NBS MONOGRAPH 1

Energy Dissipation by Fast Electrons

U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

Addendum for

NBS Monograph No. 1

Energy Dissipation by Fast Electrons

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2	9	detail in [1]. We only	detail in [1], we only
4	Eq. 15	$I_{n0}^{n+i-\frac{3}{2}}$	I_{n0}^{n+i-1}
8	Eq. 31	$\{\times\ 1+\pi(Z/137)$ $(\beta\cos\chi\sqrt{2})$	$\{[1+\pi(Z/137)\times$ $(\beta\cos\chi\sqrt{2})]$
8	4 from bottom	$\left.\frac{\Gamma(1+i\frac{Z}{137\beta}}{\Gamma(1-i\frac{Z}{137\beta}}\right\}$	$\left.\frac{\Gamma(1+i\frac{Z}{137\beta})}{\Gamma(1-i\frac{Z}{137\beta})}\right\}$
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Energy Dissipation by Fast Electrons

L. V. Spencer

National Bureau of Standards Monograph 1

Issued September 10, 1959

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington 25, D.C. - Price 45 cents

Contents

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Tabulations are given of the energy dissipated by fast electrons at different distances from monoenergetic electron sources, for plane perpendicular and point isotropic sources. A summary of the theoretical methods and data utilized, and a table of spatial moments are also included.

1. Introduction

This Monograph belongs to a series of reports on radiation physics data being prepared with the support of the Office of Naval Research and the Atomic Energy Commission.

Earlier reports of this series were designed in part to present input data necessary for the preparation of this report, which gives results of extensive calculations of electron penetration taking into account both nuclear elastic scattering and electron slowing down. The tabulations given here are designed to answer the following type of problem: If electrons of kinetic energy E_0 are produced at a point or on a plane in a material with atomic number Z, the electrons will travel away from their point of origin, dissipating energy to the material as they go. Eventually each electron will have completely given up its initial energy. What will be the spatial distribution of the energy transferred to the surrounding material?

Two types of electron sources are considered, namely *point isotropic* sources emitting electrons of energy E_0 equally in all directions, and *plane* sources emitting electrons of energy E_0 only in a single direction which is *perpendicular* to the source plane. Superposition of the *point* source data for different E_0 will give data for more complete source spectra, such as the beta-ray spectra from a radioactive isotope or from mixed fission products. Superposition of the *point* sources at different *spatial* locations will give results descriptive of surface and volume beta-ray source geometries. Similarly, the data for the *plane perpendicular* source may be applied to the case of a beam of electrons injected into a material, since the integral of the energy deposition on any plane perpendicular to the beam is independent of the beam width and can therefore be calculated as though the beam were infinitely wide, thus constituting a plane perpendicular source.

The calculations presented here were programed for the IBM 704 digital computer at NBS. The methods which were used were essentially those outlined in [1].[1] Results are given for E_0 varying in approximately logarithmic intervals from 0.025 to 10 Mev, for the following materials: C, Al, Cu, Sn, Pb, air, and polystyrene. In the case of Sn and Pb, some of the lower and some of the higher values of E_0 have been omitted, the lower values because the range and cross-section data are unreliable near the atomic binding energies, the higher values because radiation straggling, which has not been taken into account, tends to dominate at high energies.

The medium is assumed to be homogeneous, extending in all directions around the source a distance greater than the electron range. The electrons are assumed to slow down continuously until their initial kinetic energy has been completely exhausted. The neglect of range straggling due to large single-energy losses occurring in both radiative and inelastic collisions makes the data somewhat inaccurate; but the errors are probably important only for very large distances from the source, where only a minor fraction of the energy is dissipated. Since a major effort is required to improve the results further, and since experimental studies show generally good agreement where comparisons have been made, it is felt that the data are of sufficient accuracy and usefulness to justify their publication.

[1] Figures in brackets indicate the literature references at the end of this Monograph.

The remainder of this Monograph is divided into two parts, the first outlining the methods and data which were used to make the calculations and the second presenting and describing the tabular data. Section 3 describing the tabular data, has been made almost completely self-contained so that persons who need data but do not wish to follow the derivations may turn immediately to this latter section and find all the information they require.

2. Methods and Input Information

2.1. Calculation of Moments

Since the basic theoretical methods used to calculate electron energy dissipation distributions have already been given in considerable detail in [1]. We only sketch the arguments and procedures here.

The assumption that electrons lose their energy continuously established a relation between the residual range r of the electrons, measured along their path, and the average rate of energy loss, i.e., the stopping power (dE/dr):

$$r=\int_0^E \frac{dE}{dE/dr}, \tag{1}$$

where $0<E<E_0$ is the kinetic energy of an electron which has slowed down but not lost its energy completely. This equation is the basis for the tabulations of electron ranges [2].

It is convenient to measure both distances and residual ranges in units of $r_0=r(E_0)$. For an electron source located on the plane $z=0$ which emits electrons of kinetic energy E_0 in the direction perpendicular to this plane and towards increasing z, the distance of a point from the source plane will be conveniently identified by a dimensionless parameter $x=z/r_0$. Similarly, we replace the residual range r by a dimensionless ratio $t=r/r_0$. We define the flux of electrons, $I(t,\theta,x)2\pi\, d(\cos\theta)dt$, as the number of electrons per second that cross a small spherical probe of unit cross sectional area at a distance x from the source, having residual ranges between t and $t+dt$ and obliquities between θ and $\theta+d\theta$ relative to the direction from the source to the probe.

The electron flux must satisfy a transport equation, which has the following form in steady state conditions for the plane perpendicular source:

$$-\frac{\partial I}{\partial t}+\cos\theta\,\frac{\partial I}{\partial x}=\int_0^{2\pi} d\varphi'\int_{-1}^{1} d(\cos\theta')S(t,\Theta)\{I(t,\theta',x)-I(t,\theta,x)\}+\frac{1}{2\pi}\,\delta(x)\delta(t-1)\delta(\cos\theta-1), \tag{2}$$

where Θ is the angle between the electron directions (θ',ϕ') and (θ,ϕ) before or after a collision. This is basically a continuity equation. The terms on the left describe a rate of change in $I(t,\theta,x)$ due to slowing down (first term) and due to spatial displacement (second term). The terms on the right describe a rate of change in the flux due to elastic collisions (first term) and due to generation of electrons by the source. The last term, describing a unit-electron source current, is the product of three Dirac delta functions which guarantee that the electrons are generated only at $x=0$, $t=1$, and $\cos\theta=1$. If the source is constant with time, $I(t,\theta,x)$ must also be constant with time, and therefore the rates of change in this quantity must balance one another.

The function $S(t,\Theta)$ which appears in the first term on the right of (2) requires a precise definition: The quantity $2\pi S(t,\Theta)d(\cos\Theta)dt$ is the probability that an electron having kinetic energy corresponding to t will undergo, while slowing down from $t+dt$ to t, an elastic collision which results in a deflection through an angle between Θ and $\Theta+d\Theta$. $S(t,\Theta)$ is equal to $r_0N\sigma(E,\Theta)$, where N is the number of atoms per gram of material, E is the kinetic energy corresponding to t, σ is the elastic scattering cross section in a centimeters squared per steradian, per atom, and r_0 is measured in grams per square centimeter.

The procedure for solving (2) utilizes an expansion in spatial moments and spherical harmonics. Thus, if

$$I_{nl}(t)=\int_{-1}^{1} dx\,x^n\int_{-1}^{1} 2\pi\, d(\cos\theta)P_l(\cos\theta)I(x,\theta,t), \tag{3}$$

and

$$S_l(t)=\int_{-1}^{1} 2\pi\, d(\cos\theta)[1-P_l(\cos\theta)]S(t,\theta), \tag{4}$$

an interlinked system of equations for the $I_{nl}(t)$ can be derived from (2):

$$-\frac{\partial I_{nl}(t)}{\partial t}+S_l(t)I_{nl}(t)=\frac{n}{2l+1}\{(l+1)I_{n-1,l+1}(t)+lI_{n-1,l-1}(t)\}+\delta_{n0}\delta(1-t). \tag{5}$$

Further analysis is dependent upon the fact that the scattering coefficients $S_l(t)$ can be obtained accurately from the suitable formula

$$S_l(t)=\frac{\alpha d_l}{t(t+\alpha)}, \tag{6}$$

where d_l and α are constants. This analytic form, which is accurate over a very wide range of t, Z, and E_0 values, is made plausible by a derivation due to C. Blanchard which is given in appendix A of [1]. Expression (6) makes it possible to obtain from (5) a set of recursion relations linking "residual range moments" I_{nl}^m defined by

$$I_{nl}^m=\int_0^1 dt\left[\frac{(1+\alpha)t}{t+\alpha}\right]^{m-n-1/2} I_{nl}(t). \tag{7}$$

Derivation of the recursion relations satisfied by the I_{nl}^m will not be given, but it is essentially that outlined in [1, Appendix C] with $m=p+n+\frac{1}{2}$, and $I_{nl}^m=(1+\alpha)^p\Phi_{nl}^p$. They are

$$I_{nl}^m=n\frac{\alpha}{1+\alpha}\sum_{i=0}^{\infty}\frac{(i+1)}{[d_l-n+\frac{1}{2}+m+i]}\frac{1}{(1+\alpha)^i}\left\{\frac{l+1}{2l+1}I_{n-1,l+1}^{m+i}+\frac{l}{2l+1}I_{n-1,l-1}^{m+i}\right\}$$
$$+\delta_{n0}\frac{\alpha}{1+\alpha}\sum_{i=0}^{\infty}\frac{(i+1)}{[d_l+\frac{1}{2}+m+i]}\frac{1}{(1+\alpha)^i}. \tag{8}$$

The system of eq (8) has a complicated appearance, but it contains one fundamental simplifying feature, namely that all the terms appearing in each equation have superscripts $m'\geq m$. This means that a knowledge of the $I_{nl}^{m'}$ for $m'>m$ makes possible a solution for m and then chainwise for lower values of m. The procedure for solving eq (8) is based on this feature, together with the fact that all the sums converge essentially like a geometric series. By starting the solution at sufficiently large $m_{\text{initial}}=M$, it becomes unimportant whether or not terms $m'\geq M$ are accurately represented, since they contribute a negligible amount to the low values of m which are of primary interest.

The first step in the machine programing consists of a numerical determination of the I_{nl}^m through solution of (8). For this purpose it is convenient to restate (8) in a simpler form. We make the following definitions:

$$T_{nl}^m=n\left(\frac{\alpha}{1+\alpha}\right)\frac{1}{[d_l-n+\frac{1}{2}+m]}\left\{\frac{l+1}{2l+1}I_{n-1,l+1}^m+\frac{l}{2l+1}I_{n-1,l-1}^m\right\},\quad \text{for } n>0$$

$$T_{0l}^m=\left(\frac{\alpha}{1+\alpha}\right)\frac{1}{[d_l+\frac{1}{2}+m]},$$

$$C_{nl}^m=\sum_{i=0}^{\infty}\left(\frac{1}{1+\alpha}\right)^i T_{nl}^{m+i}. \tag{9}$$

In terms of these quantities, and by means of the summation device [1, eq 27], we can rewrite (8) in the form of coupled equations to be evaluated successively in the order stated below:

$$C_{nl}^m=T_{nl}^m+\frac{1}{1+\alpha}C_{nl}^{m+1},$$

$$I_{nl}^m=C_{nl}^m+\frac{1}{1+\alpha}I_{nl}^{m+1}. \tag{10}$$

Equations (9) and (10) exhibit more clearly the progression of the solution from large to small values of m. It is clear that given initial values T_{nl}^M, C_{nl}^M, and I_{nl}^M, these same quantities may be determined in turn for $M-1$, $M-2$, etc., down to $m=0$. To complete the analysis, therefore, it is necessary to give some device for estimating the initial values. Two choices have been used: In some cases, particularly for large α, the I_{nl}^M and C_{nl}^M were set equal to zero. More frequently, a crude estimate of these quantities was used, which was based on approximate evaluation of the sums in (8) for large M, namely

$$C_{nl}^M=\left(\frac{1+\alpha}{\alpha}\right) T_{nl}^M,$$

$$I_{nl}^M=\left(\frac{1+\alpha}{\alpha}\right)^2 T_{nl}^M. \tag{11}$$

The expressions (11) break the M linkages and permit calculation of approximate values for I_{nl}^M and C_{nl}^M with as many n, l combinations as desired.

The foregoing equations are now almost ideally suited for machine computation. Because of the rapidity of the computer operations, there is hardly any limitation to the values of M which are practical. After some preliminary exploration, M was made sufficiently large that any further increase would not change the results for small m significantly in the eighth place. For most of the calculations $M=50$ proved sufficient for this, but for energies $E_0 \geq 2$ Mev, $M=150$ was used. As a final check, comparisons were made with values of I_{00}^0 obtained from (7), with $I_{00}(t)=1$,

$$\begin{aligned} I_{00}^0&=1+\frac{1}{2}\frac{\alpha}{\sqrt{\alpha+1}}\ln\left(\frac{\sqrt{\alpha+1}+1}{\sqrt{\alpha+1}-1}\right), && \alpha>0,\\ &=1+2\frac{|\alpha|}{\sqrt{|\alpha|-1}}\left\{\frac{\pi}{4}-\frac{1}{2}\tan^{-1}\sqrt{|\alpha|-1}\right\}, && \alpha<-1. \end{aligned} \tag{12}$$

Calculation of numerical values for I_{n0}^M represents a major objective of the machine program, since these numbers describe the total flux of electrons integrated over all directions. The procedure just described for obtaining them has proved very rapid and satisfactory.

Once the I_{n0}^m have been obtained, we are in a position to calculate the energy dissipation distribution $I(z)$, which is the end product of our investigation. If $I(z)dz$ is the energy dissipated per square centimeter in the plane layer between z and $z+dz$, then $I(z)$ is an integral over $I_0(t, x)$, namely

$$I(z)=\frac{1}{r_0}\int_0^{r_0} dr\left(\frac{dE}{dr}\right) I_0(r/r_0,z/r_0). \tag{13}$$

For our purposes it is advantageous to rewrite (13) in scaled form in terms of a de-dimensionalized function $J(x)=I(z)/(dE/dr)_{E_0}$:

$$J(x)=\int_0^1 dt\,\epsilon(t)I_0(t,x), \tag{13'}$$

where $\epsilon(t)=(dE/dr)/(dE/dr)_{E_0}$. Note that $\epsilon(t)=1$ at $t=1$. Equations (13) and (13′) express the assumption that each electron contributing to the flux $I_0(t,x)$ at x dissipates energy at the average rate dE/dr per unit pathlength traveled.

Our procedure is to calculate first the spatial moments J_n of $J(x)$, and from these obtain the function itself. To obtain the J_n we use an approximate analytical representation for $\epsilon(t)$, namely

$$\epsilon(t)\approx\sum_{i=1}^4 A_i\left[\frac{(1+\alpha)t}{t+\alpha}\right]^{i-\frac{3}{2}}. \tag{14}$$

Inserting this expression into (13′), and then calculating spatial moments of both sides, we obtain an expression for J_n in terms of the I_{n0}^m:

$$J_n=\sum_{i=1}^4 A_i I_{n0}^{n+i-\frac{3}{2}}. \tag{15}$$

The representation (14) contains four constants A_i, which require four conditions for their determination. Since $\epsilon(t)$ is a ratio of stopping powers, it can be evaluated numerically for different t_j values. We may then require our representation to equal $\epsilon(t_j)$ at $t=t_j$. Each value of j then corresponds to one condition to be fulfilled by our representation. By a suitable choice of t_j values, the representation can be made to resemble closely the actual function $\epsilon(t)$. For this purpose, the values $t_1=1$, $t_2\approx0.5$, and $t_3\approx0.1$ were selected. Instead of selecting a fourth condition similar to these three, however, the condition was chosen that the total energy dissipated must always equal the initial kinetic energy E_0 of the electrons. This is expressed by the integral

$$J_0=\int_{-1}^{1} dx\int_{0}^{1} dt\epsilon(t)I_0(t,x), \tag{16}$$

which takes the form

$$J_0=\sum_{i=1}^{4} A_i I_\infty^{i-\frac{3}{2}}=\frac{E_0/r_0}{(dE/dr)_{E_0}}. \tag{17}$$

This condition insures that the stopping power is correctly expressed "on the average"; and it partially compensates for inaccuracies in (14) which arise from the difficulty of representing (dE/dr) simultaneously at low and high energies. When combined with the other three expressions obtained from (4) by setting $t=t_j$, we have a set of simultaneous linear equations whose solution yields the A_i. A short machine program was included to accomplish this and then, with the results, to evaluate the sums (15).

In summary, the machine program for calculating moments J_n of the energy dissipation distribution $J(x)$ consists of a section which solves the moment eqs (8) by means of the recursion eq (9) to (11), a section to determine the A_i, and a final section to perform the sums (15). As input data, values of the constants d_l, α, and M are required for the first section, and E_0, r_0, $(dE/dr)_{E_0}$, t_1, t_2, and the values $(dE/dt)_{t\approx0.5}$ and $(dE/dt)_{t\approx0.1}$ for the second section.

The preceding discussion outlines the calculation of moments J_n for the *plane perpendicular* source. Also of interest are the moments for the *plane isotopic* source from which one can obtain the moments of the *point isotropic* sources (see eq 28). Note that in the case of the plane isotropic source, each element of area on the source plane emits electrons equally in all directions. Only minor modifications are needed in the equations already given to obtain equations from which a calculation of plane isotropic source moments can be made. In particular, the factor $\delta(\cos\theta-1)$ must be replaced by $\frac{1}{2}$ in the last term of (2), a factor δ_{l0} must be included in the last term of (5) and (8), and in (9) the expression for T_{0l}^{m} must also include a factor δ_{l0}. Otherwise all equations are identically the same for both source types.

2.2. Calculation of the Energy Dissipation from its Moments

The method which was used to calculate the energy dissipation distributions was the "function fitting" method outlined in [1], in which several terms are added together to represent the distribution, all terms having the same functional form but differing in the value of a scale parameter. The representation is expected to be accurate if its moments agree with the known moments of the distribution, if the functional form has been well chosen, if it is smooth, nonoscillatory, positive, single-peaked, and if it is correct at $x=0$.

The chief advantage and also the chief difficulty with this method for calculating a function from its moments arise from its all-or-nothing character. To obtain values for all the scale parameters and "strength" parameters in the representation, it is necessary to solve simultaneously a set of nonlinear equations. The solution of these equations may be acceptable on the basis of the above-mentioned criteria. In this case the representation is expected to be very accurate. On the other hand, solution of the equations may lead to coefficients which are complex, too large, or too small, and which give a representation which is uneven or oscillatory in nature and not representative of the desired distribution at all. Because the solution of the equations may "fail" in this way, perhaps more often than it may succeed, the function-fitting method is not well suited to digital computer operations. Nevertheless, because only this method had proved successful in hand computations, it was necessary to attempt its use in systematic machine computations.

The expectations that frequent failures would be encountered with any function-fitting machine program led us to take three precautions. (1) The functional form selected contained a number of parameters which could be given values arbitrarily. This was to make possible a wide variety of modifications in this function without having to write new codes. It turned out that many of these arbitrary parameters were unnecessary. (2) In each machine calculation, at least five different attempts were made to calculate the distribution, each attempt corresponding to a different value of one of the arbitrary parameters. Thus, several tabulations of the distribution were usually obtained in the same machine run. (3) Where several comparable tabulations occurred, these were graphed and compared both visually and in regard to their analytic form. A choice was made of the distribution best satisfying the criteria. It almost always turned out that if two or more such approximate distributions agreed about equally well with the basic criteria, they agreed with each other to within 1 or 2 percent, except for very small $J(x)$.

Calculation of the spatial distributions proceeded as in [1]. Even and odd moment sets were considered as descriptive of even and odd functions $J^{\text{even}}(x)$ and $J^{\text{odd}}(x)$, which yield $J(x)$ through the combinations

$$J(x)=\tfrac{1}{2}[J^{\text{even}}(x)+J^{\text{odd}}(x)],$$

$$J(-x)=\tfrac{1}{2}[J^{\text{even}}(x)-J^{\text{odd}}(x)]. \tag{18}$$

The functions $J^{\text{even}}(x)$ and $J^{\text{odd}}(x)$ were calculated from the following analytic expressions:

$$(1-a_0x^2)J^{\text{even}}(x)=\sum_{i=0}^{3}\alpha_i\beta_i\left(a_1-a_2\frac{x}{\beta_i}\right)\left(1-\frac{x}{\beta_i}\right)^{\gamma}e^{-Ax/(\beta_i-x)}, \tag{19}$$

$$(1-a_0x^2)J^{\text{odd}}(x)=\sum_{i=0}^{3}\alpha_i\left(a_1-a_2\frac{x}{\beta_i}\right)\left(1-\frac{x}{\beta_i}\right)^{\gamma}e^{-Ax/(\beta_i-x)}, \tag{20}$$

where the constants a_i were usually assigned the values $a_0=1$, $a_1=1$, and $a_2=0$. The constant A, which controls the asymptotic trend of all the terms, was determined by iteration from the expression

$$\sqrt{A}=\frac{\ln\,(J_{N-2}/J_N)}{2\{\sqrt{N+\tfrac{1}{4}+(A/12)}-\sqrt{N-7/4+(A/12)}\}},\ N=n_{\text{maximum}}. \tag{21}$$

The precise value of A is not critical except for large $|x|$, where $J(x)$ is very small; and (21) gives a fairly reasonable value for this constant since it corresponds to a simple but realistic approximate form [1, Section 7 and Appendix E],

$$J(x)\sim(1-x)^{-3/2}e^{-Ax/(1-x)}. \tag{22}$$

The constant γ was assigned integral or half-integral values, usually not greater than 1 nor less than -2. The constant β_0 was given the value unity, and the constant β_1 was given five different values in succession, namely $\sqrt{0.9}$, $\sqrt{0.6}$, $\sqrt{0.4}$, $\sqrt{0.1}$, and $\sqrt{0.04}$, each yielding a separate representation of $J(x)$.

The other six constants in each of the expressions (19) and (20), namely α_i, $i=1$ to 4, and β_i, $i=3,4$. were determined so that five moment equations obtained from (19) and five from (20) were satisfied. and so that two other features of $J(x)$ were given correctly,

$$J^{\text{odd}}(0)=1, \tag{23}$$

and

$$\left(\frac{d}{dx}J^{\text{even}}\right)_{x=0}=-\frac{d}{dt}(\epsilon)\bigg|_{t=1}. \tag{24}$$

Equation (23), together with the moment equations derived from (20) give the following system of simultaneous equations:

$$\frac{J_n-a_0J_{n+2}}{a_1\omega_n-a_2\omega_{n+1}}=\sum_{i=0}^{3}\alpha_i\beta_i^{\,n+1},\qquad n=1,3,5,7,9,$$

$$1=\sum_{i=0}^{3}\alpha_i, \tag{25}$$

where ω_n indicates a number discussed below. Similarly, (24) together with the moment equations derived from (19) give the system

$$\frac{J_n-a_0J_{n+2}}{a_1\omega_n-a_2\omega_{n+1}}=\sum_{i=1}^{3}\alpha_i\beta_i^{n+2}, \qquad n=0,2,4,6,8,$$

$$\frac{\alpha}{\alpha+1}\sum_{i=1}^{4}(i-\tfrac{3}{2})A_i=[a_2+a_1(\gamma+A)]\sum_{i=0}^{3}\alpha_i. \tag{26}$$

Note that the α_i and β_i for J^{even}, obtained by solution of (25), are quite different from the corresponding values for J^{odd}, obtained from solution of (26).

The number ω_n appearing in both (25) and (26) is defined by the expression

$$\omega_n=\int_0^1 dx\; x^n(1-x)^{\gamma}e^{-Ax/(1-x)}. \tag{27}$$

Machine calculation of these numbers presented an interesting problem, since quite a few are needed, and they must be determined with great accuracy. For this purpose, recursion relations similar to those of [1, Appendix E] were derived. It was found that by estimating ω_n for a very large n, say $n=50$, and then by working back to small values of n using the recursion relations, very precise values could be obtained. Actually, there was more to the problem than this, since accurate *absolute* values were desired, whereas the method just sketched gives only accurate *relative* values. In any case, a simple and rapid machine program was devised for this purpose.

Solutions of (25) and (26) were programed for the computer, and the resulting parameters were then used in an additional routine which tabulated J^{even} and J^{odd} from (19) and (20). Finally, these tabulations were combined as in (18) to obtain $J(x)$. In the solution of (25) and (26), if β_2 and β_3 turned out to be complex, the remainder of the calculation was omitted and another calculation was attempted with a new value of β_1. Solutions involving complex β_1 were not acceptable because of being inherently oscillatory. Of the many calculations, perhaps half were not completed because of this type of failure.

The preceding discussion is largely descriptive also of the calculations of $J(x)$ for a point isotropic source; but there were a number of differences worth noting. Point isotropic source moments could be easily obtained from plane isotropic source moments, which were actually computed directly, by use of the prescription

$$J_n^{\text{Point isotropic}}=(n+1)J_n^{\text{Plane isotropic}}. \tag{28}$$

From these moments A was then determined, using (21). The representation of $J(x)$ for the point isotropic source differed somewhat from (19) because of the added condition that $J(0)=1$. This was ensured by addition of an extra term:

$$(1-a_0x^2)J(x)=(1+a_1x)(1-x)^{\gamma}e^{-Ax/(1-x)}+a_1\sum_{i=0}^{3}\alpha_i\beta_i\left(\frac{x}{\beta_i}\right)\left(1-\frac{x}{\beta_1}\right)^{\gamma}e^{-Ax/(\beta_i-x)}. \tag{29}$$

Moments of (29) have the form

$$\frac{J_n-a_0J_{n+2}-(\omega_n+a_1\omega_{n+1})}{a_1\omega_{n+1}}=\sum_{i=0}^{3}\alpha_i\beta_i^{\,n+2}, \qquad n=0,2,4,6,8, \tag{30}$$

where the ω_n are as defined by (27). To complete the set of equations, one more was added to express the condition that

$$\frac{d}{dx}J(x)\bigg|_{x=0}=-\frac{d}{dt}(\epsilon)\bigg|_{t=1}.$$

The parameters A, γ, β_0, and β_1 were specified as already indicated, and a_0, a_1 were set equal to unity.

It happened repeatedly that none of the solutions obtained from the prearranged set of values of β_1 were acceptable. When this occurred, the parameter next to be given new values was γ. On occasion it proved necessary to use several different values for γ before obtaining an acceptable result; but in no case was it necessary to modify the other parameters.

2.3. Choice and Preparation of Input Data

Three types of input data are required for the calculations outlined in the preceding section, namely electron stopping powers, electron ranges, and elastic scattering cross sections; but none of this information enters directly into the equations which are solved. Instead, a set of derived parameters is used which includes α, the d_i, and the A_i. Thus, after obtaining the basic physical data, a very substantial effort is required to determine the numerical values of the actual equation parameters. In this subsection the physical data is first discussed and then the preparation of the equation parameters is outlined.

Extensive tabulations of range and stopping-power data have been prepared by Nelms [2,3]. We used the data of [2], corrected for density effect according to Sternheimer [4]. This data is based on values for the mean excitation potential obtained by Mather and Segré [5].

The nuclear elastic scattering cross section which was used was essentially the Mott cross section (σ) modified to take into account screening by the atomic electrons. Values for the ratio σ/σ_R of the Mott cross section to the Rutherford cross section were taken from the tabulations of Doggett and Spencer [6]. Also used were unpublished values determined by Doggett and Spencer for several additional atomic numbers Z_i. The screening modification was accomplished through use of Moliére's expression for the screening parameter η [7]. To take into account deflections due to collisions with atomic electrons, the nuclear elastic scattering cross section was modified by a factor $[(Z^2+Z)/Z^2](1+\epsilon)$, in accordance with a correction due to Fano [8] to the usual prescription which replaces the factor Z^2 in the cross section by $Z(Z+1)$.

Due to the remarkable scaling of electron penetration phenomena with the range r_0 (see, e.g., [1], slowing-down and scattering properties of the medium all find expression through the single function $S(t, \Theta)$. For reasons of computational convenience, we represented this function in the form

$$S(t,\Theta)=(3/4)N_A(Z/A)\phi_0(Z+1)(1+\epsilon)(E+mc^2)^2(mc^2)^2[E(E+2mc^2)]^{-2}r_0[1+2\eta-\cos\Theta]^{-2}\{\times 1+\pi(Z/137)$$

$$(\beta\cos\chi/\sqrt{2})[1+2\eta-\cos\Theta]^{1/2}+[(\sigma/\sigma_R)-1-\pi(Z/137)\beta\cos\chi\sin\tfrac{1}{2}\Theta][1+2\eta-\cos\Theta]^2[1-\cos\Theta]^{-2}\}, \quad (31)$$

where the quantity in curly brackets can be recognized as σ/σ_R to within a minor modification, and

N_A=Avogadro's number,

$\phi_0=\frac{8}{3}\pi\left(\frac{e^2}{mc^2}\right)^2=6.65205\times10^{-25}$ cm^2 is the Thompson cross section,

$\beta=[E(E+2mc^2)]^{\frac{1}{2}}/(E+mc^2)$ is the electron velocity divided by c,

mc^2 is the rest energy of the electron,

σ is the Mott scattering cross section,

$$\epsilon=(Z+1)^{-1}(\ln 4\eta)^{-1}\left\{u_{\ln}-\ln\left[0.16Z^{-2/3}\left(1+3.33\frac{Z}{137\beta}\right)\right]\right\},$$

$$\eta=\frac{1}{4}\left[\frac{Z^{1/3}}{0.885(137)}\right]^2\frac{(mc^2)^2}{E(E+2mc^2)}\left[1.13+3.76\left(\frac{Z}{137\beta}\right)^2\right],$$

$$\cos\chi=\mathrm{Re}\left\{\frac{\Gamma\left(\frac{1}{2}-i\frac{Z}{137\beta}\right)\Gamma\left(1+i\frac{Z}{137\beta}\right)}{\Gamma\left(\frac{1}{2}+i\frac{Z}{137\beta}\right)\Gamma\left(1-i\frac{Z}{137\beta}\right)}\right\}, \text{ and}$$

$$\sigma_R=\frac{3}{4}N_A(Z/A)\phi_0 Z(E+mc^2)^2(mc^2)^2[E(E+2mc^2)]^{-2}(1-\cos\Theta)^{-2}.$$

In (31), note that $(3/4)N_A(Z/A)\phi_0=0.300$ cm^2/g, a tabulation of $\cos\chi$ has been given in [6], and the constant $-u_{\ln}$ is a number in the neighborhood of 5. Everything in (31) is known except the value of

$-u_{\text{in}}$, which affects only a correction to a correction. To be systematic in "guessing" the value of $-u_{\text{in}}$, the few values in [8] were plotted against log Z and interpolations were made from a rough curve drawn through the points.

To discuss the further processing of the data, it is convenient to give the different terms in (31) shorter names. In particular, we define G, $C(\Theta)$, $D(\Theta)$, and $F(\Theta)$ as follows:

$$G(E)=(3/4)N_A(Z/A)\phi_0(Z+1)(1+\epsilon)(E+mc^2)^2(mc^2)^2[E/(E+2mc^2)]^{-2}r(E),$$

$$C(\Theta)=[1+2\eta-\cos\Theta]^{-2},$$

$$D(\Theta)=[1+2\eta-\cos\Theta]^{-3/2},$$

$$F(\Theta)=\left\{(\sigma/\sigma_R)-1-\pi(Z/137\beta)\cos\chi\sin\tfrac{1}{2}\Theta\right\}(1-\cos\Theta)^{-2}. \tag{32}$$

Using these definitions, $S(t, \Theta)$ can be written

$$tS(t,\Theta)=G\{C(\Theta)+\sqrt{\tfrac{1}{2}}\pi(Z\beta/137)\cos\chi\, D(\Theta)+F(\Theta)\}. \tag{33}$$

The expansion in Legendre coefficients of $C(\Theta)$ and $D(\Theta)$ is a simple matter and has been given in [1]. On the other hand, $F(\Theta)$ is only known numerically, and its harmonic expansion is therefore not so easy to obtain. Our procedure consisted of approximating $F(\Theta)$ by a four term polynomial in $(1-\cos\Theta)$ over each of the angular ranges 45° to 90°, 90° to 135°, and 135° to 180°,

$$F(\Theta)=\sum_{i=0}^{3} f_i(1-\cos\Theta)^{i-1}, \tag{34}$$

and by a three-term polynomial of the same type over the range 0° to 45°. Note that in each 45° range the f_i in (34) assume different values. These coefficients were determined so that (34) agreed with the tabulated values of $F(\Theta)$ at 15° intervals. With the analytic approximations (34), it is possible to accomplish the integrations (4) to obtain coefficients F_l. The procedure actually followed was that of determining a 12×12 matrix which, multiplied by the twelve tabulated values $F(15°)$, $F(30°)$, etc., would yield in turn the first twelve harmonic coefficients $F_1, F_2, \ldots F_{12}$. The matrix multiplications were then performed by machine.

Having determined all the C_l, D_l, and F_l, the coefficients $S_l(t)$ were then calculated from the expression

$$tS_l(t)=G(E)\left\{C_l+\sqrt{\tfrac{1}{2}}\pi(Z\beta/137)\cos\chi D_l+F_l\right\}_E, \tag{35}$$

for all the energies and elements listed in tables 1 and 2, plus one lower energy, namely 0.01 Mev.

In the last stage of the preparation of the data, ratios $S_l(t)/S_1(t)$ were determined from (35). The representation (6) requires these ratios to be independent of t. Actually, they are weakly energy dependent, and to this extent (6) is in error. To minimize the effect of this error, the ratios d_l/d_1 were set equal to $S_l(1)/S_1(1)$, so that the most penetrating part of the range of the electrons is traveled before the approximation (6) incurs appreciable error:

$$\frac{d_l}{d_1}=\frac{S_l(1)}{S_1(1)}. \tag{36}$$

Finally, to obtain α and d_1 we notice from (35) that $tS_1(t)$ depends only on E, not on E_0. Therefore, according to (6), the quantity

$$\frac{\alpha d_1}{t+\alpha}=tS_1(t), \tag{37}$$

also depends only on E, and not on E_0. This makes it very easy to calculate α and d_1 from the tabular values of (35). One evaluates (37) for two values of t, namely $t=1$ and $t=t_1$, corresponding to E_0 and the next lower energy recorded. Simultaneous solution of these two equations yields α and d_1:

$$\alpha=\frac{S_1(1)-t_1[t_1S_1(t_1)]}{t_1S_1(t_1)-S_1(1)},$$

$$d_1=\frac{1+\alpha}{\alpha}S_1(1). \tag{38}$$

Combination of d_1 with the ratios d_l/d_1 then give all the d_l's.

This completes the preparation of the data, except for compounds and mixtures, in which case it is necessary to determine the S_l from an average over S_l values for the constituent elements, in proportion to their fraction of the mixture by weight.

3. Tabulations and Their Description

3.1. Description of the Tables

The following quantities appear in table 1:

Z, the atomic number; results are given for $Z=6$ (carbon), 13 (aluminum), 29 (copper), 50 (tin), and 82 (lead), and in addition for air and polystyrene. Air is assumed to be 0.755 nitrogen, 0.232 oxygen and 0.013 argon by weight, and polystyrene is taken to be C_8H_8.

E_0, the initial source energy of the electrons; results are given for $E_0=0.025$, 0.05, 0.1, 0.2, 0.4, 0.7, 1, 2, 4, and 10 Mev, except that some of the highest and lowest values have been omitted in the case of tin and lead.[2]

$(dE/dr)_{E_0}$, the stopping power of electrons at the initial (source) energy.

$r_0=r(E_0)$, the residual range of electrons at energy E_0.

x, the distance from the source in units of r_0. This quantity refers to z/r_0 for plane perpendicular sources and to ρ/r_0 for point isotropic sources, where z is measured along a perpendicular to the source *plane* and ρ is measured radially out from the source *point*.

$J(x)$, the de-dimensionalized energy dissipation distribution, for plane perpendicular and point isotropic sources, see eqs (13) and (13′). For plane perpendicular sources, $(dE/dr)_{E_0}J(x)=I(z)$, where $I(z)dz$ is the energy dissipated per cm^2 in the plane layer between z and $z+dz$ by electrons initially given kinetic energy E_0 assuming 1 electron/cm^2 to be generated at the source plane.[3] For point isotropic sources, $(dE/dr)_{E_0}J(x)=I(\rho)$, where $I(\rho)d\rho$ is the average energy per electron dissipated in the spherical shell between ρ and $\rho+d\rho$. In the case of the plane perpendicular sources, $J(x)$ has been given for positions on both sides of the source plane. Occasional negative values of $J(-x)$ represent spurious effects due to imperfections in the representation. They have been included because they give some guidance regarding the expected accuracy for $x=|-x|$. One does not expect the value $J(x)$ to be more accurate than plus or minus the corresponding value at $-x$, where that value is negative. Note that the discontinuity at the source plane is unity, and that in the case of both point isotropic and plane perpendicular sources the integral over x gives $(E_0/r_0)/(dE/dr)_{E_0}$.

Along with the tabulated energy dissipation distributions and the associated range and stopping power values at the source energy, we have included many other pieces of data in table 1 in order to give a fairly complete record of the computations. These are:

$(\sigma)/\sigma_R(\theta)$, the ratio of the Mott to the Rutherford nuclear elastic scattering cross sections which was used as input data [6];

$S_l(1)$, given by (35) for $t=r(E)/r(E_0)=1$, i.e., for $E=E_0$;

d_l, α, quantities characterizing the representation (6) of the scattering coefficients $S_l(t)$;

A_1, A_2, A_3, A_4, the coefficients A_i in the analytic approximate representation (14) of the stopping power $\epsilon=(dE/dr)/(dE/dr)_{E_0}$,

A^{PTI}, A^{PLP}, the two values of the constant A in eq (19) to (22) for the point isotropic and plane perpendicular source geometries, respectively. Theoretically the same, these values differ because

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[2] A calculation for 0.1 Mev source energy in Pb has been included to facilitate calculations for energies below 0.7 Mev. Since the binding energy of the K electrons in Pb is $\sim$0.07 Mev, the numbers in this table are not to be taken seriously.

[3] For a beam source, $I(z)dz$ represents the average energy per electron dissipated in the plane layer between z and $z+dz$.

they were obtained from (21) using different moment sets. The extent of the difference, as it affects the distribution in the manner indicated in (22), serves to indicate a region of large x in which the data are unreliable. There is no simple way to identify this region explicitly, since the representations (19, are more accurate than the expression (22) from which the constants A were determined. But when the difference in A values leads to widely different values for (18), one doesn't expect the tabulated values of $J(x)$ to be accurate. Note that the assumption of continuous energy loss makes $J(x)$ inaccurate in the same region anyway.

In table 2 the moments $I_{n0}^{p+n+\frac{1}{2}}$ have been recorded which were used to obtain the energy dissipation distributions. According to (7) these represent averages of the residual range function $\left[\frac{(1+\alpha)t}{t+\alpha}\right]^p$, over the n'th spatial moment $I_{n0}(t)$ of the flux distribution. In other words,

$$I_{n0}^{p+n+\frac{1}{2}}=\int_0^1 dt\left[\frac{(1+\alpha)t}{t+\alpha}\right]^p I_{n0}(t)=\int_0^1 dt\left[\frac{(1+\alpha)t}{t+\alpha}\right]^p\int_{-1}^1 dx\, x^n I_0(t,x), \tag{39}$$

where $I_0(t,x)dt$ is the flux of electrons having residual ranges between t and $t+dt$ crossing a small spherical probe of unit cross sectional area at a distance x from the source. The different columns in table 2 correspond to fixed values of p. Enough p values have been included to make possible calculations of electron spectra by reconstruction from these "residual range moments". Similarly, the I_{n0}^m can be combined with new representations of the stopping power of the type given by (14) to yield improved calculations of energy dissipation distributions, or perhaps calculations, using the stopping power of air, which give results corresponding to measurements of air ionization in a cavity chamber. Note that each number in table 2 ends in a symbol E-n which stands for $\times 10^{-n}$; thus 0.1000000–01, is to be interpreted as 0.1×10^{-1}, or 0.01.

Two sets of curves are given to illustrate data in table 1. In figure 1 curves are drawn of the energy dissipation distributions for plane perpendicular sources in copper. Each curve corresponds to

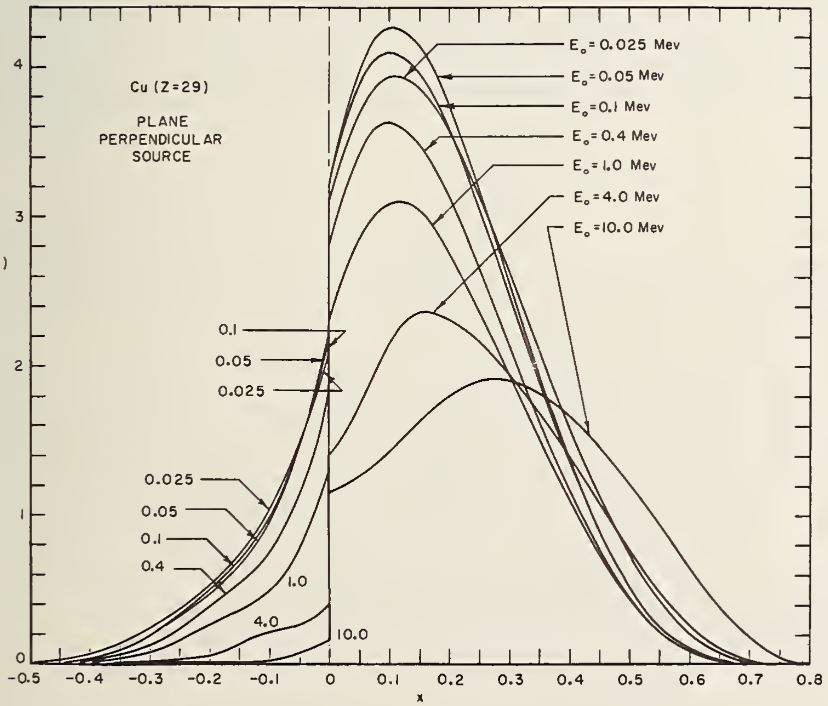

FIGURE 1. *Energy dissipation distribution for plane perpendicular sources of different initial energies in copper.*

The irregularities for negative x are spurious effects arising from inadequacy of the representation.

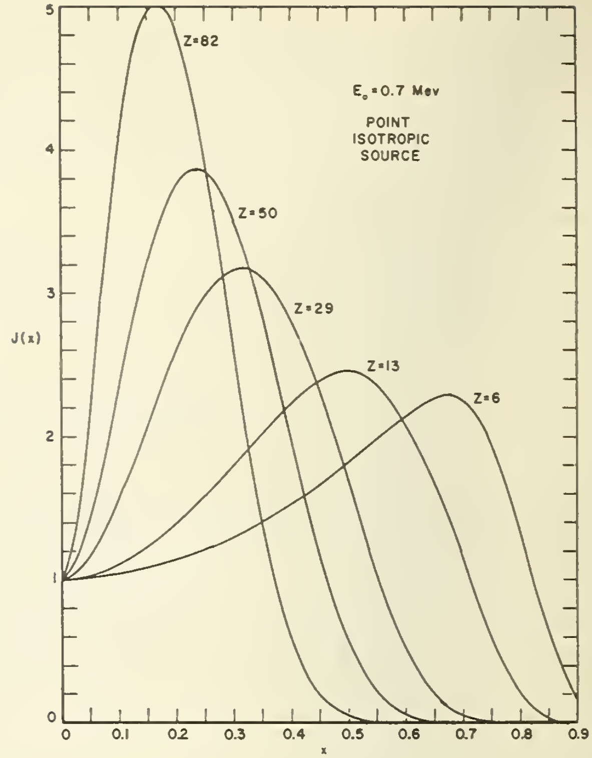

FIGURE 2. *Energy dissipation distribution for point isotropic sources of initial energy $E_0=0.7$ Mev in different materials.*

a different source energy. The curves show marked similarity for nonrelativistic source energies, which illustrates the scaling with range. They also show the tendency at relativistic energies for electrons to dissipate their energy farther out from the source, more in the manner of protons and α particles. Figure 2 gives distributions $J(x)$ for point isotropic sources corresponding to different Z values, for an initial energy $E_0=0.7$ Mev. These curves show clearly the trend towards greater energy dissipation near the source for larger Z values.

3.2. Interpolation

Three types of interpolation are of interest, namely interpolation in x, interpolation in E_0, and interpolation in Z.

The fairly fine mesh in x, namely $\Delta x=0.025$, should make possible an interpolation everywhere of precision comparable with the number of digits tabulated, although a quadratic, rather than linear, interpolation formula may be required.

Interpolation in source energy E_0 is a fairly simple matter over most of the (E_0,x) region covered by the tabulations. This is because the curves have a strong tendency to preserve their shape through source energy changes. Because logarithmically spaced source energies have been used, interpolation should be based on the variable log E_0 rather than E_0. For energies between 4 Mev and 10 Mev, and for large x values, there occur substantial shape changes which require a more sophisticated interpolation procedure which takes into account the analytic form of the approximating functions. Thus, for example, it should be substantially more accurate to interpolate the function $\{1/A \ln J(x)+x/(1-x)\}$, if a power series representation is used for the interpolation, even though the value of $J(x)$ must then be obtained from a difference between terms which affect the value of $J(x)$ exponentially.

Interpolation in Z is more difficult because of progressive shape changes with Z which result in great changes from one curve to the next. Accurate interpolation will therefore often require that the analytic form (22) be taken into account. This can be done in the manner already mentioned, by interpolating a well-chosen function of $J(x)$, such as $\{1/A \ln J(x)+x/(1-x)\}$, rather than $J(x)$ itself. The value of $J(x)$ can be obtained from this function utilizing a value for the constant A which is also interpolated from the A^{PTI} or A^{PLP} values of table 1.

Of special interest are interpolations for compounds and mixtures. Here it should be noted that the single, most important, determining piece of input data is the $S_1(1)$, which is nearly proportional to $Z+1$. One can therefore average Z over the constituent elements in the compound and use this value in an interpolation of the type discussed in the preceding paragraph.

Interpolation can be used to modify the results presented here to correspond to more accurate range and stopping power data; but changes of this type will almost certainly be small because they affect the calculations chiefly through the factor r_0 in the S_l values. A 3-percent change in r_0 would have about the same effect on the calculations as a 3-percent change in the atomic number. A similar change in the stopping power at all electron energies would have no effect because of the scaling which is utilized in de-dimensionalizing $J(x)$. Thus, new range and stopping power values can replace those presented in table 1 for most purposes, without further modifications in the results.

It should be mentioned that in a number of cases solutions were accepted for which one of the β_l exceeded unity by a small amount, say 2 percent. Because of this, the extreme asymptotic values of $J(x)$, i.e., for $x \approx 1$, do not always follow closely the trend of (22). This is noticeable mostly for the low Z elements. Interpolation will be less accurate when this occurs, but the values of $J(x)$ involved are small enough and inaccurate enough for other reasons that this should not matter.

3.3. Comparisons With Experimental Data

A number of experiments are available for comparison with the data presented here, and fortunately they are of high quality. By and large, the values in table 1 agree with the results recorded in [1], which in turn compared well with experiments due to Frantz using monoenergetic electrons incident perpendicularly on beryllium, aluminum, and gold [9]. Other results of [1] proved to be in good agreement with experiments using P^{32} beta ray sources in air (Clark, Brar, and Marinelli, point isotropic source geometry) [10], and in polystyrene (Loevinger, [11] plane isotropic source geometry).

Since the publication of [1], further experiments and calculations have been made by Huffman [12]. Huffman's results pertain to a monoenergetic electron beam incident perpendicularly on aluminum, with measurement of the energy dissipated in plane layers of *air*. His source energies are all in the proximity of 0.1 Mev. Huffman performed calculations, using the simplified method given in [1] which assumes α to be infinite. His theoretical values were in fair agreement with his experiments.

A fine summary of all this work is given in the Encyclopedia of Physics, vol. 34, in a review article by Birkhoff [13].

