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Calculated Photon Kerma Factors Based on the LLNL EGDL Data File

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Foreword

The UCRL-90400 series, *An Integrated System for Production of Neutronics and Photonics Calculational Constants*, describes an integrated, computer-oriented system for the production and application of neutronics and photonics calculational constants.

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- Vol. 4, Rev. 1, Appendix C, *The Neutron Library (ENDL82) in the Transmittal Format*, June 1982.
- Vol. 5, Part A, Rev. 1, *CLYDE: A Code for the Production of Calculational Constants from Nuclear Data*, September 1975.
- Vol. 5, Part B, Rev. 1, *Relativistic Transformations between Center-of-Mass and Laboratory Systems for Two-Body Nuclear Reactions*, April 1978.
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- Vol. 8, Part A, Rev. 1, *Supplemental Neutron-Induced Interactions ($Z \leq 35$): Graphical, Experimental Data*, July 1976.
- Vol. 8, Part B, Rev. 1, *Supplemental Neutron-Induced Interactions ($Z > 35$): Graphical, Experimental Data*, July 1976.
- Vol. 9, *Thresholds of Nuclear Reactions Induced by Neutrons, Photons, Deuterons, Tritons, and Alpha Particles*, September 1970.
- Vol. 10, Rev. 1, *Tabulated Experimental Data for Neutron-Induced Interactions*, July 1976.
- Vol. 11, *Experimental Data, Indexes, and Techniques of Obtaining a Selected Set of Neutron Resonance Parameters*, May 1972.
- Vol. 12, *An Atlas of Resolved Neutron Resonance Parameters*, July 1972.
- Vol. 13, *An Atlas of Unresolved Neutron Resonance Parameters*, September 1972.
- Vol. 14, *TARTNP: A Coupled Neutron-Photon Monte Carlo Transport Code*, February 1976.
- Vol. 15, Part A, *The LLL Evaluated-Nuclear-Data Library (ENDL): Evaluation Techniques, Reaction Index, and Descriptions of Individual Evaluations*, September 1975.
- Vol. 15, Part B, Rev. 1, *The LLL Evaluated-Nuclear-Data Library (ENDL): Graphs of Cross Sections from the Library*, October 1978.
- Vol. 15, Part C, *The LLL Evaluated-Nuclear-Data Library (ENDL): Translation of ENDL Neutron-Induced Interaction Data into the ENDF/B Format*, April 1976.
- Vol. 15, Part D, Rev. 1, *The LLL Evaluated-Nuclear-Data Library (ENDL): Descriptions of Individual Evaluations for $Z = 0-98$* , May 1978.
- Vol. 15, Part E, *Data Testing Results for the LLL Nuclear Data Library (ENDL-78)*, August 1979.
- Vol. 15, Part F, *Experimental and Evaluated Elastic Nuclear Plus Interference Cross Sections for Light Charged Particles*, July 1980.
- Vol. 16, Rev. 2, *Tabular and Graphical Presentation of 175 Neutron-Group Constants Derived from the LLL Evaluated-Nuclear-Data Library (ENDL)*, October 1978.
- Vol. 17, Part A, Rev. 2, *Program LINEAR (Version 79-1): Linearize Data in the Evaluated-Nuclear-Data File/Version B (ENDF/F) Format*, October 1979.

- Vol. 17, Part B, Rev. 2, Program SIGMAL (Version 79-1): Doppler Broadened Evaluated Cross Sections in the Evaluated-Nuclear-Data File/Version B (ENDF/B) Format, October 1979.
- Vol. 17, Part C, Program RECENT: Reconstruction of Energy-Dependent Cross Sections from Resonance Parameters in the ENDF/B Format, October 1979.
- Vol. 17, Part D, Program GROUPIL: Calculation of Self-Shielded Cross Sections and Multiband Parameters from Evaluated Data in the ENDF/B Format, 1980.
- Vol. 17, Part E, Program EVALPLOT: Plot Data in the Evaluated-Nuclear-Data File/Version B (ENDF/B) Format, February 1979.
- Vol. 17, Part F, DOWNER (Version 79-1): Group Collapse Cross Section and Transfer Matrices, January 1979.
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- Vol. 20, Bonderenko Self-Shielded Cross Sections and Multiband Parameters Derived from the LLNL Evaluated-Nuclear-Data Library (ENDL), July 1978.
- Vol. 21, Part A, Maxwell-Averaged Reactions Rates (σv) for Selected Reactions between Ions with Atomic Mass ≤ 11 , February 1979.
- Vol. 21, Part C, Program SIGMAL (Version 79-1): Doppler-Broadened Evaluated Cross Sections in the Livermore-Evaluated Nuclear Data Library (ENDL) Format, March 1979.
- Vol. 22, Rev. 1, GAMIDEN: A Program to Aid in the Identification of Unknown Materials by Gamma-Ray Spectroscopy, June 1982.
- Vol. 23, ENSL and CDRL: Evaluated Nuclear Structure Libraries, February 1981.
- Vol. 23, Addendum, ENSL82 and CDRL82: The 1982 Version of Evaluated Nuclear Structure Libraries, January 1983.
- Vol. 24, Thresholds and Q Values of Nuclear Reactions Induced by Neutrons, Protons, Deuterons, Tritons, ^3He Ions, Alpha Particles, and Photons, March 1981.
- Vol. 25, OMEGA: A CRAY 1 Executive Code for LLNL Nuclear Data Libraries, August 1983.
- Vol. 26, A Bibliography and Index for Nuclear Reactions Among Light Charged Particles, September 1984.
- Vol. 27, Calculated Neutron KERMA Factors Based on the LLNL ENDL Data File, January 1986.
- Vol. 28, Index to the LLNL Evaluated Charged-Particle Library (ECPL), March 1986.

ABSTRACT

Photon (Gamma-Ray) KERMA factors calculated from the LLNL ECDL (Evaluated Gamma-Ray Data Library) file are tabulated for the elements from Z=1 to Z=30 and for 15 composite materials. The KERMA factors are presented for 191 energy groups over the incident photon energy range from 100 eV to 100 MeV.

INTRODUCTION

Photon (Gamma-Ray) KERMA factors (Kinetic Energy Released in Matter) are used to assess physiological damage incurred by exposure to Gamma-Rays and to determine heating in materials of interest from photon interactions with matter. The energy release is obtained by forming the product of the photon KERMA factor and the photon fluence at the appropriate photon energy. Generally, the KERMA factor for a photon induced reaction is defined to be the energy available less the energy carried off by secondary photons. The KERMA factor for a material is then obtained by summing the KERMA factors of the individual reactions, properly weighted by elemental abundance in the case of composite materials.

In the context of this report, only photon interactions with atoms and molecules are considered. The energy deposited from photo-nuclear reactions is not included. Thus, for photon energies greater than the least threshold of a photo-nuclear reaction of a naturally occurring isotope of an element, the values presented here will not include all contributions to the photon KERMA factors. This deficiency is caused by the lack of evaluated data needed to include the photo-nuclear phenomena in the calculated KERMA factors. An effort is currently underway to create a photo-nuclear data library so that future tabulations of photon KERMA factors can include contributions from such reactions. Since the least threshold of a photo-nuclear reaction occurs in the few MeV region for naturally occurring isotopes, photon KERMA values presented here will be accurate for lesser energies, within the limitations of the data.

Explicit energy distributions for secondary photons are included in the EGDL (Evaluated Gamma-Ray Data Library, See Ref. 1) for each reaction. From these distributions, average photon secondary energies are calculated and the result subtracted from the available energy to obtain the requisite energy for the reaction to calculate the KERMA factor. This value and all others for the various reactions are cross section weighted to obtain the photon-energy dependent KERMA factor for the element. For the composite materials, the KERMA factors for the individual elements are combined according to their weight fractions to obtain the value for the composite.

The tables of KERMA factors are presented for 191 energy groups from .0001 to 100 MeV. For photon energies between .001 and 20 MeV the group boundaries correspond to the energies used by Singh (Ref. 2) so

that comparisons may be made between the values presented here and those of Reference 2.

The compositions of the composite materials used here were taken from Caswell et al., (Ref. 3). The composition used here differs slightly from that of Singh (Ref. 2) for "Standard Man" which is the only composite material given in common.

The values presented in the tables are given in units of Gray cm^2 . The Gray is equivalent to one Joule per kg or 100 rads or 10000 ergs per gm or $.624196 \times 10^{10}$ MeV per gm.

REFERENCES

1. E.F. Plechaty, D.E. Cullen and R.J. Howerton, Tables and Graphs of Photon Interaction Cross Sections from 0.1 keV to 100 MeV Derived from the LLNL Evaluated Nuclear-Data Library, UCRL-50400, Vol. 6, Rev. 3, Lawrence Livermore National Laboratory, 1981.
2. M.S. Singh, KERMA FACTORS FOR NEUTRON AND PHOTONS WITH ENERGIES BELOW 20 MeV, UCRL-52850, Lawrence Livermore National Laboratory, 1979.
3. R.S. Caswell, J.J. Coyne., and M.L. Randolph, Kerma Factors for Neutron Energies below 30 MeV, Radiation Research 83, 217-254 (1980).

KERMA
Gray cm2**

Energy-MeV	- H-	-He-	-Li-	-Be-	- B-	- C-
<hr/>						
1.000e-04						
1.080e-04	1.754e-10	8.524e-10	1.895e-09	1.232e-10	2.369e-10	4.207e-10
1.140e-04	1.565e-10	8.225e-10	1.838e-09	1.457e-09	2.312e-10	4.099e-10
1.360e-04	1.184e-10	7.246e-10	1.645e-09	2.631e-09	2.103e-10	3.715e-10
1.560e-04	8.516e-11	5.131e-10	1.219e-09	2.175e-09	1.625e-10	2.846e-10
1.700e-04	6.705e-11	4.213e-10	1.028e-09	1.942e-09	1.384e-10	2.458e-10
1.840e-04	5.655e-11	3.766e-10	9.291e-10	1.791e-09	1.235e-10	2.256e-10
1.910e-04	5.061e-11	3.350e-10	8.363e-10	1.647e-09	1.114e-09	2.063e-10
2.140e-04	4.234e-11	2.819e-10	7.173e-10	1.458e-09	2.187e-09	1.811e-10
2.240e-04	3.710e-11	2.625e-10	6.735e-10	1.383e-09	2.091e-09	1.739e-10
2.410e-04	3.256e-11	2.488e-10	6.420e-10	1.324e-09	2.028e-09	1.630e-10
2.470e-04	2.815e-11	2.347e-10	6.092e-10	1.263e-09	1.959e-09	1.543e-10
2.630e-04	2.505e-11	2.185e-10	5.713e-10	1.191e-09	1.875e-09	1.452e-10
2.750e-04	2.298e-11	1.950e-10	5.156e-10	1.085e-09	1.749e-09	1.312e-10
2.820e-04	2.144e-11	1.768e-10	4.728e-10	1.003e-09	1.650e-09	1.204e-10
2.960e-04	1.953e-11	1.546e-10	4.200e-10	9.023e-10	1.526e-09	1.897e-09
3.180e-04	1.679e-11	1.277e-10	3.556e-10	7.784e-10	1.369e-09	2.002e-09
3.550e-04	1.376e-11	1.142e-10	3.216e-10	7.114e-10	1.263e-09	1.885e-09
3.610e-04	1.172e-11	1.025e-10	2.920e-10	6.522e-10	1.166e-09	1.775e-09
3.700e-04	1.128e-11	9.778e-11	2.800e-10	6.280e-10	1.127e-09	1.728e-09
3.830e-04	1.058e-11	9.035e-11	2.610e-10	5.895e-10	1.063e-09	1.654e-09
4.030e-04	9.420e-12	7.818e-11	2.298e-10	5.263e-10	9.592e-10	1.530e-09
4.150e-04	8.581e-12	7.081e-11	2.107e-10	4.869e-10	8.939e-10	1.448e-09
4.300e-04	8.088e-12	6.800e-11	2.032e-10	4.704e-10	8.663e-10	1.409e-09
4.500e-04	7.375e-12	6.386e-11	1.921e-10	4.460e-10	8.251e-10	1.350e-09
4.810e-04	6.504e-12	5.682e-11	1.731e-10	4.040e-10	7.538e-10	1.246e-09
5.160e-04	5.509e-12	4.693e-11	1.462e-10	3.445e-10	6.522e-10	1.096e-09
5.470e-04	4.725e-12	4.166e-11	1.318e-10	3.127e-10	5.961e-10	1.009e-09
5.550e-04	4.269e-12	3.889e-11	1.242e-10	2.958e-10	5.658e-10	9.604e-10
5.930e-04	3.937e-12	3.515e-11	1.138e-10	2.728e-10	5.242e-10	8.935e-10
5.980e-04	3.607e-12	3.136e-11	1.033e-10	2.494e-10	4.819e-10	8.251e-10
6.250e-04	3.429e-12	2.971e-11	9.852e-11	2.388e-10	4.624e-10	7.940e-10
6.540e-04	3.154e-12	2.752e-11	9.203e-11	2.244e-10	4.354e-10	7.511e-10
6.750e-04	2.914e-12	2.532e-11	8.547e-11	2.097e-10	4.078e-10	7.072e-10
6.980e-04	2.704e-12	2.317e-11	7.903e-11	1.953e-10	3.808e-10	6.639e-10
7.110e-04	2.531e-12	2.157e-11	7.422e-11	1.843e-10	3.604e-10	6.309e-10
7.250e-04	2.419e-12	2.090e-11	7.222e-11	1.794e-10	3.516e-10	6.161e-10
7.710e-04	2.166e-12	1.929e-11	6.732e-11	1.673e-10	3.302e-10	5.795e-10
7.940e-04	1.927e-12	1.722e-11	6.101e-11	1.517e-10	3.026e-10	5.323e-10
8.180e-04	1.787e-12	1.589e-11	5.696e-11	1.417e-10	2.846e-10	5.017e-10
8.380e-04	1.697e-12	1.512e-11	5.453e-11	1.358e-10	2.737e-10	4.835e-10
8.600e-04	1.610e-12	1.435e-11	5.210e-11	1.299e-10	2.626e-10	4.651e-10
8.980e-04	1.501e-12	1.314e-11	4.828e-11	1.207e-10	2.452e-10	4.361e-10
9.200e-04	1.387e-12	1.210e-11	4.438e-11	1.119e-10	2.287e-10	4.095e-10
9.400e-04	1.303e-12	1.174e-11	4.188e-11	1.076e-10	2.201e-10	3.978e-10
9.560e-04	1.230e-12	1.142e-11	3.961e-11	1.036e-10	2.123e-10	3.870e-10

KERMA
Gray cm²

Energy-MeV	- H-	-He-	-Li-	-Be-	- B-	- C-
9.800e-04	1.181e-12	1.104e-11	3.694e-11	9.885e-11	2.030e-10	3.742e-10
9.900e-04	1.143e-12	1.070e-11	3.457e-11	9.464e-11	1.947e-10	3.627e-10
1.000e-03	1.120e-12	1.048e-11	3.312e-11	9.207e-11	1.896e-10	3.556e-10
1.080e-03	1.083e-12	1.014e-11	3.179e-11	8.908e-11	1.838e-10	3.460e-10
1.140e-03	1.028e-12	9.636e-12	3.046e-11	8.533e-11	1.764e-10	3.323e-10
1.360e-03	8.632e-13	8.103e-12	2.628e-11	7.359e-11	1.531e-10	2.890e-10
1.560e-03	5.224e-13	4.937e-12	1.745e-11	4.883e-11	1.035e-10	1.968e-10
1.700e-03	3.863e-13	3.665e-12	1.373e-11	3.840e-11	8.244e-11	1.575e-10
1.840e-03	3.322e-13	3.150e-12	1.202e-11	3.366e-11	7.264e-11	1.391e-10
1.910e-03	2.830e-13	2.682e-12	1.046e-11	2.931e-11	6.361e-11	1.222e-10
2.140e-03	2.215e-13	2.096e-12	8.485e-12	2.382e-11	5.219e-11	1.007e-10
2.240e-03	2.009e-13	1.899e-12	7.788e-12	2.188e-11	4.812e-11	9.300e-11
2.410e-03	1.882e-13	1.776e-12	7.324e-12	2.059e-11	4.538e-11	8.780e-11
2.470e-03	1.753e-13	1.652e-12	6.853e-12	1.929e-11	4.258e-11	8.249e-11
2.630e-03	1.607e-13	1.511e-12	6.317e-12	1.780e-11	3.939e-11	7.643e-11
2.750e-03	1.396e-13	1.308e-12	5.540e-12	1.564e-11	3.475e-11	6.761e-11
2.820e-03	1.236e-13	1.153e-12	4.947e-12	1.398e-11	3.121e-11	6.085e-11
2.960e-03	1.039e-13	9.645e-13	4.222e-12	1.196e-11	2.687e-11	5.258e-11
3.180e-03	8.070e-14	7.405e-13	3.352e-12	9.540e-12	2.165e-11	4.263e-11
3.550e-03	7.118e-14	6.461e-13	2.953e-12	8.423e-12	1.919e-11	3.790e-11
3.610e-03	6.319e-14	5.673e-13	2.616e-12	7.476e-12	1.710e-11	3.386e-11
3.700e-03	5.997e-14	5.356e-13	2.480e-12	7.095e-12	1.626e-11	3.223e-11
3.830e-03	5.491e-14	4.860e-13	2.267e-12	6.496e-12	1.493e-11	2.966e-11
4.030e-03	4.666e-14	4.052e-13	1.919e-12	5.518e-12	1.277e-11	2.547e-11
4.150e-03	4.185e-14	3.575e-13	1.711e-12	4.933e-12	1.146e-11	2.294e-11
4.300e-03	4.027e-14	3.409e-13	1.635e-12	4.718e-12	1.098e-11	2.199e-11
4.500e-03	3.793e-14	3.167e-13	1.524e-12	4.404e-12	1.027e-11	2.060e-11
4.810e-03	3.393e-14	2.758e-13	1.336e-12	3.873e-12	9.066e-12	1.824e-11
5.160e-03	2.836e-14	2.191e-13	1.074e-12	3.131e-12	7.384e-12	1.494e-11
5.470e-03	2.579e-14	1.909e-13	9.410e-13	2.752e-12	6.515e-12	1.322e-11
5.550e-03	2.454e-14	1.768e-13	8.733e-13	2.558e-12	6.069e-12	1.234e-11
5.930e-03	2.281e-14	1.578e-13	7.821e-13	2.296e-12	5.467e-12	1.114e-11
5.980e-03	2.105e-14	1.386e-13	6.898e-13	2.032e-12	4.856e-12	9.932e-12
6.250e-03	2.054e-14	1.320e-13	6.574e-13	1.939e-12	4.641e-12	9.502e-12
6.540e-03	2.019e-14	1.255e-13	6.245e-13	1.843e-12	4.418e-12	9.057e-12
6.750e-03	1.979e-14	1.188e-13	5.909e-13	1.746e-12	4.190e-12	8.600e-12
6.980e-03	1.935e-14	1.122e-13	5.576e-13	1.649e-12	3.964e-12	8.145e-12
7.110e-03	1.895e-14	1.063e-13	5.279e-13	1.563e-12	3.762e-12	7.740e-12
7.250e-03	1.861e-14	1.016e-13	5.041e-13	1.494e-12	3.600e-12	7.413e-12
7.710e-03	1.775e-14	9.006e-14	4.461e-13	1.325e-12	3.204e-12	6.617e-12
7.940e-03	1.663e-14	7.546e-14	3.726e-13	1.112e-12	2.702e-12	5.608e-12
8.180e-03	1.604e-14	6.716e-14	3.306e-13	9.894e-13	2.414e-12	5.028e-12
8.380e-03	1.605e-14	6.479e-14	3.179e-13	9.520e-13	2.325e-12	4.846e-12
8.600e-03	1.607e-14	6.261e-14	3.061e-13	9.172e-13	2.241e-12	4.676e-12
8.980e-03	1.607e-14	5.915e-14	2.875e-13	8.621e-13	2.110e-12	4.407e-12

