E-02	0.91780E-03	0.39848E-04	0.
533	0.3439990	0.295808E-02	0.	0.183575E 01	0.377619E-02	0.89827E-03	0.39160E-04	0.
534	0.3380621	0.289583E-02	0.	0.183575E 01	0.369526E-02	0.87922E-03	0.38484E-04	0.
535	0.3322277	0.283298E-02	0.	0.183621E 01	0.361626E-02	0.86040E-03	0.37820E-04	0.
536	0.3264939	0.277199E-02	0.	0.183667E 01	0.353912E-02	0.84204E-03	0.37168E-04	0.
537	0.3208592	0.270885E-02	0.	0.183829E 01	0.346394E-02	0.82413E-03	0.36526E-04	0.
538	0.3153216	0.264880E-02	0.	0.183991E 01	0.339062E-02	0.80676E-03	0.35896E-04	0.
539	0.3098797	0.259422E-02	0.	0.183991E 01	0.331892E-02	0.79001E-03	0.35276E-04	0.
540	0.3045316	0.254061E-02	0.	0.183991E 01	0.324883E-02	0.77357E-03	0.34667E-04	0.
541	0.2992759	0.219682E-02	0.	0.207491E 01	0.310097E-02	0.75768E-03	0.25628E-04	0.
542	0.2941109	0.210041E-02	0.	0.207861E 01	0.296029E-02	0.72599E-03	0.25186E-04	0.
543	0.2890350	0.200518E-02	0.	0.208023E 01	0.282669E-02	0.69318E-03	0.24751E-04	0.
544	0.2840467	0.190784E-02	0.	0.208023E 01	0.270035E-02	0.65875E-03	0.24324E-04	0.
545	0.2791445	0.181918E-02	0.	0.208185E 01	0.258060E-02	0.62842E-03	0.23904E-04	0.
546	0.2743269	0.174519E-02	0.	0.208347E 01	0.246628E-02	0.60301E-03	0.23491E-04	0.
547	0.2695924	0.167496E-02	0.	0.208347E 01	0.235710E-02	0.57821E-03	0.23086E-04	0.
548	0.2649397	0.160788E-02	0.	0.208347E 01	0.225282E-02	0.55452E-03	0.22688E-04	0.
549	0.2603673	0.154397E-02	0.	0.208347E 01	0.215319E-02	0.53197E-03	0.22296E-04	0.
550	0.2558737	0.148097E-02	0.	0.208347E 01	0.205815E-02	0.50974E-03	0.21911E-04	0.
551	0.2514577	0.141747E-02	0.	0.208509E 01	0.196775E-02	0.48810E-03	0.21533E-04	0.
552	0.2471180	0.135643E-02	0.	0.208671E 01	0.188180E-02	0.46707E-03	0.21161E-04	0.
553	0.2428531	0.129824E-02	0.	0.208671E 01	0.180008E-02	0.44649E-03	0.20796E-04	0.
554	0.2386618	0.123992E-02	0.	0.208753E 01	0.172261E-02	0.42620E-03	0.20437E-04	0.
555	0.2345429	0.118499E-02	0.	0.208915E 01	0.164912E-02	0.40733E-03	0.20085E-04	0.
556	0.2304951	0.113498E-02	0.	0.208996E 01	0.157924E-02	0.38986E-03	0.19738E-04	0.
557	0.2265171	0.108814E-02	0.	0.208996E 01	0.151271E-02	0.37330E-03	0.19397E-04	0.
558	0.2226078	0.104389E-02	0.	0.208996E 01	0.144935E-02	0.35767E-03	0.19063E-04	0.
559	0.2187659	0.100187E-02	0.	0.208996E 01	0.138897E-02	0.34283E-03	0.18734E-04	0.
560	0.2149903	0.961690E-03	0.	0.208996E 01	0.133144E-02	0.32866E-03	0.18410E-04	0.
561	0.2112799	0.923373E-03	0.	0.208996E 01	0.127662E-02	0.31514E-03	0.18093E-04	0.
562	0.2076336	0.886756E-03	0.	0.208996E 01	0.122438E-02	0.30224E-03	0.17780E-04	0.
563	0.2040502	0.851716E-03	0.	0.208996E 01	0.117460E-02	0.28990E-03	0.17473E-04	0.
564	0.2005286	0.818182E-03	0.	0.208996E 01	0.112716E-02	0.27810E-03	0.17172E-04	0.
565	0.1970678	0.786132E-03	0.	0.208996E 01	0.108196E-02	0.26683E-03	0.16876E-04	0.