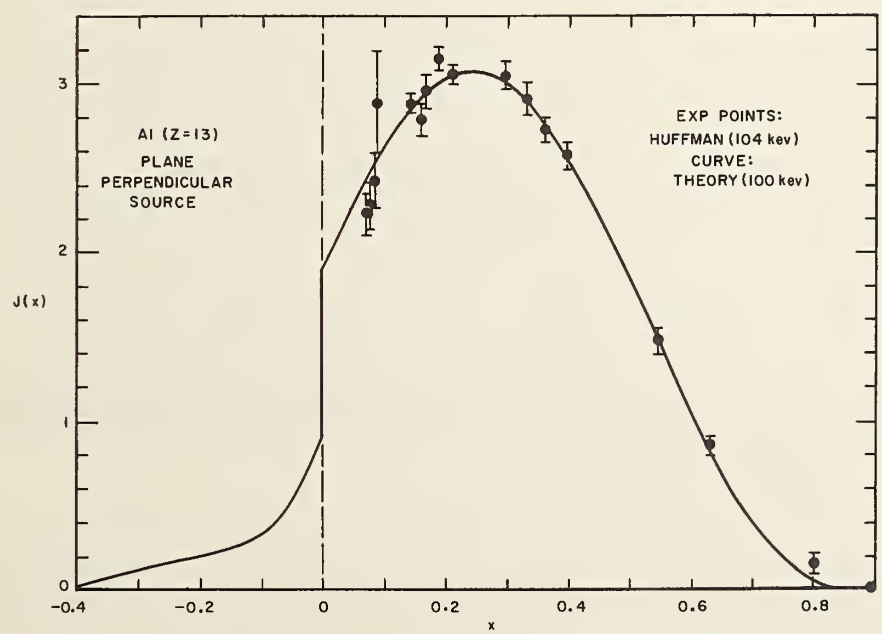

FIGURE 3. *Comparison of experimental data [12] with energy dissipation data from table 1.*

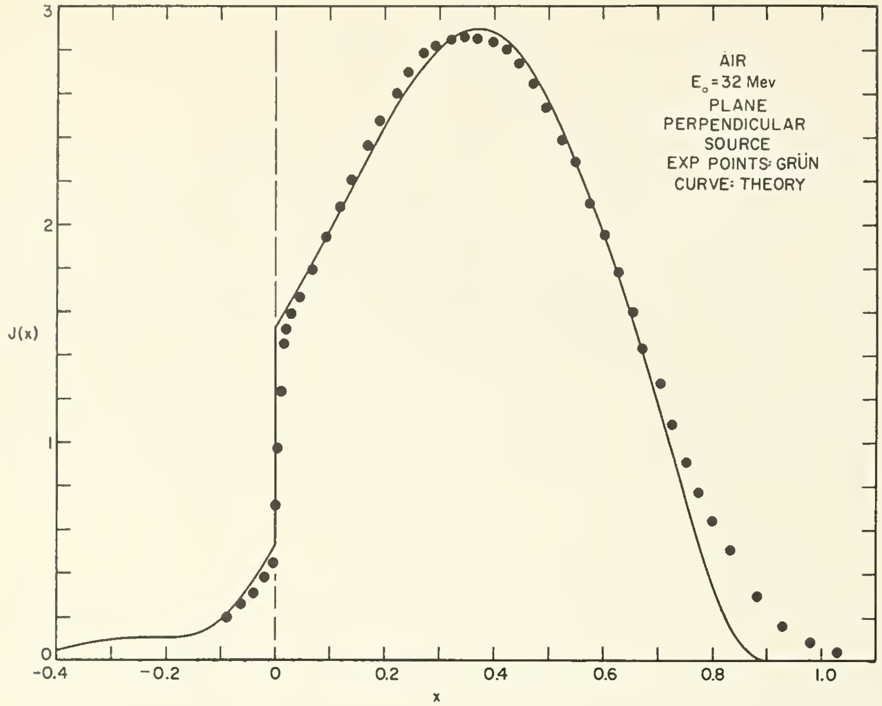

FIGURE 4. *Comparison of experimental results of Grün [14] with theoretical data interpolated from table 1.*

Although the data presented in this Monograph relate to energy dissipated in the material, rather than in an air probe, it is instructive to compare some of these new tabular data with Huffman's experimental results for 0.1 Mev electrons. Such a comparison is given in figure 3. The experimental results have been scaled to compare with $J(\alpha)$ by use of range and stopping power values from [1]. Agreement is seen to be very good, actually a little better than in the case of Huffman's calculations. Perhaps the use of a finite α, which permits a slightly better representation of the energy dependence of $S(t,\Theta)$ even at low energies, causes the difference between the two calculations.

The most complete experiment of this type is that of A. E. Grün, who made extremely detailed and consistent measurements of the energy dissipation distribution of rather low energy electrons (0.005 to 0.054 Mev) in air [14]. Grün determined the energy dissipation in plane layers of air perpendicular to a beam source, and his values include positions *behind* the source plane. In fact, Grün's experiments exhibit with remarkable clarity the discontinuity at the source plane, and he uses this feature as an experimental determination of the stopping power of electrons at these (low) source energies.

Results from table 1 have been interpolated to obtain a comparison with Grün's curve for 0.032 Mev, and this is shown in figure 4. Both curves are absolute, having been normalized to unit electron source strength, so that the discontinuity measures the stopping power in Mev-cm²/g. Substantial disagreement occurs only in two areas. One is at large penetrations, where the experimental curve is high due to the straggling in range which has been omitted from the calculations. The other is for penetrations behind the source, where the theoretical representation breaks down due to the calculation of small differences between even and odd component distributions.

Comparisons at higher energies ($\sim$2 Mev) in aluminum have been made with earlier work by Trump, Wright, and Clark [15] and indicate fairly good agreement. In high-Z materials, at both high and low energies, where one expects the schematization to break down, there do not appear to be experimental results at present.

Construction of the computer programs and applications of the computer were accomplished in collaboration with Mrs. Sally Peavy of the NBS Computer Laboratory. Calculation of input data was accomplished with the aid of R. Bach and Joel Rogers. Graphing of the computer output for the purpose of selection of suitable results was accomplished with the help of Mrs. Ann Nelms. Many people aided this project in other ways.

Table 1. Energy Dissipation Function, J(x), and Input Data

CARBON

$Z = 6, E_o = 0.025$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 9.97$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 0.00141$ g/cm^2

OTHER PARAMETERS

d_1 =	1.080	A_1 =	0.8079
α =	-107.8	A_2 =	0.2708
A^{PTI} =	0.7751	A_3 =	0.0380
A^{PLP} =	0.9124	A_4 =	-0.1167

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.004	1	1.090
30	1.003	2	2.770
45	0.998	3	4.867
60	0.990	4	7.272
75	0.979	5	9.977
90	0.966	6	12.87
105	0.953	7	15.90
120	0.940	8	19.04
135	0.928	9	22.68
150	0.920	10	26.43
165	0.914	11	30.26
180	0.912	12	34.16

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	1.422	0.422	0.500	2.636	2.671	-0.009
0.025	1.016	1.519	0.341	0.525	2.763	2.580	-0.012
0.050	1.041	1.615	0.266	0.550	2.883	2.472	-0.013
0.075	1.072	1.713	0.200	0.575	2.994	2.350	-0.008
0.100	1.111	1.812	0.144	0.600	3.088	2.216	-0.003
0.125	1.158	1.914	0.103	0.625	3.161	2.070	0.002
0.150	1.211	2.022	0.081	0.650	3.203	1.910	0.006
0.175	1.272	2.133	0.077	0.675	3.203	1.735	0.008
0.200	1.340	2.242	0.078	0.700	3.149	1.543	0.008
0.225	1.415	2.346	0.079	0.725	3.025	1.334	0.008
0.250	1.497	2.444	0.079	0.750	2.813	1.090	0.007
0.275	1.586	2.534	0.078	0.775	2.496	0.872	0.004
0.300	1.682	2.615	0.076	0.800	2.064	0.634	0.001
0.325	1.785	2.685	0.072	0.825	1.523	0.409	-0.002
0.350	1.893	2.742	0.066	0.850	0.925	0.219	-0.004
0.375	2.008	2.783	0.058	0.875	0.397	0.085	-0.003
0.400	2.127	2.806	0.048	0.900	0.091	0.019	-0.001
0.425	2.251	2.808	0.036	0.925	0.007	0.001	-0.000
0.450	2.379	2.787	0.022	0.950	0.000	0.000	-0.000
0.475	2.508	2.741	0.007	0.975	0.000	0.000	-0.000

$Z = 6, E_o = 0.05$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 5.95$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 0.00479$ g/cm^2

OTHER PARAMETERS

d_1 =	1.115	A_1 =	0.7176
α =	12.76	A_2 =	1.438
A^{PTI} =	0.7913	A_3 =	-2.387
A^{PLP} =	0.9343	A_4 =	1.231

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.004	1	1.034
30	1.001	2	2.687
45	0.990	3	4.800
60	0.974	4	7.274
75	0.953	5	10.04
90	0.930	6	13.04
105	0.905	7	16.23
120	0.882	8	19.58
135	0.862	9	23.06
150	0.846	10	26.64
165	0.836	11	30.29
180	0.833	12	34.00

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	1.363	0.363	0.500	2.654	2.725	0.005
0.025	1.008	1.443	0.290	0.525	2.798	2.630	-0.001
0.050	1.024	1.526	0.224	0.550	2.939	2.513	-0.005
0.075	1.049	1.615	0.167	0.575	3.072	2.378	-0.008
0.100	1.082	1.713	0.123	0.600	3.189	2.229	-0.007
0.125	1.123	1.825	0.096	0.625	3.279	2.066	-0.007
0.150	1.172	1.950	0.086	0.650	3.325	1.888	0.000
0.175	1.230	2.075	0.081	0.675	3.303	1.696	0.004
0.200	1.296	2.195	0.076	0.700	3.185	1.490	0.007
0.225	1.369	2.310	0.071	0.725	2.948	1.270	0.008
0.250	1.451	2.418	0.066	0.750	2.600	1.039	0.007
0.275	1.540	2.518	0.061	0.775	2.174	0.803	0.004
0.300	1.637	2.609	0.056	0.800	1.715	0.571	0.001
0.325	1.742	2.688	0.050	0.825	1.255	0.358	-0.002
0.350	1.854	2.754	0.044	0.850	0.819	0.184	-0.003
0.375	1.973	2.805	0.038	0.875	0.446	0.068	-0.003
0.400	2.099	2.837	0.032	0.900	0.178	0.014	-0.001
0.425	2.231	2.847	0.026	0.925	0.039	0.001	-0.000
0.450	2.368	2.834	0.019	0.950	0.003	0.000	-0.000
0.475	2.510	2.793	0.012	0.975	0.000	0.000	-0.000

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CARBON

$Z = 6,\ E_o = 0.1$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 3.71$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 0.0159$ g/cm^2

OTHER PARAMETERS

d_1	= 1.042	A_1	= 0.7075
α	= 39.12	A_2	= 0.8655
A^{PTI}	= 0.7714	A_3	= -1.031
A^{PLP}	= 0.9168	A_4	= 0.4576

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.004	1	1.016
30	0.996	2	2.702
45	0.976	3	4.908
60	0.946	4	7.542
75	0.909	5	10.54
90	0.868	6	13.84
105	0.826	7	17.42
120	0.786	8	21.23
135	0.751	9	25.24
150	0.725	10	29.43
165	0.708	11	33.78
180	0.702	12	38.26

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	1.341	0.341	0.500	2.474	2.599	-0.009
0.025	1.011	1.424	0.270	0.525	2.605	2.507	-0.005
0.050	1.029	1.508	0.204	0.550	2.736	2.399	-0.014
0.075	1.054	1.595	0.145	0.575	2.864	2.278	-0.009
0.100	1.086	1.687	0.097	0.600	2.983	2.145	-0.004
0.125	1.124	1.786	0.062	0.625	3.084	2.001	0.001
0.150	1.169	1.895	0.045	0.650	3.154	1.844	0.005
0.175	1.221	2.013	0.045	0.675	3.174	1.671	0.007
0.200	1.279	2.130	0.050	0.700	3.116	1.481	0.008
0.225	1.344	2.241	0.053	0.725	2.952	1.275	0.008
0.250	1.415	2.345	0.056	0.750	2.667	1.054	0.006
0.275	1.493	2.442	0.058	0.775	2.266	0.824	0.003
0.300	1.578	2.528	0.058	0.800	1.782	0.593	0.000
0.325	1.669	2.603	0.056	0.825	1.276	0.377	-0.002
0.350	1.767	2.664	0.052	0.850	0.822	0.197	-0.003
0.375	1.871	2.708	0.046	0.875	0.465	0.074	-0.003
0.400	1.981	2.734	0.038	0.900	0.218	0.015	-0.001
0.425	2.097	2.737	0.027	0.925	0.076	0.001	-0.000
0.450	2.218	2.716	0.014	0.950	0.016	0.000	0.000
0.475	2.344	2.669	0.001	0.975	0.001	0.000	0.000

$Z = 6,\ E_o = 0.2$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 2.52$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 0.0498$ g/cm^2

OTHER PARAMETERS

d_1	= 1.033	A_1	= 0.6437
α	= 18.89	A_2	= 0.8923
A^{PTI}	= 0.7726	A_3	= -0.9961
A^{PLP}	= 0.9216	A_4	= 0.4600

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.003	1	0.9815
30	0.987	2	2.666
45	0.954	3	4.912
60	0.906	4	7.634
75	0.846	5	10.77
90	0.781	6	14.28
105	0.714	7	18.11
120	0.651	8	22.24
135	0.596	9	26.64
150	0.554	10	31.28
165	0.527	11	36.14
180	0.518	12	41.19

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	1.294	0.294	0.500	2.298	2.433	-0.012
0.025	1.008	1.368	0.228	0.525	2.425	2.344	-0.016
0.050	1.022	1.444	0.168	0.550	2.552	2.242	-0.013
0.075	1.042	1.522	0.115	0.575	2.676	2.128	-0.008
0.100	1.068	1.606	0.071	0.600	2.789	2.004	-0.003
0.125	1.100	1.698	0.041	0.625	2.878	1.869	0.001
0.150	1.138	1.800	0.027	0.650	2.929	1.721	0.004
0.175	1.181	1.911	0.029	0.675	2.928	1.558	0.006
0.200	1.231	2.022	0.035	0.700	2.861	1.380	0.007
0.225	1.286	2.126	0.040	0.725	2.714	1.186	0.007
0.250	1.347	2.224	0.044	0.750	2.472	0.978	0.005
0.275	1.414	2.314	0.047	0.775	2.132	0.762	0.003
0.300	1.488	2.395	0.048	0.800	1.702	0.545	0.000
0.325	1.567	2.463	0.048	0.825	1.220	0.344	-0.002
0.350	1.653	2.518	0.045	0.850	0.753	0.178	-0.003
0.375	1.745	2.557	0.040	0.875	0.387	0.066	-0.002
0.400	1.843	2.577	0.032	0.900	0.171	0.013	-0.001
0.425	1.948	2.576	0.021	0.925	0.071	0.001	-0.000
0.450	2.059	2.551	0.009	0.950	0.027	0.000	-0.000
0.475	2.176	2.503	-0.003	0.975	0.009	0.000	-0.000

CARBON

$Z = 6,\ E_o = 0.4$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.92$ Mev(cm²/g)

RESIDUAL RANGE

$r_o = 0.143$ g/cm²

OTHER PARAMETERS

$d_1 = 1.016$ $A_1 = 0.5417$

$\alpha = 9.779$ $A_2 = 0.9422$

$A^{PTI} = 0.7603$ $A_3 = -0.8166$

$A^{PLP} = 0.9091$ $A_4 = 0.3327$

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.002	1	0.9221
30	0.977	2	2.555
45	0.929	3	4.766
60	0.860	4	7.481
75	0.776	5	10.64
90	0.683	6	14.22
105	0.590	7	18.16
120	0.501	8	22.44
135	0.425	9	27.04
150	0.366	10	31.94
165	0.328	11	37.10
180	0.316	12	42.51

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	1.233	0.233	0.500	2.048	2.192	-0.014
0.025	1.007	1.296	0.176	0.525	2.150	2.107	-0.015
0.050	1.018	1.362	0.125	0.550	2.254	2.012	-0.012
0.075	1.035	1.430	0.079	0.575	2.358	1.905	-0.007
0.100	1.056	1.503	0.042	0.600	2.457	1.792	-0.003
0.125	1.081	1.584	0.017	0.625	2.543	1.670	0.001
0.150	1.112	1.674	0.006	0.650	2.601	1.536	0.004
0.175	1.147	1.774	0.011	0.675	2.611	1.390	0.005
0.200	1.187	1.873	0.018	0.700	2.544	1.231	0.006
0.225	1.231	1.967	0.026	0.725	2.380	1.058	0.006
0.250	1.281	2.055	0.031	0.750	2.126	0.873	0.005
0.275	1.335	2.134	0.036	0.775	1.813	0.681	0.002
0.300	1.394	2.205	0.038	0.800	1.466	0.488	0.000
0.325	1.458	2.264	0.038	0.825	1.098	0.307	-0.002
0.350	1.527	2.310	0.037	0.850	0.731	0.160	-0.003
0.375	1.602	2.340	0.032	0.875	0.401	0.060	-0.002
0.400	1.681	2.352	0.025	0.900	0.157	0.012	-0.001
0.425	1.766	2.344	0.016	0.925	0.031	0.001	-0.000
0.450	1.855	2.314	0.004	0.950	0.001	0.000	-0.000
0.475	1.949	2.262	-0.006	0.975	0.000	0.000	-0.000

$Z = 6,\ E_o = 0.7$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.71$ Mev(cm²/g)

RESIDUAL RANGE

$r_o = 0.311$ g/cm²

OTHER PARAMETERS

$d_1 = 1.004$ $A_1 = 0.4643$

$\alpha = 5.157$ $A_2 = 0.9142$

$A^{PTI} = 0.7383$ $A_3 = -0.5978$

$A^{PLP} = 0.8842$ $A_4 = 0.2193$

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.001	1	0.8413
30	0.970	2	2.362
45	0.911	3	4.444
60	0.828	4	7.022
75	0.728	5	10.05
90	0.617	6	13.50
105	0.505	7	17.31
120	0.400	8	21.50
135	0.308	9	26.01
150	0.238	10	30.84
165	0.194	11	35.97
180	0.179	12	41.39

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	1.176	0.176	0.500	1.813	1.985	-0.013
0.025	1.004	1.227	0.131	0.525	1.894	1.907	-0.014
0.050	1.013	1.279	0.089	0.550	1.977	1.819	-0.011
0.075	1.025	1.334	0.052	0.575	2.060	1.724	-0.007
0.100	1.040	1.394	0.022	0.600	2.141	1.623	-0.003
0.125	1.060	1.462	0.022	0.625	2.213	1.513	0.000
0.150	1.083	1.539	-0.006	0.650	2.268	1.394	0.003
0.175	1.110	1.625	-0.001	0.675	2.288	1.265	0.005
0.200	1.140	1.712	0.007	0.700	2.253	1.123	0.005
0.225	1.174	1.795	0.014	0.725	2.137	0.970	0.005
0.250	1.213	1.872	0.020	0.750	1.929	0.805	0.004
0.275	1.255	1.942	0.025	0.775	1.642	0.632	0.002
0.300	1.301	2.004	0.029	0.800	1.306	0.458	0.000
0.325	1.351	2.056	0.030	0.825	0.963	0.293	-0.002
0.350	1.405	2.097	0.030	0.850	0.644	0.155	-0.003
0.375	1.463	2.123	0.027	0.875	0.372	0.059	-0.002
0.400	1.525	2.134	0.021	0.900	0.168	0.012	-0.001
0.425	1.591	2.126	0.013	0.925	0.049	0.001	-0.000
0.450	1.661	2.098	0.003	0.950	0.006	0.000	-0.000
0.475	1.735	2.050	-0.007	0.975	0.000	0.000	-0.000

Table 1. Energy Dissipation Function, J(x), and Input Data - Continued

CARBON

$Z = 6$, $E_o = 1.00$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.64$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o \doteq 0.491$ g/cm^2

OTHER PARAMETERS

d_1 =	0.9994	A_1 =	0.4211
α =	3.373	A_2 =	0.8811
A^{PTI} =	0.7135	A_3 =	-0.4549
A^{PLP} =	0.8553	A_4 =	0.1527

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.000	1	0.7709
30	0.967	2	2.171
45	0.903	3	4.104
60	0.814	4	6.510
75	0.705	5	9.348
90	0.586	6	12.59
105	0.466	7	16.20
120	0.352	8	20.16
135	0.254	9	24.45
150	0.179	10	29.06
165	0.131	11	33.96
180	0.115	12	39.15

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.140	0.140	0.500	1.677	1.866	-0.011
0.025	1.003	1.180	0.103	0.525	1.747	1.795	-0.013
0.050	1.009	1.223	0.069	0.550	1.819	1.714	-0.011
0.075	1.018	1.268	0.039	0.575	1.888	1.626	-0.007
0.100	1.030	1.319	0.014	0.600	1.949	1.532	-0.003
0.125	1.045	1.376	-0.003	0.625	1.997	1.431	-0.000
0.150	1.064	1.443	-0.010	0.650	2.027	1.322	0.002
0.175	1.085	1.520	-0.006	0.675	2.032	1.203	0.004
0.200	1.110	1.598	0.002	0.700	2.001	1.073	0.005
0.225	1.138	1.672	0.008	0.725	1.927	0.931	0.005
0.250	1.169	1.742	0.014	0.750	1.797	0.778	0.004
0.275	1.203	1.806	0.019	0.775	1.603	0.617	0.002
0.300	1.241	1.864	0.023	0.800	1.339	0.452	0.000
0.325	1.282	1.913	0.025	0.825	1.014	0.295	-0.001
0.350	1.327	1.952	0.025	0.850	0.655	0.160	-0.002
0.375	1.376	1.979	0.023	0.875	0.324	0.063	-0.002
0.400	1.428	1.992	0.019	0.900	0.097	0.014	-0.001
0.425	1.484	1.988	0.012	0.925	0.010	0.001	-0.000
0.450	1.545	1.966	0.004	0.950	0.000	0.000	-0.000
0.475	1.609	1.924	0.005	0.975	0.000	0.000	-0.000

$Z = 6$, $E_o = 2.00$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.62$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 1.11$ g/cm^2

OTHER PARAMETERS

d_1 =	1.021	A_1 =	0.3432
α =	1.365	A_2 =	0.9489
A^{PTI} =	0.6539	A_3 =	-0.4613
A^{PLP} =	0.7815	A_4 =	0.1692

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.000	1	0.5895
30	0.963	2	1.681
45	0.894	3	3.200
60	0.797	4	5.107
75	0.680	5	7.373
90	0.551	6	9.976
105	0.421	7	12.90
120	0.298	8	16.12
135	0.192	9	19.63
150	0.111	10	23.42
165	0.059	11	27.48
180	0.042	12	31.79

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.064	0.064	0.500	1.431	1.709	-0.003
0.025	1.001	1.088	0.042	0.525	1.490	1.659	-0.003
0.050	1.005	1.114	0.021	0.550	1.553	1.593	-0.002
0.075	1.011	1.144	0.005	0.575	1.616	1.515	-0.001
0.100	1.020	1.180	-0.006	0.600	1.675	1.431	-0.001
0.125	1.030	1.225	-0.009	0.625	1.722	1.341	0.000
0.150	1.041	1.278	-0.003	0.650	1.749	1.244	0.001
0.175	1.052	1.332	0.003	0.675	1.751	1.140	0.001
0.200	1.065	1.385	0.008	0.700	1.722	1.026	0.002
0.225	1.079	1.438	0.012	0.725	1.656	0.901	0.002
0.250	1.095	1.491	0.014	0.750	1.547	0.766	0.001
0.275	1.114	1.542	0.015	0.775	1.389	0.621	0.001
0.300	1.134	1.592	0.013	0.800	1.181	0.469	0.000
0.325	1.157	1.639	0.010	0.825	0.928	0.318	-0.000
0.350	1.183	1.681	0.007	0.850	0.647	0.182	-0.001
0.375	1.213	1.715	0.004	0.875	0.371	0.078	-0.001
0.400	1.247	1.741	0.002	0.900	0.151	0.019	-0.000
0.425	1.285	1.755	-0.000	0.925	0.031	0.002	-0.000
0.450	1.328	1.756	-0.002	0.950	0.001	0.000	-0.000
0.475	1.377	1.741	-0.003	0.975	0.000	0.000	-0.000

Table 1. Energy Dissipation Function, J(x), and Input Data - Continued

CARBON

$Z = 6,\ E_o = 4.00$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.67$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 2.32$ g/cm^2

OTHER PARAMETERS

d_1	= 1.041	A_1 =	0.2978
α	= 0.6220	A_2 =	0.9285
A^{PTI}	= 0.5522	A_3 =	-0.3785
A^{PLP}	= 0.6549	A_4 =	0.1522

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	0.999	1	0.3992
30	0.962	2	1.145
45	0.890	3	2.193
60	0.790	4	3.517
75	0.669	5	5.101
90	0.537	6	6.929
105	0.403	7	8.992
120	0.277	8	11.28
135	0.168	9	13.78
150	0.084	10	16.49
165	0.031	11	19.41
180	0.013	12	22.52

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.031	0.031	0.500	1.239	1.543	0.003
0.025	0.999	1.038	0.024	0.525	1.281	1.531	0.002
0.050	1.000	1.047	0.018	0.550	1.324	1.509	0.000
0.075	1.003	1.060	0.012	0.575	1.367	1.474	-0.001
0.100	1.006	1.075	0.008	0.600	1.410	1.426	-0.003
0.125	1.011	1.094	0.003	0.625	1.449	1.365	-0.004
0.150	1.017	1.117	0.000	0.650	1.482	1.289	-0.005
0.175	1.025	1.145	-0.002	0.675	1.506	1.200	-0.003
0.200	1.033	1.178	-0.004	0.700	1.514	1.097	-0.001
0.225	1.042	1.217	-0.004	0.725	1.501	0.981	0.001
0.250	1.051	1.261	-0.003	0.750	1.457	0.853	0.003
0.275	1.060	1.309	-0.002	0.775	1.372	0.714	0.003
0.300	1.069	1.357	-0.000	0.800	1.232	0.564	0.003
0.325	1.078	1.400	0.001	0.825	1.028	0.411	0.001
0.350	1.090	1.439	0.002	0.850	0.760	0.263	-0.000
0.375	1.103	1.473	0.003	0.875	0.456	0.136	-0.002
0.400	1.120	1.501	0.004	0.900	0.184	0.048	-0.002
0.425	1.142	1.523	0.004	0.925	0.033	0.008	-0.001
0.450	1.168	1.538	0.004	0.950	0.001	0.000	-0.000
0.475	1.201	1.545	0.004	0.975	0.000	0.000	-0.000

$Z = 6,\ E_o = 10.00$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.75$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 5.83$ g/cm^2

OTHER PARAMETERS

d_1	= 1.071	A_1 =	0.2514
α	= 0.2370	A_2 =	1.005
A^{PTI}	= 0.4129	A_3 =	-0.5297
A^{PLP}	= 0.4788	A_4 =	0.2734

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	0.999	1	0.2051
30	0.961	2	0.5920
45	0.888	3	1.140
60	0.788	4	1.838
75	0.666	5	2.679
90	0.532	6	3.655
105	0.397	7	4.762
120	0.269	8	5.995
135	0.159	9	7.351
150	0.074	10	8.827
165	0.021	11	10.42
180	0.002	12	12.12

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.007	0.007	0.500	1.070	1.296	0.000
0.025	0.999	1.007	0.007	0.525	1.087	1.325	0.000
0.050	0.999	1.009	0.005	0.550	1.109	1.352	0.001
0.075	1.000	1.013	0.005	0.575	1.137	1.373	0.001
0.100	1.002	1.019	0.004	0.600	1.169	1.384	0.000
0.125	1.004	1.027	0.003	0.625	1.204	1.378	0.000
0.150	1.007	1.037	0.003	0.650	1.239	1.349	0.000
0.175	1.009	1.049	0.002	0.675	1.273	1.297	0.000
0.200	1.011	1.064	0.001	0.700	1.303	1.232	0.000
0.225	1.013	1.079	-0.000	0.725	1.326	1.157	0.000
0.250	1.015	1.095	-0.001	0.750	1.336	1.071	0.000
0.275	1.017	1.108	-0.001	0.775	1.324	0.969	0.000
0.300	1.019	1.120	-0.001	0.800	1.279	0.847	0.000
0.325	1.022	1.134	-0.001	0.825	1.184	0.698	0.000
0.350	1.025	1.150	0.000	0.850	1.018	0.521	0.000
0.375	1.029	1.169	0.000	0.875	0.767	0.324	0.000
0.400	1.034	1.190	0.000	0.900	0.444	0.143	0.000
0.425	1.040	1.214	0.000	0.925	0.143	0.033	0.000
0.450	1.048	1.240	0.000	0.950	0.010	0.000	0.000
0.475	1.057	1.267	0.000	0.975	0.000	0.000	0.000

ALUMINUM

$Z = 13$, $E_o = 0.025$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 8.50$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 0.00167\ g/cm^2$

OTHER PARAMETERS

d_1 =	2.049	A_1 =	0.7544
α =	-17.87	A_2 =	0.4987
A^{PTI} =	1.500	A_3 =	-0.3392
A^{PLP} =	1.729	A_4 =	0.0861

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.010	1	2.170
30	1.015	2	5.399
45	1.016	3	9.302
60	1.010	4	13.65
75	1.001	5	18.29
90	0.988	6	23.10
105	0.973	7	28.00
120	0.959	8	32.94
135	0.946	9	38.92
150	0.936	10	44.97
165	0.930	11	51.07
180	0.928	12	57.20

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	2.009	1.009	0.500	3.456	1.939	0.007
0.025	1.026	2.224	0.809	0.525	3.420	1.743	0.008
0.050	1.080	2.419	0.640	0.550	3.324	1.545	0.008
0.075	1.161	2.593	0.506	0.575	3.165	1.347	0.008
0.100	1.265	2.743	0.410	0.600	2.943	1.151	0.007
0.125	1.391	2.870	0.350	0.625	2.663	0.959	0.006
0.150	1.531	2.973	0.316	0.650	2.339	0.774	0.005
0.175	1.679	3.054	0.292	0.675	1.983	0.601	0.003
0.200	1.832	3.111	0.268	0.700	1.612	0.443	0.002
0.225	1.990	3.145	0.241	0.725	1.241	0.305	0.000
0.250	2.154	3.153	0.213	0.750	0.887	0.193	-0.000
0.275	2.325	3.135	0.183	0.775	0.573	0.108	-0.001
0.300	2.499	3.090	0.153	0.800	0.320	0.051	-0.001
0.325	2.674	3.018	0.122	0.825	0.143	0.019	-0.000
0.350	2.844	2.920	0.092	0.850	0.046	0.005	-0.000
0.375	3.006	2.797	0.064	0.875	0.008	0.001	-0.000
0.400	3.153	2.653	0.041	0.900	0.001	0.000	-0.000
0.425	3.280	2.492	0.024	0.925	0.000	0.000	-0.000
0.450	3.378	2.316	0.013	0.950	0.000	0.000	-0.000
0.475	3.440	2.131	0.008	0.975	0.000	0.000	-0.000

$Z = 13$, $E_o = 0.05$ Mev

STOPPING POWER

$(dE/dr)_{E_o}$ = [illegible].14 Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 0.00561\ g/cm^2$

OTHER PARAMETERS

d_1 =	2.190	A_1 =	0.6818
α =	33.52	A_2 =	1.500
A^{PTI} =	0.1582	A_3 =	-2.445
A^{PLP} =	1.829	A_4 =	1.260

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.013	1	2.126
30	1.017	2	5.440
45	1.013	3	9.587
60	0.999	4	14.36
75	0.979	5	19.59
90	0.955	6	25.18
105	0.928	7	31.04
120	0.902	8	37.10
135	0.879	9	43.29
150	0.861	10	49.56
165	0.850	11	55.89
180	0.846	12	62.24

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.972	0.972	0.500	3.506	1.918	0.003
0.025	1.017	2.180	0.773	0.525	3.456	1.710	0.005
0.050	[illegible]	[illegible]	0.607	0.550	3.340	[illegible]	0.006
0.075	1.131	2.546	0.478	0.575	3.153	[illegible]	0.007
0.100	1.224	2.703	0.385	0.600	2.896	1.089	0.006
0.125	1.338	2.842	0.328	0.625	2.580	0.892	0.006
0.150	1.470	2.960	0.295	0.650	2.221	0.706	0.004
0.175	1.620	3.055	0.270	0.675	1.839	0.534	0.003
0.200	1.783	3.124	0.245	0.700	1.453	0.382	0.001
0.225	1.958	3.167	0.218	0.725	1.080	0.254	0.000
0.250	2.141	3.181	0.191	0.750	0.742	0.153	-0.001
0.275	2.330	3.168	0.163	0.775	0.456	0.081	-0.001
0.300	2.520	3.125	0.134	0.800	0.241	0.035	-0.001
0.325	2.708	3.053	0.106	0.825	0.102	0.012	-0.000
0.350	2.890	2.952	0.079	0.850	0.030	0.003	-0.000
0.375	3.060	2.826	0.055	0.875	0.005	0.000	-0.000
0.400	3.213	2.675	0.034	0.900	0.000	0.000	-0.000
0.425	3.342	2.505	0.018	0.925	0.000	0.000	-0.000
0.450	3.440	2.319	0.008	0.950	0.000	0.000	-0.000
0.475	3.497	2.122	0.004	0.975	0.000	0.000	-0.000

Table 1. Energy Dissipation Function, J(x), and Input Data - Continued

ALUMINUM

$Z = 13,\ E_o = 0.10$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 3.24$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 0.0183$ g/cm^2

OTHER PARAMETERS

d_1 =	2.145	A_1 =	0.6884
α =	35.45	A_2 =	0.9293
A^{PTI} =	1.580	A_3 =	-1.089
A^{PLP} =	1.833	A_4 =	0.4714

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.015	1	2.086
30	1.017	2	5.478
45	1.004	3	9.840
60	0.997	4	14.97
75	0.941	5	20.74
90	0.898	6	27.02
105	0.852	7	33.73
120	0.808	8	40.80
135	0.769	9	48.18
150	0.738	10	55.79
165	0.719	11	63.62
180	0.712	12	71.62

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	1.916	0.916	0.500	3.361	1.857	0.004
0.025	1.021	2.129	0.718	0.525	3.321	1.660	0.006
0.050	1.066	2.324	0.555	0.550	3.220	1.462	0.006
0.075	1.133	2.501	0.429	0.575	3.052	1.263	0.006
0.100	1.221	2.659	0.342	0.600	2.819	1.067	0.006
0.125	1.327	2.797	0.292	0.625	2.529	0.877	0.005
0.150	1.451	2.913	0.267	0.650	2.194	0.696	0.003
0.175	1.589	3.004	0.248	0.675	1.831	0.528	0.002
0.200	1.739	3.068	0.228	0.700	1.456	0.379	0.001
0.225	1.900	3.105	0.204	0.725	1.090	0.252	-0.000
0.250	2.069	3.112	0.179	0.750	0.750	0.152	-0.001
0.275	2.243	3.091	0.151	0.775	0.462	0.081	-0.001
0.300	2.420	3.040	0.122	0.800	0.243	0.035	-0.001
0.325	2.594	2.961	0.093	0.825	0.102	0.012	-0.000
0.350	2.764	2.856	0.066	0.850	0.030	0.003	-0.000
0.375	2.924	2.726	0.042	0.875	0.005	0.000	-0.000
0.400	3.068	2.577	0.024	0.900	0.000	0.000	-0.000
0.425	3.192	2.412	0.012	0.925	0.000	0.000	-0.000
0.450	3.287	2.235	0.006	0.950	0.000	0.000	-0.000
0.475	3.346	2.049	0.004	0.975	0.000	0.000	-0.000

$Z = 13,\ E_o = 0.20$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 2.22$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 0.0570$ g/cm^2

OTHER PARAMETERS

d_1 =	2.118	A_1 =	0.6285
α =	20.70	A_2 =	0.9389
A^{PTI} =	1.575	A_3 =	-1.056
A^{PLP} =	1.832	A_4 =	0.4883

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.018	1	2.021
30	1.013	2	5.437
45	0.988	3	9.929
60	0.943	4	15.31
75	0.883	5	21.46
90	0.815	6	28.26
105	0.743	7	35.64
120	0.674	8	43.52
135	0.613	9	51.85
150	0.566	10	60.57
165	0.536	11	69.64
180	0.526	12	79.00

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	1.822	0.822	0.500	3.143	1.750	0.003
0.025	1.016	2.022	0.636	0.525	3.106	1.566	0.004
0.050	1.053	2.205	0.482	0.550	3.010	1.380	0.005
0.075	1.110	2.372	0.365	0.575	2.853	1.194	0.005
0.100	1.185	2.521	0.287	0.600	2.640	1.009	0.005
0.125	1.276	2.653	0.245	0.625	2.376	0.829	0.004
0.150	1.383	2.763	0.226	0.650	2.072	0.658	0.003
0.175	1.503	2.850	0.213	0.675	1.737	0.499	0.002
0.200	1.635	2.910	0.198	0.700	1.386	0.358	0.001
0.225	1.778	2.943	0.178	0.725	1.038	0.238	-0.000
0.250	1.928	2.948	0.156	0.750	0.714	0.143	-0.000
0.275	2.085	2.924	0.131	0.775	0.438	0.075	-0.000
0.300	2.245	2.872	0.104	0.800	0.228	0.033	-0.001
0.325	2.405	2.793	0.077	0.825	0.094	0.011	-0.000
0.350	2.563	2.690	0.052	0.850	0.027	0.002	-0.000
0.375	2.714	2.566	0.031	0.875	0.004	0.000	-0.000
0.400	2.853	2.425	0.015	0.900	0.000	0.000	-0.000
0.425	2.973	2.270	0.006	0.925	0.000	0.000	-0.000
0.450	3.068	2.104	0.003	0.950	0.000	0.000	-0.000
0.475	3.128	1.930	0.002	0.975	0.000	0.000	-0.000

ALUMINUM

Z = 13, E_o = 0.40 Mev

STOPPING POWER

$(dE/dr)_{E_o}$ = 1.72 Mev(cm^2/g)

RESIDUAL RANGE

r_o = 0.162 g/cm^2

OTHER PARAMETERS

d_1 = 2.094		A_1 =	0.5291
α = 9.679		A_2 =	0.9542
A^{PTI} = 1.547		A_3 =	-0.8196
A^{PLP} = 1.805		A_4 =	0.3363

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.019	1	1.898
30	1.008	2	5.218
45	0.968	3	9.666
60	0.903	4	15.08
75	0.818	5	21.33
90	0.722	6	28.34
105	0.621	7	36.03
120	0.525	8	44.34
135	0.441	9	53.21
150	0.376	10	62.60
165	0.334	11	72.45
180	0.320	12	82.73

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.680	0.680	0.500	2.788	1.585	0.002
0.025	1.031	1.859	0.513	0.525	2.752	1.419	0.003
0.050	1.043	2.025	0.376	0.550	2.665	1.251	0.004
0.075	1.089	2.177	0.274	0.575	2.527	1.083	0.004
0.100	1.150	2.315	0.208	0.600	2.342	0.917	0.004
0.125	1.224	2.438	0.176	0.625	2.116	0.755	0.003
0.150	1.312	2.542	0.167	0.650	1.853	0.600	0.002
0.175	1.410	2.624	0.163	0.675	1.561	0.456	0.001
0.200	1.519	2.679	0.155	0.700	1.252	0.328	0.001
0.225	1.636	2.708	0.142	0.725	0.942	0.219	-0.000
0.250	1.761	2.710	0.125	0.750	0.652	0.133	-0.000
0.275	1.891	2.684	0.104	0.775	0.401	0.070	-0.001
0.300	2.025	2.631	0.081	0.800	0.210	0.031	-0.000
0.325	2.160	2.553	0.057	0.825	0.086	0.010	-0.000
0.350	2.293	2.453	0.035	0.850	0.025	0.002	-0.000
0.375	2.422	2.334	0.018	0.875	0.004	0.000	-0.000
0.400	2.540	2.202	0.006	0.900	0.000	0.000	-0.000
0.425	2.644	2.058	0.001	0.925	0.000	0.000	-0.000
0.450	2.725	1.906	-0.001	0.950	0.000	0.000	-0.000
0.475	2.776	1.748	0.000	0.975	0.000	0.000	-0.000

Z = 13, E_o = 0.70 Mev

STOPPING POWER

$(dE/dr)_{E_o}$ = 1.55 Mev(cm^2/g)

RESIDUAL RANGE

r_o = 0.349 g/cm^2

OTHER PARAMETERS

d_1 = 2.084		A_1 =	0.452
α = 4.755		A_2 =	0.9030
A^{PTI} = 1.497		A_3 =	-0.5669
A^{PLP} = 1.747		A_4 =	0.2118

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.019	1	1.722
30	1.003	2	4.801
45	0.954	3	8.979
60	0.874	4	14.11
75	0.773	5	20.10
90	0.658	6	26.87
105	0.538	7	34.35
120	0.424	8	42.49
135	0.324	9	51.24
150	0.247	10	60.57
165	0.198	11	70.43
180	0.181	12	80.79

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.535	0.535	0.500	2.456	1.459	0.000
0.025	1.009	1.686	0.394	0.525	2.431	1.310	0.002
0.050	1.031	1.828	0.278	0.550	2.361	1.160	0.002
0.075	1.066	1.961	0.193	0.575	2.247	1.008	0.003
0.100	1.113	2.085	0.139	0.600	2.093	0.858	0.003
0.125	1.170	2.199	0.115	0.625	1.906	0.711	0.003
0.150	1.238	2.299	0.113	0.650	1.678	0.569	0.002
0.175	1.314	2.378	0.115	0.675	1.426	0.437	0.001
0.200	1.400	2.434	0.113	0.700	1.155	0.317	0.001
0.225	1.492	2.465	0.107	0.725	0.880	0.214	-0.000
0.250	1.591	2.471	0.095	0.750	0.618	0.132	-0.000
0.275	1.696	2.450	0.080	0.775	0.387	0.071	-0.001
0.300	1.804	2.404	0.062	0.800	0.207	0.032	-0.000
0.325	1.914	2.334	0.042	0.825	0.088	0.011	-0.000
0.350	2.024	2.243	0.024	0.850	0.026	0.002	-0.000
0.375	2.131	2.136	0.010	0.875	0.004	0.000	-0.000
0.400	2.232	2.015	0.001	0.900	0.000	0.000	-0.000
0.425	2.321	1.885	-0.003	0.925	0.000	0.000	-0.000
0.450	2.394	1.748	-0.003	0.950	0.000	0.000	-0.000
0.475	2.441	1.605	-0.002	0.975	0.000	0.000	-0.000

ALUMINUM

$Z = 13$, $E_0 = 1.00$ Mev

STOPPING POWER
$(dE/dr)_{E_0} = 1.51$ Mev(cm²/g)

RESIDUAL RANGE
$r_0 = 0.545$ g/cm²

OTHER PARAMETERS

d_1	= 2.093	A_1	= 0.4150
α	= 2.965	A_2	= 0.8046
A^{PTI}	= 1.447	A_3	= -0.2985
A^{PLP}	= 1.690	A_4	= 0.0790

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.020	1	1.565
30	1.001	2	4.395
45	0.947	3	8.262
60	0.861	4	13.04
75	0.752	5	18.64
90	0.628	6	25.01
105	0.499	7	32.07
120	0.377	8	39.78
135	0.270	9	48.11
150	0.187	10	57.02
165	0.134	11	66.47
180	0.116	12	76.44

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	1.436	0.436	0.500	2.253	1.402	-0.001
0.025	1.007	1.565	0.315	0.525	2.238	1.264	0.001
0.050	1.024	1.688	0.216	0.550	2.184	1.124	0.002
0.075	1.052	1.807	0.143	0.575	2.088	0.982	0.002
0.100	1.090	1.921	0.097	0.600	1.956	0.841	0.003
0.125	1.136	2.029	0.078	0.625	1.789	0.702	0.002
0.150	1.191	2.128	0.079	0.650	1.589	0.567	0.002
0.175	1.254	2.210	0.084	0.675	1.362	0.439	0.001
0.200	1.324	2.269	0.086	0.700	1.116	0.323	0.001
0.225	1.401	2.306	0.083	0.725	0.861	0.221	0.000
0.250	1.483	2.318	0.076	0.750	0.614	0.138	-0.000
0.275	1.570	2.305	0.065	0.775	0.393	0.076	-0.001
0.300	1.662	2.268	0.050	0.800	0.216	0.035	-0.000
0.325	1.756	2.208	0.034	0.825	0.094	0.012	-0.000
0.350	1.850	2.127	0.019	0.850	0.029	0.003	-0.000
0.375	1.944	2.029	0.006	0.875	0.005	0.000	-0.000
0.400	2.034	1.918	-0.002	0.900	0.000	0.000	-0.000
0.425	2.115	1.797	-0.005	0.925	0.000	0.000	-0.000
0.450	2.184	1.670	-0.005	0.950	0.000	0.000	-0.000
0.475	2.232	1.538	-0.003	0.975	0.000	0.000	-0.000

$Z = 13$, $E_0 = 2.00$ Mev

STOPPING POWER
$(dE/dr)_{E_0} = 1.51$ Mev(cm²/g)

RESIDUAL RANGE
$r_0 = 1.21$ g/cm²

OTHER PARAMETERS

d_1	= 2.112	A_1	= 0.3274
α	= 1.288	A_2	= 0.9604
A^{PTI}	= 1.294	A_3	= -0.4639
A^{PLP}	= 1.513	A_4	= 0.1761

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.020	1	1.189
30	0.999	2	3.373
45	0.939	3	6.392
60	0.846	4	10.16
75	0.727	5	14.62
90	0.594	6	19.71
105	0.455	7	25.41
120	0.323	8	31.69
135	0.207	9	38.50
150	0.118	10	45.83
165	0.061	11	53.65
180	0.042	12	61.95

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	1.252	0.252	0.500	1.936	1.388	-0.005
0.025	1.002	1.333	0.177	0.525	1.953	1.265	-0.002
0.050	1.012	1.415	0.114	0.550	1.936	1.139	0.000
0.075	1.027	1.500	0.065	0.575	1.882	1.010	0.001
0.100	1.049	1.589	0.034	0.600	1.788	0.879	0.002
0.125	1.076	1.683	0.021	0.625	1.659	0.748	0.003
0.150	1.109	1.778	0.022	0.650	1.499	0.619	0.002
0.175	1.148	1.865	0.030	0.675	1.313	0.493	0.002
0.200	1.192	1.938	0.036	0.700	1.105	0.375	0.001
0.225	1.241	1.993	0.040	0.725	0.883	0.267	0.000
0.250	1.294	2.030	0.040	0.750	0.658	0.175	-0.000
0.275	1.353	2.048	0.038	0.775	0.446	0.102	-0.001
0.300	1.416	2.045	0.033	0.800	0.263	0.050	-0.001
0.325	1.482	2.021	0.026	0.825	0.127	0.019	-0.000
0.350	1.552	1.976	0.017	0.850	0.045	0.005	-0.000
0.375	1.624	1.911	0.007	0.875	0.009	0.001	-0.000
0.400	1.698	1.828	-0.001	0.900	0.001	0.000	-0.000
0.425	1.770	1.731	-0.006	0.925	0.000	0.000	-0.000
0.450	1.837	1.623	-0.008	0.950	0.000	0.000	-0.000
0.475	1.895	1.508	-0.007	0.975	0.000	0.000	-0.000

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ALUMINUM

$Z = 13,\ E_o = 4.00$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.56$ Mev(cm²/g)

RESIDUAL RANGE

$r_o = 2.51$ g/cm²

OTHER PARAMETERS

d_1	= 2.176	A_1	= 0.2857
α	= 0.5808	A_2	= 0.9244
A^{PTI}	= 1.065	A_3	=-0.3746
A^{PLP}	= 1.244	A_4	= 0.1645

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.020	1	0.7995
30	0.998	2	2.284
45	0.936	3	4.355
60	0.840	4	6.961
75	0.718	5	10.07
90	0.580	6	13.64
105	0.438	7	17.66
120	0.302	8	22.11
135	0.183	9	26.96
150	0.091	10	32.21
165	0.033	11	37.84
180	0.013	12	43.84

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.107	0.107	0.500	1.631	1.447	0.007
0.025	1.000	1.119	0.098	0.525	1.666	1.366	0.003
0.050	1.004	1.140	0.088	0.550	1.686	1.257	0.000
0.075	1.010	0.075	0.077	0.575	1.687	1.151	-0.002
0.100	1.020	1.228	0.064	0.600	1.664	1.037	-0.003
0.125	1.033	1.303	0.049	0.625	1.613	0.917	-0.004
0.150	1.049	1.400	0.032	0.650	1.529	0.790	-0.004
0.175	1.069	1.507	0.015	0.675	1.409	0.659	-0.003
0.200	1.091	1.604	0.000	0.700	1.251	0.526	-0.002
0.225	1.118	1.686	-0.010	0.725	1.059	0.397	-0.001
0.250	1.148	1.752	-0.017	0.750	0.839	0.277	0.001
0.275	1.181	1.800	-0.020	0.775	0.607	0.174	0.001
0.300	1.219	1.829	-0.018	0.800	0.386	0.093	0.001
0.325	1.262	1.837	-0.012	0.825	0.203	0.040	0.001
0.350	1.308	1.825	-0.004	0.850	0.080	0.013	0.000
0.375	1.359	1.793	0.005	0.875	0.020	0.002	0.000
0.400	1.414	1.744	0.013	0.900	0.002	0.000	0.000
0.425	1.472	1.683	0.016	0.925	0.000	0.000	0.000
0.450	1.530	1.612	0.015	0.950	0.000	0.000	0.000
0.475	1.584	1.533	0.011	0.975	0.000	0.000	0.000

$Z = 13,\ E_o = 10.00$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.66$ Mev(cm²/g)

RESIDUAL RANGE

$r_o = 6.22$ g/cm²

OTHER PARAMETERS

d_1	= 2.288	A_1	= 0.2366
α	= 0.2169	A_2	= 1.032
A^{PTI}	= 0.7789	A_3	= -0.6144
A^{PLP}	= 0.9059	A_4	= 0.3458

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.020	1	0.4078
30	0.997	2	1.173
45	0.935	3	2.251
60	0.838	4	3.619
75	0.714	5	5.261
90	0.575	6	7.164
105	0.431	7	9.317
120	0.294	8	11.71
135	0.174	9	14.34
150	0.081	10	17.20
165	0.023	11	20.27
180	0.002	12	23.57