KERMA
Gray cm2**

Energy-MeV	- H-	-He-	-Li-	-Be-	- B-	- C-
9.200e-03	1.603e-14	5.533e-14	2.671e-13	8.017e-13	1.965e-12	4.111e-12
9.400e-03	1.598e-14	5.243e-14	2.516e-13	7.556e-13	1.854e-12	3.886e-12
9.560e-03	1.592e-14	4.978e-14	2.375e-13	7.139e-13	1.754e-12	3.681e-12
9.800e-03	1.583e-14	4.667e-14	2.210e-13	6.649e-13	1.637e-12	3.440e-12
1.000e-02	1.571e-14	4.306e-14	2.018e-13	6.080e-13	1.500e-12	3.161e-12
1.040e-02	1.735e-14	4.175e-14	1.913e-13	5.755e-13	1.421e-12	2.999e-12
1.080e-02	2.074e-14	4.242e-14	1.877e-13	5.623e-13	1.387e-12	2.928e-12
1.110e-02	2.370e-14	4.288e-14	1.839e-13	5.486e-13	1.352e-12	2.854e-12
1.190e-02	2.833e-14	4.334e-14	1.764e-13	5.222e-13	1.286e-12	2.714e-12
1.270e-02	3.503e-14	4.352e-14	1.626e-13	4.752e-13	1.167e-12	2.464e-12
1.300e-02	3.961e-14	4.331e-14	1.511e-13	4.368e-13	1.070e-12	2.261e-12
1.390e-02	4.459e-14	4.268e-14	1.364e-13	3.880e-13	9.480e-13	2.004e-12
1.470e-02	5.159e-14	4.125e-14	1.124e-13	3.092e-13	7.506e-13	1.589e-12
1.520e-02	5.694e-14	3.994e-14	9.271e-14	2.449e-13	5.894e-13	1.250e-12
1.570e-02	6.123e-14	4.112e-14	8.931e-14	2.308e-13	5.521e-13	1.170e-12
1.640e-02	6.642e-14	4.314e-14	8.850e-14	2.237e-13	5.312e-13	1.123e-12
1.700e-02	7.202e-14	4.526e-14	8.719e-14	2.147e-13	5.050e-13	1.065e-12
1.720e-02	7.547e-14	4.652e-14	8.616e-14	2.084e-13	4.871e-13	1.025e-12
1.810e-02	8.019e-14	4.820e-14	8.441e-14	1.987e-13	4.597e-13	9.648e-13
1.900e-02	8.789e-14	5.085e-14	8.087e-14	1.807e-13	4.094e-13	8.539e-13
1.970e-02	9.470e-14	5.308e-14	7.699e-14	1.623e-13	3.587e-13	7.425e-13
2.010e-02	9.937e-14	5.456e-14	7.403e-14	1.488e-13	3.215e-13	6.606e-13
2.100e-02	1.049e-13	5.704e-14	7.481e-14	1.462e-13	3.114e-13	6.364e-13
2.170e-02	1.117e-13	6.027e-14	7.686e-14	1.464e-13	3.075e-13	6.247e-13
2.230e-02	1.172e-13	6.287e-14	7.840e-14	1.462e-13	3.034e-13	6.130e-13
2.310e-02	1.231e-13	6.565e-14	7.994e-14	1.457e-13	2.980e-13	5.984e-13
2.550e-02	1.364e-13	7.189e-14	8.299e-14	1.428e-13	2.816e-13	5.558e-13
2.920e-02	1.616e-13	8.343e-14	8.710e-14	1.318e-13	2.361e-13	4.437e-13
3.320e-02	1.928e-13	9.791e-14	9.298e-14	1.205e-13	1.853e-13	3.163e-13
3.750e-02	2.255e-13	1.141e-13	1.050e-13	1.277e-13	1.807e-13	2.887e-13
4.200e-02	2.594e-13	1.308e-13	1.172e-13	1.338e-13	1.725e-13	2.518e-13
4.740e-02	2.964e-13	1.493e-13	1.321e-13	1.460e-13	1.776e-13	2.429e-13
4.850e-02	3.202e-13	1.613e-13	1.418e-13	1.541e-13	1.817e-13	2.389e-13
5.020e-02	3.303e-13	1.663e-13	1.459e-13	1.574e-13	1.829e-13	2.360e-13
5.500e-02	3.534e-13	1.779e-13	1.556e-13	1.664e-13	1.899e-13	2.387e-13
6.100e-02	3.909e-13	1.968e-13	1.716e-13	1.813e-13	2.021e-13	2.451e-13
6.750e-02	4.332e-13	2.182e-13	1.897e-13	1.990e-13	2.182e-13	2.578e-13
6.950e-02	4.613e-13	2.323e-13	2.019e-13	2.111e-13	2.298e-13	2.683e-13
7.350e-02	4.806e-13	2.421e-13	2.102e-13	2.194e-13	2.375e-13	2.750e-13
7.840e-02	5.086e-13	2.562e-13	2.223e-13	2.312e-13	2.484e-13	2.838e-13
8.070e-02	5.308e-13	2.674e-13	2.318e-13	2.405e-13	2.568e-13	2.902e-13
8.550e-02	5.526e-13	2.784e-13	2.413e-13	2.501e-13	2.663e-13	2.995e-13
8.800e-02	5.747e-13	2.896e-13	2.509e-13	2.599e-13	2.762e-13	3.095e-13
9.050e-02	5.896e-13	2.971e-13	2.574e-13	2.664e-13	2.827e-13	3.160e-13
9.230e-02	6.022e-13	3.034e-13	2.629e-13	2.720e-13	2.883e-13	3.215e-13

KERMA
Gray cm2**

Energy-MeV	- H-	-He-	-Li-	-Be-	- B-	- C-
9.600e-02	6.180e-13	3.114e-13	2.698e-13	2.789e-13	2.952e-13	3.282e-13
1.000e-01	6.399e-13	3.225e-13	2.793e-13	2.885e-13	3.047e-13	3.373e-13
1.050e-01	6.937e-13	3.495e-13	3.027e-13	3.124e-13	3.292e-13	3.631e-13
1.100e-01	7.778e-13	3.919e-13	3.392e-13	3.498e-13	3.680e-13	4.047e-13
1.150e-01	8.601e-13	4.333e-13	3.750e-13	3.865e-13	4.060e-13	4.455e-13
1.210e-01	9.485e-13	4.777e-13	4.134e-13	4.258e-13	4.468e-13	4.891e-13
1.350e-01	1.103e-12	5.555e-13	4.806e-13	4.946e-13	5.181e-13	5.652e-13
1.490e-01	1.308e-12	6.587e-13	5.698e-13	5.859e-13	6.124e-13	6.655e-13
1.640e-01	1.510e-12	7.605e-13	6.579e-13	6.761e-13	7.059e-13	7.653e-13
1.800e-01	1.719e-12	8.658e-13	7.489e-13	7.695e-13	8.030e-13	8.698e-13
1.980e-01	1.933e-12	9.735e-13	8.420e-13	8.651e-13	9.024e-13	9.766e-13
2.180e-01	2.163e-12	1.089e-12	9.420e-13	9.677e-13	1.009e-12	1.091e-12
2.390e-01	2.405e-12	1.211e-12	1.048e-12	1.076e-12	1.122e-12	1.213e-12
2.630e-01	2.652e-12	1.336e-12	1.155e-12	1.187e-12	1.237e-12	1.338e-12
2.900e-01	2.908e-12	1.465e-12	1.267e-12	1.301e-12	1.356e-12	1.466e-12
3.190e-01	3.169e-12	1.596e-12	1.380e-12	1.418e-12	1.478e-12	1.597e-12
3.510e-01	3.456e-12	1.740e-12	1.505e-12	1.546e-12	1.611e-12	1.741e-12
3.860e-01	3.744e-12	1.885e-12	1.631e-12	1.675e-12	1.746e-12	1.886e-12
4.240e-01	4.031e-12	2.030e-12	1.756e-12	1.804e-12	1.880e-12	2.031e-12
4.670e-01	4.349e-12	2.190e-12	1.894e-12	1.946e-12	2.028e-12	2.191e-12
5.130e-01	4.671e-12	2.352e-12	2.035e-12	2.090e-12	2.178e-12	2.353e-12
5.650e-01	5.153e-12	2.595e-12	2.245e-12	2.306e-12	2.403e-12	2.596e-12
6.210e-01	5.693e-12	2.867e-12	2.480e-12	2.547e-12	2.654e-12	2.867e-12
6.830e-01	6.267e-12	3.156e-12	2.730e-12	2.804e-12	2.922e-12	3.156e-12
7.510e-01	6.845e-12	3.447e-12	2.982e-12	3.062e-12	3.191e-12	3.447e-12
8.260e-01	7.405e-12	3.729e-12	3.226e-12	3.313e-12	3.453e-12	3.729e-12
9.090e-01	8.017e-12	4.037e-12	3.492e-12	3.587e-12	3.738e-12	4.037e-12
1.000e+00	8.626e-12	4.344e-12	3.757e-12	3.859e-12	4.021e-12	4.343e-12
1.120e+00	9.443e-12	4.756e-12	4.114e-12	4.224e-12	4.402e-12	4.755e-12
1.270e+00	1.052e-11	5.300e-12	4.585e-12	4.708e-12	4.907e-12	5.300e-12
1.420e+00	1.153e-11	5.806e-12	5.023e-12	5.159e-12	5.376e-12	5.807e-12
1.600e+00	1.245e-11	6.269e-12	5.424e-12	5.571e-12	5.807e-12	6.272e-12
1.800e+00	1.354e-11	6.825e-12	5.907e-12	6.068e-12	6.327e-12	6.837e-12
2.030e+00	1.458e-11	7.348e-12	6.362e-12	6.539e-12	6.821e-12	7.373e-12
2.280e+00	1.586e-11	7.999e-12	6.930e-12	7.128e-12	7.439e-12	8.047e-12
2.570e+00	1.729e-11	8.728e-12	7.569e-12	7.791e-12	8.139e-12	8.812e-12
2.890e+00	1.855e-11	9.377e-12	8.142e-12	8.391e-12	8.777e-12	9.514e-12
3.250e+00	1.970e-11	9.977e-12	8.676e-12	8.956e-12	9.382e-12	1.019e-11
3.650e+00	2.114e-11	1.072e-11	9.341e-12	9.660e-12	1.014e-11	1.103e-11
4.110e+00	2.239e-11	1.139e-11	9.944e-12	1.031e-11	1.084e-11	1.182e-11
4.620e+00	2.390e-11	1.219e-11	1.067e-11	1.109e-11	1.170e-11	1.279e-11
5.200e+00	2.539e-11	1.299e-11	1.141e-11	1.190e-11	1.259e-11	1.380e-11
5.850e+00	2.699e-11	1.386e-11	1.221e-11	1.278e-11	1.356e-11	1.491e-11
6.580e+00	2.866e-11	1.478e-11	1.308e-11	1.373e-11	1.463e-11	1.614e-11
7.410e+00	3.066e-11	1.588e-11	1.412e-11	1.489e-11	1.592e-11	1.763e-11

KRISHN
Gray cm²/2

Energy-MeV	- H-	-He-	-Li-	-Be-	- B-	- C-
8.330e+00	3.235e-11	1.686e-11	1.507e-11	1.590e-11	1.717e-11	1.910e-11
9.370e+00	3.441e-11	1.805e-11	1.624e-11	1.731e-11	1.871e-11	2.092e-11
1.060e+01	3.652e-11	1.932e-11	1.750e-11	1.879e-11	2.043e-11	2.298e-11
1.190e+01	3.918e-11	2.067e-11	1.903e-11	2.054e-11	2.245e-11	2.530e-11
1.340e+01	4.175e-11	2.241e-11	2.058e-11	2.236e-11	2.457e-11	2.791e-11
2.000e+01	4.775e-11	2.629e-11	2.467e-11	2.731e-11	3.052e-11	3.517e-11
3.000e+01	6.076e-11	3.483e-11	3.377e-11	3.841e-11	4.390e-11	5.158e-11
4.000e+01	7.490e-11	4.462e-11	4.454e-11	5.180e-11	6.027e-11	7.183e-11
5.000e+01	8.915e-11	5.473e-11	5.578e-11	6.587e-11	7.752e-11	9.323e-11
7.500e+01	1.150e-10	7.323e-11	7.641e-11	9.171e-11	1.092e-10	1.324e-10
1.000e+02	1.532e-10	1.009e-10	1.075e-10	1.307e-10	1.570e-10	1.917e-10

KEDM
Oxay cm2**

Energy-MeV	- H-	- O-	- F-	-Ne-	-Na-	-Mg-
<hr/>						
1.000e-04						
1.000e-04	7.019e-10	9.856e-10	1.374e-09	1.923e-09	1.971e-09	2.371e-09
1.140e-04	6.830e-10	9.614e-10	1.341e-09	1.830e-09	1.947e-09	2.359e-09
1.360e-04	6.165e-10	8.738e-10	1.222e-09	1.634e-09	1.833e-09	2.261e-09
1.560e-04	4.674e-10	6.746e-10	9.488e-10	1.379e-09	1.542e-09	1.981e-09
1.700e-04	4.015e-10	5.847e-10	8.242e-10	1.242e-09	1.396e-09	1.825e-09
1.840e-04	3.677e-10	5.366e-10	7.564e-10	1.145e-09	1.301e-09	1.713e-09
1.910e-04	3.357e-10	4.903e-10	6.918e-10	1.031e-09	1.210e-09	1.602e-09
2.140e-04	2.943e-10	4.316e-10	6.082e-10	9.215e-10	1.088e-09	1.454e-09
2.240e-04	2.793e-10	4.098e-10	5.774e-10	8.466e-10	1.042e-09	1.396e-09
2.410e-04	2.681e-10	3.934e-10	5.542e-10	7.811e-10	1.004e-09	1.348e-09
2.470e-04	2.563e-10	3.761e-10	5.297e-10	7.160e-10	9.641e-10	1.296e-09
2.630e-04	2.425e-10	3.558e-10	5.010e-10	6.672e-10	9.165e-10	1.234e-09
2.750e-04	2.220e-10	3.257e-10	4.585e-10	6.293e-10	8.456e-10	1.142e-09
2.820e-04	2.061e-10	3.024e-10	4.255e-10	6.001e-10	7.903e-10	1.071e-09
2.960e-04	1.865e-10	2.736e-10	3.848e-10	5.633e-10	7.218e-10	9.812e-10
3.180e-04	1.626e-10	2.384e-10	3.349e-10	5.145e-10	6.374e-10	8.709e-10
3.550e-04	1.500e-10	2.198e-10	3.082e-10	4.738e-10	5.900e-10	8.077e-10
3.610e-04	1.387e-10	2.032e-10	2.844e-10	4.367e-10	5.472e-10	7.503e-10
3.700e-04	1.341e-10	1.964e-10	2.747e-10	4.214e-10	5.296e-10	7.266e-10
3.830e-04	1.267e-10	1.855e-10	2.591e-10	3.972e-10	5.014e-10	6.889e-10
4.030e-04	2.411e-10	1.676e-10	2.334e-10	3.572e-10	4.549e-10	6.264e-10
4.150e-04	1.901e-09	1.566e-10	2.176e-10	3.325e-10	4.258e-10	5.871e-10
4.300e-04	1.863e-09	1.521e-10	2.112e-10	3.225e-10	4.135e-10	5.705e-10
4.500e-04	1.803e-09	1.455e-10	2.016e-10	3.074e-10	3.950e-10	5.454e-10
4.810e-04	1.697e-09	1.338e-10	1.849e-10	2.814e-10	3.629e-10	5.018e-10
5.160e-04	1.539e-09	1.168e-10	1.610e-10	2.443e-10	3.169e-10	4.394e-10
5.470e-04	1.434e-09	8.388e-10	1.478e-10	2.240e-10	2.916e-10	4.051e-10
5.550e-04	1.372e-09	1.608e-09	1.407e-10	2.132e-10	2.779e-10	3.865e-10
5.930e-04	1.286e-09	1.579e-09	1.308e-10	1.983e-10	2.591e-10	3.609e-10
5.980e-04	1.198e-09	1.546e-09	1.208e-10	1.830e-10	2.398e-10	3.346e-10
6.250e-04	1.156e-09	1.510e-09	1.161e-10	1.760e-10	2.307e-10	3.221e-10
6.540e-04	1.095e-09	1.434e-09	1.093e-10	1.662e-10	2.179e-10	3.043e-10
6.750e-04	1.033e-09	1.356e-09	1.025e-10	1.562e-10	2.047e-10	2.860e-10
6.980e-04	9.711e-10	1.279e-09	7.937e-10	1.464e-10	1.918e-10	2.680e-10
7.110e-04	9.245e-10	1.221e-09	1.402e-09	1.389e-10	1.821e-10	2.546e-10
7.250e-04	9.046e-10	1.198e-09	1.386e-09	1.358e-10	1.783e-10	2.494e-10
7.710e-04	8.552e-10	1.139e-09	1.341e-09	1.279e-10	1.686e-10	2.365e-10
7.940e-04	7.911e-10	1.061e-09	1.282e-09	1.178e-10	1.561e-10	2.197e-10
8.180e-04	7.493e-10	1.010e-09	1.238e-09	1.110e-10	1.479e-10	2.085e-10
8.380e-04	7.238e-10	9.765e-10	1.199e-09	1.066e-10	1.426e-10	2.009e-10
8.600e-04	6.979e-10	9.422e-10	1.159e-09	1.021e-10	1.372e-10	1.932e-10
8.980e-04	6.570e-10	8.877e-10	1.095e-09	1.123e-09	1.288e-10	1.810e-10
9.200e-04	6.200e-10	8.384e-10	1.036e-09	1.373e-09	1.221e-10	1.710e-10
9.400e-04	6.046e-10	8.178e-10	1.011e-09	1.342e-09	1.211e-10	1.686e-10
9.560e-04	5.904e-10	7.988e-10	9.873e-10	1.313e-09	1.202e-10	1.664e-10