566	0.1936667	0.755530E-03	0.	0.208996E 01	0.103889E-02	0.25608E-03	0.16584E-04	0.
567	0.1903243	0.726314E-03	0.	0.208996E 01	0.997834E-03	0.24582E-03	0.16298E-04	0.
568	0.1870396	0.698458E-03	0.	0.208996E 01	0.958698E-03	0.23605E-03	0.16017E-04	0.
569	0.1838116	0.671933E-03	0.	0.208996E 01	0.921380E-03	0.22675E-03	0.15740E-04	0.
570	0.1806393	0.646656E-03	0.	0.208996E 01	0.885787E-03	0.21790E-03	0.15469E-04	0.
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572	0.1744580	0.599532E-03	0.	0.208996E 01	0.819428E-03	0.20143E-03	0.14939E-04	0.
573	0.1714471	0.577556E-03	0.	0.208996E 01	0.788504E-03	0.19375E-03	0.14682E-04	0.
574	0.1684882	0.556561E-03	0.	0.208996E 01	0.758984E-03	0.18643E-03	0.14428E-04	0.
575	0.1655804	0.536496E-03	0.	0.208996E 01	0.730799E-03	0.17944E-03	0.14179E-04	0.
576	0.1627227	0.517314E-03	0.	0.208996E 01	0.703885E-03	0.17276E-03	0.13934E-04	0.
577	0.1599144	0.498973E-03	0.	0.208996E 01	0.678178E-03	0.16638E-03	0.13694E-04	0.
578	0.1571545	0.481434E-03	0.	0.208996E 01	0.653620E-03	0.16029E-03	0.13458E-04	0.
579	0.1544423	0.464661E-03	0.	0.208996E 01	0.630154E-03	0.15447E-03	0.13225E-04	0.
580	0.1517768	0.448616E-03	0.	0.208996E 01	0.607726E-03	0.14890E-03	0.12997E-04	0.
581	0.1491574	0.433266E-03	0.	0.208996E 01	0.586287E-03	0.14359E-03	0.12773E-04	0.
582	0.1465832	0.418578E-03	0.	0.208996E 01	0.565787E-03	0.13851E-03	0.12552E-04	0.
583	0.1440534	0.404520E-03	0.	0.208996E 01	0.546180E-03	0.13365E-03	0.12336E-04	0.
584	0.1415672	0.391061E-03	0.	0.208996E 01	0.527423E-03	0.12901E-03	0.12123E-04	0.
585	0.1391240	0.378171E-03	0.	0.208996E 01	0.509475E-03	0.12457E-03	0.11914E-04	0.
586	0.1367230	0.365824E-03	0.	0.208996E 01	0.492296E-03	0.12031E-03	0.11708E-04	0.
587	0.1343633	0.353991E-03	0.	0.208996E 01	0.475850E-03	0.11625E-03	0.11506E-04	0.
588	0.1320444	0.342650E-03	0.	0.208996E 01	0.460100E-03	0.11235E-03	0.11307E-04	0.
589	0.1297655	0.331775E-03	0.	0.208996E 01	0.445015E-03	0.10862E-03	0.11112E-04	0.
590	0.1275260	0.321346E-03	0.	0.208996E 01	0.430560E-03	0.10505E-03	0.10920E-04	0.
591	0.1253251	0.311342E-03	0.	0.208996E 01	0.416708E-03	0.10163E-03	0.10732E-04	0.
592	0.1231622	0.301741E-03	0.	0.208996E 01	0.403428E-03	0.98349E-04	0.10547E-04	0.
593	0.1210366	0.292526E-03	0.	0.208996E 01	0.390694E-03	0.95205E-04	0.10365E-04	0.
594	0.1189477	0.283678E-03	0.	0.208996E 01	0.378479E-03	0.92191E-04	0.10186E-04	0.
595	0.1168948	0.275181E-03	0.	0.208996E 01	0.366760E-03	0.89300E-04	0.10010E-04	0.
596	0.1148774	0.267018E-03	0.	0.208996E 01	0.355513E-03	0.86527E-04	0.98373E-05	0.
597	0.1128948	0.259172E-03	0.	0.208996E 01	0.344715E-03	0.83865E-04	0.96675E-05	0.
598	0.1109464	0.251631E-03	0.	0.208996E 01	0.334346E-03	0.81311E-04	0.95007E-05	0.
599	0.1090317	0.244379E-03	0.	0.208996E 01	0.324385E-03	0.78858E-04	0.93367E-05	0.
600	0.1071500	0.237404E-03	0.	0.208996E 01	0.314815E-03	0.76501E-04	0.91756E-05	0.
601	0.1053007	0.230692E-03	0.	0.208996E 01	0.305616E-03	0.74237E-04	0.90172E-05	0.
602	0.1034834	0.224232E-03	0.	0.208996E 01	0.296771E-03	0.72062E-04	0.88616E-05	0.
603	0.1016974	0.218012E-03	0.	0.208996E 01	0.288265E-03	0.69970E-04	0.87087E-05	0.
604	0.0999423	0.212022E-03	0.	0.208996E 01	0.280081E-03	0.67958E-04	0.85584E-05	0.