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.023	0.023	0.500	1.290	1.517	-0.001
0.025	0.999	1.027	0.020	0.525	1.341	1.492	0.000
0.050	1.001	1.034	0.016	0.550	1.390	1.453	0.001
0.075	1.003	1.044	0.013	0.575	1.432	1.397	0.002
0.100	1.008	1.061	0.010	0.600	1.465	1.324	0.003
0.125	1.014	1.085	0.008	0.625	1.485	1.232	0.003
0.150	1.021	1.120	0.006	0.650	1.486	1.122	0.003
0.175	1.028	1.164	0.004	0.675	1.462	0.999	0.001
0.200	1.037	1.211	0.003	0.700	1.408	0.865	-0.001
0.225	1.044	1.256	0.002	0.725	1.316	0.724	-0.003
0.250	1.051	1.300	0.002	0.750	1.181	0.580	-0.003
0.275	1.057	1.342	0.001	0.775	0.999	0.437	-0.002
0.300	1.062	1.382	0.000	0.800	0.778	0.300	-0.001
0.325	1.071	1.418	-0.000	0.825	0.533	0.179	0.001
0.350	1.083	1.451	-0.001	0.850	0.298	0.086	0.001
0.375	1.099	1.480	-0.001	0.875	0.119	0.028	0.001
0.400	1.122	1.503	-0.002	0.900	0.027	0.005	0.000
0.425	1.153	1.519	-0.002	0.925	0.002	0.000	0.000
0.450	1.191	1.528	-0.002	0.950	0.000	0.000	0.000
0.475	1.238	1.528	-0.001	0.975	0.000	0.000	0.000

COPPER

Z = 29, E_o = 0.025 Mev

STOPPING POWER

$(dE/dr)_{E_o}$ = 6.91 Mev(cm²/g)

RESIDUAL RANGE

r_o = 0.00210 g/cm²

OTHER PARAMETERS

d_1 =	3.826	A_1 =	0.6465
α =	-4.745	A_2 =	0.8729
A^{PTI} =	3.023	A_3 =	-0.9436
A^{PLP} =	3.431	A_4 =	0.4242

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.013	1	4.847
30	1.035	2	11.32
45	1.055	3	18.48
60	1.066	4	25.84
75	1.070	5	33.12
90	1.066	6	40.14
105	1.059	7	46.80
120	1.050	8	53.03
135	1.041	9	59.51
150	1.034	10	65.07
165	1.030	11	71.36
180	1.028	12	76.81

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	3.115	2.115	0.500	2.585	0.741	0.011
0.025	1.069	3.430	1.792	0.525	2.183	0.575	0.009
0.050	1.250	3.678	1.504	0.550	1.782	0.432	0.007
0.075	1.519	3.850	1.254	0.575	1.402	0.313	0.006
0.100	1.849	3.942	1.042	0.600	1.058	0.217	0.004
0.125	2.211	3.951	0.869	0.625	0.760	0.142	0.002
0.150	2.575	3.883	0.730	0.650	0.514	0.087	0.001
0.175	2.916	3.749	0.620	0.675	0.323	0.049	0.000
0.200	3.218	3.566	0.530	0.700	0.184	0.025	-0.000
0.225	3.478	3.354	0.450	0.725	0.093	0.011	-0.000
0.250	3.697	3.124	0.375	0.750	0.040	0.004	-0.000
0.275	3.823	2.882	0.304	0.775	0.014	0.001	-0.000
0.300	3.997	2.631	0.238	0.800	0.003	0.000	-0.000
0.325	4.060	2.374	0.179	0.825	0.001	0.000	-0.000
0.350	4.056	2.114	0.129	0.850	0.000	0.000	-0.000
0.375	3.979	1.856	0.088	0.875	0.000	0.000	-0.000
0.400	3.828	1.605	0.057	0.900	0.000	0.000	-0.000
0.425	3.603	1.365	0.036	0.925	0.000	0.000	-0.000
0.450	3.313	1.139	0.022	0.950	0.000	0.000	-0.000
0.475	2.968	0.930	0.015	0.975	0.000	0.000	-0.000

Z = 29, E_o = 0.05 Mev

STOPPING POWER

$(dE/dr)_{E_o}$ = 4.26 Mev(cm²/g)

RESIDUAL RANGE

r_o = 0.00689 g/cm²

OTHER PARAMETERS

d_1 =	4.779	A_1 =	0.5326
α =	-22.11	A_2 =	1.589
A^{PTI} =	3.628	A_3 =	-1.011
A^{PLP} =	4.130	A_4 =	-0.1106

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.026	1	5.006
30	1.054	2	12.32
45	1.072	3	21.37
60	1.076	4	31.28
75	1.067	5	41.80
90	1.047	6	52.64
105	1.022	7	63.61
120	0.995	8	74.57
135	0.970	9	85.41
150	0.950	10	96.03
165	0.937	11	106.4
180	0.932	12	116.5

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	3.230	2.230	0.500	2.085	0.534	0.009
0.025	1.108	3.657	1.815	0.525	1.668	0.391	0.007
0.050	1.344	3.971	1.469	0.550	1.283	0.274	0.005
0.075	1.676	4.171	1.190	0.575	0.944	0.184	0.003
0.100	2.067	4.262	0.974	0.600	0.658	0.116	0.001
0.125	2.483	4.249	0.811	0.625	0.430	0.069	0.000
0.150	2.895	4.144	0.688	0.650	0.259	0.037	-0.000
0.175	3.278	3.972	0.590	0.675	0.141	0.018	-0.000
0.200	3.617	3.743	0.502	0.700	0.067	0.008	-0.000
0.225	3.901	3.476	0.415	0.725	0.027	0.003	-0.000
0.250	4.123	3.183	0.329	0.750	0.009	0.001	-0.000
0.275	4.271	2.875	0.249	0.775	0.002	0.000	-0.000
0.300	4.335	2.560	0.180	0.800	0.000	0.000	-0.000
0.325	4.310	2.247	0.124	0.825	0.000	0.000	-0.000
0.350	4.192	1.943	0.081	0.850	0.000	0.000	-0.000
0.375	3.986	1.653	0.052	0.875	0.000	0.000	-0.000
0.400	3.700	1.381	0.033	0.900	0.000	0.000	-0.000
0.425	3.346	1.131	0.022	0.925	0.000	0.000	-0.000
0.450	2.946	0.905	0.015	0.950	0.000	0.000	-0.000
0.475	2.518	0.705	0.011	0.975	0.000	0.000	-0.000

COPPER

$Z = 29,\ E_o = 0.10$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 2.72$ Mev(cm²/g)

RESIDUAL RANGE

$r_o = 0.0221$ g/cm²

OTHER PARAMETERS

d_1 =	4.971	A_1 =	0.6446
α =	-45.31	A_2 =	1.054
A^{PTI} =	3.808	A_3 =	-1.240
A^{PLP} =	4.342	A_4 =	0.5412

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.038	1	5.083
30	1.070	2	13.01
45	1.082	3	22.86
60	1.073	4	34.12
75	1.045	5	46.44
90	1.003	6	59.56
105	0.952	7	73.27
120	0.900	8	87.40
135	0.852	9	101.8
150	0.813	10	116.4
165	0.789	11	131.1
180	0.780	12	145.8

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	3.211	2.211	0.500	2.126	0.529	0.007
0.025	1.079	3.596	1.812	0.525	1.700	0.385	0.005
0.050	1.279	3.870	1.479	0.550	1.302	0.268	0.004
0.075	1.572	4.037	1.210	0.575	0.950	0.177	0.002
0.100	1.926	4.101	0.998	0.600	0.654	0.110	0.001
0.125	2.310	4.071	0.834	0.625	0.420	0.064	0.000
0.150	2.700	3.963	0.706	0.650	0.247	0.034	-0.000
0.175	3.074	3.792	0.599	0.675	0.130	0.016	-0.000
0.200	3.415	3.575	0.502	0.700	0.060	0.006	-0.000
0.225	3.712	3.326	0.410	0.725	0.023	0.002	-0.000
0.250	3.952	3.056	0.323	0.750	0.007	0.001	-0.000
0.275	4.123	2.771	0.245	0.775	0.002	0.000	-0.000
0.300	4.214	2.480	0.178	0.800	0.000	0.000	-0.000
0.325	4.218	2.189	0.124	0.825	0.000	0.000	-0.000
0.350	4.132	1.903	0.083	0.850	0.000	0.000	-0.000
0.375	3.957	1.627	0.053	0.875	0.000	0.000	-0.000
0.400	3.698	1.366	0.034	0.900	0.000	0.000	-0.000
0.425	3.368	1.122	0.021	0.925	0.000	0.000	-0.000
0.450	2.983	0.899	0.013	0.950	0.000	0.000	-0.000
0.475	2.561	0.701	0.010	0.975	0.000	0.000	-0.000

$Z = 29,\ E_o = 0.20$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.89$ Mev(cm²/g)

RESIDUAL RANGE

$r_o = 0.0678$ g/cm²

OTHER PARAMETERS

d_1 =	5.125	A_1 =	0.6033
α =	39.73	A_2 =	1.008
A^{PTI} =	3.901	A_3 =	-1.143
A^{PLP} =	4.452	A_4 =	0.5313

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.050	1	4.999
30	1.082	2	13.19
45	1.085	3	23.66
60	1.057	4	35.94
75	1.004	5	49.69
90	0.931	6	64.66
105	0.848	7	80.66
120	0.763	8	97.52
135	0.687	9	115.08
150	0.626	10	133.24
165	0.587	11	151.89
180	0.573	12	170.98

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	3.081	2.081	0.500	1.974	0.485	0.006
0.025	1.070	3.470	1.674	0.525	1.571	0.351	0.005
0.050	1.253	3.737	1.345	0.550	1.196	0.243	0.004
0.075	1.520	3.886	1.090	0.575	0.865	0.159	0.002
0.100	1.845	3.928	0.898	0.600	0.589	0.098	0.001
0.125	2.201	3.880	0.755	0.625	0.372	0.055	0.000
0.150	2.564	3.760	0.643	0.650	0.215	0.028	-0.000
0.175	2.913	3.591	0.547	0.675	0.111	0.013	-0.000
0.200	3.234	3.384	0.456	0.700	0.050	0.005	-0.000
0.225	3.513	3.150	0.371	0.725	0.018	0.002	-0.000
0.250	3.737	2.895	0.291	0.750	0.005	0.000	-0.000
0.275	3.895	2.624	0.219	0.775	0.001	0.000	-0.000
0.300	3.977	2.344	0.158	0.800	0.000	0.000	-0.000
0.325	3.976	2.063	0.107	0.825	0.000	0.000	-0.000
0.350	3.889	1.787	0.069	0.850	0.000	0.000	-0.000
0.375	3.718	1.521	0.041	0.875	0.000	0.000	-0.000
0.400	3.469	1.271	0.024	0.900	0.000	0.000	-0.000
0.425	3.153	1.040	0.014	0.925	0.000	0.000	-0.000
0.450	2.785	0.830	0.010	0.950	0.000	0.000	-0.000
0.475	2.385	0.645	0.007	0.975	0.000	0.000	-0.000

COPPER

$Z = 29$, $E_o = 0.40$ Mev

STOPPING POWER
$(dE/dr)_{E_o} = 1.47$ Mev(cm^2/g)

RESIDUAL RANGE
$r_o = 0.191$ g/cm^2

OTHER PARAMETERS

d_1 =	5.159	A_1 =	0.5130
α =	11.06	A_2 =	1.003
A^{PTI} =	3.857	A_3 =	-0.8755
A^{PLP} =	4.406	A_4 =	0.3598

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.059	1	4.732
30	1.089	2	12.80
45	1.080	3	23.38
60	1.032	4	36.03
75	0.952	5	50.45
90	0.847	6	66.42
105	0.729	7	83.74
120	0.611	8	102.3
135	0.505	9	121.9
150	0.420	10	142.4
165	0.366	11	163.8
180	0.348	12	185.9

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	2.806	1.806	0.500	1.789	0.449	0.004
0.025	1.059	3.161	1.441	0.525	1.430	0.324	0.003
0.050	1.214	3.416	1.148	0.550	1.093	0.224	0.002
0.075	1.442	3.571	0.921	0.575	0.794	0.147	0.002
0.100	1.721	3.633	0.753	0.600	0.542	0.090	0.001
0.125	2.027	3.608	0.631	0.625	0.344	0.051	0.000
0.150	2.341	3.507	0.539	0.650	0.199	0.027	-0.000
0.175	2.644	3.345	0.459	0.675	0.102	0.012	-0.000
0.200	2.924	3.138	0.382	0.700	0.046	0.005	-0.000
0.225	3.168	2.902	0.304	0.725	0.017	0.002	-0.000
0.250	3.364	2.652	0.232	0.750	0.005	0.000	-0.000
0.275	3.502	2.396	0.171	0.775	0.001	0.000	-0.000
0.300	3.573	2.140	0.121	0.800	0.000	0.000	-0.000
0.325	3.570	1.886	0.083	0.825	0.000	0.000	-0.000
0.350	3.492	1.638	0.055	0.850	0.000	0.000	-0.000
0.375	3.339	1.400	0.035	0.875	0.000	0.000	-0.000
0.400	3.117	1.173	0.021	0.900	0.000	0.000	-0.000
0.425	2.837	0.962	0.013	0.925	0.000	0.000	-0.000
0.450	2.511	0.769	0.008	0.950	0.000	0.000	-0.000
0.475	2.156	0.597	0.005	0.975	0.000	0.000	-0.000

$Z = 29$, $E_o = 0.70$ Mev

STOPPING POWER
$(dE/dr)_{E_o} = 1.33$ Mev(cm^2/g)

RESIDUAL RANGE
$r_o = 0.409$ g/cm^2

OTHER PARAMETERS

d_1 =	5.172	A_1 =	0.4427
α =	5.029	A_2 =	0.9364
A^{PTI} =	3.717	A_3 =	-0.6005
A^{PLP} =	4.249	A_4 =	0.2214

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.064	1	4.314
30	1.091	2	11.86
45	1.074	3	21.91
60	1.013	4	34.08
75	0.914	5	48.11
90	0.788	6	63.81
105	0.648	7	81.02
120	0.508	8	99.59
135	0.382	9	119.4
150	0.282	10	140.4
165	0.218	11	162.4
180	0.196	12	185.4

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	2.523	1.523	0.500	1.679	0.442	0.003
0.025	1.045	2.846	1.194	0.525	1.356	0.323	0.002
0.050	1.166	3.086	0.932	0.550	1.048	0.226	0.002
0.075	1.348	3.242	0.735	0.575	0.771	0.150	0.001
0.100	1.574	3.315	0.595	0.600	0.534	0.094	0.001
0.125	1.829	3.310	0.500	0.625	0.345	0.054	0.000
0.150	2.094	3.232	0.431	0.650	0.204	0.029	-0.000
0.175	2.356	3.092	0.372	0.675	0.108	0.013	-0.000
0.200	2.599	2.906	0.310	0.700	0.050	0.005	-0.000
0.225	2.810	2.690	0.246	0.725	0.020	0.002	-0.000
0.250	2.980	2.462	0.185	0.750	0.006	0.000	-0.000
0.275	3.100	2.231	0.135	0.775	0.001	0.000	-0.000
0.300	3.165	1.999	0.094	0.800	0.000	0.000	-0.000
0.325	3.170	1.769	0.064	0.825	0.000	0.000	-0.000
0.350	3.114	1.544	0.041	0.850	0.000	0.000	-0.000
0.375	2.995	1.326	0.025	0.875	0.000	0.000	-0.000
0.400	2.817	1.118	0.015	0.900	0.000	0.000	-0.000
0.425	2.585	0.923	0.009	0.925	0.000	0.000	-0.000
0.450	2.309	0.744	0.006	0.950	0.000	0.000	-0.000
0.475	2.002	0.583	0.004	0.975	0.000	0.000	-0.000

COPPER

$Z = 29$, $E_o = 1.00$ Mev

STOPPING POWER
$(dE/dr)_{E_o} = 1.29$ Mev(cm^2/g)

RESIDUAL RANGE
$r_o = 0.639$ g/cm^2

OTHER PARAMETERS

d_1	= 5.207	A_1 =	0.4033
α	= 3.091	A_2 =	0.8887
A^{PTI}	= 3.576	A_3 =	-0.4454
A^{PLP}	= 4.087	A_4 =	0.1534

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.066	1	3.934
30	1.092	2	10.91
45	1.072	3	20.26
60	1.004	4	31.68
75	0.896	5	44.92
90	0.761	6	59.83
105	0.610	7	76.25
120	0.460	8	94.07
135	0.325	9	113.2
150	0.218	10	133.5
165	0.150	11	155.0
180	0.126	12	177.5

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	2.320	1.320	0.500	1.638	0.456	0.003
0.025	1.036	2.617	1.021	0.525	1.339	0.337	0.002
0.050	1.134	2.845	0.783	0.550	1.050	0.239	0.002
0.075	1.284	3.003	0.607	0.575	0.784	0.162	0.001
0.100	1.473	3.089	0.486	0.600	0.552	0.103	0.001
0.125	1.688	3.104	0.409	0.625	0.363	0.061	0.000
0.150	1.917	3.051	0.356	0.650	0.219	0.033	-0.000
0.175	2.146	2.936	0.313	0.675	0.119	0.016	-0.000
0.200	2.363	2.772	0.264	0.700	0.056	0.006	-0.000
0.225	2.556	2.576	0.209	0.725	0.022	0.002	-0.000
0.250	2.716	2.366	0.156	0.750	0.007	0.001	-0.000
0.275	2.834	2.152	0.112	0.775	0.002	0.000	-0.000
0.300	2.904	1.937	0.077	0.800	0.000	0.000	-0.000
0.325	2.922	1.723	0.051	0.825	0.000	0.000	-0.000
0.350	2.884	1.512	0.032	0.850	0.000	0.000	-0.000
0.375	2.792	1.307	0.019	0.875	0.000	0.000	-0.000
0.400	2.644	1.109	0.011	0.900	0.000	0.000	-0.000
0.425	2.446	0.923	0.006	0.925	0.000	0.000	-0.000
0.450	2.206	0.750	0.004	0.950	0.000	0.000	-0.000
0.475	1.932	0.594	0.003	0.975	0.000	0.000	-0.000

$Z = 29$, $E_o = 2.00$ Mev

STOPPING POWER
$(dE/dr)_{E_o} = 1.30$ Mev(cm^2/g)

RESIDUAL RANGE
$r_o = 1.42$ g/cm^2

OTHER PARAMETERS

d_1	= 5.304	A_1 =	0.3259
α	= 1.297	A_2 =	0.9372
A^{PTI}	= 3.153	A_3 =	-0.4319
A^{PLP}	= 3.602	A_4 =	0.1688

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.068	1	2.995
30	1.093	2	8.401
45	1.068	3	15.76
60	0.993	4	24.84
75	0.876	5	35.49
90	0.729	6	47.59
105	0.566	7	61.05
120	0.405	8	75.77
135	0.259	9	91.69
150	0.145	10	108.7
165	0.071	11	126.9
180	0.046	12	146.0

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	1.904	0.904	0.500	1.658	0.547	0.003
0.025	1.019	2.153	0.659	0.525	1.408	0.421	0.002
0.050	1.075	2.357	0.471	0.550	1.151	0.312	0.002
0.075	1.163	2.512	0.345	0.575	0.900	0.221	0.001
0.100	1.279	2.618	0.273	0.600	0.668	0.148	-0.000
0.125	1.416	2.674	0.240	0.625	0.465	0.093	-0.000
0.150	1.569	2.681	0.222	0.650	0.300	0.054	-0.000
0.175	1.731	2.639	0.205	0.675	0.175	0.028	-0.000
0.200	1.894	2.550	0.179	0.700	0.091	0.012	-0.000
0.225	2.051	2.423	0.144	0.725	0.040	0.005	-0.000
0.250	2.195	2.268	0.104	0.750	0.015	0.001	-0.000
0.275	2.317	2.098	0.069	0.775	0.004	0.000	-0.000
0.300	2.411	1.919	0.043	0.800	0.001	0.000	-0.000
0.325	2.469	1.746	0.024	0.825	0.000	0.000	-0.000
0.350	2.486	1.551	0.013	0.850	0.000	0.000	-0.000
0.375	2.457	1.365	0.007	0.875	0.000	0.000	-0.000
0.400	2.382	1.184	0.003	0.900	0.000	0.000	-0.000
0.425	2.259	1.008	0.003	0.925	0.000	0.000	-0.000
0.450	2.093	0.843	0.003	0.950	0.000	0.000	-0.000
0.475	1.890	0.688	0.003	0.975	0.000	0.000	-0.000

COPPER

$Z = 29,\ E_o = 4.00$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.36$ Mev(cm²/g)

RESIDUAL RANGE

$r_o = 2.92$ g/cm²

OTHER PARAMETERS

d_1	= 5.567	A_1 =	0.2836
α	= 0.5645	A_2 =	0.8990
A^{PTI}	= 2.596	A_3 =	-0.3550
A^{PLP}	= 2.965	A_4 =	0.1724

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.068	1	2.008
30	1.093	2	5.680
45	1.066	3	10.74
60	0.988	4	17.04
75	0.868	5	24.50
90	0.716	6	33.03
105	0.549	7	42.59
120	0.383	8	53.12
135	0.234	9	64.58
150	0.116	10	76.93
165	0.040	11	90.13
180	0.014	12	104.2

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.407	0.407	0.500	1.787	0.767	0.001
0.025	1.007	1.546	0.313	0.525	1.607	0.623	0.000
0.050	1.032	1.732	0.259	0.550	1.399	0.489	-0.000
0.075	1.074	1.947	0.233	0.575	1.172	0.370	-0.000
0.100	1.130	2.151	0.215	0.600	0.938	0.268	-0.000
0.125	1.201	2.296	0.181	0.625	0.711	0.183	-0.000
0.150	1.284	2.357	0.129	0.650	0.505	0.117	-0.000
0.175	1.378	2.358	0.083	0.675	0.330	0.069	0.000
0.200	1.481	2.321	0.056	0.700	0.195	0.036	0.000
0.225	1.590	2.258	0.041	0.725	0.102	0.017	0.000
0.250	1.704	2.173	0.033	0.750	0.045	0.006	0.000
0.275	1.815	2.072	0.026	0.775	0.016	0.002	0.000
0.300	1.920	1.958	0.021	0.800	0.004	0.000	0.000
0.325	2.011	1.831	0.016	0.825	0.001	0.000	0.000
0.350	2.081	1.693	0.012	0.850	0.000	0.000	0.000
0.375	2.124	1.546	0.009	0.875	0.000	0.000	0.000
0.400	2.133	1.393	0.006	0.900	0.000	0.000	0.000
0.425	2.106	1.236	0.004	0.925	0.000	0.000	0.000
0.450	2.039	1.077	0.002	0.950	0.000	0.000	0.000
0.475	1.933	0.919	0.001	0.975	0.000	0.000	0.000

$Z = 29,\ E_o = 10.00$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.45$ Mev(cm²/g)

RESIDUAL RANGE

$r_o = 7.17$ g/cm²

OTHER PARAMETERS

d_1	= 6.060	A_1 =	0.2252
α	= 0.2020	A_2 =	1.082
A^{PTI}	= 2.348	A_3 =	-0.7722
A^{PLP}	= 2.043	A_4 =	0.4649

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.069	1	1.018
30	1.094	2	2.903
45	1.066	3	5.530
60	0.987	4	8.839
75	0.865	5	12.79
90	0.712	6	17.35
105	0.543	7	22.48
120	0.375	8	28.18
135	0.224	9	34.42
150	0.105	10	41.18
165	0.029	11	48.45
180	0.003	12	56.21

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.160	0.160	0.500	1.792	1.219	0.000
0.025	1.000	1.209	0.113	0.525	1.771	1.086	0.001
0.050	1.006	1.267	0.074	0.550	1.712	0.947	0.001
0.075	1.017	1.336	0.043	0.575	1.612	0.805	0.001
0.100	1.033	1.420	0.024	0.600	1.468	0.663	0.001
0.125	1.055	1.519	0.017	0.625	1.284	0.525	0.001
0.150	1.082	1.625	0.016	0.650	1.068	0.395	0.000
0.175	1.115	1.723	0.019	0.675	0.835	0.280	0.000
0.200	1.153	1.803	0.020	0.700	0.606	0.182	-0.000
0.225	1.197	1.864	0.020	0.725	0.401	0.107	-0.000
0.250	1.247	1.903	0.019	0.750	0.238	0.055	-0.000
0.275	1.302	1.920	0.016	0.775	0.123	0.024	-0.000
0.300	1.362	1.914	0.012	0.800	0.053	0.008	-0.000
0.325	1.426	1.884	0.007	0.825	0.017	0.002	-0.000
0.350	1.494	1.832	0.003	0.850	0.003	0.000	-0.000
0.375	1.563	1.761	-0.001	0.875	0.000	0.000	-0.000
0.400	1.631	1.673	-0.002	0.900	0.000	0.000	-0.000
0.425	1.694	1.574	-0.002	0.925	0.000	0.000	-0.000
0.450	1.746	1.464	-0.002	0.950	0.000	0.000	-0.000
0.475	1.781	1.346	-0.001	0.975	0.000	0.000	-0.000

TIN

Z = 50, E_o = 0.05 Mev

STOPPING POWER

$(dE/dr)_{E_o} = 3.55$ Mev(cm^2/g)

RESIDUAL RANGE

r_o = 0.00840 g/cm^2

OTHER PARAMETERS

d_1 = 6.467	A_1 = 0.5778
α = -6.385	A_2 = 1.618
A^{PTI} = 5.218	A_3 = -2.491
A^{PLP} = 5.913	A_4 = 1.295

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.018	1	7.668
30	1.060	2	17.62
45	1.120	3	28.50
60	1.173	4	39.62
75	1.207	5	50.62
90	1.225	6	61.24
105	1.230	7	71.34
120	1.229	8	80.84
135	1.229	9	89.70
150	1.221	10	97.90
165	1.219	11	105.4
180	1.219	12	112.3

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	3.995	2.995	0.500	1.140	0.209	0.005
0.025	1.167	4.491	2.424	0.525	0.798	0.134	0.003
0.050	1.572	4.702	2.003	0.550	0.529	0.081	0.001
0.075	2.096	4.704	1.686	0.575	0.328	0.046	0.000
0.100	2.661	4.571	1.427	0.600	0.189	0.024	0.000
0.125	3.221	4.354	1.197	0.625	0.099	0.011	-0.000
0.150	3.744	4.080	0.988	0.650	0.047	0.005	-0.000
0.175	4.195	3.763	0.800	0.675	0.019	0.002	-0.000
0.200	4.547	3.415	0.634	0.700	0.007	0.001	-0.000
0.225	4.779	3.049	0.490	0.725	0.002	0.000	-0.000
0.250	4.879	2.677	0.369	0.750	0.000	0.000	-0.000
0.275	4.842	2.310	0.270	0.775	0.000	0.000	-0.000
0.300	4.675	1.957	0.191	0.800	0.000	0.000	-0.000
0.325	4.389	1.625	0.132	0.825	0.000	0.000	-0.000
0.350	4.004	1.321	0.088	0.850	0.000	0.000	-0.000
0.375	3.545	1.050	0.058	0.875	0.000	0.000	-0.000
0.400	3.041	0.813	0.037	0.900	0.000	0.000	-0.000
0.425	2.522	0.611	0.023	0.925	0.000	0.000	-0.000
0.450	2.017	0.445	0.014	0.950	0.000	0.000	-0.000
0.475	1.550	0.312	0.009	0.975	0.000	0.000	-0.000

Z = 50, E_o = 0.10 Mev

STOPPING POWER

$(dE/dr)_{E_o} = 2.29$ Mev(cm^2/g)

RESIDUAL RANGE

r_o = 0.0265 g/cm^2

OTHER PARAMETERS

d_1 = 7.442	A_1 = 0.6132
α = -10.76	A_2 = 1.161
A^{PTI} = 6.029	A_3 = -1.549
A^{PLP} = 6.865	A_4 = 0.7748

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.115	1	8.205
30	1.223	2	20.01
45	1.284	3	33.87
60	1.277	4	49.01
75	1.197	5	64.94
90	1.055	6	81.33
105	0.869	7	97.89
120	0.664	8	114.4
135	0.467	9	130.8
150	0.305	10	146.9
165	0.198	11	162.6
180	0.161	12	177.8

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	4.087	3.087	0.500	0.877	0.143	0.003
0.025	1.173	4.593	2.539	0.525	0.579	0.086	0.001
0.050	1.603	4.879	2.075	0.550	0.357	0.049	0.000
0.075	2.180	4.895	1.711	0.575	0.203	0.025	0.000
0.100	2.815	4.691	1.430	0.600	0.105	0.012	-0.000
0.125	3.436	4.379	1.194	0.625	0.049	0.005	-0.000
0.150	3.992	4.035	0.981	0.650	0.019	0.002	-0.000
0.175	4.446	3.672	0.786	0.675	0.007	0.001	-0.000
0.200	4.771	3.295	0.612	0.700	0.002	0.000	-0.000
0.225	4.951	2.908	0.462	0.725	0.000	0.000	-0.000
0.250	4.980	2.520	0.337	0.750	0.000	0.000	-0.000
0.275	4.861	2.140	0.236	0.775	0.000	0.000	-0.000
0.300	4.607	1.779	0.161	0.800	0.000	0.000	-0.000
0.325	4.239	1.444	0.106	0.825	0.000	0.000	-0.000
0.350	3.782	1.144	1.069	0.850	0.000	0.000	-0.000
0.375	3.269	0.882	0.045	0.875	0.000	0.000	-0.000
0.400	2.730	0.660	0.029	0.900	0.000	0.000	-0.000
0.425	2.196	0.479	0.018	0.925	0.000	0.000	-0.000
0.450	1.696	0.334	0.011	0.950	0.000	0.000	-0.000
0.475	1.251	0.224	0.006	0.975	0.000	0.000	-0.000

Table 1. Energy Dissipation Function, J(x), and Input Data - Continued

TIN

$Z = 50,\ E_o = 0.20$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.60$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 0.0805$ g/cm^2

OTHER PARAMETERS

d_1 =	8.129	A_1 =	0.5730
α =	-35.95	A_2 =	1.083
A^{PTI} =	6.512	A_3 =	-1.237
A^{PLP} =	7.438	A_4 =	0.5813

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.072	1	8.362
30	1.161	2	21.30
45	1.232	3	37.15
60	1.262	4	55.19
75	1.246	5	74.88
90	1.188	6	95.87
105	1.101	7	117.8
120	0.999	8	140.5
135	0.899	9	163.8
150	0.815	10	187.4
165	0.760	11	211.2
180	0.741	12	235.3

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	4.076	3.076	0.500	0.694	0.108	0.001
0.025	1.180	4.637	2.401	0.525	0.441	0.061	0.001
0.050	1.617	4.791	1.948	0.500	0.261	0.033	0.001
0.075	2.192	4.704	1.616	0.575	0.142	0.016	0.000
0.100	2.812	4.491	1.342	0.600	0.070	0.007	0.000
0.125	3.408	4.204	1.101	0.625	0.030	0.003	0.000
0.150	3.932	3.869	0.888	0.650	0.011	0.001	0.000
0.175	4.351	3.499	0.702	0.675	0.004	0.000	0.000
0.200	4.641	3.111	0.542	0.700	0.001	0.000	0.000
0.225	4.786	2.715	0.409	0.725	0.000	0.000	0.000
0.250	4.780	2.326	0.299	0.750	0.000	0.000	0.000
0.275	4.628	1.952	0.211	0.775	0.000	0.000	0.000
0.300	4.343	1.602	0.144	0.800	0.000	0.000	0.000
0.325	3.949	1.287	0.094	0.825	0.000	0.000	0.000
0.350	3.474	1.002	0.058	0.850	0.000	0.000	0.000
0.375	2.952	0.759	0.034	0.875	0.000	0.000	0.000
0.400	2.417	0.557	0.019	0.900	0.000	0.000	0.000
0.425	1.900	0.394	0.010	0.925	0.000	0.000	0.000
0.450	1.430	0.267	0.005	0.950	0.000	0.000	0.000
0.475	1.024	0.173	0.002	0.975	0.000	0.000	0.000

$Z = 50,\ E_o = 0.40$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.27$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 0.225$ g/cm^2

OTHER PARAMETERS

d_1 =	8.547	A_1 =	0.4939
α =	16.16	A_2 =	1.031
A^{PTI} =	6.636	A_3 =	-0.8945
A^{PLP} =	7.582	A_4 =	0.3696

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.096	1	8.049
30	1.197	2	21.18
45	1.264	3	37.77
60	1.276	4	57.15
75	1.227	5	78.83
90	1.126	6	102.5
105	0.988	7	127.8
120	0.832	8	154.5
135	0.682	9	182.4
150	0.557	10	211.4
165	0.475	11	241.2
180	0.446	12	271.9

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	POINT PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	3.724	2.724	0.500	0.596	0.091	0.001
0.025	1.156	4.264	2.104	0.525	0.374	0.052	0.001
0.050	1.543	4.447	1.693	0.550	0.218	0.027	0.000
0.075	2.058	4.395	1.402	0.575	0.117	0.013	0.000
0.100	2.620	4.200	1.168	0.600	0.056	0.006	-0.000
0.125	3.161	3.920	0.961	0.625	0.024	0.002	-0.000
0.150	3.633	3.590	0.773	0.650	0.009	0.001	-0.000
0.175	4.000	3.228	0.604	0.675	0.003	0.000	-0.000
0.200	4.241	2.852	0.459	0.700	0.001	0.000	-0.000
0.225	4.347	2.745	0.337	0.725	0.000	0.000	-0.000
0.250	4.318	2.108	0.240	0.750	0.000	0.000	-0.000
0.275	4.162	1.760	0.164	0.775	0.000	0.000	-0.000
0.300	3.893	1.439	0.109	0.800	0.000	0.000	-0.000
0.325	3.530	1.150	0.070	0.825	0.000	0.000	-0.000
0.350	3.098	0.896	0.044	0.850	0.000	0.000	-0.000
0.375	2.625	0.678	0.027	0.875	0.000	0.000	-0.000
0.400	2.141	0.496	0.016	0.900	0.000	0.000	-0.000
0.425	1.675	0.349	0.009	0.925	0.000	0.000	-0.000
0.450	1.252	0.235	0.005	0.950	0.000	0.000	-0.000
0.475	0.889	0.151	0.003	0.975	0.000	0.000	-0.000

TIN

$Z = 50$, $E_o = 0.70$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.16$ Mev(cm²/g)

RESIDUAL RANGE

$r_o = 0.475$ g/cm²

OTHER PARAMETERS

d_1 =	8.797	A_1 =	0.4294
α =	5.083	A_2 =	0.9362
A^{PTI} =	6.448	A_3 =	-0.5806
A^{PLP} =	7.361	A_4 =	0.2150

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	s_ℓ
15°	1.109	1	7.351
30	1.216	2	19.72
45	1.279	3	35.67
60	1.277	4	54.59
75	1.208	5	76.09
90	1.078	6	99.84
105	0.907	7	125.6
120	0.718	8	153.1
135	0.535	9	182.3
150	0.385	10	212.8
165	0.285	11	244.7
180	0.251	12	277.6

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	3.353	2.353	0.500	0.580	0.094	0.002
0.025	1.126	3.851	1.788	0.525	0.370	0.054	0.001
0.050	1.444	4.040	1.410	0.550	0.218	0.029	-0.000
0.075	1.872	4.015	1.150	0.575	0.118	0.014	-0.000
0.100	2.344	3.853	0.954	0.600	0.058	0.006	-0.000
0.125	2.806	3.608	0.786	0.625	0.025	0.002	-0.000
0.150	3.214	3.314	0.636	0.650	0.009	0.001	-0.000
0.175	3.538	2.991	0.500	0.675	0.003	0.000	-0.000
0.200	3.757	2.652	0.382	0.700	0.001	0.000	-0.000
0.225	3.861	2.311	0.281	0.725	0.000	0.000	-0.000
0.250	3.848	1.976	0.199	0.750	0.000	0.000	-0.000
0.275	3.724	1.658	0.135	0.775	0.000	0.000	-0.000
0.300	3.500	1.363	0.088	0.800	0.000	0.000	-0.000
0.325	3.193	1.095	0.055	0.825	0.000	0.000	-0.000
0.350	2.823	0.858	0.033	0.850	0.000	0.000	-0.000
0.375	2.413	0.654	0.019	0.875	0.000	0.000	-0.000
0.400	1.988	0.483	0.012	0.900	0.000	0.000	-0.000
0.425	1.573	0.344	0.007	0.925	0.000	0.000	-0.000
0.450	1.189	0.235	0.004	0.950	0.000	0.000	-0.000
0.475	0.855	0.153	0.003	0.975	0.000	0.000	-0.000

$Z = 50$, $E_o = 1.00$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.13$ Mev(cm²/g)

RESIDUAL RANGE

$r_o = 0.738$ g/cm²

OTHER PARAMETERS

d_1 =	8.972	A_1 =	0.3919
α =	2.920	A_2 =	0.8830
A^{PTI} =	6.193	A_3 =	-0.4221
A^{PLP} =	7.056	A_4 =	0.1472

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	s_ℓ
15°	1.115	1	6.684
30	1.223	2	18.11
45	1.284	3	32.99
60	1.277	4	50.82
75	1.197	5	71.22
90	1.055	6	93.94
105	0.869	7	118.7
120	0.664	8	145.4
135	0.467	9	173.9
150	0.305	10	203.9
165	0.198	11	235.3
180	0.161	12	268.1

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	3.031	2.031	0.500	0.606	0.103	0.001
0.025	1.103	3.418	1.619	0.525	0.394	0.060	0.000
0.050	1.367	3.673	1.273	0.550	0.238	0.033	0.000
0.075	1.729	3.765	1.003	0.575	0.132	0.016	-0.000
0.100	2.135	3.689	0.806	0.600	0.066	0.007	-0.000
0.125	2.539	3.479	0.661	0.625	0.029	0.003	-0.000
0.150	2.905	3.186	0.540	0.650	0.011	0.001	-0.000
0.175	3.204	2.863	0.427	0.675	0.004	0.000	-0.000
0.200	3.417	2.538	0.325	0.700	0.001	0.000	-0.000
0.225	3.531	2.221	0.239	0.725	0.000	0.000	-0.000
0.250	3.543	1.916	0.169	0.750	0.000	0.000	-0.000
0.275	3.454	1.625	0.116	0.775	0.000	0.000	-0.000
0.300	3.273	1.353	0.076	0.800	0.000	0.000	-0.000
0.325	3.013	1.102	0.048	0.825	0.000	0.000	-0.000
0.350	2.691	0.875	0.029	0.850	0.000	0.000	-0.000
0.375	2.326	0.675	0.018	0.875	0.000	0.000	-0.000
0.400	1.942	0.504	0.010	0.900	0.000	0.000	-0.000
0.425	1.558	0.362	0.006	0.925	0.000	0.000	-0.000
0.450	1.197	0.250	0.004	0.950	0.000	0.000	-0.000
0.475	0.876	0.165	0.002	0.975	0.000	0.000	-0.000

Table 1. Energy Dissipation Function, J(x), and Input Data - Continued

TIN

$Z = 50,\ E_o = 2.00$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.16$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 1.61$ g/cm^2

OTHER PARAMETERS

$d_1 = 9.229$ $A_1 = 0.3167$

$\alpha = 1.201$ $A_2 = 0.9157$

$A^{PTI} = 5.344$ $A_3 = -0.3981$

$A^{PLP} = 6.068$ $A_4 = 0.1658$

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.121	1	5.036
30	1.231	2	13.84
45	1.290	3	25.52
60	1.275	4	39.72
75	1.184	5	56.19
90	1.028	6	74.73
105	0.825	7	95.21
120	0.602	8	117.5
135	0.390	9	141.4
150	0.214	10	167.0
165	0.098	11	194.0
180	0.058	12	222.4

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	2.493	1.493	0.500	0.775	0.160	0.002
0.025	1.055	2.815	1.155	0.525	0.540	0.100	0.001
0.050	1.209	3.045	0.876	0.550	0.352	0.059	0.000
0.075	1.436	3.170	0.661	0.575	0.212	0.032	-0.000
0.100	1.706	3.184	0.510	0.600	0.117	0.016	-0.000
0.125	1.993	3.098	0.412	0.625	0.058	0.007	-0.000
0.150	2.271	2.933	0.348	0.650	0.025	0.003	-0.000
0.175	2.522	2.716	0.295	0.675	0.009	0.001	-0.000
0.200	2.726	2.470	0.242	0.700	0.003	0.000	-0.000
0.225	2.872	2.211	0.186	0.725	0.001	0.000	-0.000
0.250	2.950	1.948	0.132	0.750	0.000	0.000	-0.000
0.275	2.954	1.690	0.087	0.775	0.000	0.000	-0.000
0.300	2.884	1.442	0.052	0.800	0.000	0.000	-0.000
0.325	2.743	1.209	0.029	0.825	0.000	0.000	-0.000
0.350	2.539	0.994	0.015	0.850	0.000	0.000	-0.000
0.375	2.282	0.798	0.008	0.875	0.000	0.000	-0.000
0.400	1.988	0.624	0.005	0.900	0.000	0.000	-0.000
0.425	1.673	0.472	0.004	0.925	0.000	0.000	-0.000
0.450	1.355	0.345	0.004	0.950	0.000	0.000	-0.000
0.475	1.050	0.241	0.003	0.975	0.000	0.000	-0.000

$Z = 50,\ E_o = 4.00$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.23$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 3.29$ g/cm^2

OTHER PARAMETERS

$d_1 = 9.905$ $A_1 = 0.2757$

$\alpha = 0.5076$ $A_2 = 0.8755$

$A^{PTI} = 4.281$ $A_3 = -0.3534$

$A^{PLP} = 4.558$ $A_4 = 0.2022$

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.123	1	3.335
30	1.234	2	9.263
45	1.292	3	17.24
60	1.274	4	27.06
75	1.179	5	38.57
90	1.017	6	51.65
105	0.807	7	66.22
120	0.578	8	82.20
135	0.359	9	99.51
150	0.178	10	118.1
165	0.059	11	137.9
180	0.018	12	158.9

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	1.895	0.895	0.500	1.130	0.313	-0.002
0.025	1.024	2.037	0.761	0.525	0.871	0.221	-0.001
0.050	1.096	2.221	0.606	0.550	0.635	0.148	-0.000
0.075	1.207	2.424	0.443	0.575	0.434	0.093	-0.000
0.100	1.349	2.613	0.294	0.600	0.275	0.054	0.000
0.125	1.513	2.744	0.185	0.625	0.158	0.029	0.000
0.150	1.690	2.776	0.136	0.650	0.081	0.014	0.000
0.175	1.871	2.697	0.137	0.675	0.036	0.006	0.000
0.200	2.046	2.537	0.149	0.700	0.013	0.002	0.000
0.225	2.204	2.334	0.139	0.725	0.004	0.001	0.000
0.250	2.336	2.108	0.111	0.750	0.001	0.000	0.000
0.275	2.430	1.878	0.079	0.775	0.000	0.000	0.000
0.300	2.478	1.653	0.051	0.800	0.000	0.000	0.000
0.325	2.472	1.436	0.029	0.825	-0.000	0.000	0.000
0.350	2.411	1.231	0.013	0.850	-0.000	0.000	0.000
0.375	2.293	1.038	0.002	0.875	-0.000	0.000	0.000
0.400	2.124	0.861	-0.002	0.900	-0.000	0.000	0.000
0.425	1.911	0.699	-0.004	0.925	-0.000	0.000	0.000
0.450	1.665	0.553	-0.003	0.950	-0.000	0.000	0.000
0.475	1.400	0.424	-0.002	0.975	-0.000	0.000	0.000

Table 1. Energy Dissipation Function, J(x), and Input Data - Continued

TIN

$Z = 50$, $E_o = 10.00$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.33$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 7.95$ g/cm^2

OTHER PARAMETERS

d_1 =	11.50	A_1 =	0.1902
α =	0.1689	A_2 =	1.295
A^{PTI} =	2.801	A_3 =	-1.267
A^{PLP} =	3.166	A_4 =	0.7827

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	s_ℓ
15°	1.124	1	1.662
30	1.235	2	4.616
45	1.292	3	8.592
60	1.274	4	13.48
75	1.177	5	19.22
90	1.013	6	25.74
105	0.801	7	33.00
120	0.569	8	40.96
135	0.348	9	49.59
150	0.165	10	58.85
165	0.045	11	68.72
180	0.003	12	79.18

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.436	0.436	0.500	1.712	0.759	-0.007
0.025	1.004	1.545	0.328	0.525	1.541	0.608	-0.006
0.050	1.020	1.668	0.209	0.550	1.335	0.472	-0.004
0.075	1.049	1.794	0.097	0.575	1.105	0.354	-0.002
0.100	1.091	1.902	0.013	0.600	0.864	0.254	-0.001
0.125	1.146	1.973	-0.022	0.625	0.632	0.173	-0.000
0.150	1.215	2.011	-0.012	0.650	0.424	0.110	0.000
0.175	1.294	2.036	0.008	0.675	0.258	0.065	0.000
0.200	1.382	2.053	0.026	0.700	0.139	0.034	0.000
0.225	1.476	2.060	0.040	0.725	0.065	0.015	0.000
0.250	1.574	2.050	0.050	0.750	0.026	0.006	0.000
0.275	1.671	2.018	0.055	0.775	0.008	0.001	0.000
0.300	1.764	1.962	0.053	0.800	0.002	-0.000	0.000
0.325	1.848	1.876	0.045	0.825	0.000	-0.000	0.000
0.350	1.917	1.760	0.032	0.850	0.000	-0.000	0.000
0.375	1.966	1.618	0.017	0.875	0.000	-0.000	0.000
0.400	1.988	1.454	0.004	0.900	0.000	-0.000	0.000
0.425	1.978	1.278	-0.005	0.925	0.000	-0.000	0.000
0.450	1.930	1.098	-0.009	0.950	0.000	-0.000	0.000
0.475	1.842	0.923	-0.009	0.975	0.000	-0.000	0.000

LEAD

$Z = 82$, $E_o = 0.10$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.97$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 0.0313\ g/cm^2$

OTHER PARAMETERS

d_1 =	10.90	A_1 =	0.5442
α =	-5.084	A_2 =	1.1310
A^{PTI} =	9.759	A_3 =	-1.552
A^{PLP} =	11.18	A_4 =	0.6977

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.074	1	13.56
30	1.230	2	29.52
45	1.479	3	46.58
60	1.728	4	64.12
75	1.896	5	81.67
90	1.936	6	98.84
105	1.842	7	115.4
120	1.640	8	131.1
135	1.385	9	145.8
150	1.143	10	159.6
165	0.969	11	172.4
180	0.908	12	184.7

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	5.264	4.264	0.500	0.163	0.018	0.001
0.025	1.470	5.834	3.439	0.525	0.081	0.008	0.000
0.050	2.374	5.822	2.816	0.550	0.037	0.003	0.000
0.075	3.384	5.490	2.304	0.575	0.015	0.001	-0.000
0.100	4.348	5.000	1.858	0.600	0.005	0.000	-0.000
0.125	5.149	4.430	1.466	0.625	0.002	0.000	-0.000
0.150	5.708	3.838	1.126	0.650	0.000	0.000	-0.000
0.175	5.986	3.249	0.841	0.675	0.000	0.000	-0.000
0.200	5.980	2.688	0.608	0.700	0.000	0.000	-0.000
0.225	5.713	2.168	0.427	0.725	0.000	0.000	-0.000
0.250	5.232	1.704	0.289	0.750	0.000	0.000	-0.000
0.275	4.597	1.301	0.189	0.775	0.000	0.000	-0.000
0.300	3.874	0.963	0.119	0.800	0.000	0.000	-0.000
0.325	3.128	0.689	0.072	0.825	0.000	0.000	-0.000
0.350	2.415	0.475	0.042	0.850	0.000	0.000	-0.000
0.375	1.778	0.314	0.023	0.875	0.000	0.000	-0.000
0.400	1.244	0.198	0.012	0.900	0.000	0.000	-0.000
0.425	0.824	0.119	0.006	0.925	0.000	0.000	-0.000
0.450	0.514	0.068	0.003	0.950	0.000	0.000	-0.000
0.475	0.300	0.036	0.001	0.975	-0.001	0.000	-0.000

$Z = 82$, $E_o = 0.70$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.02$ Mev(cm^2/g)

RESIDUAL RANGE

$r_o = 0.544\ g/cm^2$

OTHER PARAMETERS

d_1 =	15.90	A_1 =	0.4133
α =	6.172	A_2 =	0.9603
A^{PTI} =	12.80	A_3 =	-0.5993
A^{PLP} =	14.82	A_4 =	0.2256

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.098	1	13.68
30	1.290	2	34.41
45	1.564	3	59.30
60	1.819	4	87.92
75	1.971	5	119.8
90	1.966	6	154.5
105	1.801	7	191.6
120	1.510	8	230.8
135	1.159	9	271.9
150	0.830	10	314.5
165	0.595	11	358.5
180	0.511	12	403.5