ICRMA
Gray cm⁻²

Energy-MeV	- H-	- O-	- F-	- Ne-	- Ne-	- Mg-
9.800e-04	3.734e-10	7.760e-10	9.591e-10	1.279e-09	1.191e-10	1.637e-10
9.900e-04	3.581e-10	7.535e-10	9.338e-10	1.248e-09	1.190e-10	1.612e-10
1.000e-03	3.486e-10	7.428e-10	9.181e-10	1.229e-09	1.173e-10	1.597e-10
1.080e-03	3.349e-10	7.249e-10	8.972e-10	1.201e-09	2.301e-10	1.536e-10
1.140e-03	3.143e-10	6.986e-10	8.672e-10	1.161e-09	1.213e-09	1.425e-10
1.360e-03	4.492e-10	6.133e-10	7.677e-10	1.027e-09	1.102e-09	3.682e-10
1.560e-03	3.097e-10	4.299e-10	5.315e-10	7.365e-10	8.509e-10	9.908e-10
1.700e-03	2.498e-10	3.505e-10	4.564e-10	6.092e-10	7.305e-10	8.871e-10
1.840e-03	2.214e-10	3.121e-10	4.089e-10	5.459e-10	6.607e-10	8.072e-10
1.910e-03	1.952e-10	2.765e-10	3.646e-10	4.870e-10	5.953e-10	7.318e-10
2.140e-03	1.619e-10	2.312e-10	3.082e-10	4.119e-10	5.111e-10	6.344e-10
2.240e-03	1.500e-10	2.148e-10	2.875e-10	3.844e-10	4.798e-10	5.978e-10
2.410e-03	1.418e-10	2.035e-10	2.729e-10	3.650e-10	4.570e-10	5.707e-10
2.470e-03	1.334e-10	1.918e-10	2.578e-10	3.451e-10	4.334e-10	5.425e-10
2.630e-03	1.239e-10	1.785e-10	2.405e-10	3.221e-10	4.061e-10	5.096e-10
2.750e-03	1.099e-10	1.590e-10	2.153e-10	2.885e-10	3.661e-10	4.614e-10
2.820e-03	9.921e-11	1.440e-10	1.958e-10	2.627e-10	3.352e-10	4.242e-10
2.960e-03	8.611e-11	1.257e-10	1.720e-10	2.310e-10	2.972e-10	3.784e-10
3.180e-03	7.032e-11	1.035e-10	1.431e-10	1.925e-10	2.510e-10	3.224e-10
3.550e-03	6.269e-11	9.261e-11	1.285e-10	1.731e-10	2.267e-10	2.923e-10
3.610e-03	5.616e-11	8.324e-11	1.159e-10	1.564e-10	2.056e-10	2.660e-10
3.700e-03	5.352e-11	7.945e-11	1.108e-10	1.496e-10	1.971e-10	2.553e-10
3.830e-03	4.937e-11	7.347e-11	1.027e-10	1.388e-10	1.835e-10	2.383e-10
4.030e-03	4.257e-11	6.369e-11	8.951e-11	1.212e-10	1.613e-10	2.105e-10
4.150e-03	3.846e-11	5.776e-11	8.147e-11	1.105e-10	1.476e-10	1.934e-10
4.300e-03	3.691e-11	5.549e-11	7.836e-11	1.064e-10	1.421e-10	1.865e-10
4.500e-03	3.463e-11	5.216e-11	7.377e-11	1.002e-10	1.343e-10	1.764e-10
4.810e-03	3.076e-11	4.648e-11	6.595e-11	8.975e-11	1.206e-10	1.589e-10
5.160e-03	2.533e-11	3.851e-11	5.494e-11	7.500e-11	1.014e-10	1.343e-10
5.470e-03	2.249e-11	3.431e-11	4.910e-11	6.717e-11	9.110e-11	1.210e-10
5.550e-03	2.102e-11	3.213e-11	4.604e-11	6.306e-11	8.565e-11	1.140e-10
5.930e-03	1.903e-11	2.917e-11	4.190e-11	5.748e-11	7.825e-11	1.043e-10
5.980e-03	1.701e-11	2.617e-11	3.769e-11	5.182e-11	7.073e-11	9.458e-11
6.250e-03	1.630e-11	2.510e-11	3.618e-11	4.979e-11	6.802e-11	9.104e-11
6.540e-03	1.555e-11	2.397e-11	3.459e-11	4.763e-11	6.512e-11	8.723e-11
6.750e-03	1.478e-11	2.281e-11	3.295e-11	4.541e-11	6.212e-11	8.329e-11
6.980e-03	1.401e-11	2.165e-11	3.131e-11	4.319e-11	5.912e-11	7.935e-11
7.110e-03	1.333e-11	2.062e-11	2.984e-11	4.120e-11	5.644e-11	7.582e-11
7.250e-03	1.278e-11	1.979e-11	2.866e-11	3.960e-11	5.428e-11	7.297e-11
7.710e-03	1.143e-11	1.776e-11	2.577e-11	3.568e-11	4.899e-11	6.599e-11
7.940e-03	9.729e-12	1.518e-11	2.211e-11	3.071e-11	4.227e-11	5.713e-11
8.180e-03	8.747e-12	1.370e-11	1.999e-11	2.783e-11	3.838e-11	5.198e-11
8.380e-03	8.438e-12	1.322e-11	1.931e-11	2.691e-11	3.711e-11	5.029e-11
8.600e-03	8.148e-12	1.278e-11	1.867e-11	2.603e-11	3.591e-11	4.870e-11
8.980e-03	7.688e-12	1.207e-11	1.765e-11	2.464e-11	3.400e-11	4.616e-11

XRMM
Gray cmw2

Energy-keV	- H-	- O-	- F-	- Ne-	- Na-	- Mg-
9.200e-03	7.182e-12	1.130e-11	1.654e-11	2.311e-11	3.190e-11	4.335e-11
9.400e-03	6.796e-12	1.070e-11	1.568e-11	2.193e-11	3.029e-11	4.121e-11
9.560e-03	6.446e-12	1.016e-11	1.490e-11	2.087e-11	2.883e-11	3.926e-11
9.800e-03	6.033e-12	9.530e-12	1.399e-11	1.962e-11	2.711e-11	3.696e-11
1.000e-02	5.555e-12	8.794e-12	1.293e-11	1.816e-11	2.512e-11	3.429e-11
1.040e-02	5.276e-12	8.364e-12	1.230e-11	1.731e-11	2.394e-11	3.272e-11
1.080e-02	5.152e-12	8.170e-12	1.202e-11	1.692e-11	2.341e-11	3.200e-11
1.110e-02	5.023e-12	7.969e-12	1.173e-11	1.651e-11	2.285e-11	3.124e-11
1.190e-02	4.778e-12	7.586e-12	1.117e-11	1.574e-11	2.177e-11	2.979e-11
1.270e-02	4.542e-12	6.904e-12	1.017e-11	1.436e-11	1.986e-11	2.720e-11
1.300e-02	3.988e-12	6.349e-12	9.359e-12	1.323e-11	1.830e-11	2.509e-11
1.390e-02	3.539e-12	5.645e-12	8.330e-12	1.180e-11	1.633e-11	2.240e-11
1.470e-02	2.815e-12	4.509e-12	6.666e-12	9.489e-12	1.313e-11	1.807e-11
1.520e-02	2.223e-12	3.580e-12	5.306e-12	7.599e-12	1.051e-11	1.452e-11
1.570e-02	2.081e-12	3.355e-12	4.975e-12	7.136e-12	9.869e-12	1.364e-11
1.640e-02	1.996e-12	3.219e-12	4.773e-12	6.850e-12	9.471e-12	1.310e-11
1.700e-02	1.891e-12	3.050e-12	4.521e-12	6.495e-12	8.976e-12	1.242e-11
1.720e-02	1.819e-12	2.935e-12	4.350e-12	6.253e-12	8.639e-12	1.195e-11
1.810e-02	1.710e-12	2.759e-12	4.089e-12	5.883e-12	8.125e-12	1.125e-11
1.900e-02	1.511e-12	2.438e-12	3.613e-12	5.209e-12	7.187e-12	9.958e-12
1.970e-02	1.311e-12	2.117e-12	3.135e-12	4.532e-12	6.245e-12	8.663e-12
2.010e-02	1.164e-12	1.880e-12	2.784e-12	4.035e-12	5.553e-12	7.711e-12
2.100e-02	1.118e-12	1.806e-12	2.673e-12	3.876e-12	5.331e-12	7.405e-12
2.170e-02	1.095e-12	1.766e-12	2.611e-12	3.787e-12	5.206e-12	7.231e-12
2.230e-02	1.072e-12	1.727e-12	2.552e-12	3.701e-12	5.086e-12	7.063e-12
2.310e-02	1.043e-12	1.679e-12	2.478e-12	3.595e-12	4.937e-12	6.857e-12
2.550e-02	9.612e-13	1.542e-12	2.271e-12	3.295e-12	4.517e-12	6.273e-12
2.920e-02	7.489e-13	1.189e-12	1.738e-12	2.525e-12	3.443e-12	4.779e-12
3.320e-02	5.062e-13	7.837e-13	1.125e-12	1.636e-12	2.204e-12	3.056e-12
3.750e-02	4.421e-13	6.672e-13	9.415e-13	1.362e-12	1.817e-12	2.511e-12
4.200e-02	3.599e-13	5.199e-13	7.111e-13	1.017e-12	1.334e-12	1.831e-12
4.740e-02	3.276e-13	4.536e-13	6.011e-13	8.463e-13	1.093e-12	1.485e-12
4.850e-02	3.097e-13	4.155e-13	5.370e-13	7.459e-13	9.496e-13	1.280e-12
5.020e-02	2.998e-13	3.955e-13	5.041e-13	6.948e-13	8.774e-13	1.177e-12
5.500e-02	2.948e-13	3.790e-13	4.727e-13	6.428e-13	8.015e-13	1.066e-12
6.100e-02	2.900e-13	3.578e-13	4.301e-13	5.706e-13	6.952e-13	9.101e-13
6.750e-02	2.951e-13	3.514e-13	4.083e-13	5.284e-13	6.290e-13	8.092e-13
6.950e-02	3.022e-13	3.536e-13	4.036e-13	5.147e-13	6.050e-13	7.702e-13
7.350e-02	3.060e-13	3.531e-13	3.973e-13	5.007e-13	5.821e-13	7.343e-13
7.840e-02	3.100e-13	3.497e-13	3.841e-13	4.741e-13	5.405e-13	6.705e-13
8.070e-02	3.120e-13	3.452e-13	3.709e-13	4.488e-13	5.018e-13	6.119e-13
8.550e-02	3.197e-13	3.505e-13	3.725e-13	4.462e-13	4.940e-13	5.968e-13
8.800e-02	3.284e-13	3.573e-13	3.766e-13	4.471e-13	4.909e-13	5.883e-13
9.050e-02	3.340e-13	3.615e-13	3.786e-13	4.467e-13	4.874e-13	5.806e-13
9.230e-02	3.386e-13	3.648e-13	3.799e-13	4.456e-13	4.836e-13	5.729e-13

KEDMA
Gray cm²/2

Energy-MeV	-B-	-O-	-F-	-Ne-	-Ne-	-Hg-
9.600e-02	3.442e-13	3.685e-13	3.810e-13	4.434e-13	4.775e-13	5.613e-13
1.000e-01	3.514e-13	3.729e-13	3.814e-13	4.387e-13	4.678e-13	5.423e-13
1.050e-01	3.759e-13	3.956e-13	4.004e-13	4.553e-13	4.791e-13	5.496e-13
1.100e-01	4.172e-13	4.363e-13	4.380e-13	4.936e-13	5.148e-13	5.847e-13
1.150e-01	4.574e-13	4.757e-13	4.744e-13	5.303e-13	5.487e-13	6.176e-13
1.210e-01	5.004e-13	5.177e-13	5.129e-13	5.687e-13	5.838e-13	6.510e-13
1.350e-01	5.749e-13	5.901e-13	5.785e-13	6.332e-13	6.415e-13	7.042e-13
1.490e-01	6.727e-13	6.839e-13	6.620e-13	7.132e-13	7.105e-13	7.640e-13
1.640e-01	7.706e-13	7.789e-13	7.479e-13	7.975e-13	7.857e-13	8.329e-13
1.800e-01	8.745e-13	8.819e-13	8.443e-13	8.964e-13	8.793e-13	9.268e-13
1.980e-01	9.804e-13	9.865e-13	9.416e-13	9.957e-13	9.724e-13	1.019e-12
2.180e-01	1.095e-12	1.100e-12	1.047e-12	1.104e-12	1.075e-12	1.121e-12
2.390e-01	1.216e-12	1.221e-12	1.162e-12	1.223e-12	1.189e-12	1.239e-12
2.630e-01	1.340e-12	1.345e-12	1.278e-12	1.344e-12	1.305e-12	1.356e-12
2.900e-01	1.468e-12	1.472e-12	1.398e-12	1.468e-12	1.423e-12	1.477e-12
3.190e-01	1.599e-12	1.602e-12	1.520e-12	1.594e-12	1.543e-12	1.598e-12
3.510e-01	1.743e-12	1.746e-12	1.656e-12	1.736e-12	1.680e-12	1.738e-12
3.860e-01	1.888e-12	1.891e-12	1.793e-12	1.879e-12	1.817e-12	1.879e-12
4.240e-01	2.032e-12	2.035e-12	1.929e-12	2.021e-12	1.954e-12	2.019e-12
4.670e-01	2.192e-12	2.195e-12	2.081e-12	2.179e-12	2.106e-12	2.176e-12
5.130e-01	2.354e-12	2.357e-12	2.234e-12	2.339e-12	2.261e-12	2.335e-12
5.650e-01	2.597e-12	2.600e-12	2.464e-12	2.579e-12	2.492e-12	2.573e-12
6.210e-01	2.869e-12	2.871e-12	2.721e-12	2.848e-12	2.752e-12	2.841e-12
6.830e-01	3.158e-12	3.160e-12	2.995e-12	3.134e-12	3.028e-12	3.126e-12
7.510e-01	3.449e-12	3.451e-12	3.271e-12	3.422e-12	3.306e-12	3.412e-12
8.260e-01	3.731e-12	3.734e-12	3.538e-12	3.702e-12	3.575e-12	3.690e-12
9.090e-01	4.039e-12	4.042e-12	3.830e-12	4.007e-12	3.869e-12	3.994e-12
1.000e+00	4.345e-12	4.348e-12	4.120e-12	4.311e-12	4.162e-12	4.296e-12
1.120e+00	4.757e-12	4.760e-12	4.510e-12	4.719e-12	4.556e-12	4.703e-12
1.270e+00	5.302e-12	5.306e-12	5.027e-12	5.260e-12	5.079e-12	5.242e-12
1.420e+00	5.810e-12	5.814e-12	5.509e-12	5.764e-12	5.566e-12	5.745e-12
1.600e+00	6.276e-12	6.281e-12	5.953e-12	6.229e-12	6.015e-12	6.209e-12
1.800e+00	6.843e-12	6.850e-12	6.493e-12	6.796e-12	6.565e-12	6.779e-12
2.030e+00	7.383e-12	7.394e-12	7.012e-12	7.343e-12	7.096e-12	7.330e-12
2.280e+00	8.063e-12	8.080e-12	7.668e-12	8.034e-12	7.769e-12	8.030e-12
2.570e+00	8.838e-12	8.864e-12	8.419e-12	8.830e-12	8.546e-12	8.841e-12
2.890e+00	9.553e-12	9.593e-12	9.122e-12	9.578e-12	9.281e-12	9.613e-12
3.250e+00	1.024e-11	1.030e-11	9.810e-12	1.031e-11	1.001e-11	1.038e-11
3.650e+00	1.111e-11	1.119e-11	1.068e-11	1.124e-11	1.093e-11	1.135e-11
4.110e+00	1.194e-11	1.205e-11	1.152e-11	1.216e-11	1.185e-11	1.233e-11
4.620e+00	1.294e-11	1.310e-11	1.255e-11	1.328e-11	1.297e-11	1.353e-11
5.200e+00	1.401e-11	1.422e-11	1.367e-11	1.450e-11	1.419e-11	1.485e-11
5.850e+00	1.518e-11	1.546e-11	1.490e-11	1.584e-11	1.555e-11	1.631e-11
6.580e+00	1.649e-11	1.684e-11	1.628e-11	1.736e-11	1.709e-11	1.797e-11
7.410e+00	1.808e-11	1.852e-11	1.797e-11	1.923e-11	1.898e-11	2.001e-11

ICRMA
Gray cm⁻²

Energy-MeV	- H-	- O-	- F-	-Na-	-Na-	-Hg-
<hr/>						
8.330e+00	1.967e-11	2.024e-11	1.971e-11	2.117e-11	2.097e-11	2.219e-11
9.370e+00	2.164e-11	2.237e-11	2.187e-11	2.358e-11	2.345e-11	2.489e-11
1.060e+01	2.390e-11	2.482e-11	2.438e-11	2.639e-11	2.635e-11	2.807e-11
1.190e+01	2.650e-11	2.764e-11	2.724e-11	2.959e-11	2.963e-11	3.167e-11
1.340e+01	2.929e-11	3.067e-11	3.034e-11	3.308e-11	3.323e-11	3.562e-11
1.500e+01	3.739e-11	3.960e-11	3.959e-11	4.357e-11	4.414e-11	4.767e-11
1.680e+01	5.574e-11	5.989e-11	6.062e-11	6.746e-11	6.901e-11	7.520e-11
1.880e+01	7.859e-11	8.532e-11	8.714e-11	9.772e-11	1.007e-10	1.103e-10
2.100e+01	1.028e-10	1.123e-10	1.154e-10	1.300e-10	1.344e-10	1.479e-10
2.350e+01	1.472e-10	1.619e-10	1.671e-10	1.891e-10	1.963e-10	2.166e-10
2.630e+01	2.143e-10	2.368e-10	2.454e-10	2.786e-10	2.899e-10	3.206e-10