HCBO EQUIVALENT

BUCKLING= 0.002362

GP	FLUX	FISSION SPECTRUM	NU SIGMA FISSION	3 SIGMA ABSORPTION	TRANSPORT	J TO J+1	INELASTICS 2	3	4	5	6
1	1.475992	0.132000	0.037210	0.083414	0.392549	0.019192	0.012683	0.014027	0.011521	0.006949	0.005720
2	3.003948	0.213000	0.033407	0.074865	0.431765	0.022993	0.010711	0.011885	0.008947	0.004764	0.003852
3	4.344786	0.232000	0.025658	0.068959	0.508622	0.036065	0.016850	0.003768	0.000635	0.001376	0.000189
4	5.652061	0.179000	0.009390	0.065393	0.704041	0.051443	0.005227	0.002350	0.000790	0.000395	-0.
5	12.419576	0.116000	0.007876	0.039214	0.642669	0.033858	0.000263	0.000136	0.000040	0.000036	-0.
6	8.972924	0.067000	0.007797	0.061171	0.978570	0.056274	0.000051	0.000019	0.000011	0.000006	0.000005
7	11.555861	0.034000	0.007653	0.047767	0.940792	0.042506	0.000008	0.000000	0.000000	0.000000	0.000002
8	11.212336	0.017000	0.007854	0.045150	1.014016	0.036079	0.002816	0.000002	0.000000	0.000000	-0.
9	8.633724	0.010000	0.008171	0.046333	1.114180	0.036810	0.000899	0.000618	0.000000	-0.	-0.
10	7.357265	0.	0.009048	0.045533	1.163943	0.034032	0.001067	0.000407	-0.	-0.	-0.
11	5.158281	0.	0.009048	0.048336	1.371255	0.038213	0.000000	-0.	-0.	-0.	-0.
12	4.313967	0.	0.010179	0.046862	1.246432	0.032912	-0.	-0.	-0.	-0.	-0.
13	2.870952	0.	0.010179	0.048847	1.425599	0.034816	-0.	-0.	-0.	-0.	-0.
14	2.430732	0.	0.011672	0.039790	1.773461	0.026855	-0.	-0.	-0.	-0.	-0.
15	1.770665	0.	0.017689	0.035477	1.701016	0.011717	-0.	-0.	-0.	-0.	-0.
16	0.424068	0.	0.035332	0.047611	1.798076	0.010014	-0.	-0.	-0.	-0.	-0.
17	0.050229	0.	0.079622	0.083409	2.086336	0.007788	-0.	-0.	-0.	-0.	-0.
18	0.003919	0.	0.076456	0.099250	4.065413	0.	0.	0.	0.	0.	0.

ARGONNE NATIONAL LAB WEST
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