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	4.576	3.576	0.500	0.042	0.004	0.000
0.025	1.393	5.105	2.789	0.525	0.017	0.001	-0.000
0.050	2.236	5.068	2.194	0.550	0.006	0.000	-0.000
0.075	3.176	4.708	1.722	0.575	0.002	0.000	-0.000
0.100	4.005	4.187	1.336	0.600	0.000	0.000	-0.000
0.125	4.615	3.603	1.015	0.625	0.000	0.000	-0.000
0.150	4.956	3.016	0.749	0.650	0.000	0.000	-0.000
0.175	5.023	2.462	0.533	0.675	0.000	0.000	-0.000
0.200	4.836	1.958	0.365	0.700	0.000	0.000	-0.000
0.225	4.438	1.515	0.239	0.725	0.000	0.000	-0.000
0.250	3.887	1.136	1.149	0.750	0.000	0.000	-0.000
0.275	3.246	0.823	0.089	0.775	0.000	0.000	-0.000
0.300	2.579	0.573	0.050	0.800	0.000	0.000	-0.000
0.325	1.946	0.381	0.027	0.825	0.000	0.000	-0.000
0.350	1.389	0.241	0.014	0.850	0.000	0.000	-0.000
0.375	0.934	0.144	0.007	0.875	0.000	0.000	-0.000
0.400	0.588	0.081	0.003	0.900	0.000	0.000	-0.000
0.425	0.345	0.043	0.002	0.925	-0.000	0.000	-0.000
0.450	0.187	0.021	0.001	0.950	-0.000	0.000	-0.000
0.475	0.093	0.009	0.000	0.975	-0.000	0.000	-0.000

LEAD

$Z = 82,\ E_o = 1.00$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.01$ Mev(cm²/g)

RESIDUAL RANGE

$r_o = 0.841$ g/cm²

OTHER PARAMETERS

d_1 =	16.75	A_1 =	0.3810
α =	2.890	A_2 =	0.9006
A^{PTI}=	12.34	A_3 =	-0.4442
A^{PLP}=	14.23	A_4 =	0.1625

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.108	1	12.44
30	1.315	2	31.72
45	1.599	3	55.21
60	1.857	4	82.51
76	2.000	5	113.2
90	1.975	6	147.0
105	1.777	7	183.4
120	1.444	8	222.2
135	1.050	9	263.2
150	0.683	10	306.1
165	0.422	11	350.7
180	0.328	12	396.9

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	4.208	3.208	0.500	0.047	0.004	0.000
0.025	1.329	4.730	2.469	0.525	0.019	0.002	-0.000
0.050	2.053	4.736	1.927	0.550	0.007	0.001	-0.000
0.075	2.880	4.438	1.509	0.575	0.002	0.000	-0.000
0.100	3.629	3.978	1.172	0.600	0.001	0.000	-0.000
0.125	4.195	3.451	0.893	0.625	0.000	0.000	-0.000
0.150	4.530	2.913	0.662	0.650	0.000	0.000	-0.000
0.175	4.621	2.398	0.474	0.675	0.000	0.000	-0.000
0.200	4.484	1.924	0.325	0.700	0.000	0.000	-0.000
0.225	4.153	1.503	0.213	0.725	0.000	0.000	-0.000
0.250	3.675	1.140	0.133	0.750	0.000	0.000	-0.000
0.275	3.107	0.835	0.079	0.775	0.000	0.000	-0.000
0.300	2.504	0.589	0.044	0.800	0.000	0.000	-0.000
0.325	1.918	0.398	0.024	0.825	0.000	0.000	-0.000
0.350	1.392	0.256	0.013	0.850	0.000	0.000	-0.000
0.375	0.953	0.156	0.006	0.875	0.000	0.000	-0.000
0.400	0.611	0.089	0.003	0.900	0.000	0.000	-0.000
0.425	0.365	0.048	0.002	0.925	-0.000	0.000	-0.000
0.450	0.209	0.024	0.001	0.950	-0.000	0.000	-0.000
0.475	0.102	0.011	0.000	0.975	-0.000	0.000	-0.000

$Z = 82,\ E_o = 2.00$ Mev

STOPPING POWER

$(dE/dr)_{E_o} = 1.04$ Mev(cm²/g)

RESIDUAL RANGE

$r_o = 1.82$ g/cm²

OTHER PARAMETERS

d_1 =	17.46	A_1 =	0.3433
α =	1.144	A_2 =	0.4377
A^{PTI}=	10.26	A_3 =	0.6620
A^{PLP}=	11.72	A_4 =	-0.4430

SCATTERING COEFFICIENTS

θ	σ/σ_R	ℓ	S_ℓ
15°	1.120	1	9.317
30	1.334	2	24.27
45	1.638	3	42.94
60	1.897	4	65.09
75	2.029	5	90.42
90	1.979	6	118.7
105	1.745	7	149.6
120	1.366	8	183.1
135	0.924	9	218.8
150	0.513	10	256.7
165	0.222	11	296.5
180	0.119	12	338.1

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	3.412	2.412	0.500	0.097	0.011	0.000
0.025	1.199	3.971	1.745	0.525	0.045	0.005	-0.000
0.050	1.663	4.070	1.352	0.550	0.019	0.002	-0.000
0.075	2.232	3.902	1.090	0.575	0.007	0.001	-0.000
0.100	2.792	3.596	0.875	0.600	0.002	0.000	-0.000
0.125	3.265	3.224	0.682	0.625	0.001	0.000	-0.000
0.150	3.603	2.817	0.511	0.650	0.000	0.000	-0.000
0.175	3.780	2.403	0.369	0.675	0.000	0.000	-0.000
0.200	3.792	2.000	0.255	0.700	0.000	0.000	-0.000
0.225	3.647	1.623	0.169	0.725	0.000	0.000	-0.000
0.250	3.368	1.283	0.107	0.750	0.000	0.000	-0.000
0.275	2.987	0.985	0.066	0.775	0.000	0.000	-0.000
0.300	2.540	0.733	0.039	0.800	0.000	0.000	-0.000
0.325	2.067	0.527	0.023	0.825	0.000	0.000	-0.000
0.350	1.606	0.363	0.013	0.850	0.000	0.000	-0.000
0.375	1.185	0.240	0.007	0.875	0.000	0.000	-0.000
0.400	0.827	0.150	0.004	0.900	0.000	0.000	-0.000
0.425	0.543	0.088	0.002	0.925	0.000	0.000	-0.000
0.450	0.333	0.048	0.001	0.950	0.000	0.000	-0.000
0.475	0.188	0.025	0.000	0.975	0.000	0.000	-0.000

AIR

E_o = 0.025 Mev

STOPPING POWER

$(dE/dr)_{E_o} = 9.65$ Mev(cm^2/g)

RESIDUAL RANGE

r_o = 0.00146 g/cm^2

OTHER PARAMETERS

d_1 =	1.286	A_1 =	0.7240
α =	-65.85	A_2 =	1.164
A^{PTI} =	0.9233	A_3 =	-1.801
A^{PLP} =	1.080	A_4 =	0.9126

SCATTERING COEFFICIENTS

ℓ	S_ℓ
1	1.306
2	3.299
3	5.766
4	8.575
5	11.63
6	14.87
7	18.23
8	21.67
9	25.17
10	28.70
11	32.22
12	35.72

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.538	0.538	0.500	2.943	2.574	-0.006
0.025	1.011	1.651	0.434	0.525	3.056	2.438	-0.010
0.050	1.034	1.763	0.339	0.550	3.150	2.288	-0.008
0.075	1.069	1.876	0.257	0.575	3.218	2.126	-0.003
0.100	1.115	1.990	0.191	0.600	3.252	1.956	0.001
0.125	1.172	2.107	0.145	0.625	3.243	1.776	0.005
0.150	1.239	2.227	0.122	0.650	3.182	1.588	0.007
0.175	1.317	2.348	0.116	0.675	3.060	1.389	0.008
0.200	1.405	2.463	0.114	0.700	2.867	1.183	0.008
0.225	1.502	2.568	0.111	0.725	2.597	0.971	0.006
0.250	1.609	2.662	0.106	0.750	2.248	0.758	0.004
0.275	1.724	2.744	0.101	0.775	1.827	0.552	0.001
0.300	1.846	2.811	0.094	0.800	1.356	0.364	-0.001
0.325	1.976	2.862	0.085	0.825	0.879	0.206	-0.002
0.350	2.111	2.893	0.075	0.850	0.461	0.093	-0.003
0.375	2.251	2.904	0.062	0.875	0.170	0.028	-0.002
0.400	2.394	2.890	0.048	0.900	0.033	0.004	-0.001
0.425	2.537	2.850	0.033	0.925	0.002	0.000	0.000
0.450	2.679	2.784	0.017	0.950	0.000	0.000	0.000
0.475	2.815	2.691	0.004	0.975	0.000	0.000	0.000

E_o = 0.05 Mev

STOPPING POWER

$(dE/dr)_{E_o} = 5.77$ Mev(cm^2/g)

RESIDUAL RANGE

r_o = 0.00496 g/cm^2

OTHER PARAMETERS

d_1 =	1.329	A_1 =	0.7547
α =	16.71	A_2 =	0.8725
A^{PTI} =	0.9498	A_3 =	-1.192
A^{PLP} =	1.114	A_4 =	0.5644

SCATTERING COEFFICIENTS

ℓ	S_ℓ
1	1.254
2	3.249
3	5.791
4	8.757
5	12.06
6	15.64
7	19.43
8	23.40
9	27.51
10	31.72
11	36.02
12	40.38

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.497	0.497	0.500	2.878	2.557	-0.009
0.025	1.013	1.609	0.396	0.525	3.007	2.424	-0.010
0.050	1.036	1.721	0.305	0.550	3.122	2.278	-0.007
0.075	1.070	1.834	0.227	0.575	3.217	2.121	-0.002
0.100	1.114	1.950	0.165	0.600	3.279	1.953	0.002
0.125	1.168	2.070	0.123	0.625	3.295	1.774	0.005
0.150	1.231	2.194	0.105	0.650	3.248	1.584	0.007
0.175	1.303	2.320	0.100	0.675	3.117	1.384	0.008
0.200	1.385	2.433	0.099	0.700	2.884	1.174	0.007
0.225	1.475	2.547	0.097	0.725	2.558	0.958	0.006
0.250	1.574	2.644	0.094	0.750	2.139	0.741	0.003
0.275	1.681	2.728	0.089	0.775	1.691	0.533	0.001
0.300	1.795	2.796	0.084	0.800	1.245	0.345	-0.001
0.325	1.917	2.847	0.076	0.825	0.833	0.192	-0.002
0.350	2.045	2.878	0.066	0.850	0.483	0.083	-0.002
0.375	2.178	2.887	0.054	0.875	0.223	0.024	-0.001
0.400	2.316	2.872	0.040	0.800	0.070	0.003	-0.000
0.425	2.457	2.831	0.026	0.925	0.011	0.000	-0.000
0.450	2.600	2.763	0.011	0.950	0.000	0.000	-0.000
0.475	2.741	2.671	-0.001	0.975	0.000	0.000	-0.000

Table 1. Energy Dissipation Function, J(x), and Input Data - Continued

AIR

E_o = 0.10 Mev

STOPPING POWER

$(dE/dr)_{E_o}$ = 3.60 Mev(cm²/g)

RESIDUAL RANGE

r_o = 0.0164 g/cm²

OTHER PARAMETERS

d_1 = 1.2670 A_1 = 0.6992

α = 29.16 A_2 = 0.9039

A^{PTI} = 0.9328 A_3 = -1.048

A^{PLP} = 1.101 A_4 = 0.4452

SCATTERING COEFFICIENTS

ℓ	S_ℓ
1	1.225
2	3.247
3	5.882
4	9.019
5	12.58
6	16.49
7	20.70
8	25.18
9	29.89
10	34.79
11	39.87
12	45.08

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.453	0.453	0.500	2.749	2.472	-0.011
0.025	1.013	1.562	0.356	0.525	2.876	2.344	-0.011
0.050	1.036	1.672	0.268	0.550	2.993	2.205	-0.007
0.075	1.068	1.782	0.194	0.575	3.090	2.055	-0.002
0.100	1.108	1.896	0.135	0.600	3.158	1.895	0.002
0.125	1.158	2.014	0.096	0.625	3.181	1.725	0.005
0.150	1.216	2.137	0.079	0.650	3.138	1.543	0.006
0.175	1.282	2.262	0.079	0.675	3.008	1.351	0.007
0.200	1.356	2.380	0.082	0.700	2.780	1.149	0.006
0.225	1.439	2.487	0.083	0.725	2.466	0.940	0.005
0.250	1.529	2.583	0.083	0.750	2.098	0.730	0.003
0.275	1.626	2.664	0.080	0.775	1.695	0.527	0.001
0.300	1.731	2.730	0.076	0.800	1.275	0.343	-0.001
0.325	1.843	2.779	0.069	0.825	0.863	0.191	-0.002
0.350	1.961	2.807	0.060	0.850	0.496	0.083	-0.002
0.375	2.084	2.812	0.048	0.875	0.218	0.024	-0.001
0.400	2.213	2.793	0.035	0.900	0.060	0.003	-0.000
0.425	2.345	2.748	0.020	0.925	0.006	0.000	-0.000
0.450	2.480	2.678	0.005	0.950	0.000	0.000	-0.000
0.475	2.616	2.585	-0.006	0.975	0.000	0.000	-0.000

E_o = 0.20 Mev

STOPPING POWER

$(dE/dr)_{E_o}$ = 2.45 Mev(cm²/g)

RESIDUAL RANGE

r_o = 0.0513 g/cm²

OTHER PARAMETERS

d_1 = 1.246 A_1 = 0.6401

α = 18.84 A_2 = 0.9019

A^{PTI} = 0.928 A_3 = -1.004

A^{PLP} = 0.1100 A_4 = 0.4624

SCATTERING COEFFICIENTS

ℓ	S_ℓ
1	1.183
2	3.206
3	5.894
4	9.143
5	12.88
6	17.04
7	21.59
8	26.48
9	31.67
10	37.14
11	42.90
12	48.89

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.395	0.395	0.500	2.551	2.319	-0.013
0.025	1.009	1.493	0.306	0.525	2.677	2.200	-0.011
0.050	1.027	1.592	0.225	0.550	2.794	2.071	-0.007
0.075	1.052	1.693	0.156	0.575	2.892	1.932	-0.002
0.100	1.085	1.797	0.103	0.600	2.959	1.783	0.001
0.125	1.126	1.906	0.069	0.625	2.975	1.624	0.004
0.150	1.174	2.022	0.056	0.650	2.921	1.454	0.006
0.175	1.230	2.140	0.058	0.675	2.786	1.273	0.006
0.200	1.293	2.251	0.063	0.700	2.578	1.083	0.006
0.225	1.363	2.352	0.067	0.725	2.311	0.886	0.004
0.250	1.440	2.442	0.068	0.750	1.992	0.688	0.003
0.275	1.525	2.518	0.068	0.775	1.626	0.496	0.001
0.300	1.616	2.579	0.065	0.800	1.228	0.322	-0.001
0.325	1.714	2.623	0.060	0.825	0.827	0.179	-0.002
0.350	1.818	2.647	0.051	0.850	0.466	0.078	-0.002
0.375	1.929	2.649	0.040	0.875	0.195	0.022	-0.001
0.400	2.045	2.628	0.028	0.900	0.048	0.003	-0.000
0.425	2.167	2.583	0.014	0.925	0.004	0.000	-0.000
0.450	2.292	2.514	0.000	0.950	0.000	0.000	-0.000
0.475	2.421	2.425	-0.009	0.975	0.000	0.000	-0.000

Table 1. Energy Dissipation Function, J(x), and Input Data - Continued

AIR

E_o = 0.40 Mev

STOPPING POWER

$(dE/dr)_{E_o}$ = 1.89 Mev(cm²/g)

RESIDUAL RANGE

r_o = 0.147 g/cm²

OTHER PARAMETERS

d_1 = 1.227 A_1 = 0.5361

α = 9.408 A_2 = 0.9248

A^{PTI} = 0.9134 A_3 = -0.7547

A^{PLP} = 1.084 A_4 = 0.2938

SCATTERING COEFFICIENTS

ℓ	S_ℓ
1	1.109
2	3.067
3	5.712
4	8.952
5	12.72
6	16.97
7	21.65
8	26.73
9	32.17
10	37.96
11	44.06
12	50.46

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	1.314	0.314	0.500	2.255	2.079	-0.013
0.025	1.008	1.400	0.237	0.525	2.358	1.969	-0.010
0.050	1.022	1.486	0.168	0.550	2.455	1.850	-0.006
0.075	1.043	1.574	0.109	0.575	0.537	1.724	-0.002
0.100	1.070	1.666	0.064	0.600	2.592	1.591	0.001
0.125	1.102	1.763	0.035	0.625	2.606	1.448	0.003
0.150	1.141	1.867	0.027	0.650	2.560	1.297	0.005
0.175	1.186	1.974	0.033	0.675	2.443	1.136	0.005
0.200	1.237	2.074	0.041	0.700	2.262	0.967	0.005
0.225	1.293	2.165	0.047	0.725	2.030	0.792	0.004
0.250	1.355	2.245	0.051	0.750	1.752	0.616	0.002
0.275	1.423	2.311	0.053	0.775	1.434	0.445	0.000
0.300	1.497	2.364	0.052	0.800	1.088	0.290	-0.001
0.325	1.576	2.399	0.048	0.825	0.737	0.161	-0.002
0.350	1.660	2.415	0.041	0.850	0.418	0.070	-0.002
0.375	1.749	2.411	0.032	0.875	0.177	0.020	-0.001
0.400	1.843	2.385	0.020	0.900	0.044	0.003	-0.000
0.425	1.942	2.336	0.007	0.925	0.004	0.000	-0.000
0.450	2.044	2.266	-0.005	0.950	0.000	0.000	0.000
0.475	2.149	2.179	-0.012	0.975	0.000	0.000	0.000

E_o = 0.70 Mev

STOPPING POWER

$(dE/dr)_{E_o}$ = 1.70 Mev(cm²/g)

RESIDUAL RANGE

r_o = 0.317 g/cm²

OTHER PARAMETERS

d_1 = 1.215 A_1 = 0.4343

α = 4.830 A_2 = 0.9874

A^{PTI} = 0.9157 A_3 = -0.7402

A^{PLP} = 1.090 A_4 = 0.3184

SCATTERING COEFFICIENTS

ℓ	S_ℓ
1	1.007
2	2.822
3	5.302
4	8.368
5	11.96
6	16.04
7	20.57
8	25.51
9	30.84
10	36.52
11	42.59
12	48.96

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	1.271	0.271	0.500	2.013	1.827	-0.012
0.025	1.004	1.347	0.200	0.525	2.092	1.722	-0.009
0.050	1.013	1.423	0.136	0.550	2.164	1.612	-0.005
0.075	1.028	1.501	0.083	0.575	2.224	1.496	-0.002
0.100	1.049	1.581	0.042	0.600	2.262	1.374	0.001
0.125	1.075	1.667	0.018	0.625	2.267	1.246	0.003
0.150	1.106	1.758	0.012	0.650	2.224	1.110	0.004
0.175	1.143	1.851	0.020	0.675	2.118	0.968	0.004
0.200	1.185	1.937	0.030	0.700	1.948	0.819	0.004
0.225	1.231	2.014	0.038	0.725	1.729	0.667	0.003
0.250	1.283	2.080	0.043	0.750	1.477	0.516	0.002
0.275	1.339	2.134	0.046	0.775	1.198	0.370	0.000
0.300	1.400	2.172	0.046	0.800	0.902	0.239	-0.001
0.325	1.466	2.195	0.042	0.825	0.609	0.132	-0.002
0.350	1.535	2.198	0.036	0.850	0.346	0.056	-0.002
0.375	1.609	2.182	0.026	0.875	0.148	0.016	-0.001
0.400	1.686	2.145	0.014	0.900	0.038	0.002	-0.000
0.425	1.766	2.088	0.002	0.925	0.003	0.000	-0.000
0.450	1.848	2.013	-0.008	0.950	0.000	0.000	-0.000
0.475	1.931	1.925	-0.013	0.975	0.000	0.000	-0.000

AIR

E_o = 1.00 Mev

STOPPING POWER

$(dE/dr)_{E_o}$ = 1.65 Mev(cm^2/g)

RESIDUAL RANGE

r_o = 0.497 g/cm^2

OTHER PARAMETERS

d_1 = 1.223 A_1 = 0.3807

α = 2.968 A_2 = 1.205

A^{PTI} = 0.8594 A_3 = -1.095

A^{PLP} = 0.1022 A_4 = 0.5094

SCATTERING COEFFICIENTS

ℓ	S_ℓ
1	0.9151
2	2.582
3	4.874
4	7.721
5	11.08
6	14.90
7	19.15
8	23.82
9	28.87
10	34.29
11	40.05
12	46.14

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.186	0.186	0.500	1.820	1.789	-0.013
0.025	1.001	1.239	0.135	0.525	1.897	1.693	-0.012
0.050	1.007	1.294	0.090	0.550	1.972	1.590	-0.008
0.075	1.017	1.352	0.050	0.575	2.037	1.482	-0.004
0.100	1.032	1.416	0.020	0.600	2.086	1.367	-0.001
0.125	1.051	1.487	0.002	0.625	2.105	1.247	0.002
0.150	1.073	1.567	-0.003	0.650	2.076	1.119	0.004
0.175	1.100	1.654	-0.003	0.675	1.986	0.984	0.005
0.200	1.132	1.737	0.011	0.700	1.837	0.842	0.005
0.225	1.167	1.814	0.018	0.725	1.648	0.695	0.004
0.250	1.206	1.882	0.024	0.750	1.427	0.546	0.002
0.275	1.250	1.942	0.028	0.775	1.177	0.400	0.001
0.300	1.298	1.990	0.030	0.800	0.906	0.265	-0.001
0.325	1.349	2.025	0.030	0.825	0.628	0.151	-0.002
0.350	1.405	2.046	0.028	0.850	0.370	0.068	-0.002
0.375	1.465	2.049	0.023	0.875	0.166	0.020	-0.001
0.400	1.529	2.035	0.016	0.900	0.045	0.003	-0.000
0.425	1.597	2.000	0.007	0.925	0.004	0.000	0.000
0.450	1.669	1.946	-0.003	0.950	0.000	0.000	0.000
0.475	1.743	1.875	-0.010	0.975	0.000	0.000	0.000

E_o = 2.00 Mev

STOPPING POWER

$(dE/dr)_{E_o}$ = 1.68 Mev(cm^2/g)

RESIDUAL RANGE

r_o = 1.10 g/cm^2

OTHER PARAMETERS

d_1 = 1.251 A_1 = 0.2699

α = 1.230 A_2 = 1.856

A^{PTI} = 0.7775 A_3 = -2.638

A^{PLP} = 0.9236 A_4 = 1.512

SCATTERING COEFFICIENTS

ℓ	S_ℓ
1	0.6902
2	1.966
3	3.738
4	5.955
5	8.592
6	11.62
7	15.01
8	18.75
9	22.83
10	27.22
11	31.23
12	36.91

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.096	0.096	0.500	1.495	1.673	-0.004
0.025	0.993	1.115	0.070	0.525	1.568	1.610	-0.009
0.050	0.989	1.138	0.046	0.550	1.645	1.531	-0.010
0.075	0.988	1.165	0.025	0.575	1.724	1.440	-0.009
0.100	0.990	1.198	0.008	0.600	1.797	1.340	-0.005
0.125	0.995	1.240	-0.003	0.625	1.851	1.233	-0.001
0.150	1.003	1.294	-0.007	0.650	1.863	1.118	0.002
0.175	1.014	1.358	-0.005	0.675	1.811	0.995	0.004
0.200	1.028	1.423	-0.001	0.700	1.691	0.865	0.005
0.225	1.045	1.485	0.003	0.725	1.525	0.726	0.005
0.250	1.066	1.543	0.007	0.750	1.331	0.582	0.003
0.275	1.089	1.597	0.009	0.775	1.113	0.437	0.002
0.300	1.116	1.645	0.012	0.800	0.875	0.298	-0.000
0.325	1.447	1.687	0.013	0.825	0.627	0.176	-0.002
0.350	1.182	1.721	0.014	0.850	0.387	0.083	-0.002
0.375	1.221	1.746	0.013	0.875	0.186	0.027	-0.001
0.400	1.264	1.760	0.012	0.900	0.057	0.004	-0.000
0.425	1.313	1.762	0.009	0.925	0.006	0.000	-0.000
0.450	1.368	1.749	0.005	0.950	0.000	0.000	-0.000
0.475	1.428	1.720	0.001	0.975	0.000	0.000	0.000

AIR

E_o = 4.00 Mev

STOPPING POWER
$(dE/dr)_{E_o}$ = 1.78 Mev(cm^2/g)
RESIDUAL RANGE
r_o = 2.26 g/cm^2
OTHER PARAMETERS

d_1 =	1.326	A_1 =	0.2624
α =	0.5283	A_2 =	1.034
A^{PTI} =	0.6663	A_3 =	-0.6649
A^{PLP} =	0.7867	A_4 =	0.3688

SCATTERING COEFFICIENTS

ℓ	S_ℓ
1	0.4584
2	1.314
3	2.513
4	4.028
5	5.837
6	7.924
7	10.28
8	12.89
9	15.74
10	18.83
11	22.14
12	25.68

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.038	0.038	0.500	1.257	1.526	0.001
0.025	0.998	1.046	0.028	0.525	1.291	1.496	-0.001
0.050	0.997	1.056	0.019	0.550	1.328	1.450	-0.003
0.075	0.998	1.069	0.011	0.575	1.367	1.388	-0.004
0.100	1.000	1.087	0.004	0.600	1.408	1.312	-0.004
0.125	1.004	1.110	-0.000	0.625	1.447	1.224	-0.003
0.150	1.009	1.142	-0.003	0.650	1.479	1.129	-0.001
0.175	1.016	1.184	-0.003	0.675	1.496	1.027	0.001
0.200	1.024	1.230	-0.002	0.700	1.486	0.916	0.002
0.225	1.033	1.274	-0.000	0.725	1.438	0.797	0.002
0.250	1.044	1.317	0.001	0.750	1.343	0.669	0.002
0.275	1.057	1.359	0.002	0.775	1.191	0.543	0.002
0.300	1.071	1.398	0.003	0.800	0.978	0.395	0.001
0.325	1.087	1.435	0.003	0.825	0.716	0.261	-0.000
0.350	1.105	1.468	0.004	0.850	0.437	0.143	-0.001
0.375	1.125	1.497	0.004	0.875	0.198	0.057	-0.001
0.400	1.147	1.520	0.004	0.900	0.055	0.013	-0.000
0.425	1.171	1.537	0.004	0.925	0.008	0.001	-0.000
0.450	1.197	1.544	0.003	0.950	0.003	0.000	-0.000
0.475	1.226	1.541	0.002	0.975	0.005	0.000	-0.000

E_o = 10.00 Mev

STOPPING POWER
$(dE/dr)_{E_o}$ = 1.97 Mev(cm^2/g)
RESIDUAL RANGE
r_o = 5.44 g/cm^2
OTHER PARAMETERS

d_1 =	1.682	A_1 =	0.1200
α =	0.1557	A_2 =	1.942
A^{PTI} =	0.5002	A_3 =	-2.596
A^{PLP} =	0.5760	A_4 =	1.534

SCATTERING COEFFICIENTS

ℓ	S_ℓ
1	0.2266
2	0.6534
3	1.257
4	2.026
5	2.951
6	4.024
7	5.240
8	6.594
9	8.082
10	9.700
11	11.45
12	13.32

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.010	0.010	0.500	1.051	1.303	-0.007
0.025	0.997	1.008	0.009	0.525	1.063	1.314	-0.007
0.050	0.995	1.009	0.008	0.550	1.079	1.314	-0.007
0.075	0.994	1.011	0.008	0.575	1.099	1.301	-0.004
0.100	0.993	1.014	0.007	0.600	1.123	1.279	0.001
0.125	0.992	1.019	0.006	0.625	1.154	1.252	0.007
0.150	0.993	1.027	0.006	0.650	1.193	1.220	0.012
0.175	0.993	1.036	0.005	0.675	1.238	1.179	0.015
0.200	0.994	1.047	0.004	0.700	1.285	1.127	0.016
0.225	0.996	1.060	0.003	0.725	1.322	1.059	0.014
0.250	0.999	1.075	0.003	0.750	1.330	0.968	0.007
0.275	1.001	1.092	0.002	0.775	1.290	0.849	-0.004
0.300	1.005	1.111	0.001	0.800	1.184	0.695	-0.018
0.325	1.008	1.132	-0.000	0.825	0.996	0.511	-0.028
0.350	1.012	1.155	-0.001	0.850	0.728	0.315	-0.023
0.375	1.016	1.181	-0.002	0.875	0.420	0.142	-0.000
0.400	1.020	1.207	-0.003	0.900	0.162	0.029	0.020
0.425	1.026	1.234	-0.004	0.925	0.031	-0.009	-0.017
0.450	1.033	1.260	-0.005	0.950	0.001	-0.004	0.005
0.475	1.041	1.284	-0.006	0.975	0.000	-0.000	0.000

POLYSTYRENE

E_o = 0.025 Mev

STOPPING POWER
$(dE/dr)_{E_o}$ = 11.2 Mev(cm^2/g)

RESIDUAL RANGE
r_o = 0.00125 g/cm^2

OTHER PARAMETERS

d_1 =	0.9338	A_1 =	0.7245
α =	-63.71	A_2 =	1.169
A^{PTI} =	0.6711	A_3 =	-1.781
A^{PLP} =	0.7937	A_4 =	0.8868

SCATTERING COEFFICIENTS

ℓ	S_ℓ
1	0.9487
2	1.467
3	4.251
4	6.360
5	8.733
6	11.28
7	13.94
8	16.71
9	19.91
10	23.19
11	26.55
12	29.98

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.342	0.342	0.500	2.500	2.754	0.003
0.025	1.010	1.414	0.278	0.525	2.631	2.690	-0.008
0.050	1.027	1.488	0.218	0.550	2.761	2.601	-0.016
0.075	1.052	1.565	0.163	0.575	2.884	2.491	-0.016
0.100	1.084	1.647	0.116	0.600	2.998	2.367	-0.011
0.125	1.123	1.735	0.079	0.625	3.095	2.231	-0.004
0.150	1.169	1.833	0.058	0.650	3.168	2.082	0.002
0.175	1.221	1.942	0.053	0.675	3.206	1.919	0.006
0.200	1.280	2.055	0.055	0.700	3.196	1.739	0.009
0.225	1.346	2.164	0.057	0.725	3.123	1.540	0.010
0.250	1.419	2.270	0.058	0.750	2.967	1.321	0.010
0.275	1.499	2.370	0.059	0.775	2.710	1.083	0.007
0.300	1.585	2.465	0.058	0.800	2.338	0.831	0.003
0.325	1.679	2.553	0.057	0.825	1.850	0.576	-0.001
0.350	1.779	2.631	0.055	0.850	1.274	0.341	-0.004
0.375	1.886	2.698	0.051	0.875	0.694	0.154	-0.005
0.400	1.999	2.750	0.045	0.900	0.243	0.042	-0.003
0.425	2.118	2.786	0.037	0.925	0.034	0.004	-0.001
0.450	2.242	2.800	0.028	0.950	0.000	0.000	-0.000
0.475	2.370	2.791	0.016	0.975	0.000	0.000	0.000

E_o = 0.05 Mev

STOPPING POWER
$(dE/dr)_{E_o}$ = 6.64 Mev(cm^2/g)

RESIDUAL RANGE
r_o = 0.00428 g/cm^2

OTHER PARAMETERS

d_1 =	0.9697	A_1 =	0.7637
α =	13.56	A_2 =	0.9428
A^{PTI} =	0.6898	A_3 =	-1.383
A^{PLP} =	0.8173	A_4 =	0.6763

SCATTERING COEFFICIENTS

ℓ	S_ℓ
1	0.9031
2	2.349
3	4.202
4	6.375
5	8.807
6	11.45
7	14.27
8	17.23
9	20.31
10	23.48
11	26.72
12	30.02

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.300	0.300	0.500	2.448	2.754	0.005
0.025	1.010	1.369	0.240	0.525	2.587	2.697	-0.003
0.050	1.026	1.440	0.186	0.550	2.729	2.614	-0.009
0.075	1.049	1.516	0.137	0.575	2.867	2.510	-0.011
0.100	1.079	1.599	0.097	0.600	2.996	2.390	-0.009
0.125	1.114	1.693	0.070	0.625	3.107	2.254	-0.004
0.150	1.156	1.801	0.059	0.650	3.191	2.105	0.001
0.175	1.205	1.916	0.057	0.675	3.237	1.939	0.005
0.200	1.259	2.029	0.056	0.700	3.231	1.754	0.007
0.225	1.321	2.139	0.054	0.725	3.156	1.549	0.008
0.250	1.389	2.245	0.052	0.750	2.993	1.323	0.008
0.275	1.464	2.346	0.050	0.775	2.724	1.078	0.006
0.300	1.545	2.442	0.048	0.800	2.334	0.819	0.003
0.325	1.634	2.530	0.045	0.825	1.826	0.560	-0.001
0.350	1.729	2.609	0.042	0.850	1.238	0.325	-0.003
0.375	1.832	2.677	0.038	0.875	0.657	0.142	-0.004
0.400	1.941	2.732	0.033	0.900	0.221	0.037	-0.002
0.425	2.058	2.770	0.027	0.925	0.028	0.003	-0.000
0.450	2.181	2.788	0.021	0.950	0.000	0.000	0.000
0.475	2.311	2.784	0.013	0.975	0.000	0.000	0.000

Table 1. Energy Dissipation Function, J(x), and Input Data - Continued

POLYSTYRENE

E_o = 0.10 Mev

STOPPING POWER

$(dE/dr)_{E_o}$ = 4.13 Mev(cm^2/g)

RESIDUAL RANGE

r_o = 0.0142 g/cm^2

OTHER PARAMETERS

d_1 = 0.9090	A_1 = 0.7102
α = 45.20	A_2 = 0.8488
A^{PTI} = 0.6738	A_3 = -0.9880
A^{PLP} = 0.8051	A_4 = 0.4290

SCATTERING COEFFICIENTS

ℓ	S_ℓ
1	0.8894
2	2.367
3	4.303
4	6.618
5	9.254
6	12.17
7	15.32
8	18.68
9	22.23
10	25.93
11	29.78
12	33.75

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.252	0.252	0.500	2.310	2.649	0.005
0.025	1.011	1.319	0.196	0.525	2.448	2.591	0.002
0.050	1.028	1.391	0.146	0.550	2.590	2.509	-0.001
0.075	1.052	1.469	0.105	0.575	2.733	2.410	-0.003
0.100	1.082	1.561	0.078	0.600	2.871	2.299	-0.004
0.125	1.119	1.668	0.069	0.625	2.996	2.175	-0.004
0.150	1.161	1.778	0.064	0.650	3.095	2.036	-0.003
0.175	1.206	1.886	0.059	0.675	3.151	1.880	-0.001
0.200	1.252	1.991	0.055	0.700	3.146	1.705	0.002
0.225	1.302	2.093	0.051	0.725	3.057	1.509	0.005
0.250	1.358	2.192	0.046	0.750	2.868	1.293	0.006
0.275	1.419	2.287	0.042	0.775	2.577	1.057	0.006
0.300	1.487	2.376	0.038	0.800	2.203	0.809	0.004
0.325	1.562	2.457	0.034	0.825	1.762	0.559	0.000
0.350	1.644	2.531	0.029	0.850	1.269	0.329	-0.002
0.375	1.734	2.593	0.025	0.875	0.762	0.147	-0.004
0.400	1.832	2.643	0.021	0.900	0.325	0.040	-0.002
0.425	1.938	2.676	0.017	0.925	0.066	0.004	-0.000
0.450	2.054	2.690	0.013	0.950	0.002	0.000	-0.000
0.475	2.178	2.682	0.009	0.975	0.000	0.000	-0.000

E_o = 0.20 Mev

STOPPING POWER

$(dE/dr)_{E_o}$ = 2.79 Mev(cm^2/g)

RESIDUAL RANGE

r_o = 0.0448 g/cm^2

OTHER PARAMETERS

d_1 = 0.9034	A_1 = 0.6469
α = 20.18	A_2 = 0.8812
A^{PTI} = 0.6770	A_3 = -0.9830
A^{PLP} = 0.8119	A_4 = 0.4548

SCATTERING COEFFICIENTS

ℓ	S_ℓ
1	0.8607
2	2.340
3	4.314
4	6.709
5	9.472
6	12.56
7	15.94
8	19.59
9	23.47
10	27.57
11	31.87
12	36.35

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.237	0.237	0.500	2.150	2.480	-0.007
0.025	1.008	1.297	0.185	0.525	2.272	2.418	-0.015
0.050	1.020	1.359	0.137	0.550	2.399	2.338	-0.017
0.075	1.038	1.424	0.093	0.575	2.525	2.244	-0.013
0.100	1.060	1.494	0.056	0.600	2.645	2.138	-0.008
0.125	1.087	1.573	0.029	0.625	2.750	2.022	-0.002
0.150	1.118	1.663	0.015	0.650	2.834	1.892	0.002
0.175	1.155	1.766	0.015	0.675	2.885	1.748	0.005
0.200	1.197	1.872	0.021	0.700	2.891	1.586	0.007
0.225	1.244	1.974	0.026	0.725	2.836	1.404	0.008
0.250	1.296	2.073	0.031	0.750	2.704	1.201	0.007
0.275	1.354	2.166	0.035	0.775	2.476	0.979	0.005
0.300	1.417	2.254	0.038	0.800	2.137	0.744	0.002
0.325	1.486	2.333	0.039	0.825	1.688	0.509	-0.001
0.350	1.561	2.403	0.038	0.850	1.159	0.294	-0.004
0.375	1.642	2.461	0.036	0.875	0.625	0.127	-0.004
0.400	1.729	2.504	0.032	0.900	0.216	0.032	-0.002
0.425	1.824	2.531	0.025	0.925	0.029	0.003	-0.000
0.450	1.925	2.537	0.016	0.950	0.000	0.000	-0.000
0.475	2.034	2.520	0.004	0.975	0.000	0.000	-0.000

POLYSTYRENE

$E_o = 0.40$ Mev

STOPPING POWER
$(dE/dr)_{E_o} = 2.13$ Mev(cm^2/g)
RESIDUAL RANGE
$r_o = 0.129$ g/cm^2
OTHER PARAMETERS
$d_1 = 0.8909$ $A_1 = 0.5444$
$\alpha = 9.898$ $A_2 = 0.9242$
$A^{PTI} = 0.6689$ $A_3 = -0.7832$
$A^{PLP} = 0.8040$ $A_4 = 0.3145$

SCATTERING COEFFICIENTS

ℓ	S_ℓ
1	0.8092
2	2.243
3	4.188
4	6.576
5	9.361
6	12.51
7	15.98
8	19.76
9	23.82
10	28.14
11	32.70
12	37.49

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	1.186	0.186	0.500	1.926	2.232	-0.010
0.025	1.006	1.237	0.142	0.525	2.026	2.168	-0.016
0.050	1.017	1.290	0.100	0.550	2.129	2.090	-0.016
0.075	1.031	1.346	0.063	0.575	2.232	2.002	-0.012
0.100	1.049	1.407	0.032	0.600	2.330	1.904	-0.006
0.125	1.070	1.476	0.010	0.625	2.416	1.798	-0.002
0.150	1.096	1.555	0.001	0.650	2.484	1.681	0.002
0.175	1.125	1.646	0.001	0.675	2.524	1.551	0.005
0.200	1.159	1.740	0.008	0.700	2.526	1.405	0.006
0.225	1.197	1.831	0.015	0.725	2.476	1.243	0.007
0.250	1.238	1.918	0.020	0.750	2.361	1.063	0.006
0.275	1.285	2.000	0.025	0.775	2.163	0.867	0.004
0.300	1.335	2.076	0.029	0.800	1.871	0.659	0.002
0.325	1.390	2.145	0.031	0.825	1.482	0.450	-0.001
0.350	1.451	2.204	0.032	0.850	1.021	0.260	-0.003
0.375	1.516	2.252	0.030	0.875	0.555	0.112	-0.003
0.400	1.586	2.286	0.026	0.900	0.193	0.029	-0.002
0.425	1.662	2.303	0.020	0.925	0.026	0.002	-0.000
0.450	1.744	2.300	0.011	0.950	0.000	0.000	-0.000
0.475	1.832	2.277	0.000	0.975	0.000	0.000	-0.000

$E_o = 0.70$ Mev

STOPPING POWER
$(dE/dr)_{E_o} = 1.89$ Mev(cm^2/g)
RESIDUAL RANGE
$r_o = 0.281$ g/cm^2
OTHER PARAMETERS
$d_1 = 0.8808$ $A_1 = 0.4652$
$\alpha = 5.200$ $A_2 = 0.9275$
$A^{PTI} = 0.6502$ $A_3 = -0.6353$
$A^{PLP} = 0.7821$ $A_4 = 0.2426$

SCATTERING COEFFICIENTS

ℓ	S_ℓ
1	0.7387
2	2.075
3	3.906
4	6.174
5	8.841
6	11.87
7	15.24
8	18.93
9	22.91
10	27.17
11	31.70
12	36.48

x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)	x	POINT ISOTROPIC SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(x)	PLANE PERPENDICULAR SOURCE J(-x)
0.000	1.000	1.140	0.140	0.500	1.705	2.019	-0.009
0.025	1.004	1.180	0.104	0.525	1.792	1.960	-0.014
0.050	1.012	1.221	0.071	0.550	1.884	1.889	-0.015
0.075	1.023	1.266	0.042	0.575	1.980	1.808	-0.011
0.100	1.038	1.315	0.017	0.600	2.074	1.719	-0.006
0.125	1.055	1.371	-0.001	0.625	2.157	1.624	-0.002
0.150	1.075	1.438	-0.010	0.650	2.217	1.519	0.001
0.175	1.098	1.515	-0.007	0.675	2.245	1.402	0.004
0.200	1.123	1.596	-0.000	0.700	2.232	1.273	0.005
0.225	1.151	1.675	0.006	0.725	2.150	1.129	0.006
0.250	1.181	1.750	0.012	0.750	2.050	0.970	0.006
0.275	1.213	1.822	0.017	0.775	1.864	0.795	0.004
0.300	1.249	1.888	0.021	0.800	1.608	0.609	0.002
0.325	1.287	1.948	0.024	0.825	1.287	0.420	-0.001
0.350	1.330	2.000	0.025	0.850	0.921	0.246	-0.003
0.375	1.378	2.042	0.024	0.875	0.550	0.109	-0.003
0.400	1.431	2.071	0.022	0.900	0.240	0.029	-0.002
0.425	1.489	2.086	0.016	0.925	0.057	0.002	-0.000
0.450	1.554	2.083	0.009	0.950	0.003	0.000	-0.000
0.475	1.626	2.061	0.000	0.975	0.000	0.000	-0.000

POLYSTYRENE

E_o = 1.00 Mev

STOPPING POWER
$(dE/dr)_{E_o}$ = 1.82 Mev(cm^2/g)

RESIDUAL RANGE
r_o = 0.443 g/cm^2

OTHER PARAMETERS

d_1 = 0.8767 A_1 = 0.4222
α = 3.391 A_2 = 0.8847
A^{PTI} = 0.6288 A_3 = -0.4664
A^{PLP} = 0.7565 A_4 = 0.1595

SCATTERING COEFFICIENTS

ℓ	$S_ℓ$
1	0.6770
2	1.908
3	3.608
4	5.726
5	8.224
6	11.08
7	14.26
8	17.75
9	21.54
10	25.60
11	29.93
12	34.51

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.110	0.110	0.500	1.575	1.889	-0.007
0.025	1.003	1.142	0.081	0.525	1.636	1.836	-0.013
0.050	1.008	1.176	0.054	0.550	1.700	1.770	-0.014
0.075	1.016	1.212	0.030	0.575	1.766	1.696	-0.011
0.100	1.026	1.253	0.010	0.600	1.834	1.614	-0.007
0.125	1.039	1.300	-0.005	0.625	1.900	1.526	-0.003
0.150	1.054	1.357	-0.012	0.650	1.962	1.430	0.001
0.175	1.072	1.424	-0.010	0.675	2.013	1.324	0.003
0.200	1.093	1.496	-0.003	0.700	2.042	1.206	0.005
0.225	1.117	1.566	0.003	0.725	2.032	1.074	0.006
0.250	1.143	1.634	0.008	0.750	1.963	0.928	0.005
0.275	1.172	1.698	0.013	0.775	1.818	0.767	0.004
0.300	1.204	1.758	0.017	0.800	1.582	0.594	0.002
0.325	1.239	1.812	0.020	0.825	1.253	0.416	-0.001
0.350	1.278	1.860	0.021	0.850	0.854	0.249	-0.003
0.375	1.319	1.899	0.021	0.875	0.450	0.113	-0.003
0.400	1.364	1.928	0.020	0.900	0.150	0.031	-0.002
0.425	1.412	1.943	0.016	0.925	0.023	0.003	-0.000
0.450	1.463	1.943	0.009	0.950	0.006	0.000	-0.000
0.475	1.517	1.925	0.001	0.975	0.010	0.000	-0.000

E_o = 2.00 Mev

STOPPING POWER
$(dE/dr)_{E_o}$ = 1.79 Mev(cm^2/g)

RESIDUAL RANGE
r_o = 1.00 g/cm^2

OTHER PARAMETERS

d_1 = 0.8960 A_1 = 0.3442
α = 1.370 A_2 = 0.9492
A^{PTI} = 0.5780 A_3 = -0.4675
A^{PLP} = 0.6926 A_4 = 0.1740

SCATTERING COEFFICIENTS

ℓ	$S_ℓ$
1	0.5179
2	1.477
3	2.814
4	4.492
5	6.486
6	8.779
7	11.35
8	14.19
9	17.29
10	20.63
11	24.20
12	28.00

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.058	0.058	0.500	1.361	1.698	0.001
0.025	1.000	1.074	0.043	0.525	1.403	1.669	-0.004
0.050	1.002	1.092	0.028	0.550	1.448	1.623	-0.008
0.075	1.006	1.112	0.015	0.575	1.495	1.562	-0.010
0.100	1.011	1.136	0.004	0.600	1.544	1.490	-0.008
0.125	1.018	1.165	-0.005	0.625	1.594	1.412	-0.005
0.150	1.027	1.203	-0.009	0.650	1.644	1.326	-0.002
0.175	1.038	1.251	-0.009	0.675	1.688	1.233	0.001
0.200	1.050	1.305	-0.005	0.700	1.720	1.131	0.003
0.225	1.064	1.378	-0.002	0.725	1.725	1.017	0.004
0.250	1.080	1.410	0.001	0.750	1.687	0.889	0.005
0.275	1.098	1.461	0.003	0.775	1.589	0.748	0.004
0.300	1.118	1.510	0.006	0.800	1.415	0.593	0.002
0.325	1.140	1.556	0.008	0.825	1.157	0.430	0.000
0.350	1.164	1.599	0.009	0.850	0.823	0.269	-0.002
0.375	1.191	1.637	0.010	0.875	0.461	0.131	-0.003
0.400	1.220	1.669	0.010	0.900	0.167	0.040	-0.002
0.425	1.251	1.693	0.010	0.925	0.026	0.004	-0.000
0.450	1.285	1.708	0.008	0.950	0.001	0.000	-0.000
0.475	1.322	1.710	0.005	0.975	0.001	0.000	-0.000

POLYSTYRENE

E_o = 4.00 Mev

STOPPING POWER

$(dE/dr)_{E_o}$ = 1.84 Mev(cm²/g)

RESIDUAL RANGE

r_o = 2.10 g/cm²

OTHER PARAMETERS

d_1 = 0.9138 A_1 = 0.2982

α = 0.6231 A_2 = 0.9289

A^{PTI} = 0.4952 A_3 = -0.3859

A^{PLP} = 0.5886 A_4 = 0.1588

SCATTERING COEFFICIENTS

ℓ	s_ℓ
1	0.3508
2	1.006
3	1.927
4	3.092
5	4.394
6	6.093
7	7.909
8	9.922
9	12.13
10	14.51
11	17.08
12	19.82

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)	x	J(x)	J(x)	J(-x)
0.000	1.000	1.025	0.025	0.500	1.197	1.508	0.002
0.025	0.999	1.030	0.019	0.525	1.223	1.514	0.001
0.050	0.999	1.036	0.014	0.550	1.250	1.509	0.000
0.075	1.000	1.045	0.009	0.575	1.280	1.490	-0.001
0.100	1.002	1.056	0.005	0.600	1.312	1.454	-0.002
0.125	1.006	1.070	0.001	0.625	1.346	1.401	-0.003
0.150	1.010	1.090	-0.002	0.650	1.381	1.331	-0.003
0.175	1.015	1.117	-0.002	0.675	1.418	1.250	-0.002
0.200	1.021	1.150	-0.002	0.700	1.453	1.160	-0.000
0.225	1.028	1.183	-0.001	0.725	1.484	1.060	0.001
0.250	1.036	1.217	-0.000	0.750	1.501	0.949	0.002
0.275	1.046	1.251	0.000	0.775	1.487	0.824	0.002
0.300	1.057	1.285	0.001	0.800	1.410	0.684	0.002
0.325	1.069	1.320	0.001	0.825	1.230	0.528	0.001
0.350	1.082	1.353	0.002	0.850	0.933	0.363	-0.000
0.375	1.097	1.386	0.002	0.875	0.560	0.203	-0.001
0.400	1.114	1.418	0.002	0.900	0.224	0.077	-0.001
0.425	1.132	1.447	0.003	0.925	0.044	0.013	-0.000
0.450	1.152	1.472	0.003	0.950	0.002	0.000	0.000
0.475	1.173	1.493	0.002	0.975	0.000	0.000	0.000