ICRMA
Gray cm⁻²

Energy-MeV	-Al-	-Si-	-P-	-S-	-Cl-	-Ar-
1.000e-04						
1.000e-04	1.964e-09	1.104e-09	1.600e-10	2.237e-10	2.775e-10	3.185e-10
1.140e-04	2.027e-09	1.462e-09	1.558e-10	2.201e-10	2.756e-10	3.204e-10
1.360e-04	2.259e-09	1.986e-09	3.503e-10	2.093e-10	2.670e-10	3.165e-10
1.560e-04	2.166e-09	2.250e-09	2.128e-09	1.921e-10	2.505e-10	3.041e-10
1.700e-04	2.058e-09	2.342e-09	2.192e-09	8.276e-10	2.364e-10	2.953e-10
1.840e-04	1.951e-09	2.242e-09	2.215e-09	2.529e-09	2.233e-10	2.852e-10
1.910e-04	1.843e-09	2.169e-09	2.241e-09	2.379e-09	2.151e-10	2.740e-10
2.140e-04	1.698e-09	2.053e-09	2.352e-09	2.299e-09	1.046e-09	2.557e-10
2.240e-04	1.639e-09	1.938e-09	2.258e-09	2.247e-09	2.269e-09	2.423e-10
2.410e-04	1.587e-09	1.817e-09	2.149e-09	2.358e-09	2.287e-09	2.313e-10
2.470e-04	1.531e-09	1.724e-09	2.061e-09	2.376e-09	2.209e-09	4.164e-10
2.630e-04	1.463e-09	1.674e-09	2.004e-09	2.328e-09	2.168e-09	2.825e-09
2.750e-04	1.362e-09	1.596e-09	1.916e-09	2.248e-09	2.194e-09	2.583e-09
2.820e-04	1.282e-09	1.533e-09	1.844e-09	2.182e-09	2.290e-09	2.284e-09
2.960e-04	1.183e-09	1.454e-09	1.752e-09	2.096e-09	2.237e-09	2.189e-09
3.180e-04	1.060e-09	1.347e-09	1.629e-09	1.977e-09	2.153e-09	2.100e-09
3.550e-04	9.860e-10	1.257e-09	1.524e-09	1.857e-09	2.038e-09	2.174e-09
3.610e-04	9.184e-10	1.172e-09	1.424e-09	1.743e-09	1.925e-09	2.096e-09
3.700e-04	8.903e-10	1.137e-09	1.383e-09	1.696e-09	1.877e-09	2.057e-09
3.830e-04	8.456e-10	1.082e-09	1.317e-09	1.619e-09	1.800e-09	1.994e-09
4.030e-04	7.714e-10	9.889e-10	1.208e-09	1.492e-09	1.672e-09	1.886e-09
4.150e-04	7.248e-10	9.308e-10	1.139e-09	1.411e-09	1.588e-09	1.810e-09
4.300e-04	7.048e-10	9.063e-10	1.109e-09	1.375e-09	1.550e-09	1.766e-09
4.500e-04	6.747e-10	8.691e-10	1.064e-09	1.320e-09	1.491e-09	1.700e-09
4.810e-04	6.222e-10	8.040e-10	9.856e-10	1.224e-09	1.387e-09	1.582e-09
5.160e-04	5.469e-10	7.102e-10	8.722e-10	1.084e-09	1.237e-09	1.412e-09
5.470e-04	5.052e-10	6.569e-10	8.073e-10	1.006e-09	1.150e-09	1.313e-09
5.550e-04	4.825e-10	6.275e-10	7.715e-10	9.625e-10	1.101e-09	1.258e-09
5.930e-04	4.513e-10	5.869e-10	7.220e-10	9.025e-10	1.034e-09	1.182e-09
5.980e-04	4.192e-10	5.453e-10	6.712e-10	8.409e-10	9.644e-10	1.103e-09
6.250e-04	4.042e-10	5.260e-10	6.477e-10	8.120e-10	9.319e-10	1.066e-09
6.540e-04	3.829e-10	4.989e-10	6.148e-10	7.709e-10	8.857e-10	1.014e-09
6.750e-04	3.611e-10	4.712e-10	5.810e-10	7.287e-10	8.382e-10	9.596e-10
6.980e-04	3.396e-10	4.437e-10	5.475e-10	6.869e-10	7.911e-10	9.060e-10
7.110e-04	3.233e-10	4.229e-10	5.222e-10	6.552e-10	7.555e-10	8.653e-10
7.250e-04	3.164e-10	4.139e-10	5.112e-10	6.417e-10	7.402e-10	8.477e-10
7.710e-04	2.992e-10	3.916e-10	4.840e-10	6.079e-10	7.022e-10	8.040e-10
7.940e-04	2.769e-10	3.626e-10	4.486e-10	5.640e-10	6.528e-10	7.470e-10
8.180e-04	2.624e-10	3.437e-10	4.254e-10	5.354e-10	6.203e-10	7.098e-10
8.380e-04	2.535e-10	3.323e-10	4.111e-10	5.176e-10	5.999e-10	6.866e-10
8.600e-04	2.445e-10	3.207e-10	3.965e-10	4.996e-10	5.792e-10	6.631e-10
8.980e-04	2.302e-10	3.023e-10	3.734e-10	4.711e-10	5.464e-10	6.259e-10
9.200e-04	2.171e-10	2.862e-10	3.537e-10	4.467e-10	5.158e-10	5.926e-10
9.400e-04	2.112e-10	2.804e-10	3.478e-10	4.391e-10	5.013e-10	5.798e-10
9.560e-04	2.058e-10	2.750e-10	3.422e-10	4.321e-10	4.879e-10	5.678e-10

XENON
Gray cm²/g

Energy-MeV	-Al-	-Si-	-P-	-S-	-Cl-	-Ar-
9.800e-04	1.994e-10	2.686e-10	3.355e-10	4.235e-10	4.720e-10	5.535e-10
9.900e-04	1.934e-10	2.627e-10	3.294e-10	4.157e-10	4.577e-10	5.406e-10
1.000e-03	1.900e-10	2.591e-10	3.256e-10	4.109e-10	4.489e-10	5.325e-10
1.000e-03	1.852e-10	2.531e-10	3.180e-10	4.019e-10	4.382e-10	5.202e-10
1.140e-03	1.782e-10	2.438e-10	3.053e-10	3.870e-10	4.237e-10	5.012e-10
1.360e-03	1.559e-10	2.135e-10	2.650e-10	3.389e-10	3.756e-10	4.397e-10
1.560e-03	1.100e-10	1.485e-10	1.795e-10	2.359e-10	2.708e-10	3.075e-10
1.700e-03	1.025e-09	1.187e-10	1.447e-10	1.919e-10	2.245e-10	2.511e-10
1.840e-03	9.389e-10	1.122e-10	1.299e-10	1.712e-10	2.010e-10	2.245e-10
1.910e-03	8.568e-10	9.561e-10	1.162e-10	1.519e-10	1.793e-10	1.997e-10
2.140e-03	7.499e-10	8.783e-10	9.661e-11	1.260e-10	1.509e-10	1.682e-10
2.240e-03	7.081e-10	8.394e-10	7.859e-10	1.117e-10	1.388e-10	1.570e-10
2.410e-03	6.761e-10	8.039e-10	8.221e-10	9.996e-11	1.297e-10	1.492e-10
2.470e-03	6.427e-10	7.667e-10	7.903e-10	8.846e-11	1.204e-10	1.411e-10
2.630e-03	6.039e-10	7.231e-10	7.525e-10	8.465e-10	1.100e-10	1.319e-10
2.750e-03	5.469e-10	6.590e-10	6.961e-10	8.031e-10	9.493e-11	1.183e-10
2.820e-03	5.029e-10	6.093e-10	6.521e-10	7.628e-10	8.345e-11	1.078e-10
2.960e-03	4.488e-10	5.480e-10	5.974e-10	7.123e-10	7.187e-10	9.501e-11
3.180e-03	3.826e-10	4.727e-10	5.287e-10	6.455e-10	6.789e-10	7.781e-11
3.550e-03	3.473e-10	4.311e-10	4.843e-10	5.904e-10	6.268e-10	6.409e-10
3.610e-03	3.164e-10	3.943e-10	4.446e-10	5.407e-10	5.787e-10	6.309e-10
3.700e-03	3.038e-10	3.793e-10	4.284e-10	5.204e-10	5.588e-10	6.114e-10
3.830e-03	2.839e-10	3.555e-10	4.026e-10	4.882e-10	5.274e-10	5.803e-10
4.030e-03	2.512e-10	3.163e-10	3.601e-10	4.352e-10	4.754e-10	5.287e-10
4.150e-03	2.310e-10	2.921e-10	3.338e-10	4.024e-10	4.430e-10	4.953e-10
4.300e-03	2.230e-10	2.823e-10	3.229e-10	3.891e-10	4.294e-10	4.797e-10
4.500e-03	2.110e-10	2.676e-10	3.067e-10	3.693e-10	4.091e-10	4.565e-10
4.810e-03	1.906e-10	2.425e-10	2.788e-10	3.351e-10	3.739e-10	4.163e-10
5.160e-03	1.616e-10	2.068e-10	2.391e-10	2.867e-10	3.237e-10	3.592e-10
5.470e-03	1.459e-10	1.872e-10	2.172e-10	2.603e-10	2.957e-10	3.274e-10
5.550e-03	1.376e-10	1.768e-10	2.054e-10	2.461e-10	2.805e-10	3.103e-10
5.930e-03	1.262e-10	1.626e-10	1.893e-10	2.267e-10	2.597e-10	2.868e-10
5.980e-03	1.147e-10	1.481e-10	1.729e-10	2.070e-10	2.384e-10	2.629e-10
6.250e-03	1.105e-10	1.428e-10	1.669e-10	1.998e-10	2.306e-10	2.541e-10
6.540e-03	1.060e-10	1.371e-10	1.604e-10	1.920e-10	2.220e-10	2.445e-10
6.750e-03	1.013e-10	1.311e-10	1.536e-10	1.839e-10	2.130e-10	2.344e-10
6.980e-03	9.660e-11	1.251e-10	1.467e-10	1.757e-10	2.039e-10	2.243e-10
7.110e-03	9.240e-11	1.198e-10	1.406e-10	1.684e-10	1.957e-10	2.152e-10
7.250e-03	8.901e-11	1.154e-10	1.356e-10	1.624e-10	1.891e-10	2.079e-10
7.710e-03	8.069e-11	1.048e-10	1.234e-10	1.479e-10	1.729e-10	1.898e-10
7.940e-03	7.011e-11	9.131e-11	1.079e-10	1.293e-10	1.522e-10	1.668e-10
8.180e-03	6.398e-11	8.346e-11	9.891e-11	1.186e-10	1.401e-10	1.534e-10
8.380e-03	6.196e-11	8.085e-11	9.588e-11	1.150e-10	1.360e-10	1.489e-10
8.600e-03	6.004e-11	7.837e-11	9.300e-11	1.116e-10	1.320e-10	1.445e-10
8.980e-03	5.698e-11	7.441e-11	8.839e-11	1.061e-10	1.258e-10	1.376e-10

XR200A
Gray cm²/2

Energy-MeV	-Al-	-Si-	-P-	-S-	-Cl-	-Ar-
9.200e-03	5.360e-11	7.004e-11	8.330e-11	1.000e-10	1.188e-10	1.299e-10
9.400e-03	5.102e-11	6.670e-11	7.940e-11	9.539e-11	1.135e-10	1.240e-10
9.560e-03	4.867e-11	6.366e-11	7.585e-11	9.117e-11	1.086e-10	1.187e-10
9.800e-03	4.590e-11	6.007e-11	7.167e-11	8.620e-11	1.029e-10	1.123e-10
1.000e-02	4.268e-11	5.590e-11	6.681e-11	8.041e-11	9.620e-11	1.050e-10
1.040e-02	4.079e-11	5.344e-11	6.393e-11	7.699e-11	9.225e-11	1.006e-10
1.080e-02	3.990e-11	5.229e-11	6.258e-11	7.539e-11	9.037e-11	9.857e-11
1.110e-02	3.898e-11	5.109e-11	6.116e-11	7.371e-11	8.839e-11	9.641e-11
1.190e-02	3.722e-11	4.878e-11	5.843e-11	7.047e-11	8.456e-11	9.223e-11
1.270e-02	3.405e-11	4.464e-11	5.354e-11	6.466e-11	7.769e-11	8.471e-11
1.300e-02	3.147e-11	4.127e-11	4.954e-11	5.990e-11	7.206e-11	7.855e-11
1.390e-02	2.819e-11	3.697e-11	4.445e-11	5.383e-11	6.489e-11	7.071e-11
1.470e-02	2.287e-11	3.001e-11	3.621e-11	4.401e-11	5.325e-11	5.798e-11
1.520e-02	1.852e-11	2.432e-11	2.945e-11	3.596e-11	4.370e-11	4.754e-11
1.570e-02	1.744e-11	2.290e-11	2.776e-11	3.394e-11	4.129e-11	4.492e-11
1.640e-02	1.675e-11	2.200e-11	2.669e-11	3.265e-11	3.973e-11	4.322e-11
1.700e-02	1.591e-11	2.088e-11	2.535e-11	3.104e-11	3.779e-11	4.111e-11
1.720e-02	1.533e-11	2.012e-11	2.443e-11	2.994e-11	3.646e-11	3.966e-11
1.810e-02	1.444e-11	1.896e-11	2.303e-11	2.826e-11	3.443e-11	3.745e-11
1.900e-02	1.283e-11	1.683e-11	2.048e-11	2.519e-11	3.071e-11	3.341e-11
1.970e-02	1.121e-11	1.470e-11	1.791e-11	2.210e-11	2.697e-11	2.933e-11
2.010e-02	1.001e-11	1.313e-11	1.602e-11	1.983e-11	2.422e-11	2.634e-11
2.100e-02	9.629e-12	1.262e-11	1.541e-11	1.909e-11	2.332e-11	2.537e-11
2.170e-02	9.407e-12	1.233e-11	1.505e-11	1.866e-11	2.279e-11	2.479e-11
2.230e-02	9.194e-12	1.204e-11	1.471e-11	1.824e-11	2.228e-11	2.424e-11
2.310e-02	8.929e-12	1.169e-11	1.428e-11	1.773e-11	2.165e-11	2.356e-11
2.550e-02	8.183e-12	1.071e-11	1.309e-11	1.627e-11	1.987e-11	2.162e-11
2.920e-02	6.269e-12	8.185e-12	1.002e-11	1.253e-11	1.529e-11	1.665e-11
3.320e-02	4.054e-12	5.263e-12	6.461e-12	8.181e-12	9.967e-12	1.086e-11
3.750e-02	3.336e-12	4.317e-12	5.298e-12	6.737e-12	8.189e-12	8.932e-12
4.200e-02	2.437e-12	3.133e-12	3.841e-12	4.920e-12	5.955e-12	6.504e-12
4.740e-02	1.973e-12	2.520e-12	3.083e-12	3.964e-12	4.777e-12	5.220e-12
4.850e-02	1.695e-12	2.155e-12	2.629e-12	3.389e-12	4.068e-12	4.446e-12
5.020e-02	1.556e-12	1.971e-12	2.401e-12	3.099e-12	3.712e-12	4.057e-12
5.500e-02	1.403e-12	1.768e-12	2.148e-12	2.774e-12	3.311e-12	3.618e-12
6.100e-02	1.184e-12	1.479e-12	1.785e-12	2.304e-12	2.731e-12	2.983e-12
6.750e-02	1.039e-12	1.285e-12	1.539e-12	1.982e-12	2.333e-12	2.544e-12
6.950e-02	9.796e-13	1.205e-12	1.436e-12	1.844e-12	2.161e-12	2.354e-12
7.350e-02	9.266e-13	1.133e-12	1.345e-12	1.724e-12	2.012e-12	2.189e-12
7.840e-02	8.333e-13	1.009e-12	1.187e-12	1.514e-12	1.753e-12	1.903e-12
8.070e-02	7.482e-13	8.958e-13	1.043e-12	1.324e-12	1.520e-12	1.645e-12
8.550e-02	7.228e-13	8.603e-13	9.963e-13	1.259e-12	1.438e-12	1.554e-12
8.800e-02	7.064e-13	8.364e-13	9.634e-13	1.213e-12	1.379e-12	1.487e-12
9.050e-02	6.925e-13	8.167e-13	9.369e-13	1.176e-12	1.332e-12	1.434e-12
9.230e-02	6.791e-13	7.978e-13	9.117e-13	1.140e-12	1.288e-12	1.385e-12

EXTRA
Gray cmw2

Energy-MeV	-Al-	-Si-	-P-	-S-	-Cl-	-Ar-
9.600e-02	6.596e-13	7.707e-13	8.758e-13	1.090e-12	1.226e-12	1.315e-12
1.000e-01	6.284e-13	7.278e-13	8.195e-13	1.012e-12	1.129e-12	1.206e-12
1.050e-01	6.274e-13	7.200e-13	8.024e-13	9.818e-13	1.086e-12	1.154e-12
1.100e-01	6.590e-13	7.505e-13	8.290e-13	1.005e-12	1.104e-12	1.167e-12
1.150e-01	6.878e-13	7.776e-13	8.515e-13	1.023e-12	1.115e-12	1.173e-12
1.210e-01	7.160e-13	8.032e-13	8.714e-13	1.036e-12	1.121e-12	1.173e-12
1.350e-01	7.576e-13	8.383e-13	8.938e-13	1.043e-12	1.111e-12	1.148e-12
1.490e-01	7.977e-13	8.651e-13	8.989e-13	1.018e-12	1.057e-12	1.072e-12
1.640e-01	8.508e-13	9.091e-13	9.257e-13	1.022e-12	1.038e-12	1.034e-12
1.800e-01	9.379e-13	9.958e-13	1.005e-12	1.096e-12	1.102e-12	1.088e-12
1.980e-01	1.021e-12	1.077e-12	1.077e-12	1.158e-12	1.152e-12	1.125e-12
2.180e-01	1.116e-12	1.171e-12	1.161e-12	1.236e-12	1.218e-12	1.179e-12
2.390e-01	1.229e-12	1.286e-12	1.272e-12	1.347e-12	1.323e-12	1.275e-12
2.630e-01	1.341e-12	1.401e-12	1.381e-12	1.456e-12	1.423e-12	1.366e-12
2.900e-01	1.455e-12	1.516e-12	1.489e-12	1.560e-12	1.518e-12	1.450e-12
3.190e-01	1.570e-12	1.632e-12	1.597e-12	1.664e-12	1.613e-12	1.532e-12
3.510e-01	1.705e-12	1.772e-12	1.731e-12	1.800e-12	1.742e-12	1.652e-12
3.860e-01	1.841e-12	1.911e-12	1.866e-12	1.936e-12	1.870e-12	1.770e-12
4.240e-01	1.977e-12	2.050e-12	1.999e-12	2.070e-12	1.997e-12	1.887e-12
4.670e-01	2.129e-12	2.207e-12	2.151e-12	2.225e-12	2.145e-12	2.024e-12
5.130e-01	2.283e-12	2.366e-12	2.304e-12	2.381e-12	2.294e-12	2.163e-12
5.650e-01	2.515e-12	2.606e-12	2.536e-12	2.619e-12	2.522e-12	2.376e-12
6.210e-01	2.775e-12	2.874e-12	2.797e-12	2.887e-12	2.778e-12	2.616e-12
6.830e-01	3.053e-12	3.161e-12	3.075e-12	3.173e-12	3.053e-12	2.873e-12
7.510e-01	3.332e-12	3.450e-12	3.355e-12	3.461e-12	3.329e-12	3.133e-12
8.260e-01	3.633e-12	3.730e-12	3.626e-12	3.740e-12	3.596e-12	3.383e-12
9.090e-01	3.899e-12	4.036e-12	3.923e-12	4.045e-12	3.890e-12	3.659e-12
1.000e+00	4.194e-12	4.341e-12	4.219e-12	4.350e-12	4.182e-12	3.933e-12
1.120e+00	4.590e-12	4.751e-12	4.617e-12	4.760e-12	4.576e-12	4.302e-12
1.270e+00	5.117e-12	5.295e-12	5.146e-12	5.305e-12	5.100e-12	4.795e-12
1.420e+00	5.608e-12	5.804e-12	5.640e-12	5.815e-12	5.589e-12	5.255e-12
1.600e+00	6.061e-12	6.274e-12	6.097e-12	6.286e-12	6.043e-12	5.682e-12
1.800e+00	6.619e-12	6.853e-12	6.662e-12	6.871e-12	6.606e-12	6.213e-12
2.030e+00	7.161e-12	7.417e-12	7.213e-12	7.442e-12	7.159e-12	6.735e-12
2.280e+00	7.850e-12	8.135e-12	7.917e-12	8.173e-12	7.867e-12	7.405e-12
2.570e+00	8.649e-12	8.972e-12	8.738e-12	9.029e-12	8.698e-12	8.195e-12
2.890e+00	9.415e-12	9.777e-12	9.533e-12	9.861e-12	9.511e-12	8.970e-12
3.250e+00	1.019e-11	1.059e-11	1.034e-11	1.071e-11	1.034e-11	9.771e-12
3.650e+00	1.116e-11	1.162e-11	1.136e-11	1.179e-11	1.140e-11	1.078e-11
4.110e+00	1.214e-11	1.267e-11	1.241e-11	1.290e-11	1.250e-11	1.185e-11
4.620e+00	1.335e-11	1.396e-11	1.371e-11	1.428e-11	1.386e-11	1.316e-11
5.200e+00	1.468e-11	1.540e-11	1.515e-11	1.582e-11	1.540e-11	1.465e-11
5.850e+00	1.617e-11	1.699e-11	1.677e-11	1.754e-11	1.711e-11	1.632e-11
6.580e+00	1.786e-11	1.882e-11	1.861e-11	1.952e-11	1.908e-11	1.823e-11
7.410e+00	1.995e-11	2.107e-11	2.089e-11	2.196e-11	2.152e-11	2.061e-11