E_o = 10.00 Mev

STOPPING POWER

$(dE/dr)_{E_o}$ = 1.94 Mev(cm²/g)

RESIDUAL RANGE

r_o = 5.26 g/cm²

OTHER PARAMETERS

d_1 = 0.9486 A_1 = 0.2476

α = 0.2341 A_2 = 1.040

A^{PTI} = 0.3688 A_3 = -0.6041

A^{PLP} = 0.4265 A_4 = 0.3168

SCATTERING COEFFICIENTS

ℓ	s_ℓ
1	0.1799
2	0.5194
3	1.001
4	1.614
5	2.352
6	3.209
7	4.182
8	5.265
9	6.457
10	7.754
11	9.153
12	10.65

	POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE			POINT ISOTROPIC SOURCE	PLANE PERPENDICULAR SOURCE	
x	J(x)	J(x)	J(-x)		J(x)	J(x)	J(-x)
0.000	1.000	1.008	0.008	0.500	1.049	1.245	0.001
0.025	0.999	1.009	0.007	0.525	1.061	1.266	0.001
0.050	0.999	1.011	0.006	0.550	1.078	1.287	0.001
0.075	0.999	1.013	0.005	0.575	1.100	1.305	0.001
0.100	1.000	1.017	0.004	0.600	1.128	1.319	0.001
0.125	1.001	1.022	0.003	0.625	1.159	1.328	0.001
0.150	1.003	1.028	0.002	0.650	1.192	1.328	0.001
0.175	1.006	1.035	0.001	0.675	1.225	1.316	-0.000
0.200	1.008	1.044	-0.000	0.700	1.257	1.286	-0.001
0.225	1.011	1.054	-0.001	0.725	1.285	1.233	-0.002
0.250	1.012	1.065	-0.002	0.750	1.305	1.152	-0.003
0.275	1.013	1.078	-0.002	0.775	1.310	1.042	-0.002
0.300	1.015	1.092	-0.001	0.800	1.289	0.910	0.000
0.325	1.017	1.108	-0.001	0.825	1.228	0.761	0.002
0.350	1.019	1.125	-0.001	0.850	1.102	0.596	0.003
0.375	1.021	1.143	-0.001	0.875	0.889	0.413	0.002
0.400	1.024	1.162	-0.000	0.900	0.577	0.227	-0.001
0.425	1.028	1.182	0.000	0.925	0.229	0.074	-0.002
0.450	1.033	1.202	0.000	0.950	0.024	0.006	-0.000
0.475	1.040	1.224	0.001	0.975	0.000	0.000	0.000

Table 2. Spatial Moments, Plane Isotropic Source

ℓ	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 0.025	Z= 6.					
ℓ=0	0	0.200623E 01	0.665423E 00	0.398403E-00	0.284237E-00	0.220907E-00	0.180648E-00	0.152797E-00
	2	0.207134E-00	0.353090E-01	0.128270E-01	0.613529E-02	0.341688E-02	0.209981E-02	0.138322E-02
	4	0.554574E-01	0.665209E-02	0.179023E-02	0.659319E-03	0.291312E-03	0.145455E-03	0.793759E-04
	6	0.203295E-01	0.190310E-02	0.410774E-03	0.124023E-03	0.457380E-04	0.193494E-04	0.906069E-05
	8	0.882493E-02	0.680553E-03	0.123130E-03	0.316172E-04	0.100391E-04	0.369538E-05	0.151948E-05
	10	0.427186E-02	0.280751E-03	0.438166E-04	0.980682E-05	0.273872E-05	0.893686E-06	0.328035E-06
	12	0.223431E-02	0.128119E-03	0.176028E-04	0.349565E-05	0.872190E-06	0.255850E-06	0.848891E-07
		MEV= 0.05	Z= 6.					
0	0	0.195082E 01	0.676671E 00	0.412986E-00	0.297812E-00	0.233046E-00	0.191482E-00	0.162529E-00
	2	0.200989E-00	0.364758E-01	0.137752E-01	0.676858E-02	0.384528E-02	0.239959E-02	0.160009E-02
	4	0.536731E-01	0.690895E-02	0.195421E-02	0.747400E-03	0.340233E-03	0.174055E-03	0.969176E-04
	6	0.195981E-01	0.197824E-02	0.452009E-03	0.142820E-03	0.546787E-04	0.238712E-04	0.114826E-04
	8	0.846725E-02	0.706352E-03	0.135979E-03	0.367520E-04	0.121866E-04	0.465632E-05	0.197786E-05
	10	0.407747E-02	0.290559E-03	0.484358E-04	0.114620E-04	0.335871E-05	0.114313E-05	0.435520E-06
	12	0.212097E-02	0.132104E-03	0.194447E-04	0.409748E-05	0.107693E-05	0.330825E-06	0.114393E-06
		MEV= 0.10	Z= 6.					
0	0	0.198330E 01	0.670026E 00	0.404333E-00	0.289734E-00	0.225809E-00	0.185014E-00	0.156713E-00
	2	0.208707E-00	0.362987E-01	0.133567E-01	0.644678E-02	0.361474E-02	0.223311E-02	0.147723E-02
	4	0.565488E-01	0.692826E-02	0.189422E-02	0.706300E-03	0.315200E-03	0.158682E-03	0.871933E-04
	6	0.208796E-01	0.199788E-02	0.438975E-03	0.134514E-03	0.502319E-04	0.214793E-04	0.101517E-04
	8	0.910314E-02	0.717894E-03	0.132406E-03	0.345695E-04	0.111370E-04	0.415208E-05	0.172662E-05
	10	0.441732E-02	0.296977E-03	0.472980E-04	0.107789E-04	0.305905E-05	0.101272E-05	0.376580E-06
	12	0.231293E-02	0.135706E-03	0.190424E-04	0.385476E-05	0.978681E-06	0.291667E-06	0.981778E-07
		MEV= 0.20	Z= 6.					
0	0	0.196614E 01	0.673518E 00	0.408867E-00	0.293959E-00	0.229589E-00	0.188389E-00	0.159745E-00
	2	0.208310E-00	0.368629E-01	0.137127E-01	0.666916E-02	0.376064E-02	0.233345E-02	0.154901E-02
	4	0.566645E-01	0.707560E-02	0.196121E-02	0.739035E-03	0.332597E-03	0.168598E-03	0.931771E-04
	6	0.209639E-01	0.204653E-02	0.456729E-03	0.141740E-03	0.534919E-04	0.230790E-04	0.109920E-04
	8	0.914741E-02	0.736484E-03	0.138155E-03	0.365888E-04	0.119326E-04	0.449622E-05	0.188725E-05
	10	0.443911E-02	0.304840E-03	0.494290E-04	0.114406E-04	0.329124E-05	0.110274E-05	0.414468E-06
	12	0.232330E-02	0.139289E-03	0.199145E-04	0.409837E-05	0.105592E-05	0.318855E-06	0.108611E-06
		MEV= 0.40	Z= 6.					
0	0	0.193695E 01	0.679556E 00	0.416776E-00	0.301370E-00	0.236247E-00	0.194352E-00	0.165115E-00
	2	0.207728E-00	0.378685E-01	0.143514E-01	0.707140E-02	0.402638E-02	0.251725E-02	0.168114E-02
	4	0.570670E-01	0.736060E-02	0.208820E-02	0.801071E-03	0.365690E-03	0.187550E-03	0.104667E-03
	6	0.212698E-01	0.214846E-02	0.492294E-03	0.156075E-03	0.599568E-04	0.262600E-04	0.126697E-04
	8	0.933468E-02	0.778572E-03	0.150292E-03	0.407707E-04	0.135722E-04	0.520584E-05	0.221945E-05
	10	0.455114E-02	0.324045E-03	0.541621E-04	0.128676E-04	0.378705E-05	0.129462E-05	0.495360E-06
	12	0.239109E-02	0.148731E-03	0.219492E-04	0.464441E-05	0.122645E-05	0.378596E-06	0.131545E-06
		MEV= 0.70	Z= 6.					
0	0	0.188794E 01	0.689981E 00	0.430648E-00	0.314500E-00	0.248124E-00	0.205044E-00	0.174782E-00
	2	0.205297E-00	0.394641E-01	0.154562E-01	0.779301E-02	0.451406E-02	0.286008E-02	0.193067E-02
	4	0.571854E-01	0.781980E-02	0.231200E-02	0.915316E-03	0.428453E-03	0.224297E-03	0.127342E-03
	6	0.215602E-01	0.231680E-02	0.556385E-03	0.183165E-03	0.725907E-04	0.326416E-04	0.161086E-04
	8	0.955452E-02	0.849804E-03	0.172641E-03	0.488608E-04	0.168616E-04	0.667180E-05	0.292288E-05
	10	0.469773E-02	0.357313E-03	0.630519E-04	0.156866E-04	0.480490E-05	0.170122E-05	0.671518E-06
	12	0.248656E-02	0.165449E-03	0.258421E-04	0.574361E-05	0.158373E-05	0.508058E-06	0.182725E-06
		MEV= 1.00	Z= 6.					
0	0	0.183977E 01	0.700595E 00	0.445051E-00	0.328306E-00	0.260727E-00	0.216466E-00	0.185162E-00
	2	0.202286E-00	0.410641E-01	0.166306E-01	0.858396E-02	0.506017E-02	0.325033E-02	0.221848E-02
	4	0.570851E-01	0.829187E-02	0.255706E-02	0.104529E-02	0.501924E-03	0.268309E-03	0.155022E-03
	6	0.217698E-01	0.249421E-02	0.628434E-03	0.214957E-03	0.879253E-04	0.406066E-04	0.205042E-04
	8	0.974471E-02	0.926540E-03	0.198337E-03	0.586055E-04	0.209760E-04	0.856511E-05	0.385702E-05
	10	0.483431E-02	0.393849E-03	0.734754E-04	0.191584E-04	0.611089E-05	0.224176E-05	0.913156E-06
	12	0.257967E-02	0.184127E-03	0.304857E-04	C.712373E-05	0.205235E-05	0.684509E-06	0.254918E-06
		MEV= 2.00	Z= 6.					
0	0	0.168856E 01	0.736579E 00	0.496049E-00	0.378611E-00	0.307593E-00	0.259600E-00	0.224841E-00
	2	0.189832E-00	0.464625E-01	0.210603E-01	0.117631E-01	0.735947E-02	0.495445E-02	0.351326E-02
	4	0.553143E-01	0.990914E-02	0.352464E-02	0.160502E-02	0.839901E-03	0.481925E-03	0.295569E-03
	6	0.217104E-01	0.311271E-02	0.923544E-03	0.359467E-03	0.163541E-03	0.826386E-04	0.450919E-04
	8	0.996824E-02	0.119848E-02	0.306839E-03	0.104899E-03	0.424534E-04	0.192703E-04	0.952003E-05
	10	0.505878E-02	0.525255E-03	0.118637E-03	0.362749E-04	0.132632E-04	0.548194E-05	0.248185E-05
	12	0.275556E-02	0.252211E-03	0.510573E-04	0.141477E-04	0.472665E-05	0.179683E-05	0.752228E-06

	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 4.00	Z= 6.					
ℓ=0	0	0.151704E 01	0.783300E 00	0.567490E 00	0.452743E-00	0.379255E-00	0.327453E-00	0.288689E-00
	2	0.175401E-00	0.545245E-01	0.284224E-01	0.175219E-01	0.118231E-01	0.845708E-02	0.630584E-02
	4	0.536425E-01	0.125918E-01	0.534768E-02	0.278311E-02	0.162094E-02	0.101666E-02	0.672671E-03
	6	0.220420E-01	0.422722E-02	0.153779E-02	0.702075E-03	0.364277E-03	0.205819E-03	0.123733E-03
	8	0.105517E-01	0.172299E-02	0.552072E-03	0.226029E-03	0.106431E-03	0.550514E-04	0.305046E-04
	10	0.556243E-02	0.793759E-03	0.228121E-03	0.849868E-04	0.367706E-04	0.176029E-04	0.907878E-05
	12	0.313770E-02	0.398476E-03	0.104063E-03	0.356521E-04	0.143024E-04	0.638771E-05	0.308858E-05
		MEV=10.00	Z= 6.					
0	0	0.131270E 01	0.850168E 00	0.680953E 00	0.579212E 00	0.508263E 00	0.454913E-00	0.412875E-00
	2	0.155943E-00	0.682416E-01	0.431202E-01	0.305003E-01	0.229145E-01	0.179008E-01	0.143801E-01
	4	0.512465E-01	0.178329E-01	0.967636E-02	0.605345E-02	0.409141E-02	0.290878E-02	0.214480E-02
	6	0.226702E-01	0.667148E-02	0.322119E-02	0.183102E-02	0.113848E-02	0.750981E-03	0.517044E-03
	8	0.116375E-01	0.299340E-02	0.131213E-02	0.688322E-03	0.398903E-03	0.246943E-03	0.160386E-03
	10	0.654805E-02	0.150325E-02	0.606114E-03	0.296468E-03	0.161540E-03	0.945738E-04	0.583467E-04
	12	0.392541E-02	0.816145E-03	0.305548E-03	0.140390E-03	0.723784E-04	0.402988E-04	0.237363E-04
		MEV= 0.025	Z=13.					
0	0	0.203906E 01	0.658958E 00	0.390161E-00	0.276646E-00	0.214169E-00	0.174667E-00	0.147448E-00
	2	0.151044E-00	0.269695E-01	0.100702E-01	0.490342E-02	0.276502E-02	0.171482E-02	0.113752E-02
	4	0.301676E-01	0.390208E-02	0.110239E-02	0.420088E-03	0.190391E-03	0.969603E-04	0.537560E-04
	6	0.856798E-02	0.878561E-03	0.201491E-03	0.635733E-04	0.242509E-04	0.105396E-04	0.504572E-05
	8	0.296188E-02	0.252766E-03	0.489806E-04	0.132303E-04	0.436988E-05	0.166067E-05	0.701182E-06
	10	0.116552E-02	0.854027E-04	0.143590E-04	0.339694E-05	0.990875E-06	0.335017E-06	0.126677E-06
	12	0.503584E-03	0.323839E-04	0.481525E-05	0.101455E-05	0.265250E-06	0.808429E-07	0.276991E-07
		MEV= 0.05	Z=13.					
0	0	0.198057E 01	0.670578E 00	0.405047E-00	0.290399E-00	0.226403E-00	0.185544E-00	0.157189E-00
	2	0.144237E-00	0.275627E-01	0.107315E-01	0.537920E-02	0.309902E-02	0.195399E-02	0.131334E-02
	4	0.282923E-01	0.395426E-02	0.117931E-02	0.468200E-03	0.219179E-03	0.114599E-03	0.649416E-04
	6	0.788767E-02	0.878980E-03	0.214536E-03	0.711238E-04	0.282572E-04	0.127076E-04	0.626382E-05
	8	0.267656E-02	0.249209E-03	0.516923E-04	0.147654E-04	0.511241E-05	0.202318E-05	0.884914E-06
	10	0.103406E-02	0.829052E-04	0.149865E-04	0.376806E-05	0.115824E-05	0.409936E-06	0.161399E-06
	12	0.438749E-03	0.309403E-04	0.496351E-05	0.111598E-05	0.308789E-06	0.989538E-07	0.354584E-07
		MEV= 0.10	Z=13.					
0	0	0.198161E 01	0.670368E 00	0.404776E-00	0.290147E-00	0.226177E-00	0.185342E-00	0.157008E-00
	2	0.146022E-00	0.278011E-01	0.107991E-01	0.540427E-02	0.310972E-02	0.195892E-02	0.131568E-02
	4	0.288370E-01	0.401017E-02	0.119195E-02	0.472056E-03	0.220571E-03	0.115158E-03	0.651802E-04
	6	0.807240E-02	0.894246E-03	0.217362E-03	0.718395E-04	0.284736E-04	0.127806E-04	0.628995E-05
	8	0.274594E-02	0.253993E-03	0.524374E-04	0.149249E-04	0.515314E-05	0.203466E-05	0.888262E-06
	10	0.106227E-02	0.845683E-04	0.152087E-04	0.380881E-05	0.116707E-05	0.411990E-06	0.161857E-06
	12	0.450951E-03	0.315657E-04	0.503610E-05	0.112746E-05	0.310888E-06	0.993416E-07	0.355116E-07
		MEV= 0.20	Z=13.					
0	0	0.196899E 01	0.672936E 00	0.408108E-00	0.293251E-00	0.228954E-00	0.187822E-00	0.159235E-00
	2	0.146858E-00	0.282834E-01	0.110631E-01	0.556312E-02	0.321259E-02	0.202934E-02	0.136601E-02
	4	0.292205E-01	0.411316E-02	0.123302E-02	0.491523E-03	0.230870E-03	0.121054E-03	0.687649E-04
	6	0.821866E-02	0.921919E-03	0.226242E-03	0.753583E-04	0.300634E-04	0.135694E-04	0.671034E-05
	8	0.280425E-02	0.262719E-03	0.548013E-04	0.157344E-04	0.547370E-05	0.217552E-05	0.955305E-06
	10	0.108691E-02	0.876569E-04	0.159367E-04	0.402910E-05	0.124493E-05	0.442765E-06	0.175115E-06
	12	0.461912E-03	0.327586E-04	0.528603E-05	0.119540E-05	0.332619E-06	0.107159E-06	0.385920E-07
		MEV= 0.40	Z=13.					
0	0	0.193635E 01	0.679681E 00	0.416941E-00	0.301525E-00	0.236386E-00	0.194477E-00	0.165228E-00
	2	0.147251E-00	0.293022E-01	0.116914E-01	0.596068E-02	0.347761E-02	0.221430E-02	0.150005E-02
	4	0.297308E-01	0.433772E-02	0.133306E-02	0.541517E-03	0.258190E-03	0.137048E-03	0.786518E-04
	6	0.845498E-02	0.984996E-03	0.248660E-03	0.847212E-04	0.344369E-04	0.157911E-04	0.791580E-05
	8	0.291013E-02	0.283540E-03	0.609966E-04	0.179663E-04	0.638735E-05	0.258676E-05	0.115471E-05
	10	0.113599E-02	0.953750E-04	0.179177E-04	0.465794E-05	0.147446E-05	0.535669E-06	0.215901E-06
	12	0.485642E-03	0.358826E-04	0.599229E-05	0.139605E-05	0.398775E-06	0.131513E-06	0.483693E-07
		MEV= 0.70	Z=13.					
0	0	0.187981E 01	0.691746E 00	0.433023E-00	0.316764E-00	0.250183E-00	0.206905E-00	0.176469E-00
	2	0.146628E-00	0.309853E-01	0.128202E-01	0.670338E-02	0.398536E-02	0.257520E-02	0.176531E-02
	4	0.302548E-01	0.471874E-02	0.151811E-02	0.638412E-03	0.312868E-03	0.169848E-03	0.993286E-04
	6	0.875637E-02	0.109522E-02	0.291370E-03	0.103493E-03	0.435351E-04	0.205489E-04	0.105598E-04
	8	0.305865E-02	0.320925E-03	0.731157E-04	0.225748E-04	0.835180E-05	0.350039E-05	0.161012E-05
	10	0.120931E-02	0.109582E-03	0.218859E-04	0.599017E-05	0.198224E-05	0.748685E-06	0.312329E-06
	12	0.522856E-03	0.417679E-04	0.743783E-05	0.183096E-05	0.548839E-06	0.188911E-06	0.721932E-07

Table 2. Spatial Moments, Plane Isotropic Source — Continued

l	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 1.00	Z=13.					
l=0	0	0.182231E 01	0.704539E 00	0.450476E-00	0.333553E-00	0.265546E-00	0.220853E-00	0.189164E-00
	2	0.145252E-00	0.327330E-01	0.140759E-01	0.756074E-02	0.458675E-02	0.301111E-02	0.209076E-02
	4	0.305702E-01	0.512369E-02	0.173089E-02	0.755215E-03	0.381105E-03	0.211923E-03	0.126461E-03
	6	0.899403E-02	0.121500E-02	0.341890E-03	0.126943E-03	0.553828E-04	0.269583E-04	0.142249E-04
	8	0.318603E-02	0.362352E-03	0.877958E-04	0.285036E-04	0.110013E-04	0.478198E-05	0.227082E-05
	10	0.127528E-02	0.125598E-03	0.267912E-04	0.774726E-05	0.268762E-05	0.105787E-05	0.457731E-06
	12	0.557496E-03	0.485042E-04	0.925672E-05	0.241700E-05	0.762668E-06	0.274703E-06	0.109331E-06
		MEV= 2.00	Z=13.					
0	0	0.167676E 01	0.739576E 00	0.500452E 00	0.383056E-00	0.311804E-00	0.263525E-00	0.228488E-00
	2	0.142005E-00	0.380482E-01	0.181241E-01	0.104595E-01	0.670000E-02	0.459232E-02	0.330322E-02
	4	0.317098E-01	0.645579E-02	0.248215E-02	0.119390E-02	0.651216E-03	0.386159E-03	0.243305E-03
	6	0.981214E-02	0.163376E-02	0.533581E-03	0.222737E-03	0.107011E-03	0.565199E-04	0.320015E-04
	8	0.363200E-02	0.514562E-03	0.146902E-03	0.544688E-04	0.235091E-04	0.112521E-04	0.581382E-05
	10	0.151186E-02	0.186986E-03	0.475634E-04	0.159122E-04	0.625337E-05	0.274463E-05	0.130794E-05
	12	0.684819E-03	0.753012E-04	0.173055E-04	0.528451E-05	0.190997E-05	0.775567E-06	0.343609E-06
		MEV= 4.00	Z=13.					
0	0	0.150159E 01	0.787877E 00	0.574821E 00	0.460590E-00	0.387016E-00	0.334933E-00	0.295827E-00
	2	0.137017E-00	0.464647E-01	0.253533E-01	0.161098E-01	0.111136E-01	0.808732E-02	0.611429E-02
	4	0.331942E-01	0.882940E-02	0.403105E-02	0.220652E-02	0.133540E-02	0.863653E-03	0.586106E-03
	6	0.110345E-01	0.245461E-02	0.977699E-03	0.476487E-03	0.260109E-03	0.153167E-03	0.953312E-04
	8	0.435153E-02	0.837663E-03	0.297898E-03	0.131682E-03	0.658744E-04	0.358163E-04	0.207039E-04
	10	0.191754E-02	0.326544E-03	0.105281E-03	0.427361E-04	0.198007E-04	0.100343E-04	0.543321E-05
	12	0.914927E-03	0.140016E-03	0.413833E-04	0.155664E-04	0.673228E-05	0.320202E-05	0.163425E-05
		MEV=10.00	Z=13.					
0	0	0.129644E 01	0.856174E 00	0.691847E 00	0.591925E 00	0.521688E 00	0.468547E-00	0.426465E-00
	2	0.130406E-00	0.615027E-01	0.403513E-01	0.292770E-01	0.224217E-01	0.177869E-01	0.144721E-01
	4	0.358792E-01	0.139454E-01	0.803401E-02	0.524067E-02	0.365803E-02	0.266966E-02	0.201231E-02
	6	0.134213E-01	0.452050E-02	0.235675E-02	0.141508E-02	0.918362E-03	0.627483E-03	0.445119E-03
	8	0.589155E-02	0.176588E-02	0.846984E-03	0.474291E-03	0.289414E-03	0.186988E-03	0.125964E-03
	10	0.286321E-02	0.776773E-03	0.346458E-03	0.182493E-03	0.105479E-03	0.648669E-04	0.417469E-04
	12	0.149531E-02	0.371636E-03	0.155339E-03	0.774461E-04	0.426287E-04	0.250735E-04	0.154846E-04
		MEV= 0.025	Z=29.					
0	0	0.216947E 01	0.634619E 00	0.360038E-00	0.249416E-00	0.190304E-00	0.153676E-00	0.128804E-00
	2	0.996314E-01	0.169408E-01	0.618359E-02	0.297265E-02	0.166282E-02	0.102566E-02	0.677737E-03
	4	0.131741E-01	0.165209E-02	0.459264E-03	0.173260E-03	0.779974E-04	0.395361E-04	0.218464E-04
	6	0.261674E-02	0.262912E-03	0.594974E-04	0.185793E-04	0.702894E-05	0.303451E-05	0.144491E-05
	8	0.657843E-03	0.554368E-04	0.1062[illegible]3E-04	0.283690E-05	0.927317E-06	0.349098E-06	0.146167E-06
	10	0.193843E-03	0.141129E-04	0.234[illegible]76E-05	0.549354E-06	0.158273E-06	0.528662E-07	0.197618E-07
	12	0.641671E-04	0.412[illegible]18E-05	0.60[illegible]781E-06	0.126494E-06	0.326097E-07	0.979522E-08	0.330834E-08
		MEV= 0.05	Z=29.					
0	0	0.203129E 01	0.[illegible]0475E 00	0.392086E-00	0.278414E-00	0.215735E-00	0.176055E-00	0.148688E-00
	2	0.846654E-01	0.168527E-01	0.678815E-02	0.349544E-02	0.205763E-02	0.132033E-02	0.900419E-03
	4	0.101974E-01	0.153258E-02	0.484238E-03	0.201378E-03	0.979357E-04	0.528703E-04	0.307886E-04
	6	0.185200E-02	0.226240E-0[illegible]	0.593475E-04	0.20[illegible]531E-04	0.869410E-05	0.407300E-05	0.207974E-05
	8	0.427152E-03	0.442080E-04	0.995816E-05	0.3[illegible]4015E-05	0.111250E-05	0.461482E-06	0.210255E-06
	10	0.115815E-03	0.104336E-04	0.206502E-05	0.[illegible]58605E-06	0.182480E-06	0.680232E-07	0.280155E-07
	12	0.353668E-04	0.282725E-05	0.499959E-06	0.121603E-06	0.35922[illegible]E-07	0.121723E-07	0.457835E-08
		MEV= 0.10	Z=29.					
0	0	0.201498E 01	0.663686E 00	0.396179E-00	0.282183E-00	0.219080E-00	0.179024E-00	0.151343E-00
	2	0.822757E-01	0.167139E-01	0.681848E-02	0.354274E-02	0.209962E-02	0.135445E-02	0.927650E-03
	4	0.969035E-02	0.149053E-02	0.478704[illegible]-03	0.201583E-03	0.990235E-04	0.539022E-04	0.3160[illegible]7E-04
	6	0.172055E-02	0.215478E-03	0.575897[illegible]-04	0.205406E-04	0.867089E-05	0.410524E-05	0.21[illegible]42E-05
	8	0.387988E-03	0.412166E-04	0.947584E-05	0.294210E-05	0.109216E-05	0.458704E-06	0.2[illegible]1281E-06
	10	0.102871E-03	0.952165E-05	0.192605E-05	0.530688E-06	0.176141E-06	0.665847E-07	0.[illegible]77662E-07
	12	0.307274E-04	0.252569E-05	0.456992E-06	0.113361E-06	0.340708E-07	0.117231E-07	0.447056E-08
		MEV= 0.20	Z=29.					
0	0	0.198355E 01	0.669975E 00	0.404267E-00	0.289673E-00	0.225754E-00	0.184965E-00	0.156669E-00
	2	0.806730E-01	0.169690E-01	0.706935E-02	0.372680E-02	0.223266E-02	0.145239E-02	0.100146E-02
	4	0.943628E-02	0.150941E-02	0.497904E-03	0.213928E-03	0.106773E-03	0.588807E-04	0.349066E-04
	6	0.166107E-02	0.216913E-03	0.597770E-04	0.218430E-04	0.940569E-05	0.452821E-05	0.236705E-05
	8	0.370971E-03	0.411686E-04	0.978755E-05	0.312321E-05	0.118643E-05	0.508271E-06	0.238194E-06
	10	0.973453E-04	0.942574E-05	0.197610E-05	0.561018E-06	0.191054E-06	0.738611E-07	0.314179E-07
	12	0.287634E-04	0.247603E-05	0.465168E-06	0.119145E-06	0.368228E-07	0.129868E-07	0.506299E-08

l	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 0.40	Z=29.					
l=0	0	0.194377E 01	0.678134E 00	0.414906E-00	0.299613E-00	0.234665E-00	0.192933E-00	0.163836E-00
	2	0.807058E-01	0.176946E-01	0.755310E-02	0.404847E-02	0.245524E-02	0.161240E-02	0.112025E-02
	4	0.958548E-02	0.160539E-02	0.546031E-03	0.240007E-03	0.121948E-03	0.682331E-04	0.409435E-04
	6	0.170655E-02	0.233984E-03	0.667792E-04	0.250794E-04	0.110434E-04	0.541726E-05	0.287752E-05
	8	0.384436E-03	0.448806E-04	0.110864E-04	0.364917E-05	0.142278E-05	0.623271E-06	0.297816E-06
	10	0.101558E-03	0.103596E-04	0.226239E-05	0.664481E-06	0.232963E-06	0.923745E-07	0.401822E-07
	12	0.301659E-04	0.273872E-05	0.537052E-06	0.142652E-06	0.455052E-07	0.165039E-07	0.659689E-08
		MEV= 0.70	Z=29.					
0	0	0.188548E 01	0.690514E 00	0.431365E-00	0.315182E-00	0.248745E-00	0.205605E-00	0.175290E-00
	2	0.813055E-01	0.189550E-01	0.838471E-02	0.460502E-02	0.284356E-02	0.189376E-02	0.133065E-02
	4	0.996169E-02	0.178643E-02	0.635590E-03	0.288856E-03	0.150668E-03	0.861210E-04	0.526060E-04
	6	0.181938E-02	0.268300E-03	0.806377E-04	0.315300E-04	0.143479E-04	0.723496E-05	0.393471E-05
	8	0.418844E-03	0.527576E-04	0.137934E-04	0.475303E-05	0.192562E-05	0.871723E-06	0.428619E-06
	10	0.112761E-03	0.124397E-04	0.288673E-05	0.891563E-06	0.326288E-06	0.134307E-06	0.603825E-07
	12	0.340616E-04	0.335052E-05	0.700382E-06	0.196351E-06	0.656365E-07	0.248086E-07	0.102887E-07
		MEV= 1.00	Z=29.					
0	0	0.182812E 01	0.703219E 00	0.448657E-00	0.331791E-00	0.263926E-00	0.219377E-00	0.187816E-00
	2	0.817533E-01	0.202903E-01	0.930545E-02	0.523912E-02	0.329553E-02	0.222680E-02	0.158312E-02
	4	0.103283E-01	0.198668E-02	0.739939E-03	0.347898E-03	0.186389E-03	0.108897E-03	0.677511E-04
	6	0.193513E-02	0.307621E-03	0.974657E-04	0.397076E-04	0.186852E-04	0.969129E-05	0.539951E-05
	8	0.455413E-03	0.620579E-04	0.171958E-04	0.620897E-05	0.261580E-05	0.122455E-05	0.619968E-06
	10	0.125019E-03	0.149609E-04	0.369509E-05	0.120140E-05	0.459370E-06	0.196437E-06	0.913410E-07
	12	0.384329E-04	0.410960E-05	0.917469E-06	0.271824E-06	0.953161E-07	0.375769E-07	0.161811E-07
		MEV= 2.00	Z=29.					
0	0	0.167823E 01	0.739201E 00	0.499899E-00	0.382497E-00	0.311274E-00	0.263030E-00	0.228028E-00
	2	0.835772E-01	0.246550E-01	0.124760E-01	0.751944E-02	0.497948E-02	0.350465E-02	0.257621E-02
	4	0.115887E-01	0.270781E-02	0.114223E-02	0.589076E-03	0.339622E-03	0.210789E-03	0.138021E-03
	6	0.234902E-02	0.460426E-03	0.168465E-03	0.767389E-04	0.395653E-04	0.221668E-04	0.132000E-04
	8	0.592132E-03	0.100587E-03	0.326786E-04	0.133999E-04	0.627919E-05	0.322103E-05	0.176665E-05
	10	0.172851E-03	0.260051E-04	0.762307E-05	0.285131E-05	0.122828E-05	0.582725E-06	0.297051E-06
	12	0.561913E-04	0.760516E-05	0.203558E-05	0.701440E-06	0.280184E-06	0.123884E-06	0.591026E-07
		MEV= 4.00	Z=29.					
0	0	0.149518E 01	0.789798E 00	0.577916E 00	0.463916E-00	0.390316E-00	0.338120E-00	0.298875E-00
	2	0.862193E-01	0.322005E-01	0.185875E-01	0.122910E-01	0.874185E-02	0.651889E-02	0.502901E-02
	4	0.136481E-01	0.416983E-02	0.207707E-02	0.121260E-02	0.772257E-03	0.520865E-03	0.366259E-03
	6	0.309853E-02	0.812827E-03	0.360649E-03	0.190685E-03	0.111142E-03	0.691255E-04	0.450861E-04
	8	0.862994E-03	0.199720E-03	0.803840E-04	0.390628E-04	0.211032E-04	0.122406E-04	0.748151E-05
	10	0.275568E-03	0.572869E-04	0.211766E-04	0.955434E-05	0.482620E-05	0.263112E-05	0.151769E-05
	12	0.972393E-04	0.183979E-04	0.630392E-05	0.266063E-05	0.126489E-05	0.651950E-06	0.356802E-06
		MEV=10.00	Z=29.					
0	0	0.128370E 01	0.860967E 00	0.700630E 00	0.602247E 00	0.532648E 00	0.479729E-00	0.437653E-00
	2	0.920964E-01	0.474054E-01	0.326040E-01	0.244578E-01	0.192215E-01	0.155727E-01	0.128968E-01
	4	0.180872E-01	0.799009E-02	0.495631E-02	0.341245E-02	0.248629E-02	0.188029E-02	0.146109E-02
	6	0.496602E-02	0.195283E-02	0.111742E-02	0.719047E-03	0.493373E-03	0.353227E-03	0.260868E-03
	8	0.163932E-02	0.585341E-03	0.312812E-03	0.190020E-03	0.123859E-03	0.846082E-04	0.598161E-04
	10	0.610969E-03	0.200692E-03	0.100997E-03	0.583044E-04	0.363136E-04	0.237926E-04	0.161802E-04
	12	0.248663E-03	0.758668E-04	0.361751E-04	0.199466E-04	0.119233E-04	0.752331E-05	0.493993E-05
		MEV= 0.05	Z=50.					
0	0	0.211954E 01	0.643694E 00	0.371104E-00	0.259326E-00	0.198934E-00	0.161231E-00	0.135490E-00
	2	0.657000E-01	0.123535E-01	0.484113E-02	0.245494E-02	0.143179E-02	0.913340E-03	0.620441E-03
	4	0.610643E-02	0.870923E-03	0.267379E-03	0.109232E-03	0.525039E-04	0.281186E-04	0.162837E-04
	6	0.882671E-03	0.102742E-03	0.261691E-04	0.901196E-05	0.370317E-05	0.171620E-05	0.869128E-06
	8	0.165809E-03	0.164108E-04	0.358895E-05	0.107203E-05	0.385717E-06	0.157859E-06	0.711381E-07
	10	0.372759E-04	0.322182E-05	0.619234E-06	0.163696E-06	0.524763E-07	0.192548E-07	0.782418E-08
	12	0.957510E-05	0.736462E-06	0.126524E-06	0.300484E-07	0.869734E-08	0.289509E-08	0.107201E-08
		MEV= 0.10	Z=50.					
0	0	0.206696E 01	0.653575E 00	0.383376E-00	0.270443E-00	0.208691E-00	0.169821E-00	0.143126E-00
	2	0.588604E-01	0.117894E-01	0.480885E-02	0.250900E-02	0.149522E-02	0.970175E-03	0.668235E-03
	4	0.503548E-02	0.772687E-03	0.249928E-03	0.106290E-03	0.527669E-04	0.290244E-04	0.171916E-04
	6	0.671967E-03	0.846850E-04	0.229124E-04	0.828367E-05	0.354430E-05	0.169993E-05	0.886783E-06
	8	0.116840E-03	0.125775E-04	0.293975E-05	0.927912E-06	0.349903E-06	0.149137E-06	0.696441E-07
	10	0.243686E-04	0.229882E-05	0.474477E-06	0.133241E-06	0.450062E-07	0.172898E-07	0.731798E-08
	12	0.581877E-05	0.489851E-06	0.907249E-07	0.229879E-07	0.704258E-08	0.246560E-08	0.955220E-09

Table 2. Spatial Moments, Plane Isotropic Source — Continued

ℓ	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
	MEV= 0.20	Z=50.					
ℓ=0 0	0.201897E 01	0.662898E 00	0.395172E-00	0.281254E-00	0.218255E-00	0.178291E-00	0.150687E-00
2	0.551487E-01	0.116695E-01	0.492287E-02	0.262969E-02	0.159510E-02	0.104945E-02	0.731017E-03
4	0.452350E-02	0.739115E-03	0.249685E-03	0.109743E-03	0.559286E-04	0.314334E-04	0.189588E-04
6	0.579002E-03	0.780883E-04	0.222154E-04	0.835840E-05	0.369575E-05	0.182244E-05	0.973638E-06
8	0.966167E-04	0.111701E-04	0.275912E-05	0.911258E-06	0.357022E-06	0.157267E-06	0.755853E-07
10	0.193492E-04	0.196575E-05	0.430482E-06	0.127045E-06	0.447867E-07	0.178604E-07	0.781358E-08
12	0.443893E-05	0.403319E-06	0.795103E-07	0.212496E-07	0.681999E-08	0.248799E-08	0.100003E-08
	MEV= 0.40	Z=50.					
0 0	0.196068E 01	0.674639E 00	0.410328E-00	0.295324E-00	0.230813E-00	0.189483E-00	0.160730E-00
2	0.536107E-01	0.120860E-01	0.529260E-02	0.290048E-02	0.179301E-02	0.119718E-02	0.843870E-03
4	0.438571E-02	0.769632E-03	0.272686E-03	0.124176E-03	0.650711E-04	0.374099E-04	0.229944E-04
6	0.558351E-03	0.812866E-04	0.244298E-04	0.959416E-05	0.439302E-05	0.223064E-05	0.122191E-05
8	0.924943E-04	0.115844E-04	0.303927E-05	0.105390E-05	0.430089E-06	0.196178E-06	0.971900E-07
10	0.183638E-04	0.202650E-05	0.473365E-06	0.147373E-06	0.543780E-07	0.225629E-07	0.102221E-07
12	0.417223E-05	0.412643E-06	0.870680E-07	0.246440E-07	0.831279E-08	0.316839E-08	0.132422E-08
	MEV= 0.70	Z=50.					
0 0	0.188653E 01	0.690286E 00	0.431057E-00	0.314890E-00	0.248479E-00	0.205364E-00	0.175072E-00
2	0.534659E-01	0.130582E-01	0.598760E-02	0.338557E-02	0.214173E-02	0.145586E-02	0.104111E-02
4	0.450472E-02	0.864804E-03	0.324840E-03	0.154425E-03	0.836886E-04	0.494447E-04	0.310913E-04
6	0.587444E-03	0.941435E-04	0.302626E-04	0.125194E-04	0.597950E-05	0.314519E-05	0.177553E-05
8	0.992870E-04	0.137491E-04	0.388414E-05	0.142900E-05	0.612625E-06	0.291443E-06	0.149758E-06
10	0.200526E-04	0.245479E-05	0.620705E-06	0.206232E-06	0.804179E-07	0.350049E-07	0.165421E-07
12	0.462383E-05	0.508623E-06	0.116672E-06	0.354156E-07	0.126889E-07	0.509944E-08	0.223419E-08
	MEV= 1.00	Z=50.					
0 0	0.182016E 01	0.705028E 00	0.451152E-00	0.334208E-00	0.266149E-00	0.221403E-00	0.189666E-00
2	0.536072E-01	0.141435E-01	0.676105E-02	0.393286E-02	0.254087E-02	0.175582E-02	0.127244E-02
4	0.469954E-02	0.979837E-03	0.388001E-03	0.191744E-03	0.107121E-03	0.648768E-04	0.416502E-04
6	0.631781E-03	0.110616E-03	0.377907E-04	0.163844E-04	0.812906E-05	0.441436E-05	0.256094E-05
8	0.109639E-03	0.166582E-04	0.503272E-05	0.195318E-05	0.875396E-06	0.432564E-06	0.229737E-06
10	0.226675E-04	0.305452E-05	0.830089E-06	0.292508E-06	0.119888E-06	0.544909E-07	0.267503E-07
12	0.533797E-05	0.648015E-06	0.160413E-06	0.518768E-07	0.196272E-07	0.827416E-08	0.378275E-08
	MEV= 2.00	Z=50.					
0 0	0.166229E 01	0.743289E 00	0.505939E 00	0.388619E-00	0.317090E-00	0.268463E-00	0.233085E-00
2	0.563596E-01	0.177901E-01	0.941511E-02	0.587233E-02	0.399784E-02	0.287947E-02	0.215871E-02
4	0.554613E-02	0.142079E-02	0.639671E-03	0.347359E-03	0.209028E-03	0.134566E-03	0.909600E-04
6	0.826278E-03	0.180549E-03	0.715387E-04	0.347490E-04	0.189103E-04	0.111000E-04	0.688588E-05
8	0.157029E-03	0.301202E-04	0.107200E-04	0.473557E-05	0.236377E-05	0.128091E-05	0.737415E-06
10	0.352365E-04	0.604830E-05	0.196107E-05	0.797090E-06	0.368629E-06	0.186067E-06	0.100210E-06
12	0.894329E-05	0.139298E-05	0.415794E-06	0.156869E-06	0.677315E-07	0.320631E-07	0.162548E-07
	MEV= 4.00	Z=50.					
0 0	0.147129E 01	0.797057E 00	0.589712E 00	0.476666E-00	0.403018E-00	0.350432E-00	0.310682E-00
2	0.604356E-01	0.244225E-01	0.147884E-01	0.101343E-01	0.741759E-02	0.566533E-02	0.446090E-02
4	0.704963E-02	0.239096E-02	0.127496E-02	0.784646E-03	0.521921E-03	0.365321E-03	0.265324E-03
6	0.121655E-02	0.360559E-03	0.173800E-03	0.980988E-04	0.603830E-04	0.393625E-04	0.267563E-04
8	0.263396E-03	0.698191E-04	0.308944E-04	0.161936E-04	0.932378E-05	0.571517E-05	0.366782E-05
10	0.665068E-04	0.160149E-04	0.657447E-05	0.322799E-05	0.175164E-05	0.101643E-05	0.619664E-06
12	0.188108E-04	0.416192E-05	0.159766E-05	0.739569E-06	0.380376E-06	0.210013E-06	0.122194E-06
	MEV=10.00	Z=50.					
0 0	0.125340E 01	0.872687E 00	0.722447E 00	0.628176E 00	0.560420E 00	0.508263E 00	0.466373E-00
2	0.691817E-01	0.389586E-01	0.281765E-01	0.219391E-01	0.177696E-01	0.147676E-01	0.125030E-01
4	0.106504E-01	0.529093E-02	0.352000E-02	0.255667E-02	0.194688E-02	0.152929E-02	0.122868E-02
6	0.234724E-02	0.105830E-02	0.659050E-03	0.452881E-03	0.328258E-03	0.246446E-03	0.189831E-03
8	0.633232E-03	0.263255E-03	0.154970E-03	0.101557E-03	0.705565E-04	0.509503E-04	0.378467E-04
10	0.195631E-03	0.758088E-04	0.424738E-04	0.266945E-04	0.178652E-04	0.124654E-04	0.896770E-05
12	0.669040E-04	0.243809E-04	0.130781E-04	0.792272E-05	0.513129E-05	0.347468E-05	0.243123E-05
	MEV= 0.10	Z=82.					
0 0	0.215598E 01	0.637042E 00	0.362973E-00	0.252034E-00	0.192578E-00	0.155663E-00	0.130559E-00
2	0.414345E-01	0.782347E-02	0.310813E-02	0.160132E-02	0.948747E-03	0.614243E-03	0.423010E-03
4	0.248478E-02	0.361457E-03	0.113903E-03	0.478044E-04	0.235856E-04	0.129462E-04	0.767128E-05
6	0.240327E-03	0.288851E-04	0.762417E-05	0.271958E-05	0.115560E-05	0.552679E-06	0.288240E-06
8	0.311030E-04	0.321144E-05	0.733694E-06	0.228559E-06	0.855548E-07	0.363336E-07	0.169484E-07
10	0.493435E-05	0.448808E-06	0.907413E-07	0.251646E-07	0.843635E-08	0.322722E-08	0.136331E-08
12	0.912627E-06	0.744238E-07	0.135318E-07	0.338876E-08	0.103045E-08	0.359067E-09	0.138741E-09

ℓ	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 0.20	Z=82.					
ℓ=0	0	0.208503E 01	0.650141E 00	0.379085E-00	0.266540E-00	0.205256E-00	0.166792E-00	0.140429E-00
	2	0.357941E-01	0.731934E-02	0.305595E-02	0.163054E-02	0.991963E-03	0.655821E-03	0.459453E-03
	4	0.192109E-02	0.306302E-03	0.102961E-03	0.453997E-04	0.233028E-04	0.132160E-04	0.805073E-05
	6	0.166777E-03	0.221426E-04	0.629961E-05	0.238635E-05	0.106586E-05	0.531799E-06	0.287680E-06
	8	0.194256E-04	0.222825E-05	0.553039E-06	0.184513E-06	0.732142E-07	0.327026E-07	0.159456E-07
	10	0.278030E-05	0.282187E-06	0.623668E-07	0.186514E-07	0.667502E-08	0.270442E-08	0.120227E-08
	12	0.464950E-06	0.424621E-07	0.848229E-08	0.230386E-08	0.752316E-09	0.279325E-09	0.114254E-09
		MEV= 0.40	Z=82.					
0	0	0.200135E 01	0.666398E 00	0.399654E-00	0.285394E-00	0.221937E-00	0.181564E-00	0.153619E-00
	2	0.328401E-01	0.735518E-02	0.324162E-02	0.179503E-02	0.112254E-02	0.758280E-03	0.540553E-03
	4	0.168246E-02	0.297491E-03	0.107209E-03	0.497892E-04	0.266201E-04	0.156080E-04	0.977624E-05
	6	0.139326E-03	0.206778E-04	0.637633E-05	0.257265E-05	0.120976E-05	0.630230E-06	0.353757E-06
	8	0.154738E-04	0.199540E-05	0.541229E-06	0.194040E-06	0.817767E-07	0.384619E-07	0.196154E-07
	10	0.211138E-05	0.241952E-06	0.588189E-07	0.190388E-07	0.729033E-08	0.313277E-08	0.146691E-08
	12	0.336599E-06	0.348270E-07	0.769281E-08	0.227507E-08	0.799866E-09	0.316962E-09	0.137402E-09
		MEV= 0.70	Z=82.					
0	0	0.190429E 01	0.686462E 00	0.425935E-00	0.310020E-00	0.244060E-00	0.201378E-00	0.171461E-00
	2	0.317921E-01	0.791503E-02	0.370649E-02	0.213839E-02	0.137824E-02	0.953063E-03	0.692326E-03
	4	0.164978E-02	0.328727E-03	0.127998E-03	0.629108E-04	0.351542E-04	0.213623E-04	0.137849E-04
	6	0.137813E-03	0.232506E-04	0.783967E-05	0.338812E-05	0.168422E-05	0.918967E-06	0.536574E-06
	8	0.153900E-04	0.227000E-05	0.679365E-06	0.263410E-06	0.118464E-06	0.588845E-07	0.315048E-07
	10	0.210611E-05	0.277345E-06	0.749275E-07	0.264360E-07	0.108885E-07	0.498350E-08	0.246640E-08
	12	0.336048E-06	0.401029E-07	0.990174E-08	0.321299E-08	0.122333E-08	0.519821E-09	0.239751E-09
		MEV= 1.00	Z=82.					
0	0	0.181865E 01	0.705370E 00	0.451625E-00	0.334668E-00	0.266572E-00	0.221789E-00	0.190018E-00
	2	0.315889E-01	0.865881E-02	0.427977E-02	0.256099E-02	0.169580E-02	0.119761E-02	0.884910E-03
	4	0.169680E-02	0.376899E-03	0.157176E-03	0.812126E-04	0.471855E-04	0.295962E-04	0.196104E-04
	6	0.145990E-03	0.276802E-04	0.101026E-04	0.463831E-05	0.242100E-05	0.137589E-05	0.831804E-06
	8	0.167264E-04	0.278880E-05	0.910832E-06	0.378356E-06	0.180141E-06	0.939919E-07	0.524503E-07
	10	0.234107E-05	0.350034E-06	0.103876E-06	0.395406E-07	0.173618E-07	0.839758E-08	0.436285E-08
	12	0.381059E-06	0.518154E-07	0.141294E-07	0.497580E-08	0.203182E-08	0.917824E-09	0.446939E-09
		MEV= 2.00	Z=82.					
0	0	0.165215E 01	0.745919E 00	0.509848E 00	0.392598E-00	0.320882E-00	0.272013E-00	0.236395E-00
	2	0.337757E-01	0.112530E-01	0.618643E-02	0.397881E-02	0.278011E-02	0.204818E-02	0.156650E-02
	4	0.210098E-02	0.581245E-03	0.277055E-03	0.157715E-03	0.988444E-04	0.659546E-04	0.460345E-04
	6	0.206011E-03	0.494502E-04	0.210500E-04	0.108571E-04	0.622450E-05	0.382647E-05	0.247449E-05
	8	0.265658E-04	0.567501E-05	0.219634E-05	0.104140E-05	0.552968E-06	0.316611E-06	0.191556E-06
	10	0.414345E-05	0.801165E-06	0.285406E-06	0.125678E-06	0.623546E-07	0.335144E-07	0.191055E-07
	12	0.745462E-06	0.132073E-06	0.437048E-07	0.180105E-07	0.840556E-08	0.426649E-08	0.230422E-08
		MEV= 4.00	Z=82.					
0	0	0.144942E 01	0.803859E 00	0.600905E 00	0.488873E-00	0.415259E-00	0.362359E-00	0.322168E-00
	2	0.376061E-01	0.163267E-01	0.103370E-01	0.733190E-02	0.552182E-02	0.432214E-02	0.347740E-02
	4	0.288659E-02	0.107738E-02	0.612198E-03	0.396305E-03	0.275136E-03	0.199917E-03	0.150109E-03
	6	0.340194E-03	0.112925E-03	0.588505E-04	0.353791E-04	0.229827E-04	0.157092E-04	0.111414E-04
	8	0.517003E-04	0.155679E-04	0.753816E-05	0.425300E-05	0.260884E-05	0.169120E-05	0.114140E-05
	10	0.936000E-05	0.259106E-05	0.117620E-05	0.627381E-06	0.365729E-06	0.226153E-06	0.146012E-06
	12	0.193120E-05	0.496270E-06	0.212607E-06	0.107804E-06	0.600109E-07	0.355512E-07	0.220456E-07
		MEV= 0.025	Air					
0	0	0.201025E 01	0.664624E 00	0.397379E-00	0.283291E-00	0.220065E-00	0.179899E-00	0.152127E-00
	2	0.191918E-00	0.332702E-01	0.122010E-01	0.587097E-02	0.328322E-02	0.202376E-02	0.133619E-02
	4	0.479180E-01	0.589477E-02	0.161166E-02	0.600080E-03	0.267288E-03	0.134293E-03	0.736496E-04
	6	0.165278E-01	0.159400E-02	0.350845E-03	0.107433E-03	0.400500E-04	0.170892E-04	0.805872E-05
	8	0.679527E-02	0.541449E-03	0.100143E-03	0.261361E-04	0.840485E-05	0.312581E-05	0.129633E-05
	10	0.313094E-02	0.213050E-03	0.340512E-04	0.775836E-05	0.219746E-05	0.725411E-06	0.268871E-06
	12	0.156476E-02	0.930497E-04	0.131104E-04	0.265363E-05	0.672254E-06	0.199697E-06	0.669673E-07
		MEV= 0.05	Air					
0	0	0.196193E 01	0.674383E 00	0.409994E-00	0.295011E-00	0.230532E-00	0.189232E-00	0.160504E-00
	2	0.186748E-00	0.341924E-01	0.129702E-01	0.638905E-02	0.363530E-02	0.227088E-02	0.151534E-02
	4	0.464103E-01	0.607313E-02	0.173417E-02	0.667327E-03	0.305086E-03	0.156567E-03	0.873901E-04
	6	0.159093E-01	0.163909E-02	0.379187E-03	0.120819E-03	0.465378E-04	0.204114E-04	0.985433E-05
	8	0.649552E-02	0.554481E-03	0.108275E-03	0.295539E-04	0.987124E-05	0.379295E-05	0.161839E-05
	10	0.297072E-02	0.217016E-03	0.367447E-04	0.879046E-05	0.259683E-05	0.889427E-06	0.340589E-06
	12	0.147334E-02	0.942065E-04	0.140989E-04	0.300584E-05	0.796944E-06	0.246491E-06	0.857022E-07

Table 2. Spatial Moments, Plane Isotropic Source — Continued

	n	p=-1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 0.10 Air						
ℓ=0	0	0.197775E 01	0.671151E 00	0.405790E-00	0.291090E-00	0.227021E-00	0.186095E-00	0.157684E-00
	2	0.191636E-00	0.343062E-01	0.128361E-01	0.626377E-02	0.353951E-02	0.219937E-02	0.146147E-02
	4	0.482065E-01	0.614250E-02	0.172244E-02	0.653941E-03	0.295843E-03	0.150545E-03	0.834449E-04
	6	0.166754E-01	0.166879E-02	0.378026E-03	0.118499E-03	0.450466E-04	0.195426E-04	0.934806E-05
	8	0.685718E-02	0.567631E-03	0.108312E-03	0.290232E-04	0.954706E-05	0.362126E-05	0.152804E-05
	10	0.315453E-02	0.223191E-03	0.368695E-04	0.864445E-05	0.251074E-05	0.847495E-06	0.320430E-06
	12	0.157217E-02	0.972705E-04	0.141852E-04	0.295992E-05	0.770494E-06	0.234534E-06	0.804046E-07
		MEV= 0.20 Air						
0	0	0.196606E 01	0.673536E 00	0.408889E-00	0.293980E-00	0.229607E-00	0.188406E-00	0.159760E-00
	2	0.192497E-00	0.348191E-01	0.131132E-01	0.642847E-02	0.364509E-02	0.227104E-02	0.151234E-02
	4	0.487461E-01	0.627951E-02	0.177502E-02	0.678131E-03	0.308336E-03	0.157556E-03	0.876366E-04
	6	0.169338E-01	0.171391E-02	0.391767E-03	0.123727E-03	0.473315E-04	0.206449E-04	0.992161E-05
	8	0.698299E-02	0.584757E-03	0.112674E-03	0.304464E-04	0.100886E-04	0.385129E-05	0.163435E-05
	10	0.321832E-02	0.230389E-03	0.384525E-04	0.909816E-05	0.266403E-05	0.905783E-06	0.344709E-06
	12	0.160583E-02	0.100537E-03	0.148196E-04	0.312244E-05	0.819959E-06	0.251586E-06	0.868774E-07
		MEV= 0.40 Air						
0	0	0.193466E 01	0.680035E 00	0.417408E-00	0.301965E-00	0.236783E-00	0.194833E-00	0.165548E-00
	2	0.192145E-00	0.358811E-01	0.137837E-01	0.685147E-02	0.392527E-02	0.246530E-02	0.165228E-02
	4	0.492124E-01	0.656434E-02	0.190210E-02	0.740609E-03	0.341880E-03	0.176876E-03	0.994075E-04
	6	0.172423E-01	0.181043E-02	0.425645E-03	0.137517E-03	0.536086E-04	0.237593E-04	0.115762E-04
	8	0.715799E-02	0.622651E-03	0.123704E-03	0.342930E-04	0.116141E-04	0.451833E-05	0.194947E-05
	10	0.331694E-02	0.246891E-03	0.425664E-04	0.103558E-04	0.310674E-05	0.107913E-05	0.418563E-06
	12	0.166251E-02	0.108304E-03	0.165154E-04	0.358449E-05	0.966338E-06	0.303536E-06	0.107053E-06
		MEV= 0.70 Air						
0	0	0.193466E 01	0.680035E 00	0.417408E-00	0.301965E-00	0.236783E-00	0.194833E-00	0.165548E-00
	2	0.192922E-00	0.359868E-01	0.138157E-01	0.686464E-02	0.393170E-02	0.246883E-02	0.165438E-02
	4	0.494984E-01	0.659264E-02	0.190863E-02	0.742722E-03	0.342714E-03	0.177253E-03	0.995958E-04
	6	0.173535E-01	0.181893E-02	0.427196E-03	0.137922E-03	0.537399E-04	0.238087E-04	0.115970E-04
	8	0.720420E-02	0.625464E-03	0.124116E-03	0.343801E-04	0.116370E-04	0.452531E-05	0.195185E-05
	10	0.333708E-02	0.247877E-03	0.426815E-04	0.103747E-04	0.311044E-05	0.107991E-05	0.418712E-06
	12	0.167151E-02	0.108654E-03	0.165461E-04	0.358775E-05	0.966550E-06	0.303445E-06	0.106979E-06
		MEV= 1.00 Air						
0	0	0.182248E 01	0.704500E 00	0.450422E-00	0.333501E-00	0.265498E-00	0.220810E-00	0.189124E-00
	2	0.186279E-00	0.394339E-01	0.163580E-01	0.857957E-02	0.511664E-02	0.331589E-02	0.227919E-02
	4	0.491333E-01	0.753406E-02	0.240526E-02	0.100805E-02	0.493388E-03	0.267803E-03	0.156682E-03
	6	0.176428E-01	0.214872E-02	0.564296E-03	0.199120E-03	0.834817E-04	0.393432E-04	0.202076E-04
	8	0.747898E-02	0.759373E-03	0.170240E-03	0.521291E-04	0.192050E-04	0.803377E-05	0.369325E-05
	10	0.352943E-02	0.308074E-03	0.604069E-04	0.163798E-04	0.539574E-05	0.203424E-05	0.848437E-06
	12	0.179791E-02	0.137844E-03	0.240552E-04	0.586199E-05	0.174894E-05	0.601042E-06	0.229760E-06
		MEV= 2.00 Air						
0	0	0.166734E 01	0.741988E 00	0.504011E 00	0.386662E-00	0.315229E-00	0.266723E-00	0.231463E-00
	2	0.175920E-00	0.451362E-01	0.210061E-01	0.119437E-01	0.757135E-02	0.514951E-02	0.368186E-02
	4	0.482984E-01	0.919118E-02	0.339463E-02	0.158825E-02	0.848698E-03	0.495263E-03	0.308041E-03
	6	0.179694E-01	0.275856E-02	0.856301E-03	0.344746E-03	0.161113E-03	0.832369E-04	0.462794E-04
	8	0.785902E-02	0.101717E-02	0.273960E-03	0.973710E-04	0.406685E-04	0.189545E-04	0.957903E-05
	10	0.381371E-02	0.427968E-03	0.102121E-03	0.325942E-04	0.123455E-04	0.525785E-05	0.244307E-05
	12	0.199251E-02	0.197714E-03	0.424296E-04	0.123135E-04	0.427517E-05	0.167964E-05	0.723715E-06
		MEV= 4.00 Air						
0	0	0.148027E 01	0.794306E 00	0.585224E 00	0.471801E-00	0.398161E-00	0.345717E-00	0.306154E-00
	2	0.161451E-00	0.540810E-01	0.293733E-01	0.186297E-01	0.128445E-01	0.934763E-02	0.707019E-02
	4	0.467705E-01	0.120556E-01	0.541884E-02	0.293889E-02	0.176809E-02	0.113892E-02	0.770775E-03
	6	0.182931E-01	0.389930E-02	0.151819E-02	0.729354E-03	0.394250E-03	0.230518E-03	0.142721E-03
	8	0.836919E-02	0.153215E-02	0.529941E-03	0.230075E-03	0.113651E-03	0.612196E-04	0.351381E-04
	10	0.423029E-02	0.681277E-03	0.212814E-03	0.846097E-04	0.386278E-04	0.193612E-04	0.103950E-04
	12	0.229413E-02	0.330549E-03	0.943643E-04	0.346875E-04	0.147572E-04	0.693291E-05	0.350486E-05
		MEV=10.00 Air						
0	0	0.124042E 01	0.877859E 00	0.732230E 00	0.639936E 00	0.573129E 00	0.521417E 00	0.479695E-00
	2	0.137570E-00	0.708955E-01	0.488896E-01	0.368079E-01	0.290469E-01	0.236354E-01	0.196606E-01
	4	0.427443E-01	0.182523E-01	0.111437E-01	0.760442E-02	0.551207E-02	0.415678E-02	0.322583E-02
	6	0.179808E-01	0.668055E-02	0.371383E-02	0.234723E-02	0.159134E-02	0.112997E-02	0.829778E-03
	8	0.881183E-02	0.292446E-02	0.150375E-02	0.891152E-03	0.571044E-03	0.385353E-03	0.270032E-03
	10	0.475029E-02	0.143243E-02	0.688493E-03	0.385811E-03	0.235381E-03	0.151951E-03	0.102225E-03
	12	0.274325E-02	0.761565E-03	0.345134E-03	0.184204E-03	0.107696E-03	0.669143E-04	0.434715E-04

ℓ	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 0.025	Polystyrene					
ℓ=0	0	0.201060E 01	0.664555E 00	0.397290E-00	0.283208E-00	0.219992E-00	0.179834E-00	0.152069E-00
	2	0.219909E-00	0.366989E-01	0.131708E-01	0.625006E-02	0.346145E-02	0.211840E-02	0.139101E-02
	4	0.620303E-01	0.722793E-02	0.190943E-02	0.694030E-03	0.303631E-03	0.150436E-03	0.815831E-04
	6	0.238070E-01	0.215582E-02	0.454981E-03	0.135100E-03	0.491790E-04	0.205874E-04	0.955671E-05
	8	0.107687E-01	0.801152E-03	0.141358E-03	0.356101E-04	0.111353E-04	0.404741E-05	0.164657E-05
	10	0.541218E-02	0.342490E-03	0.520289E-04	0.114034E-04	0.313079E-05	0.100715E-05	0.365195E-06
	12	0.293064E-02	0.161575E-03	0.215769E-04	0.419007E-05	0.102638E-05	0.296425E-06	0.970360E-07
		MEV= 0.05	Polystyrene					
0	0	0.195355E 01	0.676108E 00	0.412248E-00	0.297120E-00	0.232425E-00	0.190926E-00	0.162028E-00
	2	0.212687E-00	0.378800E-01	0.141550E-01	0.690776E-02	0.390552E-02	0.242849E-02	0.161489E-02
	4	0.597297E-01	0.749028E-02	0.208407E-02	0.787901E-03	0.355577E-03	0.180677E-03	0.100058E-03
	6	0.228004E-01	0.223314E-02	0.500116E-03	0.155708E-03	0.589341E-04	0.254926E-04	0.121693E-04
	8	0.102519E-01	0.827705E-03	0.155796E-03	0.413994E-04	0.135435E-04	0.511769E-05	0.215361E-05
	10	0.512015E-02	0.352473E-03	0.573485E-04	0.133205E-04	0.384498E-05	0.129231E-05	0.487115E-06
	12	0.275469E-02	0.165519E-03	0.237468E-04	0.490524E-05	0.126840E-05	0.384336E-06	0.131336E-06
		MEV= 0.10	Polystyrene					
0	0	0.198551E 01	0.669579E 00	0.403755E-00	0.289198E-00	0.225329E-00	0.184586E-00	0.156329E-00
	2	0.220300E-00	0.376414E-01	0.137137E-01	0.657693E-02	0.367127E-02	0.226056E-02	0.149158E-02
	4	0.626532E-01	0.748866E-02	0.201586E-02	0.743515E-03	0.329119E-03	0.164642E-03	0.900089E-04
	6	0.241448E-01	0.224538E-02	0.484100E-03	0.146295E-03	0.540459E-04	0.229107E-04	0.107510E-04
	8	0.109394E-01	0.636447E-03	0.151036E-03	0.388083E-04	0.123449E-04	0.455467E-05	0.187750E-05
	10	0.549814E-02	0.357784E-03	0.556961E-04	0.124723E-04	0.348996E-05	0.114184E-05	0.420354E-06
	12	0.297399E-02	0.168677E-03	0.231057E-04	0.459056E-05	0.114782E-05	0.337704E-06	0.112424E-06
		MEV= 0.20	Polystyrene					
0	0	0.196823E 01	0.673091E 00	0.408310E-00	0.293439E-00	0.229123E-00	0.187973E-00	0.159371E-00
	2	0.219506E-00	0.381810E-01	0.140673E-01	0.679966E-02	0.381777E-02	0.236138E-02	0.156371E-02
	4	0.625948E-01	0.763043E-02	0.208344E-02	0.776883E-03	0.346898E-03	0.174775E-03	0.961173E-04
	6	0.241450E-01	0.229262E-02	0.502355E-03	0.153821E-03	0.574507E-04	0.245804E-04	0.116265E-04
	8	0.109386E-01	0.854619E-03	0.157057E-03	0.409575E-04	0.131947E-04	0.492200E-05	0.204856E-05
	10	0.549382E-02	0.365491E-03	0.579669E-04	0.131914E-04	0.374345E-05	0.124008E-05	0.461594E-06
	12	0.296822E-02	0.172181E-03	0.240493E-04	0.486053E-05	0.123394E-05	0.368015E-06	0.124027E-06
		MEV= 0.40	Polystyrene					
0	0	0.193766E 01	0.679408E 00	0.416582E-00	0.301188E-00	0.236082E-00	0.194204E-00	0.164982E-00
	2	0.218261E-00	0.391898E-01	0.147299E-01	0.722000E-02	0.409610E-02	0.255401E-02	0.170220E-02
	4	0.627574E-01	0.792111E-02	0.221757E-02	0.842919E-03	0.382184E-03	0.194978E-03	0.108354E-03
	6	0.243562E-01	0.239909E-02	0.540813E-03	0.169442E-03	0.645026E-04	0.280462E-04	0.134507E-04
	8	0.110860E-01	0.899668E-03	0.170507E-03	0.456270E-04	0.150264E-04	0.571325E-05	0.241794E-05
	10	0.558835E-02	0.386541E-03	0.633389E-04	0.148236E-04	0.431067E-05	0.145905E-05	0.553598E-06
	12	0.302822E-02	0.182768E-03	0.264128E-04	0.549981E-05	0.143360E-05	0.437767E-06	0.150699E-06
		MEV= 0.70	Polystyrene					
0	0	0.188873E 01	0.689809E 00	0.430416E-00	0.314279E-00	0.247924E-00	0.204863E-00	0.174618E-00
	2	0.215270E-00	0.407720E-01	0.158417E-01	0.794732E-02	0.458742E-02	0.289910E-02	0.195315E-02
	4	0.626699E-01	0.838907E-02	0.244854E-02	0.960810E-03	0.446810E-03	0.232721E-03	0.131588E-03
	6	0.245758E-01	0.257604E-02	0.608860E-03	0.198154E-03	0.778431E-04	0.347582E-04	0.170543E-04
	8	0.112846E-01	0.976854E-03	0.194914E-03	0.544359E-04	0.185905E-04	0.729358E-05	0.317261E-05
	10	0.573187E-02	0.423645E-03	0.733158E-04	0.179747E-04	0.544182E-05	0.190822E-05	0.747098E-06
	12	0.312693E-02	0.201931E-03	0.308969E-04	0.675996E-05	0.184052E-05	0.584229E-06	0.208233E-06
		MEV= 1.00	Polystyrene					
0	0	0.184048E 01	0.700436E 00	0.444834E-00	0.328097E-00	0.260535E-00	0.216291E-00	0.185003E-00
	2	0.211703E-00	0.423657E-01	0.170285E-01	0.874766E-02	0.513972E-02	0.329342E-02	0.224369E-02
	4	0.623553E-01	0.887136E-02	0.270213E-02	0.109529E-02	0.522667E-03	0.278053E-03	0.160032E-03
	6	0.247074E-01	0.276277E-02	0.685465E-03	0.231899E-03	0.940610E-04	0.431500E-04	0.216689E-04
	8	0.114492E-01	0.106003E-02	0.222990E-03	0.650511E-04	0.230510E-04	0.933610E-05	0.417573E-05
	10	0.586319E-02	0.464386E-03	0.850096E-04	0.218542E-04	0.689282E-05	0.250531E-05	0.101255E-05
	12	0.322234E-02	0.223328E-03	0.362408E-04	0.834057E-05	0.237375E-05	0.783703E-06	0.289343E-06
		MEV= 2.00	Polystyrene					
0	0	0.168928E 01	0.736399E 00	0.495786E-00	0.378345E-00	0.307342E-00	0.259366E-00	0.224624E-00
	2	0.197669E-00	0.477535E-01	0.215027E-01	0.119607E-01	0.746158E-02	0.501246E-02	0.354851E-02
	4	0.599089E-01	0.105252E-01	0.370237E-02	0.167337E-02	0.870871E-03	0.497573E-03	0.304125E-03
	6	0.243673E-01	0.341351E-02	0.998604E-03	0.384848E-03	0.173778E-03	0.872888E-04	0.473965E-04
	8	0.115575E-01	0.135438E-02	0.341179E-03	0.115282E-03	0.462352E-04	0.208338E-04	0.102299E-04
	10	0.604347E-02	0.610544E-03	0.135471E-03	0.408845E-04	0.147959E-04	0.606431E-05	0.272616E-05
	12	0.336491E-02	0.301042E-03	0.597951E-04	0.163358E-04	0.539667E-05	0.203258E-05	0.844244E-06

Table 2. Spatial Moments, Plane Isotropic Source — Continued

	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 4.00	Polystyrene					
ℓ=0	0	0.151748E 01	0.783171E 00	0.567284E 00	0.452523E-00	0.379038E-00	0.327244E-00	0.288489E-00
	2	0.181303E-00	0.557602E-01	0.289184E-01	0.177714E-01	0.119649E-01	0.854434E-02	0.636265E-02
	4	0.573708E-01	0.132424E-01	0.557353E-02	0.288344E-02	0.167210E-02	0.104523E-02	0.689710E-03
	6	0.243315E-01	0.457095E-02	0.164333E-02	0.744208E-03	0.383801E-03	0.215812E-03	0.129231E-03
	8	0.119923E-01	0.191323E-02	0.604591E-03	0.245128E-03	0.114568E-03	0.589070E-04	0.324796E-04
	10	0.649528E-02	0.903853E-03	0.255779E-03	0.942419E-04	0.404271E-04	0.192193E-04	0.985495E-05
	12	0.375781E-02	0.464687E-03	0.119341E-03	0.403929E-04	0.160510E-04	0.711324E-05	0.341694E-05
		MEV=10.00	Polystyrene					
0	0	0.131041E 01	0.851004E 00	0.682461E 00	0.580966E 00	0.510111E 00	0.456785E-00	0.414738E-00
	2	0.158946E-00	0.694258E-01	0.438542E-01	0.310214E-01	0.233106E-01	0.182148E-01	0.146364E-01
	4	0.535286E-01	0.185185E-01	0.100261E-01	0.626536E-02	0.423216E-02	0.300793E-02	0.221759E-02
	6	0.242518E-01	0.707505E-02	0.340310E-02	0.193030E-02	0.119862E-02	0.789959E-03	0.543561E-03
	8	0.127343E-01	0.324029E-02	0.141318E-02	0.739111E-03	0.427491E-03	0.264276E-03	0.171474E-03
	10	0.731978E-02	0.165969E-02	0.665135E-03	0.324127E-03	0.176166E-03	0.102950E-03	0.634292E-04
	12	0.447754E-02	0.918293E-03	0.341420E-03	0.156194E-03	0.802865E-04	0.446046E-04	0.262294E-04

Table 2. Spatial Moments, Plane Perpendicular Source

ℓ	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 0.025		Z= 6.				
ℓ=0	0	0.200623E 01	0.665423E 00	0.398403E-00	0.284237E-00	0.220907E-00	0.180648E-00	0.152797E-00
	1	0.775878E 00	0.185371E-00	0.866827E-01	0.507241E-01	0.334119E-01	0.237070E-01	0.177082E-01
	2	0.403694E-00	0.747481E-01	0.287182E-01	0.143033E-01	0.821343E-02	0.516994E-02	0.347193E-02
	3	0.229335E-00	0.350140E-01	0.114897E-01	0.500519E-02	0.255752E-02	0.145139E-02	0.887905E-03
	4	0.142350E-00	0.184342E-01	0.527029E-02	0.203848E-02	0.937970E-03	0.484612E-03	0.272287E-03
	5	0.920499E-01	0.103813E-01	0.263427E-02	0.917319E-03	0.384246E-03	0.182340E-03	0.947866E-04
	6	0.623239E-01	0.622012E-02	0.141788E-02	0.448735E-03	0.172427E-03	0.756312E-04	0.365705E-04
	7	0.432490E-01	0.387725E-02	0.803079E-03	0.233087E-03	0.827647E-04	0.337604E-04	0.152630E-04
	8	0.308954E-01	0.251355E-02	0.476938E-03	0.127801E-03	0.421687E-04	0.160719E-04	0.682128E-05
	9	0.224427E-01	0.167291E-02	0.293062E-03	0.729669E-04	0.224929E-04	0.804692E-05	0.321890E-05
	10	0.166376E-01	0.114432E-02	0.186164E-03	0.432825E-04	0.125182E-04	0.421921E-05	0.159583E-05
	11	0.124860E-01	0.797676E-03	0.121189E-03	0.264364E-04	0.720328E-05	0.229550E-05	0.823527E-06
	12	0.951441E-02	0.567480E-03	0.808698E-04	0.166152E-04	0.427937E-05	0.129320E-05	0.441210E-06
		MEV= 0.05		Z= 6.				
0	0	0.195082E 01	0.676671E 00	0.412986E-00	0.297812E-00	0.233046E-00	0.191482E-00	0.162529E-00
	1	0.760494E 00	0.191484E-00	0.921155E-01	0.548962E-01	0.366282E-01	0.262398E-01	0.197468E-01
	2	0.394309E-00	0.775606E-01	0.309137E-01	0.157929E-01	0.924108E-02	0.590229E-02	0.401032E-02
	3	0.223980E-00	0.364855E-01	0.124927E-01	0.561305E-02	0.293711E-02	0.169870E-02	0.105546E-02
	4	0.138547E-00	0.192188E-01	0.576276E-02	0.231042E-02	0.109364E-02	0.578218E-03	0.331179E-03
	5	0.894289E-01	0.108325E-01	0.289427E-02	0.104896E-02	0.453771E-03	0.221152E-03	0.117581E-03
	6	0.603383E-01	0.648362E-02	0.156162E-02	0.516276E-03	0.205608E-03	0.929351E-04	0.461055E-04
	7	0.417689E-01	0.403896E-02	0.886444E-03	0.269600E-03	0.995276E-04	0.419620E-04	0.195196E-04
	8	0.297334E-01	0.261353E-02	0.526813E-03	0.148343E-03	0.510346E-04	0.201609E-04	0.882780E-05
	9	0.215393E-01	0.173697E-02	0.323937E-03	0.849627E-04	0.273776E-04	0.101775E-04	0.421045E-05
	10	0.159118E-01	0.118540E-02	0.205702E-03	0.504929E-04	0.153012E-04	0.537155E-05	0.210604E-05
	11	0.119066E-01	0.824739E-03	0.133876E-03	0.308939E-04	0.883852E-05	0.293995E-05	0.109565E-05
	12	0.904111E-02	0.585221E-03	0.892424E-04	0.194316E-04	0.526512E-05	0.166408E-05	0.590951E-06
		MEV= 0.10		Z= 6.				
0	0	0.198330E 01	0.670026E 00	0.404333E-00	0.289734E-00	0.225809E-00	0.185014E-00	0.156713E-00
	1	0.784967E 00	0.190559E-00	0.898725E-01	0.528804E-01	0.349676E-01	0.248829E-01	0.186286E-01
	2	0.409145E-00	0.772044E-01	0.300110E-01	0.150702E-01	0.870698E-02	0.550685E-02	0.371242E-02
	3	0.234077E-00	0.364165E-01	0.121050E-01	0.532441E-02	0.274136E-02	0.156531E-02	0.962493E-03
	4	0.145405E-00	0.192068E-01	0.557148E-02	0.217955E-02	0.101213E-02	0.526925E-03	0.297973E-03
	5	0.943347E-01	0.108528E-01	0.279656E-02	0.986006E-03	0.417302E-03	0.199763E-03	0.104626E-03
	6	0.638747E-01	0.650659E-02	0.150771E-02	0.483700E-03	0.188013E-03	0.832861E-04	0.406195E-04
	7	0.443950E-01	0.406278E-02	0.855987E-03	0.252062E-03	0.906213E-04	0.373670E-04	0.170549E-04
	8	0.316988E-01	0.263353E-02	0.508690E-03	0.138419E-03	0.462873E-04	0.178503E-04	0.765544E-05
	9	0.230394E-01	0.175403E-02	0.312966E-03	0.791847E-04	0.247576E-04	0.896903E-05	0.362825E-05
	10	0.170647E-01	0.119907E-02	0.198801E-03	0.470035E-04	0.137991E-04	0.471348E-05	0.180434E-05
	11	0.128054E-01	0.835883E-03	0.129479E-03	0.287402E-04	0.795419E-05	0.257069E-05	0.934063E-06
	12	0.974589E-02	0.594066E-03	0.863562E-04	0.180644E-04	0.472895E-05	0.145030E-05	0.501499E-06
		MEV= 0.20		Z= 6.				
0	0	0.196614E 01	0.673518E 00	0.408867E-00	0.293959E-00	0.229589E-00	0.188389E-00	0.159745E-00
	1	0.785821E 00	0.193501E-00	0.919621E-01	0.543781E-01	0.360837E-01	0.257442E-01	0.193125E-01
	2	0.409596E-00	0.785816E-01	0.308582E-01	0.156056E-01	0.906392E-02	0.575615E-02	0.389328E-02
	3	0.234950E-00	0.371874E-01	0.125044E-01	0.554697E-02	0.287482E-02	0.165023E-02	0.101914E-02
	4	0.145910E-00	0.196283E-01	0.576784E-02	0.227881E-02	0.106661E-02	0.558899E-03	0.317777E-03
	5	0.947531E-01	0.111066E-01	0.290192E-02	0.103441E-02	0.441714E-03	0.213034E-03	0.112288E-03
	6	0.641268E-01	0.665948E-02	0.156617E-02	0.508500E-03	0.199626E-03	0.891787E-04	0.438099E-04
	7	0.445800E-01	0.416058E-02	0.890291E-03	0.265533E-03	0.964986E-04	0.401599E-04	0.184776E-04
	8	0.318095E-01	0.269621E-02	0.529301E-03	0.145994E-03	0.493890E-04	0.192386E-04	0.832379E-05
	9	0.231152E-01	0.179589E-02	0.325842E-03	0.836225E-04	0.264679E-04	0.969214E-05	0.395814E-05
	10	0.171068E-01	0.122705E-02	0.206983E-03	0.496696E-04	0.147717E-04	0.510358E-05	0.197360E-05
	11	0.128309E-01	0.855161E-03	0.134830E-03	0.303915E-04	0.852569E-05	0.278867E-05	0.102421E-05
	12	0.975629E-02	0.607344E-03	0.899001E-04	0.191068E-04	0.507274E-05	0.157543E-05	0.550971E-06
		MEV= 0.40		Z= 6.				
0	0	0.193695E 01	0.679556E 00	0.416776E-00	0.301370E-00	0.236247E-00	0.194352E-00	0.165115E-00
	1	0.787531E 00	0.198716E-00	0.956897E-01	0.570650E-01	0.380952E-01	0.273023E-01	0.205536E-01
	2	0.412566E-00	0.813962E-01	0.325102E-01	0.166354E-01	0.974684E-02	0.623204E-02	0.423822E-02
	3	0.238355E-00	0.388541E-01	0.133212E-01	0.599382E-02	0.314064E-02	0.181870E-02	0.113131E-02
	4	0.148560E-00	0.206183E-01	0.619256E-02	0.248748E-02	0.117967E-02	0.624810E-03	0.358449E-03
	5	0.969068E-01	0.117309E-01	0.313823E-02	0.113948E-02	0.493919E-03	0.241194E-03	0.128478E-03
	6	0.657633E-01	0.706029E-02	0.170289E-02	0.564187E-03	0.225217E-03	0.102037E-03	0.507353E-04
	7	0.458646E-01	0.442820E-02	0.973035E-03	0.296575E-03	0.109758E-03	0.463928E-04	0.216343E-04
	8	0.327963E-01	0.287777E-02	0.580825E-03	0.163942E-03	0.565573E-04	0.224063E-04	0.983853E-05
	9	0.238909E-01	0.192250E-02	0.358965E-03	0.943803E-04	0.305009E-04	0.113732E-04	0.471939E-05
	10	0.177115E-01	0.131647E-02	0.228736E-03	0.562951E-04	0.171136E-04	0.602778E-05	0.237119E-05
	11	0.133104E-01	0.919618E-03	0.149461E-03	0.345841E-04	0.992710E-05	0.331369E-05	0.123931E-05
	12	0.101352E-01	0.654289E-03	0.999038E-04	0.218158E-04	0.593207E-05	0.188197E-05	0.670878E-06

Table 2. Spatial Moments, Plane Perpendicular Source — Continued

ℓ	n	p= −1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 0.70	Z= 6.					
ℓ=0	0	0.188794E 01	0.689981E 00	0.430648E-00	0.314500E-00	0.248124E-00	0.205044E-00	0.174782E-00
	1	0.784723E 00	0.206911E-00	0.102020E-00	0.617800E-01	0.416952E-01	0.301287E-01	0.228276E-01
	2	0.415246E-00	0.861150E-01	0.354420E-01	0.185161E-01	0.110177E-01	0.712989E-02	0.489600E-02
	3	0.242517E-00	0.416984E-01	0.148013E-01	0.682984E-02	0.364885E-02	0.214605E-02	0.135206E-02
	4	0.152262E-00	0.223617E-01	0.698296E-02	0.288844E-02	0.140191E-02	0.756665E-03	0.440984E-03
	5	0.100060E-00	0.128459E-01	0.358506E-02	0.134511E-02	0.598676E-03	0.298827E-03	0.162155E-03
	6	0.682933E-01	0.779107E-02	0.196619E-02	0.675240E-03	0.277611E-03	0.128929E-03	0.654784E-04
	7	0.479040E-01	0.492198E-02	0.113439E-02	0.359360E-03	0.137339E-03	0.596600E-04	0.284860E-04
	8	0.344180E-01	0.321813E-02	0.682729E-03	0.200772E-03	0.717020E-04	0.292636E-04	0.131868E-04
	9	0.251921E-01	0.216238E-02	0.425174E-03	0.116713E-03	0.391320E-04	0.150646E-04	0.642877E-05
	10	0.187527E-01	0.148820E-02	0.272736E-03	0.702153E-04	0.221898E-04	0.808542E-05	0.327744E-05
	11	0.141507E-01	0.104465E-02	0.179333E-03	0.434808E-04	0.129981E-04	0.449677E-05	0.173614E-05
	12	0.108140E-01	0.746457E-03	0.120543E-03	0.276242E-04	0.783585E-05	0.258086E-05	0.951380E-06
		MEV= 1.00	Z= 6.					
0	0	0.183977E 01	0.700595E 00	0.445051E-00	0.328306E-00	0.260727E-00	0.216466E-00	0.185162E-00
	1	0.779351E 00	0.215034E-00	0.108634E-00	0.668357E-01	0.456213E-01	0.332497E-01	0.253628E-01
	2	0.417028E-00	0.910255E-01	0.386246E-01	0.206105E-01	0.124593E-01	0.816322E-02	0.566189E-02
	3	0.246111E-00	0.447124E-01	0.164440E-01	0.778555E-02	0.424274E-02	0.253532E-02	0.161836E-02
	4	0.155778E-00	0.242547E-01	0.788124E-02	0.335869E-02	0.166899E-02	0.918299E-03	0.543855E-03
	5	0.103138E-00	0.140729E-01	0.410124E-02	0.159102E-02	0.727419E-03	0.371273E-03	0.205305E-03
	6	0.708484E-01	0.860829E-02	0.227544E-02	0.810530E-03	0.343356E-03	0.163521E-03	0.848526E-04
	7	0.499951E-01	0.548004E-02	0.132630E-02	0.437000E-03	0.172556E-03	0.770669E-04	0.376898E-04
	8	0.361154E-01	0.360752E-02	0.805497E-03	0.246979E-03	0.913580E-04	0.384269E-04	0.177766E-04
	9	0.265698E-01	0.243929E-02	0.505761E-03	0.145074E-03	0.504928E-04	0.200773E-04	0.881456E-05
	10	0.198720E-01	0.168844E-02	0.326855E-03	0.881021E-04	0.289616E-04	0.109220E-04	0.456374E-05
	11	0.150629E-01	0.119158E-02	0.216399E-03	0.550297E-04	0.171435E-04	0.614982E-05	0.245207E-05
	12	0.115599E-01	0.855703E-03	0.146382E-03	0.352399E-04	0.104349E-04	0.356995E-05	0.136139E-05
		MEV= 2.00	Z= 6.					
0	0	0.168856E 01	0.736579E 00	0.496049E-00	0.378611E-00	0.307593E-00	0.259600E-00	0.224841E-00
	1	0.749520E 00	0.241768E-00	0.132702E-00	0.862225E-01	0.612275E-01	0.459963E-01	0.359423E-01
	2	0.413272E-00	0.107601E-00	0.506534E-01	0.290584E-01	0.185519E-01	0.126912E-01	0.911811E-02
	3	0.250831E-00	0.551498E-01	0.228826E-01	0.118254E-01	0.689727E-02	0.435412E-02	0.290902E-02
	4	0.162281E-00	0.309520E-01	0.115128E-01	0.542854E-02	0.292266E-02	0.171751E-02	0.107514E-02
	5	0.109636E-00	0.184990E-01	0.624697E-02	0.271340E-02	0.135897E-02	0.748298E-03	0.441400E-03
	6	0.766172E-01	0.116030E-01	0.359178E-02	0.144779E-02	0.678622E-03	0.351934E-03	0.196492E-03
	7	0.549461E-01	0.755515E-02	0.216089E-02	0.813281E-03	0.358568E-03	0.175886E-03	0.932959E-04
	8	0.402654E-01	0.507326E-02	0.134940E-02	0.476614E-03	0.198488E-03	0.924242E-04	0.467231E-04
	9	0.300307E-01	0.349374E-02	0.868966E-03	0.289301E-03	0.114220E-03	0.506465E-04	0.244686E-04
	10	0.227420E-01	0.245857E-02	0.574496E-03	0.180963E-03	0.679481E-04	0.287693E-04	0.133153E-04
	11	0.174461E-01	0.176216E-02	0.388430E-03	0.116148E-03	0.415924E-04	0.168566E-04	0.749013E-05
	12	0.135382E-01	0.128357E-02	0.267849E-03	0.762512E-04	0.261061E-04	0.101494E-04	0.433805E-05
		MEV= 4.00	Z= 6.					
0	0	0.151704E 01	0.783300E 00	0.567490E 00	0.452743E-00	0.379255E-00	0.327453E-00	0.288689E-00
	1	0.710917E 00	0.279926E-00	0.170542E-00	0.118835E-00	0.888722E-01	0.695287E-01	0.561510E-01
	2	0.410431E-00	0.133749E-00	0.716391E-01	0.450107E-01	0.308126E-01	0.222955E-01	0.167826E-01
	3	0.259722E-00	0.728698E-01	0.351120E-01	0.202348E-01	0.128563E-01	0.870521E-02	0.616988E-02
	4	0.174128E-00	0.430710E-01	0.189379E-01	0.101192E-01	0.602040E-02	0.384385E-02	0.258240E-02
	5	0.121481E-00	0.269368E-01	0.109191E-01	0.545210E-02	0.305706E-02	0.185068E-02	0.118432E-02
	6	0.873658E-01	0.175828E-01	0.662226E-02	0.310843E-02	0.165078E-02	0.951600E-03	0.582256E-03
	7	0.643352E-01	0.118674E-01	0.417909E-02	0.185301E-02	0.935792E-03	0.515454E-03	0.302485E-03
	8	0.483073E-01	0.823189E-02	0.272446E-02	0.114572E-02	0.552061E-03	0.291406E-03	0.164430E-03
	9	0.368607E-01	0.584086E-02	0.182481E-02	0.730310E-03	0.336714E-03	0.170746E-03	0.928451E-04
	10	0.285174E-01	0.422512E-02	0.125073E-02	0.477781E-03	0.211303E-03	0.103159E-03	0.541592E-04
	11	0.223250E-01	0.310731E-02	0.874410E-03	0.319653E-03	0.135902E-03	0.639978E-04	0.324955E-04
	12	0.176605E-01	0.231860E-02	0.622020E-03	0.218101E-03	0.893129E-04	0.406374E-04	0.199862E-04
		MEV=10.00	Z= 6.					
0	0	0.131270E 01	0.850168E 00	0.680953E 00	0.579212E 00	0.508263E 00	0.454913E-00	0.412875E-00
	1	0.651212E 00	0.340514E-00	0.240074E-00	0.184960E-00	0.149337E-00	0.124268E-00	0.105652E-00
	2	0.401648E-00	0.180575E-00	0.115752E-00	0.826969E-01	0.626065E-01	0.492114E-01	0.397375E-01
	3	0.270937E-00	0.108034E-00	0.640418E-01	0.429708E-01	0.308235E-01	0.230931E-01	0.178513E-01
	4	0.192561E-00	0.693910E-01	0.384454E-01	0.244235E-01	0.167112E-01	0.120030E-01	0.892856E-02
	5	0.141749E-00	0.467645E-01	0.243967E-01	0.147578E-01	0.967788E-02	0.669197E-02	0.480799E-02
	6	0.107094E-00	0.326570E-01	0.161320E-01	0.933191E-02	0.588644E-02	0.393082E-02	0.273551E-02
	7	0.825615E-01	0.234445E-01	0.110147E-01	0.611394E-02	0.372020E-02	0.240513E-02	0.162486E-02
	8	0.647000E-01	0.172120E-01	0.771869E-02	0.412260E-02	0.242546E-02	0.152125E-02	0.999541E-03
	9	0.513958E-01	0.128731E-01	0.552705E-02	0.284718E-02	0.162283E-02	0.989158E-03	0.633085E-03
	10	0.413020E-01	0.978104E-02	0.403102E-02	0.200680E-02	0.111002E-02	0.658494E-03	0.411079E-03
	11	0.335225E-01	0.753319E-02	0.298680E-02	0.143953E-02	0.773857E-03	0.447377E-03	0.272730E-03
	12	0.274468E-01	0.587122E-02	0.224396E-02	0.104865E-02	0.548588E-03	0.309423E-03	0.184395E-03

ℓ	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 0.025	Z=13.					
ℓ=0	0	0.203906E 01	0.658958E 00	0.390161E-00	0.276646E-00	0.214169E-00	0.174667E-00	0.147448E-00
	1	0.560891E 00	0.141344E-00	0.683960E-01	0.409665E-01	0.274409E-01	0.197177E-01	0.148737E-01
	2	0.246525E-00	0.482409E-01	0.192809E-01	0.989262E-02	0.581444E-02	0.372930E-02	0.254360E-02
	3	0.114489E-00	0.188148E-01	0.649958E-02	0.294300E-02	0.155048E-02	0.902158E-03	0.563576E-03
	4	0.616519E-01	0.861956E-02	0.259981E-02	0.104740E-02	0.497977E-03	0.264381E-03	0.152027E-03
	5	0.341734E-01	0.419965E-02	0.113096E-02	0.411974E-03	0.178912E-03	0.874901E-04	0.466618E-04
	6	0.204383E-01	0.223083E-02	0.540876E-03	0.179350E-03	0.715414E-04	0.323736E-04	0.160774E-04
	7	0.124584E-01	0.122910E-02	0.271904E-03	0.829333E-04	0.306396E-04	0.129173E-04	0.600698E-05
	8	0.796245E-02	0.715314E-03	0.145291E-03	0.409782E-04	0.140849E-04	0.555349E-05	0.242635E-05
	9	0.515980E-02	0.426662E-03	0.802685E-04	0.210862E-04	0.678366E-05	0.251428E-05	0.103656E-05
	10	0.345534E-02	0.264418E-03	0.462930E-04	0.113733E-04	0.343691E-05	0.120121E-05	0.468588E-06
	11	0.233870E-02	0.166829E-03	0.273483E-04	0.631683E-05	0.180121E-05	0.595965E-06	0.220740E-06
	12	0.162208E-02	0.108302E-03	0.166841E-04	0.363468E-05	0.980757E-06	0.307991E-06	0.108564E-06
		MEV= 0.05	Z=13.					
0	0	0.198057E 01	0.670578E 00	0.405047E-00	0.290399E-00	0.226403E-00	0.185544E-00	0.157189E-00
	1	0.543576E 00	0.144828E-00	0.722112E-01	0.440978E-01	0.299475E-01	0.217424E-01	0.165342E-01
	2	0.235139E-00	0.491161E-01	0.204189E-01	0.107657E-01	0.645705E-02	0.420734E-02	0.290635E-02
	3	0.108350E-00	0.190939E-01	0.690198E-02	0.322972E-02	0.174515E-02	0.103621E-02	0.658197E-03
	4	0.575659E-01	0.867334E-02	0.275356E-02	0.115278E-02	0.564912E-03	0.307396E-03	0.180432E-03
	5	0.316229E-01	0.420053E-02	0.119570E-02	0.454567E-03	0.204304E-03	0.102783E-03	0.561486E-04
	6	0.186833E-01	0.221114E-02	0.569007E-03	0.197737E-03	0.819546E-04	0.382939E-04	0.195449E-04
	7	0.112824E-01	0.120945E-02	0.284873E-03	0.913700E-04	0.351922E-04	0.153692E-04	0.736759E-05
	8	0.712875E-02	0.697376E-03	0.151273E-03	0.450122E-04	0.161817E-04	0.662984E-05	0.299472E-05
	9	0.457603E-02	0.412695E-03	0.831181E-04	0.230983E-04	0.779375E-05	0.300991E-05	0.128632E-05
	10	0.303116E-02	0.253392E-03	0.476028E-04	0.124039E-04	0.394183E-05	0.143930E-05	0.583511E-06
	11	0.203234E-02	0.158566E-03	0.279456E-04	0.686113E-05	0.206218E-05	0.714502E-06	0.275673E-06
	12	0.139488E-02	0.101989E-03	0.169223E-04	0.392693E-05	0.111938E-05	0.368934E-06	0.135766E-06
		MEV= 0.10	Z=13.					
0	0	0.198161E 01	0.670368E 00	0.404776E-00	0.290147E-00	0.226177E-00	0.185342E-00	0.157008E-00
	1	0.550135E 00	0.146071E-00	0.726769E-01	0.443178E-01	0.300650E-01	0.218099E-01	0.165748E-01
	2	0.237612E-00	0.494515E-01	0.205123E-01	0.107985E-01	0.646959E-02	0.421200E-02	0.290768E-02
	3	0.110031E-00	0.192869E-01	0.694764E-02	0.324320E-02	0.174931E-02	0.103727E-02	0.658170E-03
	4	0.584098E-01	0.875133E-02	0.276787E-02	0.115563E-02	0.565152E-03	0.307041E-03	0.179998E-03
	5	0.321740E-01	0.424612E-02	0.120324E-02	0.455908E-03	0.204381E-03	0.102614E-03	0.559646E-04
	6	0.189949E-01	0.223310E-02	0.571952E-03	0.198054E-03	0.818578E-04	0.381633E-04	0.194427E-04
	7	0.114879E-01	0.122268E-02	0.286502E-03	0.915287E-04	0.351426E-04	0.153084E-04	0.732291E-05
	8	0.725261E-02	0.704343E-03	0.151973E-03	0.450344E-04	0.161363E-04	0.659334E-05	0.297149E-05
	9	0.465897E-02	0.416987E-03	0.835109E-04	0.231056E-04	0.776855E-05	0.299136E-05	0.127522E-05
	10	0.308322E-02	0.255764E-03	0.477732E-04	0.123922E-04	0.392369E-05	0.142829E-05	0.577548E-06
	11	0.206768E-02	0.160047E-03	0.280388E-04	0.685163E-05	0.205140E-05	0.708469E-06	0.272592E-06
	12	0.141764E-02	0.102825E-03	0.169581E-04	0.391635E-05	0.111196E-05	0.365271E-06	0.134036E-06
		MEV= 0.20	Z=13.					
0	0	0.196899E 01	0.672936E 00	0.408108E-00	0.293251E-00	0.228954E-00	0.187822E-00	0.159235E-00
	1	0.555017E 00	0.148675E-00	0.742974E-01	0.454302E-01	0.308786E-01	0.224321E-01	0.170666E-01
	2	0.239490E-00	0.503902E-01	0.210347E-01	0.111216E-01	0.668455E-02	0.436283E-02	0.301786E-02
	3	0.111623E-00	0.197707E-01	0.716893E-02	0.336249E-02	0.182037E-02	0.108263E-02	0.688660E-03
	4	0.592385E-01	0.897652E-02	0.286094E-02	0.120140E-02	0.590237E-03	0.321881E-03	0.189298E-03
	5	0.327506E-01	0.437081E-02	0.124848E-02	0.475995E-03	0.214468E-03	0.108135E-03	0.591898E-04
	6	0.193308E-01	0.229936E-02	0.594068E-03	0.207149E-03	0.861119E-04	0.403435E-04	0.206403E-04
	7	0.117170E-01	0.126173E-02	0.298325E-03	0.960106E-04	0.370931E-04	0.162445E-04	0.780699E-05
	8	0.739470E-02	0.726838E-03	0.158328E-03	0.472922E-04	0.170608E-04	0.701237E-05	0.317678E-05
	9	0.475657E-02	0.430890E-03	0.871440E-04	0.243120E-04	0.823316E-05	0.319035E-05	0.136769E-05
	10	0.314628E-02	0.264225E-03	0.498591E-04	0.130472E-04	0.416292E-05	0.152571E-05	0.620696E-06
	11	0.211153E-02	0.165470E-03	0.292923E-04	0.722320E-05	0.218007E-05	0.758322E-06	0.293660E-06
	12	0.144681E-02	0.106261E-03	0.177138E-04	0.412972E-05	0.118247E-05	0.391386E-06	0.144606E-06
		MEV= 0.40	Z=13.					
0	0	0.193635E 01	0.679681E 00	0.416941E-00	0.301525E-00	0.236386E-00	0.194477E-00	0.165228E-00
	1	0.560952E 00	0.154196E-00	0.780799E-01	0.481457E-01	0.329191E-01	0.240213E-01	0.183397E-01
	2	0.242860E-00	0.527236E-01	0.224113E-01	0.119960E-01	0.727566E-02	0.478199E-02	0.332642E-02
	3	0.114620E-00	0.209646E-01	0.775758E-02	0.369189E-02	0.202106E-02	0.121270E-02	0.777031E-03
	4	0.610421E-01	0.957624E-02	0.312403E-02	0.133484E-02	0.664784E-03	0.366564E-03	0.217569E-03
	5	0.340165E-01	0.470361E-02	0.137756E-02	0.535408E-03	0.244995E-03	0.125117E-03	0.692283E-04
	6	0.201408E-01	0.248577E-02	0.659831E-03	0.235037E-03	0.994248E-04	0.472672E-04	0.244868E-04
	7	0.122778E-01	0.137266E-02	0.333884E-03	0.109937E-03	0.432884E-04	0.192663E-04	0.938923E-05
	8	0.776954E-02	0.793614E-03	0.178104E-03	0.545151E-04	0.200759E-04	0.839901E-05	0.386409E-05
	9	0.501960E-02	0.472766E-03	0.986062E-04	0.282250E-04	0.976999E-05	0.385851E-05	0.168197E-05
	10	0.332794E-02	0.290764E-03	0.566465E-04	0.152279E-04	0.497282E-05	0.185994E-05	0.770391E-06
	11	0.224127E-02	0.182797E-03	0.334365E-04	0.847866E-05	0.262196E-05	0.931790E-06	0.367789E-06
	12	0.153875E-02	0.117678E-03	0.202871E-04	0.486857E-05	0.142988E-05	0.484068E-06	0.182498E-06