KINDA
Gray cm²/g

Energy-MeV	-Al-	-Si-	- P-	- S-	-Cl-	-Ar-
8.330e+00	2.219e-11	2.351e-11	2.337e-11	2.464e-11	2.420e-11	2.324e-11
9.370e+00	2.497e-11	2.653e-11	2.646e-11	2.797e-11	2.754e-11	2.651e-11
1.060e+01	2.826e-11	3.013e-11	3.013e-11	3.194e-11	3.154e-11	3.044e-11
1.190e+01	3.196e-11	3.416e-11	3.425e-11	3.639e-11	3.601e-11	3.482e-11
1.340e+01	3.605e-11	3.863e-11	3.883e-11	4.135e-11	4.100e-11	3.972e-11
2.000e+01	4.859e-11	5.243e-11	5.302e-11	5.679e-11	5.662e-11	5.513e-11
3.000e+01	7.726e-11	8.397e-11	8.550e-11	9.214e-11	9.239e-11	9.043e-11
4.000e+01	1.139e-10	1.244e-10	1.272e-10	1.376e-10	1.385e-10	1.360e-10
5.000e+01	1.532e-10	1.677e-10	1.719e-10	1.863e-10	1.878e-10	1.846e-10
7.500e+01	2.250e-10	2.469e-10	2.536e-10	2.754e-10	2.780e-10	2.738e-10
1.000e+02	3.337e-10	3.668e-10	3.773e-10	4.103e-10	4.146e-10	4.088e-10

KEDMA
Gray cm²/s

Energy-MeV	-K-	-Ca-	-Sc-	-Ti-	-V-	-Cr-
1.000e-04						
1.080e-04	3.523e-10	3.812e-10	4.305e-10	4.768e-10	5.339e-10	7.050e-10
1.140e-04	3.583e-10	3.897e-10	4.386e-10	4.842e-10	5.411e-10	7.111e-10
1.360e-04	3.627e-10	3.993e-10	4.456e-10	4.884e-10	5.430e-10	7.053e-10
1.560e-04	3.551e-10	3.996e-10	4.391e-10	4.750e-10	5.230e-10	6.640e-10
1.700e-04	3.482e-10	3.962e-10	4.331e-10	4.667e-10	5.119e-10	6.421e-10
1.840e-04	3.397e-10	3.893e-10	4.249e-10	4.579e-10	5.014e-10	6.247e-10
1.910e-04	3.296e-10	3.800e-10	4.143e-10	4.465e-10	4.882e-10	6.044e-10
2.140e-04	3.150e-10	3.664e-10	3.989e-10	4.300e-10	4.694e-10	5.762e-10
2.240e-04	3.093e-10	3.620e-10	3.942e-10	4.253e-10	4.640e-10	5.674e-10
2.410e-04	3.031e-10	3.567e-10	3.885e-10	4.194e-10	4.578e-10	5.582e-10
2.470e-04	2.958e-10	3.499e-10	3.812e-10	4.119e-10	4.496e-10	5.468e-10
2.630e-04	2.866e-10	3.410e-10	3.716e-10	4.018e-10	4.387e-10	5.319e-10
2.750e-04	2.723e-10	3.268e-10	3.563e-10	3.858e-10	4.212e-10	5.085e-10
2.820e-04	2.608e-10	3.152e-10	3.438e-10	3.726e-10	4.069e-10	4.895e-10
2.960e-04	3.915e-10	3.004e-10	3.278e-10	3.558e-10	3.886e-10	4.653e-10
3.180e-04	2.886e-09	2.798e-10	3.075e-10	3.344e-10	3.654e-10	4.348e-10
3.550e-04	2.282e-09	6.441e-10	2.937e-10	3.199e-10	3.500e-10	4.152e-10
3.610e-04	2.139e-09	2.230e-09	2.801e-10	3.056e-10	3.346e-10	3.958e-10
3.700e-04	2.091e-09	2.267e-09	2.742e-10	2.994e-10	3.279e-10	3.875e-10
3.830e-04	2.130e-09	2.264e-09	2.648e-10	2.893e-10	3.171e-10	3.741e-10
4.030e-04	2.210e-09	2.191e-09	2.487e-10	2.723e-10	2.988e-10	3.514e-10
4.150e-04	2.164e-09	2.112e-09	1.757e-09	2.602e-10	2.858e-10	3.371e-10
4.300e-04	2.117e-09	2.037e-09	2.140e-09	2.534e-10	2.783e-10	3.308e-10
4.500e-04	2.045e-09	2.113e-09	2.083e-09	2.431e-10	2.671e-10	3.211e-10
4.810e-04	1.916e-09	2.112e-09	1.952e-09	1.386e-09	2.523e-10	3.034e-10
5.160e-04	1.728e-09	1.946e-09	1.918e-09	1.947e-09	2.534e-10	2.771e-10
5.470e-04	1.613e-09	1.832e-09	1.936e-09	1.818e-09	1.478e-09	2.597e-10
5.550e-04	1.548e-09	1.764e-09	1.848e-09	1.735e-09	1.726e-09	2.494e-10
5.930e-04	1.456e-09	1.667e-09	1.757e-09	1.846e-09	1.790e-09	8.883e-10
5.980e-04	1.363e-09	1.568e-09	1.679e-09	1.821e-09	1.712e-09	2.023e-09
6.250e-04	1.319e-09	1.521e-09	1.635e-09	1.774e-09	1.652e-09	2.002e-09
6.540e-04	1.257e-09	1.454e-09	1.563e-09	1.700e-09	1.789e-09	1.881e-09
6.750e-04	1.192e-09	1.384e-09	1.488e-09	1.623e-09	1.742e-09	1.758e-09
6.980e-04	1.129e-09	1.315e-09	1.413e-09	1.546e-09	1.667e-09	1.708e-09
7.110e-04	1.080e-09	1.261e-09	1.356e-09	1.486e-09	1.609e-09	1.857e-09
7.250e-04	1.059e-09	1.237e-09	1.331e-09	1.459e-09	1.581e-09	1.818e-09
7.710e-04	1.005e-09	1.176e-09	1.267e-09	1.390e-09	1.510e-09	1.723e-09
7.940e-04	9.356e-10	1.096e-09	1.184e-09	1.300e-09	1.416e-09	1.625e-09
8.180e-04	8.899e-10	1.044e-09	1.129e-09	1.241e-09	1.355e-09	1.563e-09
8.380e-04	8.612e-10	1.011e-09	1.094e-09	1.204e-09	1.316e-09	1.520e-09
8.600e-04	8.320e-10	9.775e-10	1.058e-09	1.167e-09	1.277e-09	1.476e-09
8.980e-04	7.856e-10	9.242e-10	1.001e-09	1.107e-09	1.214e-09	1.405e-09
9.200e-04	7.435e-10	8.773e-10	9.505e-10	1.058e-09	1.160e-09	1.344e-09
9.400e-04	7.254e-10	8.604e-10	9.314e-10	1.045e-09	1.144e-09	1.327e-09
9.560e-04	7.088e-10	8.447e-10	9.137e-10	1.033e-09	1.129e-09	1.310e-09

KERMA
Gray cm²/g

Energy-MeV	-K-	-Ca-	-Sc-	-Ti-	-V-	-Cr-
9.800e-04	6.889e-10	8.257e-10	8.923e-10	1.019e-09	1.110e-09	1.290e-09
9.900e-04	6.709e-10	8.086e-10	8.729e-10	1.005e-09	1.094e-09	1.271e-09
1.000e-03	6.598e-10	7.979e-10	8.609e-10	9.966e-10	1.083e-09	1.260e-09
1.080e-03	6.446e-10	7.808e-10	8.433e-10	9.777e-10	1.062e-09	1.236e-09
1.140e-03	6.223e-10	7.536e-10	8.162e-10	9.439e-10	1.026e-09	1.194e-09
1.360e-03	5.491e-10	6.646e-10	7.254e-10	8.332e-10	9.082e-10	1.055e-09
1.560e-03	3.907e-10	4.721e-10	5.270e-10	5.934e-10	6.515e-10	7.541e-10
1.700e-03	3.223e-10	3.891e-10	4.396e-10	4.899e-10	5.401e-10	6.240e-10
1.840e-03	2.892e-10	3.491e-10	3.958e-10	4.399e-10	4.858e-10	5.607e-10
1.910e-03	2.584e-10	3.118e-10	3.548e-10	3.934e-10	4.350e-10	5.018e-10
2.140e-03	2.191e-10	2.643e-10	3.023e-10	3.339e-10	3.702e-10	4.264e-10
2.240e-03	2.049e-10	2.472e-10	2.830e-10	3.125e-10	3.468e-10	3.993e-10
2.410e-03	1.949e-10	2.352e-10	2.692e-10	2.974e-10	3.303e-10	3.801e-10
2.470e-03	1.846e-10	2.228e-10	2.550e-10	2.818e-10	3.131e-10	3.603e-10
2.630e-03	1.727e-10	2.084e-10	2.385e-10	2.637e-10	2.932e-10	3.373e-10
2.750e-03	1.552e-10	1.874e-10	2.144e-10	2.373e-10	2.641e-10	3.037e-10
2.820e-03	1.418e-10	1.713e-10	1.959e-10	2.170e-10	2.417e-10	2.778e-10
2.960e-03	1.253e-10	1.514e-10	1.731e-10	1.920e-10	2.142e-10	2.460e-10
3.180e-03	1.044e-10	1.273e-10	1.454e-10	1.617e-10	1.807e-10	2.074e-10
3.550e-03	9.036e-11	1.152e-10	1.311e-10	1.463e-10	1.637e-10	1.877e-10
3.610e-03	1.134e-10	1.046e-10	1.186e-10	1.330e-10	1.488e-10	1.706e-10
3.700e-03	6.684e-10	1.003e-10	1.136e-10	1.275e-10	1.428e-10	1.636e-10
3.830e-03	6.446e-10	9.347e-11	1.056e-10	1.189e-10	1.332e-10	1.526e-10
4.030e-03	6.044e-10	8.227e-11	9.253e-11	1.048e-10	1.175e-10	1.345e-10
4.150e-03	5.755e-10	6.448e-10	8.374e-11	9.613e-11	1.079e-10	1.235e-10
4.300e-03	5.587e-10	6.627e-10	7.930e-11	9.267e-11	1.041e-10	1.192e-10
4.500e-03	5.335e-10	6.320e-10	9.252e-11	8.754e-11	9.851e-11	1.128e-10
4.810e-03	4.897e-10	5.787e-10	5.692e-10	7.876e-11	8.891e-11	1.017e-10
5.160e-03	4.271e-10	5.025e-10	5.147e-10	3.395e-10	7.513e-11	8.618e-11
5.470e-03	3.917e-10	4.595e-10	4.770e-10	5.239e-10	7.475e-11	7.777e-11
5.550e-03	3.724e-10	4.361e-10	4.544e-10	4.987e-10	5.406e-10	7.331e-11
5.930e-03	3.458e-10	4.041e-10	4.234e-10	4.639e-10	5.089e-10	6.724e-11
5.980e-03	3.187e-10	3.713e-10	3.917e-10	4.283e-10	4.762e-10	6.107e-11
6.250e-03	3.086e-10	3.593e-10	3.799e-10	4.152e-10	4.629e-10	5.043e-10
6.540e-03	2.975e-10	3.461e-10	3.667e-10	4.007e-10	4.462e-10	5.008e-10
6.750e-03	2.858e-10	3.323e-10	3.528e-10	3.853e-10	4.287e-10	4.815e-10
6.980e-03	2.740e-10	3.184e-10	3.387e-10	3.698e-10	4.110e-10	4.621e-10
7.110e-03	2.633e-10	3.058e-10	3.261e-10	3.559e-10	3.951e-10	4.446e-10
7.250e-03	2.547e-10	2.957e-10	3.158e-10	3.446e-10	3.822e-10	4.304e-10
7.710e-03	2.335e-10	2.708e-10	2.905e-10	3.168e-10	3.505e-10	3.955e-10
7.940e-03	2.065e-10	2.390e-10	2.582e-10	2.812e-10	3.101e-10	3.508e-10
8.180e-03	1.907e-10	2.204e-10	2.392e-10	2.603e-10	2.864e-10	3.247e-10
8.380e-03	1.853e-10	2.141e-10	2.326e-10	2.532e-10	2.784e-10	3.158e-10
8.600e-03	1.801e-10	2.080e-10	2.263e-10	2.463e-10	2.707e-10	3.072e-10
8.980e-03	1.717e-10	1.984e-10	2.161e-10	2.352e-10	2.583e-10	2.934e-10

KERMA
Gray cm²/g

Energy-MeV	-K-	-Ca-	-Sc-	-Ti-	-V-	-Cr-
9.200e-03	1.624e-10	1.877e-10	2.048e-10	2.230e-10	2.446e-10	2.782e-10
9.400e-03	1.553e-10	1.794e-10	1.961e-10	2.135e-10	2.341e-10	2.664e-10
9.560e-03	1.488e-10	1.720e-10	1.882e-10	2.049e-10	2.245e-10	2.557e-10
9.800e-03	1.412e-10	1.631e-10	1.788e-10	1.948e-10	2.132e-10	2.431e-10
1.000e-02	1.323e-10	1.528e-10	1.680e-10	1.829e-10	2.000e-10	2.283e-10
1.040e-02	1.270e-10	1.467e-10	1.615e-10	1.759e-10	1.922e-10	2.196e-10
1.080e-02	1.245e-10	1.439e-10	1.583e-10	1.726e-10	1.885e-10	2.155e-10
1.110e-02	1.218e-10	1.408e-10	1.550e-10	1.690e-10	1.846e-10	2.110e-10
1.190e-02	1.166e-10	1.349e-10	1.486e-10	1.621e-10	1.769e-10	2.025e-10
1.270e-02	1.073e-10	1.242e-10	1.370e-10	1.495e-10	1.632e-10	1.869e-10
1.300e-02	9.963e-11	1.155e-10	1.274e-10	1.392e-10	1.519e-10	1.741e-10
1.390e-02	8.987e-11	1.043e-10	1.152e-10	1.260e-10	1.374e-10	1.578e-10
1.470e-02	7.403e-11	8.610e-11	9.544e-11	1.046e-10	1.139e-10	1.312e-10
1.520e-02	6.102e-11	7.119e-11	7.916e-11	8.702e-11	9.458e-11	1.093e-10
1.570e-02	5.773e-11	6.742e-11	7.501e-11	8.254e-11	8.969e-11	1.038e-10
1.640e-02	5.558e-11	6.496e-11	7.227e-11	7.958e-11	8.648e-11	1.001e-10
1.700e-02	5.289e-11	6.189e-11	6.884e-11	7.588e-11	8.246e-11	9.552e-11
1.720e-02	5.105e-11	5.979e-11	6.650e-11	7.335e-11	7.971e-11	9.237e-11
1.810e-02	4.824e-11	5.657e-11	6.291e-11	6.946e-11	7.550e-11	8.755e-11
1.900e-02	4.310e-11	5.067e-11	5.633e-11	6.234e-11	6.776e-11	7.869e-11
1.970e-02	3.792e-11	4.472e-11	4.970e-11	5.516e-11	5.996e-11	6.975e-11
2.010e-02	3.411e-11	4.035e-11	4.482e-11	4.988e-11	5.422e-11	6.316e-11
2.100e-02	3.286e-11	3.891e-11	4.322e-11	4.814e-11	5.234e-11	6.100e-11
2.170e-02	3.212e-11	3.806e-11	4.226e-11	4.710e-11	5.122e-11	5.971e-11
2.230e-02	3.141e-11	3.724e-11	4.134e-11	4.610e-11	5.014e-11	5.846e-11
2.310e-02	3.053e-11	3.622e-11	4.019e-11	4.485e-11	4.879e-11	5.690e-11
2.550e-02	2.803e-11	3.333e-11	3.695e-11	4.130e-11	4.495e-11	5.247e-11
2.920e-02	2.161e-11	2.587e-11	2.859e-11	3.214e-11	3.503e-11	4.099e-11
3.320e-02	1.414e-11	1.717e-11	1.885e-11	2.144e-11	2.344e-11	2.756e-11
3.750e-02	1.162e-11	1.419e-11	1.553e-11	1.775e-11	1.944e-11	2.289e-11
4.200e-02	8.454e-12	1.043e-11	1.133e-11	1.307e-11	1.436e-11	1.695e-11
4.740e-02	6.775e-12	8.420e-12	9.096e-12	1.055e-11	1.162e-11	1.374e-11
4.850e-02	5.762e-12	7.195e-12	7.740e-12	9.013e-12	9.945e-12	1.177e-11
5.020e-02	5.254e-12	6.579e-12	7.059e-12	8.241e-12	9.104e-12	1.078e-11
5.500e-02	4.678e-12	5.876e-12	6.282e-12	7.356e-12	8.136e-12	9.637e-12
6.100e-02	3.845e-12	4.851e-12	5.156e-12	6.062e-12	6.718e-12	7.959e-12
6.750e-02	3.267e-12	4.134e-12	4.370e-12	5.154e-12	5.719e-12	6.775e-12
6.950e-02	3.016e-12	3.818e-12	4.026e-12	4.751e-12	5.275e-12	6.247e-12
7.350e-02	2.798e-12	3.543e-12	3.727e-12	4.403e-12	4.889e-12	5.789e-12
7.840e-02	2.422e-12	3.070e-12	3.213e-12	3.801e-12	4.225e-12	4.999e-12
8.070e-02	2.083e-12	2.643e-12	2.750e-12	3.260e-12	3.626e-12	4.287e-12
8.550e-02	1.962e-12	2.488e-12	2.581e-12	3.060e-12	3.403e-12	4.021e-12
8.800e-02	1.873e-12	2.371e-12	2.455e-12	2.908e-12	3.234e-12	3.818e-12
9.050e-02	1.802e-12	2.279e-12	2.356e-12	2.790e-12	3.102e-12	3.660e-12
9.230e-02	1.736e-12	2.193e-12	2.263e-12	2.679e-12	2.978e-12	3.512e-12

EBR-II
Gray cast#2

Energy-MeV	-K-	-Ca-	-Sc-	-Ti-	-V-	-Cr-
9.600e-02	1.643e-12	2.073e-12	2.134e-12	2.524e-12	2.805e-12	3.304e-12
1.000e-01	1.500e-12	1.867e-12	1.933e-12	2.204e-12	2.530e-12	2.985e-12
1.030e-01	1.427e-12	1.787e-12	1.823e-12	2.149e-12	2.383e-12	2.797e-12
1.100e-01	1.435e-12	1.787e-12	1.818e-12	2.135e-12	2.363e-12	2.766e-12
1.150e-01	1.435e-12	1.776e-12	1.802e-12	2.107e-12	2.327e-12	2.717e-12
1.210e-01	1.425e-12	1.752e-12	1.771e-12	2.061e-12	2.269e-12	2.642e-12
1.350e-01	1.378e-12	1.670e-12	1.677e-12	1.931e-12	2.113e-12	2.443e-12
1.490e-01	1.258e-12	1.485e-12	1.471e-12	1.661e-12	1.797e-12	2.049e-12
1.640e-01	1.190e-12	1.367e-12	1.336e-12	1.476e-12	1.576e-12	1.769e-12
1.800e-01	1.239e-12	1.401e-12	1.361e-12	1.483e-12	1.569e-12	1.744e-12
1.980e-01	1.266e-12	1.405e-12	1.355e-12	1.450e-12	1.517e-12	1.663e-12
2.100e-01	1.314e-12	1.434e-12	1.373e-12	1.446e-12	1.496e-12	1.620e-12
2.390e-01	1.415e-12	1.531e-12	1.463e-12	1.527e-12	1.570e-12	1.690e-12
2.630e-01	1.508e-12	1.618e-12	1.540e-12	1.593e-12	1.627e-12	1.738e-12
2.900e-01	1.591e-12	1.689e-12	1.602e-12	1.638e-12	1.659e-12	1.755e-12
3.190e-01	1.673e-12	1.757e-12	1.661e-12	1.678e-12	1.684e-12	1.765e-12
3.510e-01	1.799e-12	1.882e-12	1.776e-12	1.786e-12	1.786e-12	1.864e-12
3.860e-01	1.924e-12	2.005e-12	1.889e-12	1.891e-12	1.884e-12	1.958e-12
4.240e-01	2.047e-12	2.124e-12	1.999e-12	1.991e-12	1.976e-12	2.045e-12
4.670e-01	2.194e-12	2.272e-12	2.137e-12	2.123e-12	2.103e-12	2.172e-12
5.130e-01	2.342e-12	2.420e-12	2.274e-12	2.254e-12	2.228e-12	2.295e-12
5.650e-01	2.571e-12	2.652e-12	2.491e-12	2.464e-12	2.432e-12	2.502e-12
6.210e-01	2.828e-12	2.914e-12	2.735e-12	2.702e-12	2.664e-12	2.736e-12
6.830e-01	3.105e-12	3.197e-12	3.000e-12	2.960e-12	2.918e-12	2.994e-12
7.510e-01	3.384e-12	3.482e-12	3.266e-12	3.221e-12	3.173e-12	3.253e-12
8.260e-01	3.654e-12	3.757e-12	3.523e-12	3.471e-12	3.417e-12	3.501e-12
9.090e-01	3.950e-12	4.060e-12	3.807e-12	3.745e-12	3.690e-12	3.779e-12
1.000e+00	4.245e-12	4.362e-12	4.089e-12	4.025e-12	3.961e-12	4.055e-12
1.120e+00	4.644e-12	4.771e-12	4.471e-12	4.400e-12	4.329e-12	4.431e-12
1.270e+00	5.175e-12	5.316e-12	4.982e-12	4.902e-12	4.823e-12	4.935e-12
1.420e+00	5.671e-12	5.826e-12	5.459e-12	5.371e-12	5.284e-12	5.407e-12
1.600e+00	6.132e-12	6.300e-12	5.902e-12	5.808e-12	5.713e-12	5.846e-12
1.800e+00	6.706e-12	6.892e-12	6.459e-12	6.357e-12	6.255e-12	6.401e-12
2.030e+00	7.273e-12	7.477e-12	7.010e-12	6.902e-12	6.794e-12	6.956e-12
2.280e+00	8.001e-12	8.231e-12	7.721e-12	7.607e-12	7.492e-12	7.675e-12
2.570e+00	8.862e-12	9.124e-12	8.565e-12	8.445e-12	8.324e-12	8.535e-12
2.890e+00	9.711e-12	1.001e-11	9.406e-12	9.284e-12	9.161e-12	9.402e-12
3.250e+00	1.059e-11	1.093e-11	1.029e-11	1.017e-11	1.004e-11	1.032e-11
3.650e+00	1.171e-11	1.210e-11	1.141e-11	1.129e-11	1.117e-11	1.149e-11
4.110e+00	1.289e-11	1.334e-11	1.260e-11	1.249e-11	1.238e-11	1.276e-11
4.620e+00	1.435e-11	1.488e-11	1.407e-11	1.398e-11	1.387e-11	1.432e-11
5.200e+00	1.600e-11	1.664e-11	1.576e-11	1.568e-11	1.559e-11	1.612e-11
5.850e+00	1.785e-11	1.860e-11	1.765e-11	1.759e-11	1.752e-11	1.815e-11
6.580e+00	1.999e-11	2.087e-11	1.985e-11	1.982e-11	1.978e-11	2.052e-11
7.410e+00	2.265e-11	2.369e-11	2.257e-11	2.258e-11	2.258e-11	2.348e-11

**TABLE
Gray curve?**

Energy-MeV	-K -	-Ca-	-Se-	-Ti-	- V-	-Cr-

8.330e+00	2.560e-11	2.683e-11	2.563e-11	2.570e-11	2.575e-11	2.683e-11
9.370e+00	2.927e-11	3.079e-11	2.944e-11	2.930e-11	2.971e-11	3.101e-11
1.060e+01	3.369e-11	3.547e-11	3.404e-11	3.420e-11	3.450e-11	3.609e-11
1.190e+01	3.860e-11	4.072e-11	3.914e-11	3.940e-11	3.979e-11	4.160e-11
1.340e+01	4.419e-11	4.663e-11	4.489e-11	4.535e-11	4.578e-11	4.801e-11
2.000e+01	6.153e-11	6.590e-11	6.311e-11	6.399e-11	6.481e-11	6.819e-11
3.000e+01	1.014e-10	1.081e-10	1.049e-10	1.067e-10	1.084e-10	1.143e-10
4.000e+01	1.529e-10	1.634e-10	1.589e-10	1.620e-10	1.650e-10	1.744e-10
5.000e+01	2.000e-10	2.226e-10	2.167e-10	2.213e-10	2.255e-10	2.387e-10
7.500e+01	3.087e-10	3.308e-10	3.225e-10	3.297e-10	3.364e-10	3.564e-10
1.000e+02	4.614e-10	4.947e-10	4.827e-10	4.938e-10	5.043e-10	5.346e-10

ICRMA
Gray cm⁻²

Energy-MeV	-Al-	-Fe-	-Co-	-Ni-	-Cu-	-Zn-
1.000e-04						
1.000e-04	7.286e-10	8.426e-10	8.910e-10	9.484e-10	1.031e-09	1.098e-09
1.140e-04	7.371e-10	8.530e-10	9.092e-10	9.741e-10	1.024e-09	1.116e-09
1.360e-04	7.366e-10	8.538e-10	9.155e-10	1.034e-09	1.065e-09	1.130e-09
1.560e-04	7.036e-10	8.182e-10	8.875e-10	1.030e-09	1.130e-09	1.199e-09
1.700e-04	6.847e-10	7.970e-10	8.696e-10	1.017e-09	1.127e-09	1.204e-09
1.840e-04	6.679e-10	7.773e-10	8.510e-10	9.943e-10	1.093e-09	1.192e-09
1.910e-04	6.477e-10	7.538e-10	8.279e-10	9.666e-10	1.054e-09	1.172e-09
2.140e-04	6.195e-10	7.208e-10	7.947e-10	9.271e-10	1.002e-09	1.140e-09
2.240e-04	6.108e-10	7.104e-10	7.842e-10	9.152e-10	9.879e-10	1.130e-09
2.410e-04	6.014e-10	6.992e-10	7.721e-10	9.016e-10	9.736e-10	1.116e-09
2.470e-04	5.896e-10	6.852e-10	7.570e-10	8.845e-10	9.554e-10	1.097e-09
2.630e-04	5.740e-10	6.668e-10	7.370e-10	8.617e-10	9.312e-10	1.072e-09
2.750e-04	5.495e-10	6.379e-10	7.056e-10	8.257e-10	8.928e-10	1.031e-09
2.820e-04	5.295e-10	6.144e-10	6.800e-10	7.964e-10	8.615e-10	9.973e-10
2.960e-04	5.040e-10	5.844e-10	6.472e-10	7.588e-10	8.213e-10	9.540e-10
3.180e-04	4.719e-10	5.468e-10	6.061e-10	7.113e-10	7.704e-10	8.986e-10
3.550e-04	4.515e-10	5.228e-10	5.794e-10	6.796e-10	7.360e-10	8.593e-10
3.610e-04	4.313e-10	4.992e-10	5.530e-10	6.483e-10	7.021e-10	8.203e-10
3.700e-04	4.225e-10	4.889e-10	5.416e-10	6.348e-10	6.874e-10	8.035e-10
3.830e-04	4.083e-10	4.724e-10	5.232e-10	6.130e-10	6.638e-10	7.762e-10
4.030e-04	3.844e-10	4.445e-10	4.921e-10	5.762e-10	6.239e-10	7.302e-10
4.150e-04	3.692e-10	4.268e-10	4.723e-10	5.533e-10	6.009e-10	7.012e-10
4.300e-04	3.625e-10	4.191e-10	4.635e-10	5.438e-10	5.935e-10	6.886e-10
4.500e-04	3.521e-10	4.070e-10	4.498e-10	5.288e-10	5.813e-10	6.688e-10
4.810e-04	3.332e-10	3.851e-10	4.249e-10	5.015e-10	5.582e-10	6.330e-10
5.160e-04	3.050e-10	3.524e-10	3.881e-10	4.607e-10	5.217e-10	5.795e-10
5.470e-04	2.877e-10	3.319e-10	3.665e-10	4.361e-10	4.926e-10	5.448e-10
5.550e-04	2.776e-10	3.199e-10	3.541e-10	4.217e-10	4.741e-10	5.244e-10
5.930e-04	2.635e-10	3.032e-10	3.366e-10	4.015e-10	4.482e-10	4.958e-10
5.980e-04	2.500e-10	2.875e-10	3.185e-10	3.805e-10	4.215e-10	4.662e-10
6.250e-04	2.432e-10	2.805e-10	3.101e-10	3.695e-10	4.067e-10	4.528e-10
6.540e-04	5.651e-10	2.682e-10	2.981e-10	3.525e-10	3.831e-10	4.341e-10
6.750e-04	1.653e-09	2.555e-10	2.856e-10	3.350e-10	3.591e-10	4.146e-10
6.980e-04	1.793e-09	2.454e-10	2.731e-10	3.175e-10	3.354e-10	3.951e-10
7.110e-04	1.734e-09	2.382e-10	2.633e-10	3.048e-10	3.198e-10	3.804e-10
7.250e-04	1.695e-09	1.033e-09	2.588e-10	3.007e-10	3.185e-10	3.745e-10
7.710e-04	1.613e-09	1.638e-09	2.473e-10	2.902e-10	3.150e-10	3.594e-10
7.940e-04	1.738e-09	1.712e-09	6.907e-10	2.762e-10	3.095e-10	3.395e-10
8.180e-04	1.662e-09	1.643e-09	1.684e-09	2.654e-10	3.019e-10	3.258e-10
8.380e-04	1.618e-09	1.584e-09	1.684e-09	2.546e-10	2.875e-10	3.157e-10
8.600e-04	1.573e-09	1.686e-09	1.655e-09	2.443e-10	2.724e-10	3.053e-10
8.980e-04	1.501e-09	1.696e-09	1.587e-09	1.262e-09	2.487e-10	2.887e-10
9.200e-04	1.442e-09	1.623e-09	1.509e-09	1.753e-09	2.313e-10	2.734e-10
9.400e-04	1.432e-09	1.597e-09	1.647e-09	1.741e-09	3.225e-10	2.662e-10
9.560e-04	1.421e-09	1.574e-09	1.720e-09	1.728e-09	1.318e-09	2.596e-10

K2000
Gray cm²/g

Energy-MeV	-H-	-Fe-	-Co-	-Ni-	-Cu-	-Zn-
9.800e-04	1.400e-09	1.545e-09	1.724e-09	1.710e-09	1.760e-09	2.552e-10
9.900e-04	1.395e-09	1.518e-09	1.727e-09	1.694e-09	1.890e-09	2.551e-10
1.000e-03	1.386e-09	1.502e-09	1.728e-09	1.683e-09	1.972e-09	2.550e-10
1.000e-03	1.363e-09	1.474e-09	1.704e-09	1.857e-09	1.904e-09	1.356e-09
1.140e-03	1.317e-09	1.427e-09	1.647e-09	1.832e-09	1.909e-09	1.818e-09
1.360e-03	1.165e-09	1.271e-09	1.457e-09	1.628e-09	1.790e-09	1.700e-09
1.560e-03	8.350e-10	9.295e-10	1.045e-09	1.182e-09	1.342e-09	1.372e-09
1.700e-03	6.930e-10	7.793e-10	8.664e-10	9.866e-10	1.132e-09	1.180e-09
1.840e-03	6.234e-10	7.040e-10	7.799e-10	8.893e-10	1.015e-09	1.059e-09
1.910e-03	5.503e-10	6.335e-10	6.991e-10	7.984e-10	9.064e-10	9.457e-10
2.140e-03	4.752e-10	5.431e-10	5.958e-10	6.821e-10	7.678e-10	8.018e-10
2.240e-03	4.452e-10	5.101e-10	5.586e-10	6.401e-10	7.183e-10	7.508e-10
2.410e-03	4.239e-10	4.864e-10	5.323e-10	6.103e-10	6.836e-10	7.153e-10
2.470e-03	4.019e-10	4.618e-10	5.050e-10	5.794e-10	6.478e-10	6.784e-10
2.630e-03	3.764e-10	4.332e-10	4.733e-10	5.436e-10	6.063e-10	6.358e-10
2.750e-03	3.391e-10	3.913e-10	4.270e-10	4.910e-10	5.457e-10	5.733e-10
2.820e-03	3.103e-10	3.590e-10	3.913e-10	4.504e-10	4.989e-10	5.251e-10
2.960e-03	2.749e-10	3.193e-10	3.474e-10	4.005e-10	4.415e-10	4.659e-10
3.180e-03	2.320e-10	2.709e-10	2.940e-10	3.398e-10	3.719e-10	3.941e-10
3.550e-03	2.101e-10	2.457e-10	2.668e-10	3.088e-10	3.369e-10	3.582e-10
3.610e-03	1.910e-10	2.237e-10	2.430e-10	2.816e-10	3.064e-10	3.269e-10
3.700e-03	1.833e-10	2.147e-10	2.334e-10	2.705e-10	2.940e-10	3.141e-10
3.830e-03	1.710e-10	2.006e-10	2.180e-10	2.530e-10	2.744e-10	2.938e-10
4.030e-03	1.508e-10	1.773e-10	1.929e-10	2.241e-10	2.422e-10	2.606e-10
4.150e-03	1.385e-10	1.630e-10	1.775e-10	2.065e-10	2.226e-10	2.403e-10
4.300e-03	1.336e-10	1.573e-10	1.714e-10	1.995e-10	2.149e-10	2.324e-10
4.500e-03	1.265e-10	1.489e-10	1.625e-10	1.892e-10	2.035e-10	2.206e-10
4.810e-03	1.142e-10	1.345e-10	1.470e-10	1.714e-10	1.840e-10	2.003e-10
5.160e-03	9.674e-11	1.141e-10	1.252e-10	1.462e-10	1.564e-10	1.716e-10
5.470e-03	8.737e-11	1.031e-10	1.134e-10	1.325e-10	1.415e-10	1.561e-10
5.550e-03	8.240e-11	9.719e-11	1.071e-10	1.253e-10	1.337e-10	1.479e-10
5.930e-03	7.565e-11	8.921e-11	9.856e-11	1.154e-10	1.230e-10	1.367e-10
5.980e-03	6.877e-11	8.108e-11	8.985e-11	1.053e-10	1.120e-10	1.252e-10
6.250e-03	6.529e-11	7.751e-11	8.651e-11	1.016e-10	1.081e-10	1.211e-10
6.540e-03	6.082e-11	7.273e-11	8.262e-11	9.772e-11	1.039e-10	1.166e-10
6.750e-03	4.849e-10	6.789e-11	7.861e-11	9.363e-11	9.947e-11	1.120e-10
6.980e-03	4.687e-10	6.314e-11	7.462e-11	8.951e-11	9.505e-11	1.073e-10
7.110e-03	4.539e-10	5.893e-11	7.106e-11	8.582e-11	9.109e-11	1.031e-10
7.250e-03	4.419e-10	4.616e-10	6.818e-11	8.284e-11	8.788e-11	9.967e-11
7.710e-03	4.121e-10	4.421e-10	6.250e-11	7.550e-11	8.002e-11	9.128e-11
7.940e-03	3.737e-10	4.108e-10	4.539e-10	6.616e-11	7.000e-11	8.056e-11
8.180e-03	3.506e-10	3.914e-10	4.353e-10	6.034e-11	6.395e-11	7.426e-11
8.380e-03	3.413e-10	3.818e-10	4.246e-10	1.491e-10	6.130e-11	7.196e-11
8.600e-03	3.321e-10	3.722e-10	4.136e-10	4.366e-10	5.871e-11	6.974e-11
8.980e-03	3.173e-10	3.567e-10	3.959e-10	4.206e-10	5.607e-11	6.621e-11