Table 2. Spatial Moments, Plane Perpendicular Source — Continued

ℓ	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 0.70	Z=13.					
ℓ=0	0	0.187981E 01	0.691746E 00	0.433023E-00	0.316764E-00	0.250183E-00	0.206905E-00	0.176469E-00
	1	0.566164E 00	0.163275E-00	0.847478E-01	0.530956E-01	0.367175E-01	0.270240E-01	0.207720E-01
	2	0.247399E-00	0.568825E-01	0.249941E-01	0.136837E-01	0.843863E-02	0.561854E-02	0.394917E-02
	3	0.118898E-00	0.231038E-01	0.888019E-02	0.434277E-02	0.242742E-02	0.148091E-02	0.961912E-03
	4	0.638515E-01	0.106904E-01	0.364211E-02	0.160714E-02	0.820864E-03	0.462003E-03	0.278936E-03
	5	0.360121E-01	0.532622E-02	0.163500E-02	0.658760E-03	0.310268E-03	0.162275E-03	0.916139E-04
	6	0.214784E-01	0.284287E-02	0.793844E-03	0.294236E-03	0.128568E-03	0.628046E-04	0.332986E-04
	7	0.132138E-01	0.158684E-02	0.407149E-03	0.139913E-03	0.570772E-04	0.261776E-04	0.130920E-04
	8	0.841563E-02	0.924942E-03	0.219538E-03	0.703323E-04	0.269114E-04	0.116341E-04	0.550729E-05
	9	0.547805E-02	0.555814E-03	0.122864E-03	0.368973E-04	0.133030E-04	0.544225E-05	0.244676E-05
	10	0.365262E-02	0.344218E-03	0.712154E-04	0.201312E-04	0.686350E-05	0.266537E-05	0.114122E-05
	11	0.247578E-02	0.217995E-03	0.424153E-04	0.113319E-04	0.366616E-05	0.135558E-05	0.554242E-06
	12	0.170847E-02	0.141188E-03	0.259320E-04	0.656889E-05	0.202232E-05	0.713744E-06	0.279283E-06
		MEV= 1.00	Z=13.					
0	0	0.182231E 01	0.704539E 00	0.450476E-00	0.333553E-00	0.265546E-00	0.220853E-00	0.189164E-00
	1	0.568399E 00	0.172613E-00	0.920220E-01	0.586621E-01	0.410761E-01	0.305206E-01	0.236372E-01
	2	0.251021E-00	0.613611E-01	0.279288E-01	0.156635E-01	0.983424E-02	0.664012E-02	0.472041E-02
	3	0.122626E-00	0.254381E-01	0.101839E-01	0.512814E-02	0.293151E-02	0.182092E-02	0.120043E-02
	4	0.664483E-01	0.119342E-01	0.425868E-02	0.194497E-02	0.102063E-02	0.587229E-03	0.361127E-03
	5	0.378910E-01	0.602870E-02	0.194641E-02	0.815038E-03	0.395928E-03	0.212445E-03	0.122564E-03
	6	0.227731E-01	0.325195E-02	0.958771E-03	0.370771E-03	0.167718E-03	0.843417E-04	0.458414E-04
	7	0.141308E-01	0.183443E-02	0.498477E-03	0.179308E-03	0.759680E-04	0.359775E-04	0.184984E-04
	8	0.906012E-02	0.107853E-02	0.271885E-03	0.914531E-04	0.364512E-04	0.163190E-04	0.796371E-05
	9	0.593989E-02	0.653715E-03	0.153840E-03	0.486342E-04	0.183139E-04	0.777896E-05	0.361441E-05
	10	0.398422E-02	0.407839E-03	0.900253E-04	0.268546E-04	0.958640E-05	0.387473E-05	0.171864E-05
	11	0.271736E-02	0.260189E-03	0.541147E-04	0.152892E-04	0.519061E-05	0.200203E-05	0.849811E-06
	12	0.188528E-02	0.169606E-03	0.333569E-04	0.895362E-05	0.289859E-05	0.106937E-05	0.435313E-06
		MEV= 2.00	Z=13.					
0	0	0.167676E 01	0.739576E 00	0.500452E 00	0.383056E-00	0.311804E-00	0.263525E-00	0.228488E-00
	1	0.573559E 00	0.200308E-00	0.114760E-00	0.767045E-01	0.555952E-01	0.424243E-01	0.335660E-01
	2	0.263196E-00	0.757799E-01	0.378565E-01	0.226402E-01	0.149184E-01	0.104654E-01	0.767603E-02
	3	0.134599E-00	0.333040E-01	0.148548E-01	0.808553E-02	0.490912E-02	0.320142E-02	0.219772E-02
	4	0.752097E-01	0.163208E-01	0.658325E-02	0.329292E-02	0.185678E-02	0.113323E-02	0.732391E-03
	5	0.442924E-01	0.858878E-02	0.317009E-02	0.146995E-02	0.775147E-03	0.445326E-03	0.272305E-03
	6	0.273130E-01	0.479173E-02	0.163183E-02	0.705938E-03	0.349963E-03	0.190096E-03	0.110401E-03
	7	0.173932E-01	0.279099E-02	0.883537E-03	0.358662E-03	0.167945E-03	0.865998E-04	0.479341E-04
	8	0.114034E-01	0.168730E-02	0.499391E-03	0.191098E-03	0.848442E-04	0.416671E-04	0.220445E-04
	9	0.764399E-02	0.105039E-02	0.292161E-03	0.105824E-03	0.447031E-04	0.209714E-04	0.106329E-04
	10	0.523013E-02	0.671234E-03	0.176193E-03	0.606147E-04	0.244329E-04	0.109769E-04	0.534560E-05
	11	0.363788E-02	0.438254E-03	0.108974E-03	0.357178E-04	0.137744E-04	0.594012E-05	0.278417E-05
	12	0.256976E-02	0.291808E-03	0.689538E-04	0.215891E-04	0.798358E-05	0.331135E-05	0.149646E-05
		MEV= 4.00	Z=13.					
0	0	0.150159E 01	0.767877E 00	0.574821E 00	0.460590E-00	0.387016E-00	0.334933E-00	0.295827E-00
	1	0.572468E 00	0.242184E-00	0.153087E-00	0.109311E-00	0.832301E-01	0.660300E-01	0.539302E-01
	2	0.279520E-00	0.100374E-00	0.567412E-01	0.370087E-01	0.260649E-01	0.192938E-01	0.147989E-01
	3	0.151933E-00	0.478173E-01	0.246255E-01	0.148771E-01	0.980345E-02	0.683761E-02	0.496803E-02
	4	0.890286E-01	0.250165E-01	0.118675E-01	0.669737E-02	0.415842E-02	0.274958E-02	0.190268E-02
	5	0.548428E-01	0.139612E-01	0.615493E-02	0.326654E-02	0.192162E-02	0.121023E-02	0.800937E-03
	6	0.351621E-01	0.819614E-02	0.338047E-02	0.169584E-02	0.949215E-03	0.571506E-03	0.362899E-03
	7	0.232361E-01	0.500322E-02	0.194146E-02	0.924638E-03	0.494222E-03	0.285357E-03	0.174336E-03
	8	0.157540E-01	0.315537E-02	0.115725E-02	0.525118E-03	0.268831E-03	0.149240E-03	0.879265E-04
	9	0.109048E-01	0.204368E-02	0.711219E-03	0.308446E-03	0.151640E-03	0.811244E-04	0.461856E-04
	10	0.768693E-02	0.135458E-02	0.448805E-03	0.186523E-03	0.882584E-04	0.455913E-04	0.251259E-04
	11	0.550226E-02	0.915562E-03	0.289656E-03	0.115633E-03	0.527675E-04	0.263660E-04	0.140882E-04
	12	0.399315E-02	0.629695E-03	0.190709E-03	0.732801E-04	0.323069E-04	0.156386E-04	0.811301E-05
		MEV=10.00	Z=13.					
0	0	0.129644E 01	0.856174E 00	0.691847E 00	0.591925E 00	0.521688E 00	0.468547E-00	0.426465E-00
	1	0.562491E 00	0.311597E-00	0.226015E-00	0.177511E-00	0.145425E-00	0.122432E-00	0.105105E-00
	2	0.304850E-00	0.148861E-00	0.996151E-01	0.733261E-01	0.568037E-01	0.454927E-01	0.373167E-01
	3	0.182307E-00	0.803939E-01	0.503201E-01	0.350854E-01	0.259311E-01	0.199102E-01	0.157144E-01
	4	0.115994E-00	0.468728E-01	0.276734E-01	0.183964E-01	0.130437E-01	0.964849E-02	0.735938E-02
	5	0.770350E-01	0.288250E-01	0.161496E-01	0.102838E-01	0.702292E-02	0.502220E-02	0.371367E-02
	6	0.528664E-01	0.184611E-01	0.986044E-02	0.603619E-02	0.398226E-02	0.276043E-02	0.198360E-02
	7	0.372220E-01	0.122067E-01	0.623876E-02	0.368207E-02	0.235247E-02	0.158407E-02	0.110831E-02
	8	0.267668E-01	0.828565E-02	0.406458E-02	0.231832E-02	0.143730E-02	0.941840E-03	0.642644E-03
	9	0.195885E-01	0.574602E-02	0.271350E-02	0.149878E-02	0.903245E-03	0.576865E-03	0.384389E-03
	10	0.145528E-01	0.405278E-02	0.184981E-02	0.991167E-03	0.581508E-03	0.362440E-03	0.236133E-03
	11	0.109526E-01	0.291816E-02	0.128399E-02	0.668443E-03	0.382286E-03	0.232804E-03	0.148455E-03
	12	0.833801E-02	0.212600E-02	0.905541E-03	0.458665E-03	0.256005E-03	0.152486E-03	0.952661E-04

ℓ	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 0.025	Z=29.					
ℓ=0	0	0.216947E 01	0.634619E 00	0.360038E-00	0.249416E-00	0.190304E-00	0.153676E-00	0.128804E-00
	1	0.353260E-00	0.873889E-01	0.425694E-01	0.257620E-01	0.174285E-01	0.126330E-01	0.960132E-02
	2	0.134714E-00	0.249486E-01	0.978854E-02	0.499731E-02	0.293967E-02	0.189206E-02	0.129652E-02
	3	0.452376E-01	0.725027E-02	0.249685E-02	0.113522E-02	0.602184E-03	0.353154E-03	0.222411E-03
	4	0.210711E-01	0.283837E-02	0.842541E-03	0.337188E-03	0.160047E-03	0.850763E-04	0.490673E-04
	5	0.914676E-02	0.110081E-02	0.294128E-03	0.106868E-03	0.464263E-04	0.227507E-04	0.121730E-04
	6	0.475547E-02	0.506332E-03	0.121046E-03	0.397805E-04	0.157797E-04	0.711788E-05	0.352992E-05
	7	0.237059E-02	0.230472E-03	0.505317E-04	0.153127E-04	0.563064E-05	0.236616E-05	0.109816E-05
	8	0.132650E-02	0.117323E-03	0.235438E-04	0.657178E-05	0.223917E-05	0.876580E-06	0.380805E-06
	9	0.722547E-03	0.592318E-04	0.110487E-04	0.287711E-05	0.917935E-06	0.337689E-06	0.138317E-06
	10	0.426740E-03	0.323820E-04	0.561193E-05	0.136334E-05	0.407429E-06	0.140919E-06	0.544550E-07
	11	0.247482E-03	0.175945E-04	0.286252E-05	0.654549E-06	0.184610E-06	0.604238E-07	0.221516E-07
	12	0.152419E-03	0.101499E-04	0.155053E-05	0.333856E-06	0.889226E-07	0.275609E-07	0.959262E-08
		MEV= 0.05	Z=29.					
0	0	0.203129E 01	0.660475E 00	0.392086E-00	0.278414E-00	0.215735E-00	0.176055E-00	0.148688E-00
	1	0.314083E-00	0.881791E-01	0.459883E-01	0.291046E-01	0.203362E-01	0.151092E-01	0.117108E-01
	2	0.113059E-00	0.243071E-01	0.104363E-01	0.566974E-02	0.349307E-02	0.233101E-02	0.164478E-02
	3	0.361477E-01	0.680550E-02	0.260233E-02	0.127636E-02	0.717715E-03	0.441031E-03	0.288659E-03
	4	0.159719E-01	0.255940E-02	0.856186E-03	0.374699E-03	0.190783E-03	0.107358E-03	0.649239E-04
	5	0.661714E-02	0.954830E-03	0.290564E-03	0.116695E-03	0.549335E-04	0.287620E-04	0.162720E-04
	6	0.327440E-02	0.421401E-03	0.115949E-03	0.425680E-04	0.184802E-04	0.898814E-05	0.475217E-05
	7	0.156060E-02	0.184408E-03	0.469011E-04	0.160115E-04	0.649785E-05	0.296785E-05	0.147955E-05
	8	0.833313E-03	0.900864E-04	0.211330E-04	0.670055E-05	0.254030E-05	0.108934E-05	0.512067E-06
	9	0.434610E-03	0.437273E-04	0.959228E-05	0.285643E-05	0.102104E-05	0.414258E-06	0.184815E-06
	10	0.245461E-03	0.229565E-04	0.470638E-05	0.131605E-05	0.443587E-06	0.170328E-06	0.721495E-07
	11	0.136475E-03	0.119966E-04	0.231988E-05	0.613908E-06	0.196412E-06	0.717814E-07	0.290112E-07
	12	0.805204E-04	0.665139E-05	0.121335E-05	0.303953E-06	0.923446E-07	0.321374E-07	0.123997E-07
		MEV= 0.10	Z=29.					
0	0	0.201498E 01	0.663686E 00	0.396179E-00	0.282183E-00	0.219080E-00	0.179024E-00	0.151343E-00
	1	0.306929E-00	0.876050E-01	0.461053E-01	0.293570E-01	0.206050E-01	0.153626E-01	0.119409E-01
	2	0.108722E-00	0.237994E-01	0.103308E-01	0.565612E-02	0.350553E-02	0.235062E-02	0.166532E-02
	3	0.343618E-01	0.659808E-02	0.255529E-02	0.126500E-02	0.716516E-03	0.442915E-03	0.291344E-03
	4	0.149447E-01	0.244577E-02	0.830007E-03	0.367197E-03	0.188582E-03	0.106879E-03	0.650259E-04
	5	0.612762E-02	0.904007E-03	0.279441E-03	0.113591E-03	0.539961E-04	0.285018E-04	0.162369E-04
	6	0.298559E-02	0.393261E-03	0.110064E-03	0.409537E-04	0.179765E-04	0.882476E-05	0.470323E-05
	7	0.140886E-02	0.170514E-03	0.441543E-04	0.152928E-04	0.628095E-05	0.289817E-05	0.145762E-05
	8	0.741066E-03	0.821247E-04	0.196362E-04	0.632353E-05	0.242895E-05	0.105336E-05	0.500040E-06
	9	0.382742E-03	0.394957E-04	0.883720E-05	0.267495E-05	0.969532E-06	0.398119E-06	0.179500E-06
	10	0.213044E-03	0.204491E-04	0.427988E-05	0.121764E-05	0.416549E-06	0.162029E-06	0.694237E-07
	11	0.117311E-03	0.105876E-04	0.209135E-05	0.563442E-06	0.183081E-06	0.678260E-07	0.277463E-07
	12	0.682457E-04	0.579123E-05	0.107990E-05	0.275631E-06	0.851156E-07	0.300513E-07	0.117451E-07
		MEV= 0.20	Z=29.					
0	0	0.198355E 01	0.669975E 00	0.404267E-00	0.289673E-00	0.225754E-00	0.184965E-00	0.156669E-00
	1	0.304265E-00	0.892455E-01	0.476253E-01	0.305964E-01	0.216125E-01	0.161925E-01	0.126348E-01
	2	0.106473E-00	0.240893E-01	0.106583E-01	0.591156E-02	0.369910E-02	0.249902E-02	0.178119E-02
	3	0.337182E-01	0.669993E-02	0.265032E-02	0.133195E-02	0.763150E-03	0.476084E-03	0.315535E-03
	4	0.145119E-01	0.246560E-02	0.857732E-03	0.386452E-03	0.201315E-03	0.115416E-03	0.708955E-04
	5	0.594742E-02	0.911746E-03	0.289385E-03	0.120015E-03	0.579681E-04	0.310029E-04	0.178582E-04
	6	0.287024E-02	0.393665E-03	0.113417E-03	0.431630E-04	0.192954E-04	0.961747E-05	0.519246E-05
	7	0.135170E-02	0.170461E-03	0.454976E-04	0.161409E-04	0.676164E-05	0.317243E-05	0.161859E-05
	8	0.704666E-03	0.814840E-04	0.201195E-04	0.664945E-05	0.261001E-05	0.115296E-05	0.556140E-06
	9	0.362833E-03	0.390880E-04	0.904120E-05	0.281203E-05	0.104284E-05	0.436753E-06	0.200341E-06
	10	0.200252E-03	0.200880E-04	0.435234E-05	0.127430E-05	0.446724E-06	0.177494E-06	0.774828E-07
	11	0.109852E-03	0.103659E-04	0.212144E-05	0.588781E-06	0.196263E-06	0.743519E-07	0.310230E-07
	12	0.633861E-04	0.562834E-05	0.108862E-05	0.286592E-06	0.909065E-07	0.328627E-07	0.131166E-07
		MEV= 0.40	Z=29.					
0	0	0.194377E 01	0.678134E 00	0.414906E-00	0.299613E-00	0.234665E-00	0.192933E-00	0.163836E-00
	1	0.308599E-00	0.934421E-01	0.506347E-01	0.328402E-01	0.233523E-01	0.175836E-01	0.137742E-01
	2	0.107369E-00	0.252966E-01	0.114497E-01	0.644699E-02	0.407845E-02	0.277845E-02	0.199360E-02
	3	0.346926E-01	0.717876E-02	0.290973E-02	0.148737E-02	0.863157E-03	0.543928E-03	0.363476E-03
	4	0.148883E-01	0.264588E-02	0.947585E-03	0.436048E-03	0.230885E-03	0.134112E-03	0.832737E-04
	5	0.618472E-02	0.991991E-03	0.324608E-03	0.137738E-03	0.677439E-04	0.367719E-04	0.214458E-04
	6	0.298005E-02	0.428761E-03	0.127759E-03	0.498989E-04	0.227780E-04	0.115520E-04	0.632932E-05
	7	0.141706E-02	0.187522E-03	0.518281E-04	0.188985E-04	0.809702E-05	0.387160E-05	0.200764E-05
	8	0.738027E-03	0.897074E-04	0.229881E-04	0.782717E-05	0.314927E-05	0.142078E-05	0.697914E-06
	9	0.382755E-03	0.433581E-04	0.104187E-04	0.334267E-05	0.127245E-05	0.545018E-06	0.254950E-06
	10	0.211104E-03	0.222939E-04	0.502663E-05	0.152091E-05	0.548288E-06	0.223190E-06	0.995268E-07
	11	0.116443E-03	0.115709E-04	0.246640E-05	0.708166E-06	0.243041E-06	0.944475E-07	0.403057E-07
	12	0.671510E-04	0.628471E-05	0.126773E-05	0.345779E-06	0.113095E-06	0.420009E-07	0.171710E-07

	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 0.70		Z=29.				
ℓ=0	0	0.188548E 01	0.690514E 00	0.431365E-00	0.315182E-00	0.248745E-00	0.205605E-00	0.175290E-00
	1	0.317061E-00	0.100632E-00	0.557714E-01	0.366803E-01	0.263397E-01	0.199798E-01	0.157425E-01
	2	0.110227E-00	0.275947E-01	0.129181E-01	0.743820E-02	0.478232E-02	0.329861E-02	0.239031E-02
	3	0.368331E-01	0.810123E-02	0.340545E-02	0.178563E-02	0.105633E-02	0.675839E-03	0.457256E-03
	4	0.158588E-01	0.301558E-02	0.112783E-02	0.535598E-03	0.290590E-03	0.172132E-03	0.108626E-03
	5	0.674346E-02	0.115807E-02	0.396687E-03	0.174199E-03	0.880385E-04	0.488664E-04	0.290389E-04
	6	0.326536E-02	0.504955E-03	0.158226E-03	0.642378E-04	0.302539E-04	0.157471E-04	0.882014E-05
	7	0.158042E-02	0.224946E-03	0.655109E-04	0.248902E-04	0.110299E-04	0.542600E-05	0.288321E-05
	8	0.827667E-03	0.108476E-03	0.293865E-04	0.104604E-04	0.436707E-05	0.203310E-05	0.102626E-05
	9	0.435365E-03	0.532130E-04	0.135403E-04	0.455083E-05	0.180141E-05	0.797948E-06	0.384383E-06
	10	0.241478E-03	0.275638E-04	0.659720E-05	0.209654E-05	0.787976E-06	0.332558E-06	0.153083E-06
	11	0.134777E-03	0.144846E-04	0.328205E-05	0.991492E-06	0.355426E-06	0.143475E-06	0.633242E-07
	12	0.761555E-04	0.792114E-05	0.170177E-05	0.489400E-06	0.167557E-06	0.647776E-07	0.274463E-07
		MEV= 1.00		Z=29.				
0	0	0.182812E 01	0.703219E 00	0.448657E-00	0.331791E-00	0.263926E-00	0.219377E-00	0.187816E-00
	1	0.324857E-00	0.108204E-00	0.613753E-01	0.409593E-01	0.297185E-01	0.227209E-01	0.180145E-01
	2	0.113198E-00	0.301428E-01	0.146006E-01	0.860064E-02	0.562251E-02	0.392830E-02	0.287607E-02
	3	0.390279E-01	0.914074E-02	0.398879E-02	0.214718E-02	0.129582E-02	0.842343E-03	0.577395E-03
	4	0.169016E-01	0.344476E-02	0.134644E-02	0.660304E-03	0.367316E-03	0.222024E-03	0.142486E-03
	5	0.734395E-02	0.135347E-02	0.485892E-03	0.221027E-03	0.114884E-03	0.652582E-04	0.395439E-04
	6	0.358124E-02	0.596591E-03	0.196802E-03	0.831215E-04	0.404197E-04	0.216073E-04	0.123809E-04
	7	0.176214E-02	0.270496E-03	0.831262E-04	0.329433E-04	0.151132E-04	0.765552E-05	0.417177E-05
	8	0.929619E-03	0.131730E-03	0.377784E-04	0.140727E-04	0.610140E-05	0.293353E-05	0.152278E-05
	9	0.495588E-03	0.655568E-04	0.176936E-04	0.623712E-05	0.256987E-05	0.117830E-05	0.584993E-06
	10	0.276873E-03	0.342647E-04	0.872014E-05	0.291407E-05	0.114297E-05	0.500549E-06	0.238035E-06
	11	0.156294E-03	0.182268E-04	0.439863E-05	0.139998E-05	0.524771E-06	0.220256E-06	0.100626E-06
	12	0.912673E-04	0.100507E-04	0.230420E-05	0.699625E-06	0.251008E-06	0.101112E-06	0.444373E-07
		MEV= 2.00		Z=29.				
0	0	0.167823E 01	0.739201E 00	0.499899E-00	0.382497E-00	0.311274E-00	0.263030E-00	0.228028E-00
	1	0.347708E-00	0.132451E-00	0.801521E-01	0.557530E-01	0.416798E-01	0.326084E-01	0.263371E-01
	2	0.123808E-00	0.390436E-01	0.207407E-01	0.130027E-01	0.890195E-02	0.644847E-02	0.486177E-02
	3	0.464463E-01	0.129550E-01	0.626346E-02	0.362522E-02	0.231305E-02	0.157244E-02	0.111864E-02
	4	0.206823E-01	0.510663E-02	0.224971E-02	0.120409E-02	0.717321E-03	0.458532E-03	0.308411E-03
	5	0.953182E-02	0.213928E-02	0.873181E-03	0.437418E-03	0.245595E-03	0.148733E-03	0.951706E-04
	6	0.478427E-02	0.980503E-03	0.372067E-03	0.174976E-03	0.928427E-04	0.534012E-04	0.325825E-04
	7	0.246480E-02	0.467550E-03	0.166476E-03	0.740229E-04	0.373332E-04	0.204935E-04	0.119725E-04
	8	0.133729E-02	0.235782E-03	0.790241E-04	0.333123E-04	0.160080E-04	0.840472E-05	0.471083E-05
	9	0.740716E-03	0.122371E-03	0.388310E-04	0.155909E-04	0.716625E-05	0.361072E-05	0.194734E-05
	10	0.425002E-03	0.660179E-04	0.198863E-04	0.762200E-05	0.335772E-05	0.162646E-05	0.845441E-06
	11	0.247999E-03	0.364157E-04	0.104547E-04	0.383770E-05	0.162485E-05	0.758524E-06	0.380838E-06
	12	0.148512E-03	0.206721E-04	0.566868E-05	0.199660E-05	0.813792E-06	0.366669E-06	0.178062E-06
		MEV= 4.00		Z=29.				
0	0	0.149518E 01	0.789798E 00	0.577916E 00	0.463916E-00	0.390316E-00	0.338120E-00	0.298875E-00
	1	0.376583E-00	0.172750E-00	0.114444E-00	0.845172E-01	0.660563E-01	0.535272E-01	0.444974E-01
	2	0.141857E-00	0.561377E-01	0.336913E-01	0.229764E-01	0.167702E-01	0.127887E-01	0.100622E-01
	3	0.590544E-01	0.209535E-01	0.116325E-01	0.743410E-02	0.512532E-02	0.371259E-02	0.278660E-02
	4	0.277876E-01	0.891719E-02	0.460396E-02	0.276938E-02	0.181039E-02	0.124995E-02	0.897826E-03
	5	0.137946E-01	0.406896E-02	0.197291E-02	0.112514E-02	0.701505E-03	0.463925E-03	0.320242E-03
	6	0.728703E-02	0.198967E-02	0.910123E-03	0.493893E-03	0.294613E-03	0.187139E-03	0.124454E-03
	7	0.398612E-02	0.101640E-02	0.441124E-03	0.228801E-03	0.131062E-03	0.802174E-04	0.515404E-04
	8	0.226662E-02	0.542470E-03	0.224140E-03	0.111423E-03	0.614364E-04	0.363092E-04	0.225819E-04.
	9	0.132163E-02	0.298541E-03	0.117877E-03	0.563312E-04	0.299737E-04	0.171436E-04	0.103414E-04
	10	0.791803E-03	0.169442E-03	0.640970E-04	0.295077E-04	0.151796E-04	0.841586E-05	0.493123E-05
	11	0.483568E-03	0.984120E-04	0.357624E-04	0.158946E-04	0.791992E-05	0.426344E-05	0.243024E-05
	12	0.301405E-03	0.585002E-04	0.204628E-04	0.879480E-05	0.425078E-05	0.222468E-05	0.123508E-05
		MEV=10.00		Z=29.				
0	0	0.128370E 01	0.860967E 00	0.700630E 00	0.602247E 00	0.532648E 00	0.479729E-00	0.437653E-00
	1	0.418644E-00	0.248185E-00	0.186629E-00	0.150390E-00	0.125706E-00	0.107591E-00	0.936628E-01
	2	0.180140E-00	0.964691E-01	0.679755E-01	0.519592E-01	0.414805E-01	0.340653E-01	0.285521E-01
	3	0.870162E-01	0.428992E-01	0.286279E-01	0.209275E-01	0.160666E-01	0.127366E-01	0.103338E-01
	4	0.457815E-01	0.209860E-01	0.133397E-01	0.936815E-02	0.694326E-02	0.533147E-02	0.420042E-02
	5	0.254550E-01	0.109450E-01	0.666056E-02	0.451140E-02	0.323867E-02	0.241585E-02	0.185306E-02
	6	0.148127E-01	0.601090E-02	0.351476E-02	0.230266E-02	0.160506E-02	0.116560E-02	0.872151E-03
	7	0.891635E-02	0.343290E-02	0.193493E-02	0.122921E-02	0.833722E-03	0.590554E-03	0.431787E-03
	8	0.552685E-02	0.202721E-02	0.110417E-02	0.681535E-03	0.450571E-03	0.311776E-03	0.223060E-03
	9	0.350698E-02	0.122987E-02	0.648771E-03	0.389766E-03	0.251548E-03	0.170267E-03	0.119349E-03
	10	0.227241E-02	0.764162E-03	0.391123E-03	0.229049E-03	0.144491E-03	0.957821E-04	0.658472E-04
	11	0.149844E-02	0.484450E-03	0.240987E-03	0.137752E-03	0.850389E-04	0.552655E-04	0.372992E-04
	12	0.100408E-02	0.312799E-03	0.151446E-03	0.846000E-04	0.511634E-04	0.326295E-04	0.216393E-04

Table 2. Spatial Moments, Plane Perpendicular Source — Continued

ℓ	n	p = −1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 0.05	Z=50.					
ℓ=0	0	0.211954E 01	0.643694E 00	0.371104E-00	0.259326E-00	0.198934E-00	0.161231E-00	0.135490E-00
	1	0.235416E-00	0.637948E-01	0.330460E-01	0.209325E-01	0.146746E-01	0.109466E-01	0.851898E-02
	2	0.815438E-01	0.164232E-01	0.684021E-02	0.365803E-02	0.223484E-02	0.148490E-02	0.104569E-02
	3	0.206691E-01	0.372254E-02	0.139850E-02	0.680999E-03	0.382068E-03	0.234842E-03	0.153959E-03
	4	0.864823E-02	0.130823E-02	0.424379E-03	0.182391E-03	0.918464E-04	0.513369E-04	0.309221E-04
	5	0.298817E-02	0.412418E-03	0.122684E-03	0.486437E-04	0.227293E-04	0.118508E-04	0.669023E-05
	6	0.139028E-02	0.169983E-03	0.453723E-04	0.163292E-04	0.699312E-05	0.336895E-05	0.176931E-05
	7	0.570350E-03	0.645869E-04	0.160209E-04	0.538011E-05	0.215868E-05	0.978053E-06	0.484789E-06
	8	0.285624E-03	0.294815E-04	0.671315E-05	0.208381E-05	0.777598E-06	0.329437E-06	0.153409E-06
	9	0.131006E-03	0.126619E-04	0.270625E-05	0.790811E-06	0.278640E-06	0.111785E-06	0.494265E-07
	10	0.693742E-04	0.621967E-05	0.123853E-05	0.338723E-06	0.112170E-06	0.424551E-07	0.177709E-07
	11	0.344513E-04	0.291617E-05	0.549239E-06	0.142391E-06	0.448011E-07	0.161470E-07	0.644977E-08
	12	0.190751E-04	0.151552E-05	0.268707E-06	0.657872E-07	0.196068E-07	0.671263E-08	0.255361E-08
		MEV= 0.10	Z=50.					
0	0	0.206696E 01	0.653575E 00	0.383376E-00	0.270443E-00	0.208691E-00	0.169821E-00	0.143126E-00
	1	0.215043E-00	0.613067E-01	0.326594E-01	0.210845E-01	0.149928E-01	0.113103E-01	0.888330E-02
	2	0.716962E-01	0.152845E-01	0.658869E-02	0.360913E-02	0.224544E-02	0.151379E-02	0.107896E-02
	3	0.172138E-01	0.330374E-02	0.129371E-02	0.649382E-03	0.373058E-03	0.233763E-03	0.155745E-03
	4	0.692665E-02	0.112116E-02	0.381048E-03	0.169615E-03	0.878185E-04	0.502161E-04	0.308323E-04
	5	0.228122E-02	0.338451E-03	0.106042E-03	0.437678E-04	0.211251E-04	0.113153E-04	0.653587E-05
	6	0.102035E-02	0.134489E-03	0.379585E-04	0.142780E-04	0.634019E-05	0.314877E-05	0.169732E-05
	7	0.400554E-03	0.490581E-04	0.129177E-04	0.455198E-05	0.190102E-05	0.891120E-06	0.454869E-06
	8	0.192885E-03	0.215788E-04	0.523181E-05	0.170966E-05	0.666197E-06	0.292915E-06	0.140881E-06
	9	0.848891E-04	0.891400E-05	0.203461E-05	0.627880E-06	0.231740E-06	0.967779E-07	0.443237E-07
	10	0.432491E-04	0.421981E-05	0.899540E-06	0.260501E-06	0.906106E-07	0.357964E-07	0.155609E-07
	11	0.206497E-04	0.190575E-05	0.385144E-06	0.105997E-06	0.351205E-07	0.132458E-07	0.550843E-08
	12	0.110075E-04	0.954845E-06	0.182020E-06	0.474131E-07	0.149154E-07	0.535609E-08	0.212619E-08
		MEV= 0.20	Z=50.					
0	0	0.201897E 01	0.662898E 00	0.395172E-00	0.281254E-00	0.218255E-00	0.178291E-00	0.150687E-00
	1	0.205269E-00	0.610985E-01	0.332872E-01	0.218090E-01	0.156768E-01	0.119267E-01	0.943213E-02
	2	0.666747E-01	0.149595E-01	0.664435E-02	0.371445E-02	0.234611E-02	0.160048E-02	0.115182E-02
	3	0.156733E-01	0.317794E-02	0.128812E-02	0.662748E-03	0.388029E-03	0.246877E-03	0.166573E-03
	4	0.614824E-02	0.105628E-02	0.373615E-03	0.171296E-03	0.907638E-04	0.528834E-04	0.329822E-04
	5	0.198453E-02	0.313343E-03	0.102531E-03	0.437438E-04	0.216803E-04	0.118694E-04	0.698375E-05
	6	0.865731E-03	0.121807E-03	0.360451E-04	0.140692E-04	0.643827E-05	0.327886E-05	0.180569E-05
	7	0.333278E-03	0.436546E-04	0.120839E-04	0.443109E-05	0.191240E-05	0.921730E-06	0.481890E-06
	8	0.156613E-03	0.187789E-04	0.480027E-05	0.163736E-05	0.661321E-06	0.299816E-06	0.148084E-06
	9	0.676175E-04	0.762095E-05	0.183773E-05	0.593312E-06	0.227504E-06	0.981879E-07	0.462823E-07
	10	0.336375E-04	0.352843E-05	0.796462E-06	0.241899E-06	0.876321E-07	0.358647E-07	0.160830E-07
	11	0.157601E-04	0.156544E-05	0.335555E-06	0.970339E-07	0.335503E-07	0.131343E-07	0.564536E-08
	12	0.820766E-05	0.767291E-06	0.155424E-06	0.426257E-07	0.140223E-07	0.523757E-08	0.215330E-08
		MEV= 0.40	Z=50.					
0	0	0.196068E 01	0.674639E 00	0.410328E-00	0.295324E-00	0.230813E-00	0.189483E-00	0.160730E-00
	1	0.204177E-00	0.638034E-01	0.355919E-01	0.236670E-01	0.171922E-01	0.131851E-01	0.104943E-01
	2	0.650598E-01	0.155235E-01	0.713892E-02	0.408446E-02	0.262356E-02	0.181303E-02	0.131834E-02
	3	0.155116E-01	0.334919E-02	0.140991E-02	0.744853E-03	0.444883E-03	0.287550E-03	0.196536E-03
	4	0.598905E-02	0.110327E-02	0.408327E-03	0.193489E-03	0.105168E-03	0.625426E-04	0.396708E-04
	5	0.194989E-02	0.330466E-03	0.113425E-03	0.501562E-04	0.255725E-04	0.143287E-04	0.859626E-05
	6	0.838945E-03	0.127244E-03	0.397003E-04	0.161404E-04	0.763257E-05	0.399438E-05	0.225106E-05
	7	0.324582E-03	0.458694E-04	0.134133E-04	0.513525E-05	0.229589E-05	0.113988E-05	0.611276E-06
	8	0.150637E-03	0.195444E-04	0.529767E-05	0.189380E-05	0.795254E-06	0.372654E-06	0.189391E-06
	9	0.651971E-04	0.795661E-05	0.203783E-05	0.690872E-06	0.276007E-06	0.123388E-06	0.599714E-07
	10	0.320623E-04	0.364950E-05	0.877453E-06	0.280692E-06	0.106260E-06	0.451754E-07	0.209458E-07
	11	0.150313E-04	0.162110E-05	0.370623E-06	0.113073E-06	0.409292E-07	0.166757E-07	0.742470E-08
	12	0.774398E-05	0.787323E-06	0.170484E-06	0.494502E-07	0.170725E-07	0.665280E-08	0.283996E-08
		MEV= 0.70	Z=50.					
0	0	0.188653E 01	0.690286E 00	0.431057E-00	0.314890E-00	0.248479E-00	0.205364E-00	0.175072E-00
	1	0.209573E-00	0.696077E-01	0.399547E-01	0.270382E-01	0.198835E-01	0.153905E-01	0.123395E-01
	2	0.658805E-01	0.170208E-01	0.818054E-02	0.481897E-02	0.316132E-02	0.222016E-02	0.163520E-02
	3	0.163973E-01	0.383367E-02	0.169110E-02	0.922786E-03	0.564705E-03	0.372054E-03	0.258296E-03
	4	0.628417E-02	0.126567E-02	0.495752E-03	0.244739E-03	0.137291E-03	0.837387E-04	0.542364E-04
	5	0.211121E-02	0.391314E-03	0.142474E-03	0.658275E-04	0.347442E-04	0.200264E-04	0.123030E-04
	6	0.904831E-03	0.150976E-03	0.503065E-04	0.215059E-04	0.105884E-04	0.572961E-05	0.332170E-05
	7	0.358585E-03	0.557725E-04	0.174530E-04	0.704391E-05	0.328777E-05	0.169242E-05	0.936146E-06
	8	0.166118E-03	0.238155E-04	0.694183E-05	0.262875E-05	0.115772E-05	0.564869E-06	0.297273E-06
	9	0.732789E-04	0.988654E-05	0.272770E-05	0.981791E-06	0.412358E-06	0.192415E-06	0.970784E-07
	10	0.360169E-04	0.454514E-05	0.118156E-05	0.402820E-06	0.160916E-06	0.716613E-07	0.346057E-07
	11	0.171487E-04	0.205146E-05	0.507887E-06	0.165459E-06	0.633350E-07	0.270899E-07	0.125902E-07
	12	0.883675E-05	0.998685E-06	0.234854E-06	0.729663E-07	0.267221E-07	0.109648E-07	0.490000E-08

Table 2. Spatial Moments, Plane Perpendicular Source — Continued

l	n	p=-1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 1.00	Z=50.					
l=0	0	0.182016E 01	0.705028E 00	0.451152E-00	0.334208E-00	0.266149E-00	0.221403E-00	0.189666E-00
	1	0.216277E-00	0.759749E-01	0.447614E-01	0.307823E-01	0.228941E-01	0.178731E-01	0.144275E-01
	2	0.675084E-01	0.187673E-01	0.938938E-02	0.568044E-02	0.379942E-02	0.270839E-02	0.201871E-02
	3	0.175624E-01	0.441848E-02	0.203380E-02	0.114304E-02	0.715244E-03	0.479632E-03	0.337839E-03
	4	0.672288E-02	0.147006E-02	0.606190E-03	0.310589E-03	0.179310E-03	0.111932E-03	0.739030E-04
	5	0.233309E-02	0.469695E-03	0.180437E-03	0.867562E-04	0.472562E-04	0.279522E-04	0.175507E-04
	6	0.100198E-02	0.182575E-03	0.645765E-04	0.288898E-04	0.147534E-04	0.822968E-05	0.489601E-05
	7	0.407229E-03	0.692098E-04	0.230354E-04	0.975259E-05	0.473339E-05	0.251802E-05	0.143275E-05
	8	0.189366E-03	0.297735E-04	0.927092E-05	0.369861E-05	0.170061E-05	0.860687E-06	0.467542E-06
	9	0.852592E-04	0.126232E-04	0.372704E-05	0.141629E-05	0.622436E-06	0.301953E-06	0.157601E-06
	10	0.421024E-04	0.584587E-05	0.163172E-05	0.589308E-06	0.247143E-06	0.114781E-06	0.575100E-07
	11	0.203918E-04	0.268572E-05	0.715037E-06	0.247236E-06	0.995533E-07	0.444984E-07	0.215013E-07
	12	0.105623E-04	0.131682E-05	0.333890E-06	0.110405E-06	0.426501E-07	0.183370E-07	0.854136E-08
		MEV= 2.00	Z=50.					
0	0	0.166229E 01	0.743289E 00	0.505939E 00	0.388619E-00	0.317090E-00	0.268463E-00	0.233085E-00
	1	0.239573E-00	0.968341E-01	0.608830E-01	0.436085E-01	0.333873E-01	0.266494E-01	0.218973E-01
	2	0.750472E-01	0.250330E-01	0.138126E-01	0.892260E-02	0.626340E-02	0.463613E-02	0.356242E-02
	3	0.220783E-01	0.667265E-02	0.340934E-02	0.206088E-02	0.136316E-02	0.955672E-03	0.698394E-03
	4	0.860304E-02	0.230878E-02	0.107869E-02	0.604927E-03	0.374710E-03	0.247695E-03	0.171575E-03
	5	0.326758E-02	0.809187E-03	0.354403E-03	0.187812E-03	0.110529E-03	0.696982E-04	0.462063E-04
	6	0.143778E-02	0.326514E-03	0.133521E-03	0.666869E-04	0.372207E-04	0.223644E-04	0.141797E-04
	7	0.627508E-03	0.133259E-03	0.515694E-04	0.245288E-04	0.130945E-04	0.755019E-05	0.460592E-05
	8	0.299775E-03	0.594201E-04	0.217351E-04	0.983870E-05	0.502193E-05	0.277841E-05	0.163095E-05
	9	0.143178E-03	0.267931E-04	0.933993E-05	0.404991E-05	0.198726E-05	0.105986E-05	0.601074E-06
	10	0.727000E-04	0.128411E-04	0.426562E-05	0.177193E-05	0.836035E-06	0.429951E-06	0.235666E-06
	11	0.370406E-04	0.622060E-05	0.197989E-05	0.791379E-06	0.360375E-06	0.179290E-06	0.952512E-07
	12	0.197269E-04	0.315160E-05	0.961416E-06	0.369923E-06	0.162654E-06	0.783202E-07	0.403490E-07
		MEV= 4.00	Z=50.					
0	0	0.147129E 01	0.797057E 00	0.589712E 00	0.476666E-00	0.403018E-00	0.350432E-00	0.310682E-00
	1	0.272545E-00	0.133502E-00	0.918895E-01	0.698177E-01	0.558315E-01	0.461187E-01	0.389763E-01
	2	0.888482E-01	0.377488E-01	0.236636E-01	0.166827E-01	0.125132E-01	0.976718E-02	0.784291E-02
	3	0.303306E-01	0.117744E-01	0.691871E-02	0.461884E-02	0.330087E-02	0.246552E-02	0.190086E-02
	4	0.124397E-01	0.440065E-02	0.242025E-02	0.152896E-02	0.104090E-02	0.744115E-03	0.551047E-03
	5	0.526459E-02	0.173289E-02	0.903447E-03	0.545271E-03	0.356354E-03	0.245392E-03	0.175512E-03
	6	0.244442E-02	0.750038E-03	0.371146E-03	0.214262E-03	0.134580E-03	0.893743E-04	0.618097E-04
	7	0.116332E-02	0.336296E-03	0.159038E-03	0.882917E-04	0.535379E-04	0.344199E-04	0.230947E-04
	8	0.585948E-03	0.159954E-03	0.724046E-04	0.387069E-04	0.226867E-04	0.141365E-04	0.921270E-05
	9	0.301124E-03	0.781168E-04	0.339902E-04	0.175570E-04	0.997527E-05	0.603964E-05	0.383152E-05
	10	0.160883E-03	0.397454E-04	0.166478E-04	0.831877E-05	0.458668E-05	0.270111E-05	0.166968E-05
	11	0.874041E-04	0.206493E-04	0.835013E-05	0.404593E-05	0.216920E-05	0.124472E-05	0.750911E-06
	12	0.488658E-04	0.110602E-04	0.432326E-05	0.203337E-05	0.106108E-05	0.593781E-06	0.349881E-06
		MEV=10.00	Z=50.					
0	0	0.125340E 01	0.872687E 00	0.722447E 00	0.628176E 00	0.560420E 00	0.508263E 00	0.466373E-00
	1	0.327278E-00	0.208403E-00	0.162842E-00	0.134966E-00	0.115397E-00	0.100671E-00	0.891002E-01
	2	0.121946E-00	0.711676E-01	0.526326E-01	0.417175E-01	0.343079E-01	0.288989E-01	0.247667E-01
	3	0.508175E-01	0.277170E-01	0.196126E-01	0.149889E-01	0.119370E-01	0.976560E-02	0.814610E-02
	4	0.236335E-01	0.121182E-01	0.823256E-02	0.608339E-02	0.470297E-02	0.374500E-02	0.304686E-02
	5	0.116337E-01	0.565588E-02	0.370732E-02	0.265901E-02	0.200198E-02	0.155614E-02	0.123796E-02
	6	0.606391E-02	0.280738E-02	0.178013E-02	0.124185E-02	0.912238E-03	0.693290E-03	0.540103E-03
	7	0.327652E-02	0.145156E-02	0.893005E-03	0.607349E-03	0.436163E-03	0.324674E-03	0.248095E-03
	8	0.183605E-02	0.780768E-03	0.466905E-03	0.310063E-03	0.217979E-03	0.159124E-03	0.119400E-03
	9	0.105550E-02	0.432222E-03	0.251752E-03	0.163508E-03	0.112688E-03	0.807753E-04	0.595890E-04
	10	0.622816E-03	0.246178E-03	0.139872E-03	0.889583E-04	0.601710E-04	0.423961E-04	0.307795E-04
	11	0.374914E-03	0.143399E-03	0.796084E-04	0.496484E-04	0.329999E-04	0.228822E-04	0.163671E-04
	12	0.230459E-03	0.854826E-04	0.464375E-04	0.284362E-04	0.185957E-04	0.127044E-04	0.896317E-05
		MEV= 0.10	Z=82.					
0	0	0.215598E 01	0.637042E 00	0.362973E-00	0.252034E-00	0.192578E-00	0.155663E-00	0.130559E-00
	1	0.145450E-00	0.399781E-01	0.212012E-01	0.137484E-01	0.984798E-02	0.748935E-02	0.592969E-02
	2	0.475773E-01	0.945426E-02	0.394269E-02	0.212383E-02	0.131041E-02	0.880286E-03	0.626953E-03
	3	0.810198E-02	0.148787E-02	0.574647E-03	0.287948E-03	0.166049E-03	0.104720E-03	0.703060E-04
	4	0.313144E-02	0.476640E-03	0.157015E-03	0.687455E-04	0.352988E-04	0.201167E-04	0.123482E-04
	5	0.773991E-03	0.110047E-03	0.338981E-04	0.139162E-04	0.672167E-05	0.361509E-05	0.210067E-05
	6	0.328149E-03	0.410248E-04	0.112572E-04	0.416878E-05	0.183603E-05	0.908617E-06	0.489538E-06
	7	0.100658E-03	0.118577E-04	0.306801E-05	0.107335E-05	0.447636E-06	0.210272E-06	0.107787E-06
	8	0.455790E-04	0.487253E-05	0.115210E-05	0.371075E-06	0.143438E-06	0.628257E-07	0.301867E-07
	9	0.161539E-04	0.163826E-05	0.367667E-06	0.112559E-06	0.414285E-07	0.173100E-07	0.794881E-08
	10	0.770234E-05	0.722688E-06	0.150683E-06	0.430609E-07	0.148618E-07	0.584708E-08	0.253777E-08
	11	0.303136E-05	0.271285E-06	0.539713E-07	0.147332E-07	0.486389E-08	0.183319E-08	0.763318E-09
	12	0.150822E-05	0.126499E-06	0.236501E-07	0.608648E-08	0.190044E-08	0.679484E-09	0.269157E-09