ENRGA
Gray cm⁻²

Energy-keV	-Na-	-Fe-	-Co-	-Ni-	-Cu-	-Zn-
9.200e-03	3.009e-10	3.394e-10	3.763e-10	4.027e-10	4.071e-10	6.231e-11
9.400e-03	2.803e-10	3.261e-10	3.612e-10	3.880e-10	3.953e-10	5.932e-11
9.560e-03	2.768e-10	3.139e-10	3.474e-10	3.761e-10	3.843e-10	5.660e-11
9.800e-03	2.632e-10	2.996e-10	3.310e-10	3.611e-10	3.713e-10	5.400e-11
1.000e-02	2.474e-10	2.828e-10	3.120e-10	3.434e-10	3.560e-10	5.930e-11
1.040e-02	2.300e-10	2.728e-10	3.007e-10	3.327e-10	3.463e-10	5.847e-11
1.080e-02	2.333e-10	2.679e-10	2.952e-10	3.269e-10	3.403e-10	5.782e-11
1.110e-02	2.288e-10	2.627e-10	2.894e-10	3.208e-10	3.339e-10	5.712e-11
1.190e-02	2.193e-10	2.525e-10	2.779e-10	3.066e-10	3.213e-10	5.574e-11
1.270e-02	2.027e-10	2.338e-10	2.572e-10	2.865e-10	2.983e-10	5.322e-11
1.300e-02	1.889e-10	2.185e-10	2.401e-10	2.682e-10	2.793e-10	5.113e-11
1.390e-02	1.713e-10	1.988e-10	2.181e-10	2.447e-10	2.548e-10	4.844e-11
1.470e-02	1.426e-10	1.667e-10	1.824e-10	2.063e-10	2.150e-10	4.406e-11
1.520e-02	1.190e-10	1.403e-10	1.531e-10	1.747e-10	1.821e-10	4.045e-11
1.570e-02	1.130e-10	1.335e-10	1.455e-10	1.665e-10	1.736e-10	3.950e-11
1.640e-02	1.090e-10	1.289e-10	1.404e-10	1.608e-10	1.677e-10	3.885e-11
1.700e-02	1.040e-10	1.231e-10	1.341e-10	1.537e-10	1.604e-10	3.803e-11
1.720e-02	1.006e-10	1.191e-10	1.297e-10	1.489e-10	1.554e-10	3.747e-11
1.810e-02	9.539e-11	1.130e-10	1.230e-10	1.414e-10	1.477e-10	3.661e-11
1.900e-02	8.579e-11	1.019e-10	1.108e-10	1.277e-10	1.334e-10	3.502e-11
1.970e-02	7.610e-11	9.055e-11	9.841e-11	1.138e-10	1.191e-10	3.341e-11
2.010e-02	6.897e-11	8.222e-11	8.928e-11	1.036e-10	1.085e-10	3.223e-11
2.100e-02	6.663e-11	7.947e-11	8.628e-11	1.002e-10	1.050e-10	3.183e-11
2.170e-02	6.523e-11	7.781e-11	8.446e-11	9.809e-11	1.028e-10	3.159e-11
2.230e-02	6.387e-11	7.619e-11	8.270e-11	9.608e-11	1.008e-10	3.136e-11
2.310e-02	6.217e-11	7.417e-11	8.050e-11	9.356e-11	9.816e-11	3.106e-11
2.550e-02	5.734e-11	6.843e-11	7.425e-11	8.639e-11	9.072e-11	3.023e-11
2.920e-02	4.486e-11	5.356e-11	5.808e-11	6.780e-11	7.142e-11	2.805e-11
3.320e-02	3.023e-11	3.613e-11	3.913e-11	4.596e-11	4.872e-11	2.494e-11
3.750e-02	2.513e-11	2.999e-11	3.249e-11	3.820e-11	4.062e-11	2.576e-11
4.200e-02	1.864e-11	2.217e-11	2.403e-11	2.829e-11	3.025e-11	2.402e-11
4.740e-02	1.512e-11	1.793e-11	1.944e-11	2.289e-11	2.457e-11	2.760e-11
4.850e-02	1.296e-11	1.532e-11	1.663e-11	1.958e-11	2.106e-11	2.364e-11
5.020e-02	1.187e-11	1.401e-11	1.521e-11	1.791e-11	1.930e-11	2.165e-11
5.500e-02	1.062e-11	1.250e-11	1.358e-11	1.598e-11	1.726e-11	1.934e-11
6.100e-02	8.775e-12	1.029e-11	1.118e-11	1.315e-11	1.424e-11	1.593e-11
6.750e-02	7.473e-12	8.725e-12	9.489e-12	1.114e-11	1.210e-11	1.352e-11
6.950e-02	6.890e-12	8.026e-12	8.733e-12	1.024e-11	1.114e-11	1.243e-11
7.350e-02	6.384e-12	7.422e-12	8.079e-12	9.467e-12	1.031e-11	1.149e-11
7.840e-02	5.513e-12	6.382e-12	6.952e-12	8.131e-12	8.869e-12	9.875e-12
8.070e-02	4.728e-12	5.446e-12	5.938e-12	6.928e-12	7.576e-12	8.421e-12
8.550e-02	4.433e-12	5.095e-12	5.557e-12	6.476e-12	7.086e-12	7.870e-12
8.800e-02	4.208e-12	4.828e-12	5.265e-12	6.130e-12	6.710e-12	7.447e-12
9.050e-02	4.032e-12	4.619e-12	5.037e-12	5.860e-12	6.416e-12	7.117e-12
9.230e-02	3.868e-12	4.424e-12	4.825e-12	5.609e-12	6.143e-12	6.810e-12

SEMM
Gray cm⁻²

Energy-keV	-Mn-	-Fe-	-Co-	-Ni-	-Cu-	-Zn-
9.600e-02	3.630e-12	4.152e-12	4.529e-12	5.230e-12	3.761e-12	6.301e-12
1.000e-01	3.204e-12	3.733e-12	4.072e-12	4.717e-12	3.172e-12	5.722e-12
1.050e-01	3.073e-12	3.481e-12	3.796e-12	4.309e-12	4.811e-12	5.315e-12
1.100e-01	3.034e-12	3.431e-12	3.737e-12	4.314e-12	4.724e-12	5.214e-12
1.150e-01	2.975e-12	3.356e-12	3.653e-12	4.209e-12	4.604e-12	5.076e-12
1.210e-01	2.887e-12	3.248e-12	3.530e-12	4.059e-12	4.434e-12	4.882e-12
1.350e-01	2.659e-12	2.972e-12	3.222e-12	3.688e-12	4.016e-12	4.408e-12
1.490e-01	2.211e-12	2.439e-12	2.629e-12	2.979e-12	3.223e-12	3.515e-12
1.640e-01	1.889e-12	2.054e-12	2.197e-12	2.460e-12	2.638e-12	2.853e-12
1.800e-01	1.848e-12	1.996e-12	2.122e-12	2.361e-12	2.512e-12	2.703e-12
1.980e-01	1.746e-12	1.868e-12	1.970e-12	2.170e-12	2.284e-12	2.440e-12
2.180e-01	1.683e-12	1.785e-12	1.865e-12	2.036e-12	2.117e-12	2.244e-12
2.390e-01	1.747e-12	1.845e-12	1.917e-12	2.084e-12	2.151e-12	2.271e-12
2.630e-01	1.786e-12	1.877e-12	1.939e-12	2.095e-12	2.143e-12	2.252e-12
2.900e-01	1.789e-12	1.870e-12	1.915e-12	2.054e-12	2.076e-12	2.166e-12
3.190e-01	1.783e-12	1.852e-12	1.879e-12	1.999e-12	1.993e-12	2.062e-12
3.510e-01	1.876e-12	1.943e-12	1.963e-12	2.081e-12	2.062e-12	2.126e-12
3.860e-01	1.963e-12	2.029e-12	2.040e-12	2.156e-12	2.122e-12	2.179e-12
4.240e-01	2.043e-12	2.106e-12	2.109e-12	2.220e-12	2.170e-12	2.219e-12
4.670e-01	2.164e-12	2.229e-12	2.225e-12	2.338e-12	2.276e-12	2.322e-12
5.130e-01	2.282e-12	2.347e-12	2.337e-12	2.451e-12	2.377e-12	2.418e-12
5.650e-01	2.483e-12	2.552e-12	2.534e-12	2.654e-12	2.566e-12	2.606e-12
6.210e-01	2.712e-12	2.784e-12	2.760e-12	2.887e-12	2.783e-12	2.821e-12
6.830e-01	2.965e-12	3.042e-12	3.012e-12	3.148e-12	3.031e-12	3.068e-12
7.510e-01	3.219e-12	3.302e-12	3.266e-12	3.411e-12	3.279e-12	3.317e-12
8.260e-01	3.461e-12	3.549e-12	3.506e-12	3.659e-12	3.513e-12	3.549e-12
9.090e-01	3.734e-12	3.827e-12	3.778e-12	3.942e-12	3.782e-12	3.818e-12
1.000e+00	4.005e-12	4.104e-12	4.050e-12	4.224e-12	4.049e-12	4.086e-12
1.120e+00	4.375e-12	4.482e-12	4.421e-12	4.609e-12	4.417e-12	4.455e-12
1.270e+00	4.872e-12	4.991e-12	4.921e-12	5.130e-12	4.915e-12	4.955e-12
1.420e+00	5.337e-12	5.466e-12	5.388e-12	5.616e-12	5.380e-12	5.422e-12
1.600e+00	5.770e-12	5.909e-12	5.823e-12	6.069e-12	5.814e-12	5.857e-12
1.800e+00	6.319e-12	6.473e-12	6.380e-12	6.650e-12	6.372e-12	6.420e-12
2.030e+00	6.869e-12	7.039e-12	6.939e-12	7.236e-12	6.936e-12	6.990e-12
2.280e+00	7.582e-12	7.774e-12	7.669e-12	8.001e-12	7.673e-12	7.736e-12
2.570e+00	8.438e-12	8.659e-12	8.547e-12	8.924e-12	8.565e-12	8.642e-12
2.890e+00	9.305e-12	9.558e-12	9.444e-12	9.870e-12	9.482e-12	9.576e-12
3.250e+00	1.023e-11	1.052e-11	1.041e-11	1.089e-11	1.047e-11	1.059e-11
3.650e+00	1.140e-11	1.174e-11	1.163e-11	1.219e-11	1.174e-11	1.188e-11
4.110e+00	1.268e-11	1.308e-11	1.297e-11	1.362e-11	1.313e-11	1.331e-11
4.620e+00	1.426e-11	1.473e-11	1.464e-11	1.538e-11	1.486e-11	1.508e-11
5.200e+00	1.607e-11	1.663e-11	1.655e-11	1.742e-11	1.686e-11	1.714e-11
5.850e+00	1.813e-11	1.879e-11	1.873e-11	1.975e-11	1.914e-11	1.949e-11
6.580e+00	2.054e-11	2.132e-11	2.129e-11	2.248e-11	2.181e-11	2.224e-11
7.410e+00	2.353e-11	2.447e-11	2.447e-11	2.588e-11	2.515e-11	2.568e-11

ESSEN
Gray cm²/2

Energy-MeV	-Mn-	-Fe-	-Co-	-Ni-	-Cu-	-Zn-

8.330e+00	2.695e-11	2.807e-11	2.812e-11	2.979e-11	2.900e-11	2.965e-11
9.370e+00	3.120e-11	3.257e-11	3.268e-11	3.466e-11	3.379e-11	3.459e-11
1.060e+01	3.630e-11	3.804e-11	3.823e-11	4.062e-11	3.965e-11	4.064e-11
1.190e+01	4.207e-11	4.405e-11	4.432e-11	4.714e-11	4.606e-11	4.727e-11
1.340e+01	4.853e-11	5.087e-11	5.124e-11	5.456e-11	5.337e-11	5.482e-11
2.000e+01	6.914e-11	7.268e-11	7.340e-11	7.835e-11	7.683e-11	7.910e-11
3.000e+01	1.164e-10	1.226e-10	1.243e-10	1.330e-10	1.308e-10	1.350e-10
4.000e+01	1.776e-10	1.875e-10	1.903e-10	2.042e-10	2.012e-10	2.079e-10
5.000e+01	2.434e-10	2.571e-10	2.612e-10	2.804e-10	2.765e-10	2.859e-10
7.500e+01	3.637e-10	3.846e-10	3.909e-10	4.199e-10	4.142e-10	4.285e-10
1.000e+02	5.458e-10	5.775e-10	5.874e-10	6.312e-10	6.228e-10	6.445e-10

**ICBM
Gray curve2**

Energy-MeV Tissue Approx.	Bone (Femur)	Muscle (ICBM)	Std. Man
1.000e-04			
1.000e-04	8.102e-10	6.236e-10	8.173e-10
1.140e-04	7.888e-10	6.100e-10	7.957e-10
1.360e-04	7.142e-10	5.739e-10	7.212e-10
1.560e-04	5.501e-10	5.858e-10	5.598e-10
1.700e-04	4.758e-10	5.402e-10	4.884e-10
1.840e-04	4.362e-10	5.170e-10	4.571e-10
1.910e-04	3.988e-10	4.916e-10	4.188e-10
2.140e-04	3.504e-10	4.640e-10	3.699e-10
2.240e-04	3.322e-10	4.440e-10	3.512e-10
2.410e-04	3.185e-10	4.262e-10	3.377e-10
2.470e-04	3.040e-10	4.090e-10	3.230e-10
2.630e-04	2.873e-10	3.920e-10	3.058e-10
2.750e-04	2.627e-10	3.664e-10	2.805e-10
2.820e-04	2.437e-10	3.463e-10	2.609e-10
2.960e-04	4.875e-10	8.188e-10	4.573e-10
3.180e-04	4.768e-10	8.206e-10	4.499e-10
3.550e-04	4.453e-10	8.257e-10	4.186e-10
3.610e-04	4.164e-10	1.014e-09	3.913e-10
3.700e-04	4.044e-10	1.000e-09	3.799e-10
3.830e-04	3.852e-10	9.696e-10	3.621e-10
4.030e-04	3.577e-10	9.120e-10	3.370e-10
4.150e-04	3.953e-10	9.129e-10	3.762e-10
4.300e-04	3.849e-10	8.859e-10	3.663e-10
4.500e-04	3.691e-10	8.728e-10	3.514e-10
4.810e-04	3.415e-10	8.304e-10	3.253e-10
5.160e-04	3.014e-10	7.448e-10	2.873e-10
5.470e-04	8.014e-10	9.922e-10	7.983e-10
5.550e-04	1.343e-09	1.280e-09	1.350e-09
5.930e-04	1.308e-09	1.229e-09	1.317e-09
5.980e-04	1.271e-09	1.176e-09	1.281e-09
6.250e-04	1.240e-09	1.142e-09	1.249e-09
6.540e-04	1.177e-09	1.086e-09	1.186e-09
6.750e-04	1.113e-09	1.027e-09	1.121e-09
6.980e-04	1.049e-09	9.689e-10	1.057e-09
7.110e-04	1.001e-09	9.250e-10	1.008e-09
7.250e-04	9.808e-10	9.062e-10	9.884e-10
7.710e-04	9.314e-10	8.596e-10	9.388e-10
7.940e-04	8.669e-10	7.988e-10	8.740e-10
8.180e-04	8.242e-10	7.588e-10	8.311e-10
8.380e-04	7.965e-10	7.333e-10	8.031e-10
8.600e-04	7.682e-10	7.074e-10	7.747e-10
			7.517e-10

ISSN
Gray cover

Library-Title	Accession	Date (From)	Issue (From)	Vol. No
8.9000-04	7.2330-10	6.6630-10	7.2060-10	7.0070-10
9.2000-04	6.6290-10	6.2940-10	6.6000-10	6.6910-10
9.4000-04	6.6300-10	6.1430-10	6.7170-10	6.5260-10
9.5600-04	6.5010-10	6.0040-10	6.5390-10	6.3730-10
9.8000-04	6.3130-10	5.8300-10	6.3700-10	6.1000-10
9.9000-04	6.1440-10	5.6680-10	6.1990-10	6.0260-10
1.0000-03	6.0390-10	5.5930-10	6.0940-10	5.9240-10
1.0000-03	5.8920-10	5.4600-10	5.9470-10	5.7820-10
1.1400-03	5.6760-10	5.2600-10	5.7370-10	5.5850-10
1.3600-03	4.9700-10	4.6170-10	5.0340-10	4.9010-10
1.5600-03	3.4790-10	3.2300-10	3.5210-10	3.4310-10
1.7000-03	2.8310-10	2.6370-10	2.6670-10	2.7950-10
1.8400-03	2.5190-10	2.3500-10	2.5310-10	2.4080-10
1.9100-03	2.2300-10	2.0840-10	2.2590-10	2.2030-10
2.1400-03	1.8620-10	1.7430-10	1.8070-10	1.8410-10
2.2400-03	1.7290-10	2.1080-10	1.7660-10	1.7800-10
2.4100-03	1.6370-10	2.0510-10	1.6730-10	1.6930-10
2.4700-03	1.5430-10	1.9450-10	1.5770-10	1.5970-10
2.6300-03	1.4350-10	1.8380-10	1.5060-10	1.5070-10
2.7500-03	1.2770-10	1.6580-10	1.3430-10	1.3460-10
2.8200-03	1.1560-10	1.5180-10	1.2190-10	1.2220-10
2.9600-03	1.0080-10	1.3470-10	1.0660-10	1.0800-10
3.1800-03	8.2900-11	1.1380-10	8.8050-11	8.9540-11
3.5500-03	7.4130-11	1.0280-10	7.8620-11	8.0280-11
3.6100-03	6.6590-11	9.3170-11	7.0980-11	7.2360-11
3.7000-03	6.3540-11	8.9260-11	6.9440-11	7.0240-11
3.8300-03	5.8730-11	8.3080-11	6.4320-11	6.5110-11
4.0300-03	5.0870-11	7.2940-11	5.5940-11	5.6700-11
4.1500-03	4.6100-11	1.5040-10	5.0900-11	6.0120-11
4.3000-03	4.4290-11	1.5100-10	4.8940-11	5.8450-11
4.5000-03	4.1610-11	1.4350-10	4.6040-11	5.5140-11
4.8100-03	3.7060-11	1.3050-10	4.1100-11	4.9470-11
5.1600-03	3.0680-11	1.1210-10	3.4150-11	4.1490-11
5.4700-03	2.7320-11	1.0190-10	3.0490-11	3.7220-11
5.5500-03	2.5570-11	9.6380-11	2.8570-11	3.4980-11
5.9300-03	2.3210-11	8.8890-11	2.5980-11	3.1940-11
5.9800-03	2.0810-11	8.1250-11	2.3350-11	2.8840-11
6.2500-03	1.9950-11	7.8460-11	2.2400-11	2.7730-11
6.5400-03	1.9050-11	7.5430-11	2.1410-11	2.6530-11
6.7500-03	1.8130-11	7.2280-11	2.0390-11	2.5300-11
6.9800-03	1.7200-11	6.9100-11	1.9370-11	2.4070-11
7.1100-03	1.6380-11	6.6260-11	1.8460-11	2.2970-11