ℓ	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 0.20	Z=82.					
ℓ=0	0	0.208503E 01	0.650141E 00	0.379085E-00	0.266540E-00	0.205256E-00	0.166792E-00	0.140429E-00
	1	0.129397E-00	0.378541E-01	0.207433E-01	0.137474E-01	0.100086E-01	0.771089E-02	0.617124E-02
	2	0.405122E-01	0.866059E-02	0.377005E-02	0.209057E-02	0.131774E-02	0.900110E-03	0.649876E-03
	3	0.640491E-02	0.127430E-02	0.517870E-03	0.269181E-03	0.159681E-03	0.103034E-03	0.705094E-04
	4	0.236493E-02	0.392324E-03	0.137012E-03	0.626458E-04	0.332769E-04	0.194941E-04	0.122444E-04
	5	0.546094E-03	0.850667E-04	0.279536E-04	0.120603E-04	0.606263E-05	0.337048E-05	0.201437E-05
	6	0.220857E-03	0.303625E-04	0.893498E-05	0.349600E-05	0.161048E-05	0.827566E-06	0.460441E-06
	7	0.635871E-04	0.826954E-05	0.230574E-05	0.856624E-06	0.375535E-06	0.184045E-06	0.978660E-07
	8	0.274445E-04	0.324725E-05	0.830644E-06	0.285307E-06	0.116413E-06	0.534094E-07	0.267195E-07
	9	0.916256E-05	0.103163E-05	0.251432E-06	0.824235E-07	0.321552E-07	0.141301E-07	0.678226E-08
	10	0.416290E-05	0.434481E-06	0.986783E-07	0.302989E-07	0.111226E-07	0.461811E-08	0.210202E-08
	11	0.154778E-05	0.154459E-06	0.335769E-07	0.988146E-08	0.348186E-08	0.138967E-08	0.608890E-09
	12	0.733784E-06	0.687369E-07	0.140762E-07	0.391646E-08	0.130908E-08	0.497125E-09	0.207821E-09
		MEV= 0.40	Z=82.					
0	0	0.200135E 01	0.666398E 00	0.399654E-00	0.285394E-00	0.221937E-00	0.181564E-00	0.153619E-00
	1	0.123079E-00	0.386056E-01	0.218830E-01	0.148141E-01	0.109507E-01	0.853667E-02	0.689780E-02
	2	0.370955E-01	0.865618E-02	0.396087E-02	0.227020E-02	0.146553E-02	0.101951E-02	0.746886E-03
	3	0.579388E-02	0.126244E-02	0.542024E-03	0.292742E-03	0.178748E-03	0.118009E-03	0.822904E-04
	4	0.206347E-02	0.378532E-03	0.141196E-03	0.677305E-04	0.373337E-04	0.225291E-04	0.145013E-04
	5	0.469783E-03	0.811198E-04	0.285853E-04	0.129961E-04	0.680938E-05	0.391629E-05	0.240826E-05
	6	0.183513E-03	0.281352E-04	0.894626E-05	0.371592E-05	0.179621E-05	0.960596E-06	0.552841E-06
	7	0.520154E-04	0.755804E-05	0.228426E-05	0.904164E-06	0.417488E-06	0.213734E-06	0.117987E-06
	8	0.217093E-04	0.288196E-05	0.803549E-06	0.295743E-06	0.127797E-06	0.615607E-07	0.321224E-07
	9	0.712748E-05	0.901714E-06	0.240162E-06	0.846157E-07	0.350715E-07	0.162338E-07	0.815316E-08
	10	0.313455E-05	0.368745E-06	0.919126E-07	0.304704E-07	0.119378E-07	0.524368E-08	0.250765E-08
	11	0.114513E-05	0.128961E-06	0.308329E-07	0.982206E-08	0.370384E-08	0.156831E-08	0.724014E-09
	12	0.525960E-06	0.557353E-07	0.125961E-07	0.380780E-08	0.136725E-08	0.552899E-09	0.244407E-09
		MEV= 0.70	Z=82.					
0	0	0.190429E 01	0.686462E 00	0.425935E-00	0.310020E-00	0.244060E-00	0.201378E-00	0.171461E-00
	1	0.124255E-00	0.422318E-01	0.248427E-01	0.172010E-01	0.129161E-01	0.101887E-01	0.831048E-02
	2	0.362491E-01	0.939300E-02	0.455604E-02	0.271366E-02	0.180096E-02	0.127955E-02	0.953191E-03
	3	0.591669E-02	0.143238E-02	0.653853E-03	0.368301E-03	0.232044E-03	0.157014E-03	0.111707E-03
	4	0.205193E-02	0.423803E-03	0.170447E-03	0.863191E-04	0.496027E-04	0.309460E-04	0.204722E-04
	5	0.483367E-03	0.940092E-04	0.358066E-04	0.172408E-04	0.944918E-05	0.563743E-05	0.357462E-05
	6	0.184656E-03	0.321566E-04	0.111604E-04	0.495474E-05	0.252608E-05	0.141171E-05	0.843250E-06
	7	0.537625E-04	0.887634E-05	0.293419E-05	0.124478E-05	0.608026E-06	0.326280E-06	0.187509E-06
	8	0.220120E-04	0.333989E-05	0.102589E-05	0.407568E-06	0.187560E-06	0.952883E-07	0.520550E-07
	9	0.738256E-05	0.106788E-05	0.313892E-06	0.119663E-06	0.529605E-07	0.259257E-07	0.136697E-07
	10	0.319240E-05	0.431261E-06	0.119294E-06	0.430348E-07	0.181025E-07	0.845321E-08	0.426470E-08
	11	0.118630E-05	0.153472E-06	0.407845E-07	0.141677E-07	0.574981E-08	0.259470E-08	0.126689E-08
	12	0.536695E-06	0.655528E-07	0.165393E-07	0.547754E-08	0.212647E-08	0.920522E-09	0.432191E-09
		MEV= 1.00	.2=82.					
0	0	0.181865E 01	0.705370E 00	0.451625E-00	0.334668E-00	0.266572E-00	0.221789E-00	0.190018E-00
	1	0.128040E-00	0.468159E-01	0.284706E-01	0.201156E-01	0.153189E-01	0.122129E-01	0.100458E-01
	2	0.365076E-01	0.104137E-01	0.532366E-02	0.328317E-02	0.223467E-02	0.161879E-02	0.122471E-02
	3	0.631034E-02	0.168145E-02	0.810674E-03	0.474076E-03	0.307187E-03	0.212514E-03	0.153956E-03
	4	0.215368E-02	0.495763E-03	0.213264E-03	0.113353E-03	0.676095E-04	0.434620E-04	0.294736E-04
	5	0.530928E-03	0.115085E-03	0.469732E-04	0.237965E-04	0.135731E-04	0.836629E-05	0.545236E-05
	6	0.200546E-03	0.392370E-04	0.147224E-04	0.693319E-05	0.370558E-05	0.215345E-05	0.132970E-05
	7	0.605889E-04	0.112404E-04	0.402398E-05	0.181487E-05	0.931610E-06	0.521158E-06	0.310375E-06
	8	0.246079E-04	0.421917E-05	0.141273E-05	0.600478E-06	0.292113E-06	0.155546E-06	0.884934E-07
	9	0.851047E-05	0.139141E-05	0.446534E-06	0.182498E-06	0.855729E-07	0.440078E-07	0.242212E-07
	10	0.365895E-05	0.561020E-06	0.170295E-06	0.661961E-07	0.296443E-07	0.146087E-07	0.772609E-08
	11	0.139535E-05	0.204950E-06	0.598519E-07	0.224449E-07	0.971749E-08	0.463773E-08	0.237889E-08
	12	0.628667E-06	0.874612E-07	0.243484E-07	0.874139E-08	0.363496E-08	0.167062E-08	0.827060E-09
		MEV= 2.00	Z=82.					
0	0	0.165215E 01	0.745919E 00	0.509848E 00	0.392598E-00	0.320882E-00	0.272013E-00	0.236395E-00
	1	0.146382E-00	0.620839E-01	0.403520E-01	0.296927E-01	0.232637E-01	0.189486E-01	0.158531E-01
	2	0.408400E-01	0.141726E-01	0.804347E-02	0.531817E-02	0.380957E-02	0.287132E-02	0.224289E-02
	3	0.837800E-02	0.271018E-02	0.145459E-02	0.915541E-03	0.627006E-03	0.453262E-03	0.340461E-03
	4	0.284931E-02	0.817193E-03	0.401014E-03	0.234226E-03	0.150285E-03	0.102490E-03	0.730148E-04
	5	0.805298E-03	0.217301E-03	0.101487E-03	0.567293E-04	0.349620E-04	0.229648E-04	0.157922E-04
	6	0.306551E-03	0.759179E-04	0.331570E-04	0.174973E-04	0.102443E-04	0.642229E-05	0.423055E-05
	7	0.103708E-03	0.243530E-04	0.101797E-04	0.516554E-05	0.291725E-05	0.176828E-05	0.112837E-05
	8	0.427448E-04	0.938565E-05	0.371664E-05	0.179883E-05	0.973424E-06	0.567319E-06	0.349036E-06
	9	0.162757E-04	0.340932E-05	0.129795E-05	0.606382E-06	0.317602E-06	0.179527E-06	0.107304E-06
	10	0.713232E-05	0.141335E-05	0.514022E-06	0.230615E-06	0.116412E-06	0.635915E-07	0.368121E-07
	11	0.295694E-05	0.561719E-06	0.197126E-06	0.856344E-07	0.419557E-07	0.222851E-07	0.125622E-07
	12	0.136165E-05	0.246650E-06	0.831772E-07	0.348690E-07	0.165342E-07	0.851882E-08	0.466651E-08

MEV= 4.00 Z=82.

l	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
l=0	0	0.144942E 01	0.803859E 00	0.600905E 00	0.488873E-00	0.415259E-00	0.362359E-00	0.322168E-00
	1	0.175290E-00	0.911787E-01	0.650525E-01	0.508133E-01	0.415816E-01	0.350395E-01	0.301395E-01
	2	0.488544E-01	0.220284E-01	0.143264E-01	0.103941E-01	0.798688E-02	0.636705E-02	0.520992E-02
	3	0.124684E-01	0.525701E-02	0.325720E-02	0.226721E-02	0.167836E-02	0.129275E-02	0.102435E-02
	4	0.432734E-02	0.166951E-02	0.972066E-03	0.642564E-03	0.454585E-03	0.336094E-03	0.256488E-03
	5	0.144980E-02	0.528464E-03	0.295044E-03	0.188108E-03	0.128802E-03	0.923970E-04	0.685452E-04
	6	0.569255E-03	0.194395E-03	0.103490E-03	0.633727E-04	0.418606E-04	0.290585E-04	0.209101E-04
	7	0.221469E-03	0.720346E-04	0.369676E-04	0.219292E-04	0.140741E-04	0.951257E-05	0.667575E-05
	8	0.946449E-04	0.292140E-04	0.144161E-04	0.826854E-05	0.514848E-05	0.338423E-05	0.231406E-05
	9	0.405929E-04	0.120066E-04	0.573452E-05	0.319694E-05	0.193983E-05	0.124487E-05	0.832227E-06
	10	0.184882E-04	0.523197E-05	0.241592E-05	0.130803E-05	0.772953E-06	0.484050E-06	0.316267E-06
	11	0.850554E-05	0.231722E-05	0.103891E-05	0.548163E-06	0.316399E-06	0.193853E-06	0.124076E-06
	12	0.407434E-05	0.106803E-05	0.464743E-06	0.238899E-06	0.134662E-06	0.807107E-07	0.506027E-07

MEV= 0.025 Air

l	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
0	0	0.201025E 01	0.664624E 00	0.397379E-00	0.283291E-00	0.220065E-00	0.179899E-00	0.152127E-00
	1	0.718231E 00	0.174648E-00	0.825087E-01	0.486035E-01	0.321643E-01	0.229003E-01	0.171509E-01
	2	0.357447E-00	0.675555E-01	0.263011E-01	0.132235E-01	0.764741E-02	0.484052E-02	0.326534E-02
	3	0.193674E-00	0.303174E-01	0.101140E-01	0.445910E-02	0.229969E-02	0.131480E-02	0.809282E-03
	4	0.115974E-00	0.154210E-01	0.448773E-02	0.175879E-02	0.817693E-03	0.426054E-03	0.241085E-03
	5	0.723178E-01	0.839313E-02	0.217138E-02	0.767127E-03	0.325029E-03	0.155697E-03	0.815818E-04
	6	0.474855E-01	0.488290E-02	0.113583E-02	0.364972E-03	0.141947E-03	0.628874E-04	0.306678E-04
	7	0.319594E-01	0.295650E-02	0.625594E-03	0.184516E-03	0.663636E-04	0.273596E-04	0.124817E-04
	8	0.222188E-01	0.186718E-02	0.362222E-03	0.986955E-04	0.330026E-04	0.127186E-04	0.544937E-05
	9	0.157111E-01	0.121108E-02	0.217099E-03	0.550025E-04	0.171931E-04	0.622256E-05	0.251388E-05
	10	0.113640E-01	0.808958E-03	0.134760E-03	0.318987E-04	0.935952E-05	0.319260E-05	0.121997E-05
	11	0.832331E-02	0.550847E-03	0.857570E-04	0.190574E-04	0.527059E-05	0.170057E-05	0.616603E-06
	12	0.620031E-02	0.383374E-03	0.560159E-04	0.117299E-04	0.306772E-05	0.938956E-06	0.323870E-06

MEV= 0.05 Air

l	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
0	0	0.196193E 01	0.674383E 00	0.409994E-00	0.295011E-00	0.230532E-00	0.189232E-00	0.160504E-00
	1	0.705657E 00	0.179575E-00	0.869395E-01	0.520278E-01	0.348157E-01	0.249951E-01	0.188411E-01
	2	0.348996E-00	0.695371E-01	0.279540E-01	0.143694E-01	0.844785E-02	0.541585E-02	0.369102E-02
	3	0.188819E-00	0.312723E-01	0.108252E-01	0.490269E-02	0.258131E-02	0.150041E-02	0.936134E-03
	4	0.112446E-00	0.158762E-01	0.481587E-02	0.194729E-02	0.927948E-03	0.493322E-03	0.283870E-03
	5	0.698961E-01	0.863278E-02	0.233574E-02	0.854352E-03	0.372267E-03	0.182511E-03	0.975266E-04
	6	0.456573E-01	0.500728E-02	0.122192E-02	0.407821E-03	0.163626E-03	0.744112E-04	0.371073E-04
	7	0.306120E-01	0.302496E-02	0.673128E-03	0.206768E-03	0.769235E-04	0.326370E-04	0.152630E-04
	8	0.211749E-01	0.190367E-02	0.389250E-03	0.110733E-03	0.383970E-04	0.152659E-04	0.672055E-05
	9	0.149114E-01	0.123109E-02	0.233039E-03	0.617733E-04	0.200677E-04	0.750918E-05	0.312367E-05
	10	0.107323E-01	0.819174E-03	0.144350E-03	0.358209E-04	0.109456E-04	0.386816E-05	0.152503E-05
	11	0.782718E-02	0.555917E-03	0.916832E-04	0.213963E-04	0.617376E-05	0.206760E-05	0.774902E-06
	12	0.580240E-02	0.385352E-03	0.597286E-04	0.131558E-04	0.359586E-05	0.114439E-05	0.408722E-06

MEV= 0.10 Air

l	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
0	0	0.197775E 01	0.671151E 00	0.405790E-00	0.291090E-00	0.227021E-00	0.186095E-00	0.157684E-00
	1	0.721772E 00	0.180139E-00	0.862902E-01	0.512850E-01	0.341521E-01	0.244297E-01	0.183629E-01
	2	0.358245E-00	0.698270E-01	0.277014E-01	0.141107E-01	0.824038E-02	0.525554E-02	0.356698E-02
	3	0.195105E-00	0.315178E-01	0.107372E-01	0.480773E-02	0.250954E-02	0.144878E-02	0.898931E-03
	4	0.116541E-00	0.160228E-01	0.477434E-02	0.190529E-02	0.898725E-03	0.473892E-03	0.270857E-03
	5	0.727640E-01	0.873662E-02	0.231779E-02	0.835291E-03	0.359716E-03	0.174680E-03	0.926010E-04
	6	0.476509E-01	0.507490E-02	0.121268E-02	0.398236E-03	0.157715E-03	0.709576E-04	0.350663E-04
	7	0.320552E-01	0.307278E-02	0.668713E-03	0.201856E-03	0.740357E-04	0.310410E-04	0.143707E-04
	8	0.222199E-01	0.193642E-02	0.386849E-03	0.108033E-03	0.368945E-04	0.144812E-04	0.630515E-05
	9	0.156884E-01	0.125465E-02	0.231829E-03	0.602680E-04	0.192640E-04	0.710974E-05	0.292246E-05
	10	0.113115E-01	0.835869E-03	0.143670E-03	0.349368E-04	0.104952E-04	0.365523E-05	0.142288E-05
	11	0.826711E-02	0.568151E-03	0.913331E-04	0.208709E-04	0.591590E-05	0.195102E-05	0.721430E-06
	12	0.613760E-02	0.394253E-03	0.595297E-04	0.128308E-04	0.344280E-05	0.107823E-05	0.379686E-06

MEV= 0.20 Air

l	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
0	0	0.196606E 01	0.673536E 00	0.408889E-00	0.293980E-00	0.229607E-00	0.188406E-00	0.159760E-00
	1	0.726624E 00	0.182837E-00	0.879590E-01	0.524210E-01	0.349766E-01	0.250560E-01	0.188551E-01
	2	0.360996E-00	0.710537E-01	0.283556E-01	0.145037E-01	0.849604E-02	0.543166E-02	0.369367E-02
	3	0.197482E-00	0.322106E-01	0.110444E-01	0.496906E-02	0.260353E-02	0.150763E-02	0.937821E-03
	4	0.118047E-00	0.163968E-01	0.492170E-02	0.197527E-02	0.936000E-03	0.495417E-03	0.284067E-03
	5	0.738788E-01	0.896200E-02	0.239608E-02	0.868875E-03	0.376101E-03	0.183428E-03	0.976007E-04
	6	0.484020E-01	0.520982E-02	0.125532E-02	0.415063E-03	0.165327E-03	0.747482E-04	0.370975E-04
	7	0.326056E-01	0.315908E-02	0.693473E-03	0.210857E-03	0.778189E-04	0.328033E-04	0.152584E-04
	8	0.226054E-01	0.199159E-02	0.401501E-03	0.112998E-03	0.388498E-04	0.153385E-04	0.671324E-05
	9	0.159734E-01	0.129153E-02	0.240888E-03	0.631336E-04	0.203240E-04	0.754829E-05	0.312016E-05
	10	0.115164E-01	0.860546E-03	0.149351E-03	0.366285E-04	0.110866E-04	0.388720E-05	0.152232E-05
	11	0.842039E-02	0.585208E-03	0.950121E-04	0.219039E-04	0.625780E-05	0.207843E-05	0.773463E-06
	12	0.625008E-02	0.406053E-03	0.619380E-04	0.134724E-04	0.364482E-05	0.115002E-05	0.407711E-06

ℓ	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV= 0.40	Air					
ℓ=0	0	0.193466E 01	0.680035E 00	0.417408E-00	0.301965E-00	0.236783E-00	0.194833E-00	0.165548E-00
	1	0.729586E 00	0.188407E-00	0.918987E-01	0.552590E-01	0.371037E-01	0.267060E-01	0.201713E-01
	2	0.364348E-00	0.739031E-01	0.300292E-01	0.155520E-01	0.919460E-02	0.592058E-02	0.404941E-02
	3	0.201019E-00	0.338395E-01	0.118444E-01	0.540952E-02	0.286724E-02	0.167575E-02	0.105034E-02
	4	0.120635E-00	0.173285E-01	0.532376E-02	0.217449E-02	0.104482E-02	0.559318E-03	0.323756E-03
	5	0.759028E-01	0.953196E-02	0.261331E-02	0.966381E-03	0.424984E-03	0.210012E-03	0.112996E-03
	6	0.498807E-01	0.556471E-02	0.137744E-02	0.465338E-03	0.188663E-03	0.865806E-04	0.435221E-04
	7	0.337314E-01	0.338977E-02	0.765483E-03	0.238182E-03	0.896165E-04	0.384032E-04	0.181194E-04
	8	0.234434E-01	0.214395E-02	0.445211E-03	0.128413E-03	0.450780E-04	0.181196E-04	0.805560E-05
	9	0.166148E-01	0.139521E-02	0.268329E-03	0.721627E-04	0.237503E-04	0.899219E-05	0.378051E-05
	10	0.120031E-01	0.932019E-03	0.166958E-03	0.420654E-04	0.130331E-04	0.466430E-05	0.186013E-05
	11	0.879712E-02	0.635579E-03	0.106596E-03	0.252713E-04	0.739848E-05	0.251096E-05	0.952611E-06
	12	0.654068E-02	0.441928E-03	0.696892E-04	0.156030E-04	0.433012E-05	0.139757E-05	0.505652E-06
		MEV= 0.70	Air					
0	0	0.193466E 01	0.680035E 00	0.417408E-00	0.301965E-00	0.236783E-00	0.194833E-00	0.165548E-00
	1	0.732494E 00	0.188955E-00	0.921103E-01	0.553644E-01	0.371642E-01	0.267440E-01	0.201968E-01
	2	0.365447E-00	0.740506E-01	0.300728E-01	0.155695E-01	0.920289E-02	0.592501E-02	0.405198E-02
	3	0.201790E-00	0.339162E-01	0.118609E-01	0.541415E-02	0.286867E-02	0.167617E-02	0.105043E-02
	4	0.121007E-00	0.173527E-01	0.532606E-02	0.217410E-02	0.104420E-02	0.558832E-03	0.323411E-03
	5	0.761462E-01	0.954376E-02	0.261346E-02	0.965685E-03	0.424450E-03	0.209668E-03	0.112780E-03
	6	0.500051E-01	0.556719E-02	0.137632E-02	0.464566E-03	0.188237E-03	0.863475E-04	0.433908E-04
	7	0.338087E-01	0.339006E-02	0.764492E-03	0.237646E-03	0.893530E-04	0.382705E-04	0.180497E-04
	8	0.234800E-01	0.214247E-02	0.444265E-03	0.128011E-03	0.449039E-04	0.180395E-04	0.801653E-05
	9	0.166341E-01	0.139357E-02	0.267608E-03	0.718914E-04	0.236420E-04	0.894571E-05	0.375915E-05
	10	0.120078E-01	0.930183E-03	0.166371E-03	0.418712E-04	0.129621E-04	0.463592E-05	0.184787E-05
	11	0.879600E-02	0.633960E-03	0.106154E-03	0.251375E-04	0.735290E-05	0.249378E-05	0.945578E-06
	12	0.653464E-02	0.440441E-03	0.693420E-04	0.155070E-04	0.429964E-05	0.138676E-05	0.501456E-06
		MEV= 1.00	Air					
0	0	0.182248E 01	0.704500E 00	0.450422E-00	0.333501E-00	0.265498E-00	0.220810E-00	0.189124E-00
	1	0.722003E 00	0.206761E-00	0.106559E-00	0.664098E-01	0.457469E-01	0.335712E-01	0.257461E-01
	2	0.368356E-00	0.841037E-01	0.366584E-01	0.199286E-01	0.122159E-01	0.809147E-02	0.566190E-02
	3	0.208128E-00	0.397848E-01	0.151071E-01	0.731864E-02	0.405930E-02	0.246027E-02	0.158893E-02
	4	0.126889E-00	0.208665E-01	0.702612E-02	0.307374E-02	0.155907E-02	0.872290E-03	0.523895E-03
	5	0.811430E-01	0.117319E-01	0.355394E-02	0.141920E-02	0.663947E-03	0.345354E-03	0.194054E-03
	6	0.539961E-01	0.696998E-02	0.192002E-02	0.705661E-03	0.306528E-03	0.149057E-03	0.787324E-04
	7	0.369786E-01	0.431607E-02	0.109110E-02	0.371712E-03	0.150793E-03	0.688854E-04	0.343465E-04
	8	0.259710E-01	0.276784E-02	0.646823E-03	0.205445E-03	0.782093E-04	0.337010E-04	0.159180E-04
	9	0.186006E-01	0.182515E-02	0.396790E-03	0.118104E-03	0.423712E-04	0.172855E-04	0.775892E-05
	10	0.135601E-01	0.123332E-02	0.250745E-03	0.702427E-04	0.238363E-04	0.923520E-05	0.395041E-05
	11	0.100288E-01	0.850431E-03	0.162442E-03	0.429937E-04	0.138452E-04	0.510912E-05	0.208792E-05
	12	0.751662E-02	0.597184E-03	0.107594E-03	0.269941E-04	0.827305E-05	0.291500E-05	0.114063E-05
		MEV= 2.00	Air					
0	0	0.166734E 01	0.741968E 00	0.504011E 00	0.386662E-00	0.315229E-00	0.266723E-00	0.231463E-00
	1	0.700656E 00	0.235285E-00	0.131882E-00	0.868731E-01	0.623038E-01	0.471615E-01	0.370761E-01
	2	0.370237E-00	0.101296E-00	0.490618E-01	0.287047E-01	0.185996E-01	0.128738E-01	0.933841E-02
	3	0.216259E-00	0.502938E-01	0.215901E-01	0.114320E-01	0.679401E-02	0.435432E-02	0.294601E-02
	4	0.135288E-00	0.274205E-01	0.105973E-01	0.513855E-02	0.282788E-02	0.169190E-02	0.107524E-02
	5	0.886039E-01	0.159477E-01	0.561555E-02	0.251615E-02	0.129167E-02	0.725893E-03	0.435661E-03
	6	0.601780E-01	0.975193E-02	0.315733E-02	0.131641E-02	0.633977E-03	0.336280E-03	0.191406E-03
	7	0.420102E-01	0.619795E-02	0.185908E-02	0.725489E-03	0.329358E-03	0.165569E-03	0.896930E-04
	8	0.300170E-01	0.406753E-02	0.113731E-02	0.417424E-03	0.179354E-03	0.857427E-04	0.443415E-04
	9	0.218524E-01	0.273993E-02	0.717930E-03	0.248871E-03	0.101561E-03	0.463124E-04	0.229242E-04
	10	0.161723E-01	0.188775E-02	0.465613E-03	0.152992E-03	0.594777E-04	0.259387E-04	0.123179E-04
	11	0.121341E-01	0.132555E-02	0.308970E-03	0.965366E-04	0.358493E-04	0.149871E-04	0.684222E-05
	12	0.921784E-02	0.946632E-03	0.209225E-03	0.623344E-04	0.221641E-04	0.890077E-05	0.391384E-05
		MEV= 4.00	Air					
0	0	0.148027E 01	0.794306E 00	0.585224E 00	0.471801E-00	0.398161E-00	0.345717E-00	0.306154E-00
	1	0.663454E 00	0.277876E-00	0.174712E-00	0.124337E-00	0.944591E-01	0.748193E-01	0.610377E-01
	2	0.368655E-00	0.129566E-00	0.723667E-01	0.468175E-01	0.327759E-01	0.241486E-01	0.184532E-01
	3	0.225379E-00	0.688764E-01	0.348872E-01	0.208389E-01	0.136159E-01	0.943322E-02	0.681642E-02
	4	0.146480E-00	0.397651E-01	0.185006E-01	0.103028E-01	0.633362E-02	0.415490E-02	0.285655E-02
	5	0.992995E-01	0.243153E-01	0.104877E-01	0.548393E-02	0.319053E-02	0.199190E-02	0.130883E-02
	6	0.695327E-01	0.155340E-01	0.625575E-02	0.308807E-02	0.170800E-02	0.101879E-02	0.642004E-03
	7	0.499307E-01	0.102700E-01	0.388379E-02	0.181797E-02	0.959441E-03	0.548518E-03	0.332439E-03
	8	0.366088E-01	0.698359E-02	0.249177E-02	0.111008E-02	0.560727E-03	0.308075E-03	0.180000E-03
	9	0.273060E-01	0.486066E-02	0.164293E-02	0.698801E-03	0.338732E-03	0.179262E-03	0.101178E-03
	10	0.206703E-01	0.345112E-02	0.110886E-02	0.451516E-03	0.210510E-03	0.107521E-03	0.567277E-04
	11	0.158462E-01	0.249246E-02	0.763562E-03	0.298360E-03	0.134064E-03	0.662044E-04	0.350484E-04
	12	0.122844E-01	0.182728E-02	0.535135E-03	0.201082E-03	0.872349E-04	0.417152E-04	0.214346E-04

Table 2. Spatial Moments, Plane Perpendicular Source — Continued

ℓ	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV=10.00	Air					
ℓ=0	0	0.124042E 01	0.877859E 00	0.732230E 00	0.639936E 00	0.573129E 00	0.521417E 00	0.479695E-00
	1	0.589641E 00	0.351734E-00	0.265061E-00	0.213940E-00	0.179097E-00	0.153517E-00	0.133842E-00
	2	0.350544E-00	0.185083E-00	0.129313E-00	0.982693E-01	0.781190E-01	0.639498E-01	0.534688E-01
	3	0.228750E-00	0.109508E-00	0.718858E-01	0.519597E-01	0.395578E-01	0.311558E-01	0.251471E-01
	4	0.157693E-00	0.694556E-01	0.431920E-01	0.298836E-01	0.219055E-01	0.166772E-01	0.130497E-01
	5	0.112824E-00	0.461852E-01	0.273657E-01	0.182047E-01	0.128973E-01	0.952315E-02	0.724582E-02
	6	0.829849E-01	0.318110E-01	0.180372E-01	0.115759E-01	0.794876E-02	0.570669E-02	0.423165E-02
	7	0.623676E-01	0.225208E-01	0.122619E-01	0.761225E-02	0.507780E-02	0.355170E-02	0.257141E-02
	8	0.477036E-01	0.163049E-01	0.854884E-02	0.514511E-02	0.334038E-02	0.228014E-02	0.161425E-02
	9	0.370280E-01	0.120285E-01	0.608800E-02	0.355904E-02	0.225264E-02	0.150283E-02	0.104181E-02
	10	0.291107E-01	0.901978E-02	0.441663E-02	0.251239E-02	0.155266E-02	0.101381E-02	0.689095E-03
	11	0.231505E-01	0.686417E-02	0.325857E-02	0.180681E-02	0.109195E-02	0.698835E-03	0.466380E-03
	12	0.186125E-01	0.529781E-02	0.244347E-02	0.132303E-02	0.783226E-03	0.492083E-03	0.322934E-03
		MEV= 0.025	Polystyrene					
0	0	0.201060E 01	0.664555E 00	0.397290E-00	0.283208E-00	0.219992E-00	0.179834E-00	0.152069E-00
	1	0.823196E 00	0.192682E-00	0.890826E-01	0.517516E-01	0.339174E-01	0.239768E-01	0.178590E-01
	2	0.443707E-00	0.801637E-01	0.303328E-01	0.149483E-01	0.851668E-02	0.532833E-02	0.356096E-02
	3	0.261138E-00	0.387507E-01	0.124828E-01	0.536575E-02	0.271393E-02	0.152771E-02	0.928411E-03
	4	0.166713E-00	0.209460E-01	0.586828E-02	0.223599E-02	0.101685E-02	0.520390E-03	0.290082E-03
	5	0.110812E-00	0.121017E-01	0.300419E-02	0.102902E-02	0.425436E-03	0.199730E-03	0.102892E-03
	6	0.768367E-01	0.741666E-02	0.165203E-02	0.513737E-03	0.194645E-03	0.843864E-04	0.404019E-04
	7	0.545785E-01	0.472610E-02	0.955440E-03	0.272199E-03	0.952123E-04	0.383544E-04	0.171555E-04
	8	0.398179E-01	0.312595E-02	0.578406E-03	0.152009E-03	0.493709E-04	0.185695E-04	0.779232E-05
	9	0.295273E-01	0.212182E-02	0.362143E-03	0.883601E-04	0.267917E-04	0.945232E-05	0.373602E-05
	10	0.223107E-01	0.147814E-02	0.234113E-03	0.533032E-04	0.151541E-04	0.503402E-05	0.188029E-05
	11	0.170599E-01	0.104903E-02	0.155050E-03	0.331001E-04	0.885996E-05	0.278115E-05	0.984788E-06
	12	0.132297E-01	0.759006E-03	0.105162E-03	0.211319E-04	0.534380E-05	0.158985E-05	0.535113E-06
		MEV= 0.05	Polystyrene					
0	0	0.195355E 01	0.676108E 00	0.412248E-00	0.297120E-00	0.232425E-00	0.190926E-00	0.162028E-00
	1	0.803874E 00	0.198790E-00	0.946863E-01	0.560715E-01	0.372474E-01	0.265964E-01	0.199649E-01
	2	0.431432E-00	0.830220E-01	0.326475E-01	0.165233E-01	0.960152E-02	0.609947E-02	0.412637E-02
	3	0.253508E-00	0.402555E-01	0.135597E-01	0.602114E-02	0.312238E-02	0.179293E-02	0.110747E-02
	4	0.161166E-00	0.217559E-01	0.640719E-02	0.253499E-02	0.118758E-02	0.622633E-03	0.354127E-03
	5	0.106820E-00	0.125691E-01	0.329339E-02	0.117636E-02	0.503059E-03	0.242867E-03	0.128102E-03
	6	0.737640E-01	0.769029E-02	0.181453E-02	0.590653E-03	0.232333E-03	0.103944E-03	0.511205E-04
	7	0.522256E-01	0.489374E-02	0.105106E-02	0.314452E-03	0.114563E-03	0.477731E-04	0.220154E-04
	8	0.379467E-01	0.322913E-02	0.636430E-03	0.176154E-03	0.597669E-04	0.233381E-04	0.101179E-04
	9	0.280437E-01	0.218735E-02	0.398529E-03	0.102669E-03	0.326052E-04	0.119739E-04	0.490194E-05
	10	0.211050E-01	0.151957E-02	0.257431E-03	0.620279E-04	0.185147E-04	0.641745E-05	0.248867E-05
	11	0.160819E-01	0.107580E-02	0.170368E-03	0.385676E-04	0.108622E-04	0.356557E-05	0.131369E-05
	12	0.124222E-01	0.776040E-03	0.115385E-03	0.246329E-04	0.656731E-05	0.204740E-05	0.718506E-06
		MEV= 0.10	Polystyrene					
0	0	0.198551E 01	0.669579E 00	0.403755E-00	0.289198E-00	0.225329E-00	0.184586E-00	0.156329E-00
	1	0.828097E 00	0.197590E-00	0.923083E-01	0.539872E-01	0.355506E-01	0.252203E-01	0.188368E-01
	2	0.446433E-00	0.824925E-01	0.316549E-01	0.157539E-01	0.904172E-02	0.568919E-02	0.381958E-02
	3	0.263871E-00	0.400675E-01	0.131122E-01	0.570307E-02	0.291121E-02	0.165097E-02	0.100949E-02
	4	0.168325E-00	0.216669E-01	0.617853E-02	0.238678E-02	0.109750E-02	0.566823E-03	0.318407E-03
	5	0.112019E-00	0.125381E-01	0.317168E-02	0.110295E-02	0.461731E-03	0.219061E-03	0.113871E-03
	6	0.775700E-01	0.767892E-02	0.174508E-02	0.551700E-03	0.211948E-03	0.929839E-04	0.449779E-04
	7	0.550934E-01	0.489421E-02	0.101032E-02	0.292931E-03	0.104011E-03	0.424462E-04	0.192027E-04
	8	0.401240E-01	0.323303E-02	0.611391E-03	0.163693E-03	0.540278E-04	0.206090E-04	0.875624E-05
	9	0.297287E-01	0.219319E-02	0.382825E-03	0.952399E-04	0.293730E-04	0.105197E-04	0.421384E-05
	10	0.224174E-01	0.152530E-02	0.247238E-03	0.574443E-04	0.166265E-04	0.561181E-05	0.212623E-05
	11	0.171185E-01	0.108130E-02	0.163648E-03	0.356760E-04	0.972956E-05	0.310567E-05	0.111642E-05
	12	0.132454E-01	0.780812E-03	0.110836E-03	0.227597E-04	0.586842E-05	0.177681E-05	0.607615E-06
		MEV= 0.20	Polystyrene					
0	0	0.196823E 01	0.673091E 00	0.408310E-00	0.293439E-00	0.229123E-00	0.187973E-00	0.159371E-00
	1	0.827434E 00	0.200379E-00	0.943671E-01	0.554782E-01	0.366664E-01	0.260830E-01	0.195225E-01
	2	0.445861E-00	0.838140E-01	0.325044E-01	0.162966E-01	0.940471E-02	0.594293E-02	0.400362E-02
	3	0.263951E-00	0.408071E-01	0.135166E-01	0.593157E-02	0.304885E-02	0.173864E-02	0.106796E-02
	4	0.168248E-00	0.220726E-01	0.637996E-02	0.249026E-02	0.115459E-02	0.600364E-03	0.339170E-03
	5	0.111992E-00	0.127821E-01	0.328074E-02	0.115403E-02	0.487656E-03	0.233176E-03	0.122017E-03
	6	0.774780E-01	0.782573E-02	0.180621E-02	0.578210E-03	0.224452E-03	0.993397E-04	0.484175E-04
	7	0.550076E-01	0.498778E-02	0.104647E-02	0.307488E-03	0.110416E-03	0.454968E-04	0.207562E-04
	8	0.400185E-01	0.329266E-02	0.633287E-03	0.171971E-03	0.574497E-04	0.221447E-04	0.949543E-05
	9	0.296299E-01	0.223273E-02	0.396593E-03	0.100138E-03	0.312811E-04	0.113290E-04	0.458305E-05
	10	0.223166E-01	0.155145E-02	0.256043E-03	0.604167E-04	0.177238E-04	0.605356E-05	0.231792E-05
	11	0.170262E-01	0.109908E-02	0.169437E-03	0.375338E-04	0.103811E-04	0.335524E-05	0.121967E-05
	12	0.131575E-01	0.792850E-03	0.114689E-03	0.239432E-04	0.626448E-05	0.192165E-05	0.664909E-06

MEV= 0.40 Polystyrene

ℓ	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
ℓ=0	0	0.193766E 01	0.679408E 00	0.416582E-00	0.301188E-00	0.236082E-00	0.194204E-00	0.164982E-00
	1	0.826759E 00	0.205567E-00	0.982038E-01	0.582699E-01	0.387641E-01	0.277105E-01	0.208198E-01
	2	0.447505E-00	0.866848E-01	0.342392E-01	0.173861E-01	0.101288E-01	0.644774E-02	0.436940E-02
	3	0.266532E-00	0.425353E-01	0.143888E-01	0.641235E-02	0.333540E-02	0.192022E-02	0.118874E-02
	4	0.170411E-00	0.231196E-01	0.684214E-02	0.271894E-02	0.127865E-02	0.672630E-03	0.383694E-03
	5	0.113849E-00	0.134529E-01	0.354210E-02	0.127108E-02	0.545877E-03	0.264548E-03	0.140018E-03
	6	0.789362E-01	0.826359E-02	0.195993E-02	0.641266E-03	0.253454E-03	0.113892E-03	0.562371E-04
	7	0.561866E-01	0.528440E-02	0.114089E-02	0.343167E-03	0.125668E-03	0.526551E-04	0.243724E-04
	8	0.409442E-01	0.349683E-02	0.692953E-03	0.192904E-03	0.658159E-04	0.258352E-04	0.112552E-04
	9	0.303731E-01	0.237700E-02	0.435476E-03	0.112859E-03	0.360529E-04	0.133142E-04	0.547934E-05
	10	0.229059E-01	0.165469E-02	0.281925E-03	0.683580E-04	0.205322E-04	0.715949E-05	0.279217E-05
	11	0.175015E-01	0.117443E-02	0.187067E-03	0.426238E-04	0.120833E-04	0.399151E-05	0.147947E-05
	12	0.135385E-01	0.848400E-03	0.126895E-03	0.272738E-04	0.732143E-05	0.229777E-05	0.811517E-06

MEV= 0.70 Polystyrene

ℓ	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
0	0	0.188873E 01	0.689809E 00	0.430416E-00	0.314279E-00	0.247924E-00	0.204863E-00	0.174618E-00
	1	0.821698E 00	0.213622E-00	0.104538E-00	0.630050E-01	0.423819E-01	0.305505E-01	0.231039E-01
	2	0.449039E-00	0.914614E-01	0.372402E-01	0.193127E-01	0.114292E-01	0.736498E-02	0.504030E-02
	3	0.270091E-00	0.454823E-01	0.159361E-01	0.728596E-02	0.386524E-02	0.226061E-02	0.141770E-02
	4	0.173874E-00	0.249697E-01	0.768627E-02	0.314638E-02	0.151478E-02	0.812234E-03	0.470784E-03
	5	0.116949E-00	0.146605E-01	0.402856E-02	0.149438E-02	0.659181E-03	0.326625E-03	0.176148E-03
	6	0.815179E-01	0.907091E-02	0.225193E-02	0.764017E-03	0.311100E-03	0.143340E-03	0.723099E-04
	7	0.583284E-01	0.583969E-02	0.132290E-02	0.413720E-03	0.156505E-03	0.674124E-04	0.319565E-04
	8	0.426917E-01	0.388627E-02	0.809806E-03	0.234954E-03	0.830115E-04	0.335780E-04	0.150160E-04
	9	0.318064E-01	0.265591E-02	0.512575E-03	0.138742E-03	0.459971E-04	0.175423E-04	0.742635E-05
	10	0.240770E-01	0.185751E-02	0.333934E-03	0.847272E-04	0.264641E-04	0.954904E-05	0.383844E-05
	11	0.184644E-01	0.132428E-02	0.222882E-03	0.532317E-04	0.157209E-04	0.538375E-05	0.206054E-05
	12	0.143304E-01	0.960467E-03	0.151986E-03	0.342937E-04	0.960641E-05	0.313090E-05	0.114375E-05

MEV= 1.00 Polystyrene

ℓ	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
0	0	0.184048E 01	0.700436E 00	0.444834E-00	0.328097E-00	0.260535E-00	0.216291E-00	0.185003E-00
	1	0.814119E 00	0.221640E-00	0.111186E-00	0.681030E-01	0.463432E-01	0.336989E-01	0.256603E-01
	2	0.449603E-00	0.964364E-01	0.405036E-01	0.214627E-01	0.129077E-01	0.842320E-02	0.582346E-02
	3	0.273043E-00	0.486097E-01	0.176562E-01	0.828626E-02	0.448550E-02	0.266615E-02	0.169445E-02
	4	0.177121E-00	0.269796E-01	0.864620E-02	0.364806E-02	0.179881E-02	0.983549E-03	0.579466E-03
	5	0.119976E-00	0.159932E-01	0.459163E-02	0.176189E-02	0.798673E-03	0.404798E-03	0.222530E-03
	6	0.841304E-01	0.997559E-02	0.259537E-02	0.913742E-03	0.383527E-03	0.181273E-03	0.934628E-04
	7	0.605445E-01	0.646998E-02	0.154000E-02	0.501177E-03	0.195968E-03	0.868180E-04	0.421678E-04
	8	0.445362E-01	0.433343E-02	0.950908E-03	0.287810E-03	0.105370E-03	0.439439E-04	0.201815E-04
	9	0.333450E-01	0.297970E-02	0.606766E-03	0.171710E-03	0.591225E-04	0.232991E-04	0.101512E-04
	10	0.253519E-01	0.209518E-02	0.398109E-03	0.105814E-03	0.343958E-04	0.128508E-04	0.532697E-05
	11	0.195277E-01	0.150161E-02	0.267522E-03	0.670508E-04	0.206467E-04	0.733497E-05	0.290041E-05
	12	0.152147E-01	0.109416E-02	0.183525E-03	0.435264E-04	0.127346E-04	0.431311E-05	0.163068E-05

MEV= 2.00 Polystyrene

ℓ	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
0	0	0.168928E 01	0.736399E 00	0.495786E-00	0.378345E-00	0.307342E-00	0.259366E-00	0.224624E-00
	1	0.777972E 00	0.248071E-00	0.135372E-00	0.876350E-01	0.620705E-01	0.465399E-01	0.363124E-01
	2	0.441878E-00	0.113219E-00	0.528241E-01	0.301218E-01	0.191457E-01	0.130522E-01	0.935143E-02
	3	0.275416E-00	0.594207E-01	0.243831E-01	0.125041E-01	0.725071E-02	0.455605E-02	0.303235E-02
	4	0.182396E-00	0.340732E-01	0.125158E-01	0.584913E-02	0.312760E-02	0.182781E-02	0.113894E-02
	5	0.125893E-00	0.207742E-01	0.691972E-02	0.297612E-02	0.147918E-02	0.809425E-03	0.474964E-03
	6	0.897232E-01	0.132727E-01	0.404876E-02	0.161471E-02	0.750589E-03	0.386612E-03	0.214616E-03
	7	0.655413E-01	0.879372E-02	0.247640E-02	0.921521E-03	0.402687E-03	0.196087E-03	0.103368E-03
	8	0.488675E-01	0.600246E-02	0.157077E-02	0.548213E-03	0.226163E-03	0.104496E-03	0.524782E-04
	9	0.370507E-01	0.419872E-02	0.102674E-02	0.337576E-03	0.131965E-03	0.580376E-04	0.278448E-04
	10	0.285008E-01	0.299906E-02	0.688570E-03	0.214085E-03	0.795564E-04	0.333967E-04	0.153444E-04
	11	0.221948E-01	0.218062E-02	0.472010E-03	0.139242E-03	0.493279E-04	0.198137E-04	0.873713E-05
	12	0.174735E-01	0.161047E-02	0.329832E-03	0.925913E-04	0.313482E-04	0.120747E-04	0.512015E-05

MEV= 4.00 Polystyrene

ℓ	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
0	0	0.151748E 01	0.783171E 00	0.567284E 00	0.452523E-00	0.379038E-00	0.327244E-00	0.288489E-00
	1	0.731808E 00	0.285635E-00	0.173290E-00	0.120430E-00	0.898954E-01	0.702288E-01	0.566523E-01
	2	0.433623E-00	0.139439E-00	0.741694E-01	0.463857E-01	0.316462E-01	0.228380E-01	0.171540E-01
	3	0.280941E-00	0.775528E-01	0.370364E-01	0.212141E-01	0.134169E-01	0.905172E-02	0.639625E-02
	4	0.192399E-00	0.467274E-01	0.203334E-01	0.107867E-01	0.638228E-02	0.405691E-02	0.271551E-02
	5	0.136871E-00	0.297518E-01	0.119217E-01	0.590457E-02	0.329014E-02	0.198172E-02	0.126281E-02
	6	0.100227E-00	0.197485E-01	0.734549E-02	0.341742E-02	0.180244E-02	0.103323E-02	0.629230E-03
	7	0.750644E-01	0.135414E-01	0.470536E-02	0.206655E-02	0.103592E-02	0.567158E-03	0.331128E-03
	8	0.572692E-01	0.953477E-02	0.311150E-02	0.129530E-02	0.619219E-03	0.324745E-03	0.182241E-03
	9	0.443653E-01	0.686253E-02	0.211255E-02	0.836494E-03	0.382465E-03	0.192621E-03	0.104133E-03
	10	0.348226E-01	0.503245E-02	0.146695E-02	0.554150E-03	0.242940E-03	0.117752E-03	0.614436E-04
	11	0.276409E-01	0.374996E-02	0.103852E-02	0.375251E-03	0.158086E-03	0.738855E-04	0.372763E-04
	12	0.221586E-01	0.283378E-02	0.747765E-03	0.259044E-03	0.105074E-03	0.474345E-04	0.231737E-04

	n	p=−1/2	1/2	3/2	5/2	7/2	9/2	11/2
		MEV=10.00		Polystyrene				
$\ell=0$	0	0.131041E 01	0.851004E 00	0.682461E 00	0.580966E 00	0.510111E 00	0.456785E-00	0.414738E-00
	1	0.661394E 00	0.345512E-00	0.243552E-00	0.187640E-00	0.151512E-00	0.126091E-00	0.107215E-00
	2	0.415490E-00	0.186092E-00	0.119109E-00	0.850245E-01	0.643354E-01	0.505532E-01	0.408114E-01
	3	0.285277E-00	0.113084E-00	0.668626E-01	0.447947E-01	0.320986E-01	0.240306E-01	0.185656E-01
	4	0.206146E-00	0.737334E-01	0.407113E-01	0.258085E-01	0.176332E-01	0.126517E-01	0.940323E-02
	5	0.154130E-00	0.504078E-01	0.261891E-01	0.158013E-01	0.103435E-01	0.714256E-02	0.512630E-02
	6	0.118165E-00	0.356836E-01	0.175444E-01	0.101189E-01	0.636947E-02	0.424665E-02	0.295163E-02
	7	0.923637E-01	0.259515E-01	0.121292E-01	0.671038E-02	0.407355E-02	0.262891E-02	0.177355E-02
	8	0.733366E-01	0.192895E-01	0.860163E-02	0.457767E-02	0.268631E-02	0.168159E-02	0.110319E-02
	9	0.589888E-01	0.145985E-01	0.623010E-02	0.319697E-02	0.181719E-02	0.110531E-02	0.706255E-03
	10	0.479735E-01	0.112186E-01	0.459397E-02	0.227768E-02	0.125617E-02	0.743534E-03	0.463352E-03
	11	0.393866E-01	0.873530E-02	0.344016E-02	0.165086E-02	0.884721E-03	0.510269E-03	0.310494E-03
	12	0.326062E-01	0.688028E-02	0.261113E-02	0.121470E-02	0.633399E-03	0.356380E-03	0.211966E-03

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WASHINGTON, February 10, 1959.

U.S. GOVERNMENT PRINTING OFFICE: 1959 O—508105