ICRMA
Gray cm²

Energy-MeV	Tissue Approx.	Bone (Femur)	Muscle (ICRU)	Std. Man
7.250e-03	1.572e-11	6.395e-11	1.772e-11	2.492e-11
7.710e-03	1.410e-11	5.831e-11	1.593e-11	2.267e-11
7.940e-03	1.284e-11	5.110e-11	1.365e-11	1.977e-11
8.180e-03	1.086e-11	4.691e-11	1.234e-11	1.808e-11
8.380e-03	1.048e-11	4.551e-11	1.192e-11	1.751e-11
8.600e-03	1.013e-11	4.417e-11	1.152e-11	1.696e-11
8.980e-03	9.568e-12	4.204e-11	1.089e-11	1.610e-11
9.200e-03	8.949e-12	3.967e-11	1.020e-11	1.514e-11
9.400e-03	8.478e-12	3.786e-11	9.671e-12	1.441e-11
9.560e-03	8.049e-12	3.621e-11	9.191e-12	1.375e-11
9.800e-03	7.546e-12	3.427e-11	8.626e-12	1.297e-11
1.000e-02	6.961e-12	3.201e-11	7.971e-12	1.206e-11
1.040e-02	6.619e-12	3.067e-11	7.587e-12	1.152e-11
1.080e-02	6.466e-12	3.005e-11	7.414e-12	1.128e-11
1.110e-02	6.307e-12	2.939e-11	7.234e-12	1.102e-11
1.190e-02	6.004e-12	2.811e-11	6.890e-12	1.052e-11
1.270e-02	5.464e-12	2.582e-11	6.277e-12	9.636e-12
1.300e-02	5.024e-12	2.395e-11	5.779e-12	8.911e-12
1.390e-02	4.467e-12	2.156e-11	5.146e-12	7.988e-12
1.470e-02	3.567e-12	1.769e-11	4.123e-12	6.494e-12
1.520e-02	2.832e-12	1.451e-11	3.287e-12	5.269e-12
1.570e-02	2.654e-12	1.371e-11	3.085e-12	4.967e-12
1.640e-02	2.547e-12	1.320e-11	2.961e-12	4.778e-12
1.700e-02	2.415e-12	1.256e-11	2.808e-12	4.541e-12
1.720e-02	2.324e-12	1.212e-11	2.704e-12	4.380e-12
1.810e-02	2.186e-12	1.146e-11	2.545e-12	4.133e-12
1.900e-02	1.934e-12	1.024e-11	2.254e-12	3.682e-12
1.970e-02	1.681e-12	9.005e-12	1.961e-12	3.227e-12
2.010e-02	1.495e-12	8.100e-12	1.747e-12	2.893e-12
2.100e-02	1.437e-12	7.806e-12	1.679e-12	2.787e-12
2.170e-02	1.407e-12	7.635e-12	1.643e-12	2.727e-12
2.230e-02	1.377e-12	7.470e-12	1.608e-12	2.669e-12
2.310e-02	1.339e-12	7.264e-12	1.564e-12	2.597e-12
2.550e-02	1.234e-12	6.682e-12	1.440e-12	2.391e-12
2.920e-02	9.593e-13	5.180e-12	1.118e-12	1.859e-12
3.320e-02	6.451e-13	3.433e-12	7.479e-13	1.244e-12
3.750e-02	5.586e-13	2.856e-12	6.429e-13	1.054e-12
4.200e-02	4.482e-13	2.126e-12	5.092e-13	8.112e-13
4.740e-02	4.020e-13	1.746e-12	4.506e-13	6.937e-13
4.850e-02	3.759e-13	1.517e-12	4.170e-13	6.240e-13
5.020e-02	3.618e-13	1.401e-12	3.992e-13	5.881e-13

KIRMA
Gray cm²/g

Energy-MeV	Tissue Approx.	Bone (Femur)	Muscle (ICRU)	Std. Man
5.500e-02	3.525e-13	1.274e-12	3.856e-13	5.536e-13
6.100e-02	3.420e-13	1.092e-12	3.689e-13	5.062e-13
6.750e-02	3.437e-13	9.725e-13	3.663e-13	4.818e-13
6.950e-02	3.499e-13	9.242e-13	3.706e-13	4.763e-13
7.350e-02	3.526e-13	8.802e-13	3.716e-13	4.690e-13
7.840e-02	3.544e-13	8.019e-13	3.707e-13	4.536e-13
8.070e-02	3.544e-13	7.301e-13	3.682e-13	4.381e-13
8.550e-02	3.620e-13	7.101e-13	3.748e-13	4.398e-13
8.800e-02	3.710e-13	6.978e-13	3.830e-13	4.442e-13
9.050e-02	3.766e-13	6.870e-13	3.881e-13	4.463e-13
9.230e-02	3.812e-13	6.763e-13	3.922e-13	4.476e-13
9.600e-02	3.866e-13	6.605e-13	3.969e-13	4.485e-13
1.000e-01	3.936e-13	6.349e-13	4.028e-13	4.485e-13
1.050e-01	4.199e-13	6.395e-13	4.284e-13	4.703e-13
1.100e-01	4.651e-13	6.763e-13	4.735e-13	5.139e-13
1.150e-01	5.091e-13	7.103e-13	5.172e-13	5.560e-13
1.210e-01	5.560e-13	7.443e-13	5.638e-13	6.005e-13
1.350e-01	6.373e-13	7.967e-13	6.443e-13	6.760e-13
1.490e-01	7.433e-13	8.521e-13	7.489e-13	7.717e-13
1.640e-01	8.498e-13	9.190e-13	8.544e-13	8.704e-13
1.800e-01	9.637e-13	1.017e-12	9.681e-13	9.816e-13
1.980e-01	1.080e-12	1.112e-12	1.084e-12	1.094e-12
2.180e-01	1.205e-12	1.219e-12	1.208e-12	1.216e-12
2.390e-01	1.338e-12	1.344e-12	1.342e-12	1.348e-12
2.630e-01	1.475e-12	1.469e-12	1.478e-12	1.483e-12
2.900e-01	1.615e-12	1.595e-12	1.619e-12	1.621e-12
3.190e-01	1.758e-12	1.723e-12	1.762e-12	1.762e-12
3.510e-01	1.917e-12	1.873e-12	1.920e-12	1.919e-12
3.860e-01	2.075e-12	2.023e-12	2.079e-12	2.077e-12
4.240e-01	2.235e-12	2.172e-12	2.238e-12	2.235e-12
4.670e-01	2.410e-12	2.340e-12	2.414e-12	2.410e-12
5.130e-01	2.588e-12	2.509e-12	2.593e-12	2.588e-12
5.650e-01	2.855e-12	2.765e-12	2.860e-12	2.854e-12
6.210e-01	3.153e-12	3.052e-12	3.159e-12	3.152e-12
6.830e-01	3.471e-12	3.357e-12	3.477e-12	3.469e-12
7.510e-01	3.791e-12	3.665e-12	3.797e-12	3.788e-12
8.260e-01	4.101e-12	3.963e-12	4.107e-12	4.097e-12
9.090e-01	4.439e-12	4.289e-12	4.446e-12	4.435e-12
1.000e+00	4.776e-12	4.613e-12	4.784e-12	4.771e-12
1.120e+00	5.228e-12	5.049e-12	5.236e-12	5.223e-12
1.270e+00	5.827e-12	5.628e-12	5.837e-12	5.822e-12

KIRBA
Gray cm²

Energy-MeV	Tissue Approx.	Bone (Femur)	Muscle (ICRU)	Std. Man
1.420e+00	6.385e-12	6.167e-12	6.396e-12	6.379e-12
1.600e+00	6.897e-12	6.663e-12	6.903e-12	6.891e-12
1.800e+00	7.519e-12	7.267e-12	7.531e-12	7.512e-12
2.030e+00	8.110e-12	7.847e-12	8.124e-12	8.104e-12
2.280e+00	8.854e-12	8.579e-12	8.869e-12	8.849e-12
2.570e+00	9.700e-12	9.418e-12	9.717e-12	9.697e-12
2.890e+00	1.048e-11	1.020e-11	1.050e-11	1.048e-11
3.250e+00	1.122e-11	1.097e-11	1.125e-11	1.123e-11
3.650e+00	1.216e-11	1.193e-11	1.219e-11	1.218e-11
4.110e+00	1.305e-11	1.286e-11	1.308e-11	1.307e-11
4.620e+00	1.413e-11	1.401e-11	1.417e-11	1.417e-11
5.200e+00	1.527e-11	1.524e-11	1.532e-11	1.533e-11
5.850e+00	1.652e-11	1.660e-11	1.658e-11	1.660e-11
6.580e+00	1.790e-11	1.811e-11	1.797e-11	1.801e-11
7.410e+00	1.959e-11	1.998e-11	1.968e-11	1.973e-11
8.330e+00	2.127e-11	2.189e-11	2.137e-11	2.145e-11
9.370e+00	2.334e-11	2.425e-11	2.346e-11	2.357e-11
1.060e+01	2.569e-11	2.699e-11	2.583e-11	2.599e-11
1.190e+01	2.842e-11	3.013e-11	2.859e-11	2.879e-11
1.340e+01	3.132e-11	3.352e-11	3.153e-11	3.178e-11
2.000e+01	3.968e-11	4.360e-11	4.000e-11	4.043e-11
3.000e+01	5.859e-11	6.650e-11	5.917e-11	6.001e-11
4.000e+01	8.203e-11	9.529e-11	8.295e-11	8.434e-11
5.000e+01	1.068e-10	1.259e-10	1.081e-10	1.101e-10
7.500e+01	1.523e-10	1.819e-10	1.542e-10	1.573e-10
1.000e+02	2.209e-10	2.666e-10	2.239e-10	2.286e-10

KIDDA
Gray cm2**

Energy-MeV	A-150 Plastic	Nylon 6.6/6	Lucite	Liq. Masc. Eq.
1.000e-04				
1.000e-04	4.510e-10	5.113e-10	5.814e-10	8.250e-10
1.140e-04	4.384e-10	4.969e-10	5.657e-10	8.032e-10
1.360e-04	3.959e-10	4.480e-10	5.116e-10	7.273e-10
1.560e-04	3.048e-10	3.428e-10	3.932e-10	5.603e-10
1.700e-04	2.636e-10	2.955e-10	3.397e-10	4.847e-10
1.840e-04	2.419e-10	2.706e-10	3.113e-10	4.443e-10
1.910e-04	2.215e-10	2.473e-10	2.847e-10	4.063e-10
2.140e-04	1.948e-10	2.169e-10	2.499e-10	3.570e-10
2.240e-04	1.842e-10	2.050e-10	2.365e-10	3.385e-10
2.410e-04	1.758e-10	1.958e-10	2.261e-10	3.245e-10
2.470e-04	1.671e-10	1.862e-10	2.153e-10	3.098e-10
2.630e-04	1.572e-10	1.753e-10	2.028e-10	2.927e-10
2.750e-04	1.429e-10	1.594e-10	1.847e-10	2.678e-10
2.820e-04	1.318e-10	1.471e-10	1.706e-10	2.485e-10
2.960e-04	1.506e-09	1.272e-09	1.227e-09	4.396e-10
3.180e-04	1.583e-09	1.330e-09	1.278e-09	4.249e-10
3.550e-04	1.497e-09	1.251e-09	1.202e-09	3.963e-10
3.610e-04	1.439e-09	1.177e-09	1.130e-09	3.701e-10
3.700e-04	1.403e-09	1.146e-09	1.100e-09	3.593e-10
3.830e-04	1.344e-09	1.096e-09	1.052e-09	3.420e-10
4.030e-04	1.249e-09	1.029e-09	9.720e-10	3.177e-10
4.150e-04	1.242e-09	1.181e-09	9.194e-10	3.584e-10
4.300e-04	1.208e-09	1.150e-09	8.944e-10	3.489e-10
4.500e-04	1.161e-09	1.104e-09	8.566e-10	3.347e-10
4.810e-04	1.076e-09	1.023e-09	7.907e-10	3.098e-10
5.160e-04	9.496e-10	9.058e-10	6.954e-10	2.734e-10
5.470e-04	9.134e-10	9.392e-10	8.737e-10	7.952e-10
5.550e-04	9.121e-10	1.009e-09	1.090e-09	1.358e-09
5.930e-04	8.537e-10	9.518e-10	1.041e-09	1.325e-09
5.980e-04	7.938e-10	8.926e-10	9.892e-10	1.289e-09
6.250e-04	7.654e-10	8.626e-10	9.591e-10	1.258e-09
6.540e-04	7.246e-10	8.170e-10	9.092e-10	1.194e-09
6.750e-04	6.829e-10	7.703e-10	8.579e-10	1.129e-09
6.980e-04	6.539e-10	7.241e-10	8.072e-10	1.064e-09
7.110e-04	6.332e-10	6.891e-10	7.689e-10	1.016e-09
7.250e-04	6.190e-10	6.739e-10	7.524e-10	9.954e-10
7.710e-04	5.840e-10	6.361e-10	7.117e-10	9.455e-10
7.940e-04	5.386e-10	5.872e-10	6.587e-10	8.803e-10
8.180e-04	5.090e-10	5.553e-10	6.240e-10	8.371e-10
8.380e-04	4.909e-10	5.358e-10	6.023e-10	8.090e-10
8.600e-04	4.726e-10	5.160e-10	5.802e-10	7.803e-10

KERMA
Gray cm²/g

Energy-MeV	A-150 Plastic	Nylon 6.6/6	Lucite	Liq. Nuc. Eq.
8.980e-04	4.437e-10	4.847e-10	5.454e-10	7.349e-10
9.200e-04	4.174e-10	4.562e-10	5.137e-10	6.938e-10
9.400e-04	4.659e-10	4.439e-10	5.001e-10	6.765e-10
9.560e-04	3.954e-10	4.326e-10	4.875e-10	6.606e-10
9.800e-04	3.828e-10	4.191e-10	4.725e-10	6.415e-10
9.900e-04	3.715e-10	4.070e-10	4.591e-10	6.243e-10
1.000e-03	3.645e-10	3.995e-10	4.508e-10	6.138e-10
1.080e-03	3.549e-10	3.891e-10	4.393e-10	5.988e-10
1.140e-03	3.412e-10	3.742e-10	4.227e-10	5.769e-10
1.360e-03	2.975e-10	3.265e-10	3.694e-10	5.061e-10
1.560e-03	2.042e-10	2.245e-10	2.555e-10	3.538e-10
1.700e-03	1.643e-10	1.808e-10	2.065e-10	2.881e-10
1.840e-03	1.455e-10	1.602e-10	1.832e-10	2.563e-10
1.910e-03	1.281e-10	1.411e-10	1.617e-10	2.269e-10
2.140e-03	1.060e-10	1.169e-10	1.343e-10	1.895e-10
2.240e-03	9.815e-11	1.082e-10	1.245e-10	1.760e-10
2.410e-03	9.277e-11	1.023e-10	1.177e-10	1.667e-10
2.470e-03	8.726e-11	9.619e-11	1.108e-10	1.571e-10
2.630e-03	8.096e-11	8.925e-11	1.029e-10	1.461e-10
2.750e-03	7.178e-11	7.915e-11	9.137e-11	1.301e-10
2.820e-03	6.475e-11	7.141e-11	8.253e-11	1.178e-10
2.960e-03	5.614e-11	6.193e-11	7.172e-11	1.027e-10
3.180e-03	4.577e-11	5.050e-11	5.866e-11	8.447e-11
3.550e-03	4.078e-11	4.500e-11	5.233e-11	7.554e-11
3.610e-03	3.651e-11	4.029e-11	4.692e-11	6.787e-11
3.700e-03	3.479e-11	3.839e-11	4.473e-11	6.476e-11
3.830e-03	3.208e-11	3.539e-11	4.128e-11	5.987e-11
4.030e-03	2.764e-11	3.050e-11	3.563e-11	5.186e-11
4.150e-03	3.544e-11	2.754e-11	3.222e-11	4.701e-11
4.300e-03	3.481e-11	2.643e-11	3.093e-11	4.516e-11
4.500e-03	3.283e-11	2.479e-11	2.903e-11	4.243e-11
4.810e-03	2.945e-11	2.200e-11	2.580e-11	3.779e-11
5.160e-03	2.469e-11	1.810e-11	2.127e-11	3.129e-11
5.470e-03	2.215e-11	1.606e-11	1.890e-11	2.786e-11
5.550e-03	2.081e-11	1.500e-11	1.767e-11	2.608e-11
5.930e-03	1.900e-11	1.358e-11	1.601e-11	2.367e-11
5.980e-03	1.715e-11	1.213e-11	1.432e-11	2.123e-11
6.250e-03	1.649e-11	1.162e-11	1.372e-11	2.035e-11
6.540e-03	1.579e-11	1.108e-11	1.309e-11	1.944e-11
6.750e-03	1.507e-11	1.053e-11	1.245e-11	1.850e-11
6.980e-03	1.434e-11	9.985e-12	1.181e-11	1.756e-11
7.110e-03	1.369e-11	9.497e-12	1.124e-11	1.672e-11

RESULTS
Geop. 02002

Energy-MeV	A-150 Plastic	Nylon 6.6/6	Lucite	Liq. Mass. Eq.
7.250e-03	1.317e-11	9.103e-12	1.077e-11	1.604e-11
7.710e-03	1.109e-11	8.142e-12	9.647e-12	1.439e-11
7.940e-03	1.027e-11	6.924e-12	8.217e-12	1.229e-11
8.100e-03	9.323e-12	6.223e-12	7.394e-12	1.108e-11
8.300e-03	9.020e-12	6.002e-12	7.134e-12	1.070e-11
8.600e-03	8.733e-12	5.795e-12	6.090e-12	1.034e-11
8.900e-03	8.276e-12	5.467e-12	6.503e-12	9.767e-12
9.200e-03	7.772e-12	5.106e-12	6.077e-12	9.136e-12
9.400e-03	7.306e-12	4.831e-12	5.752e-12	8.655e-12
9.560e-03	7.036e-12	4.501e-12	5.457e-12	8.218e-12
9.800e-03	6.623e-12	4.207e-12	5.111e-12	7.704e-12
1.000e-02	6.144e-12	3.946e-12	4.708e-12	7.108e-12
1.040e-02	5.863e-12	3.747e-12	4.473e-12	6.759e-12
1.080e-02	5.736e-12	3.660e-12	4.369e-12	6.603e-12
1.110e-02	5.602e-12	3.568e-12	4.261e-12	6.440e-12
1.190e-02	5.347e-12	3.395e-12	4.054e-12	6.130e-12
1.270e-02	4.889e-12	3.086e-12	3.687e-12	5.579e-12
1.300e-02	4.515e-12	2.835e-12	3.389e-12	5.131e-12
1.390e-02	4.040e-12	2.517e-12	3.010e-12	4.562e-12
1.470e-02	3.272e-12	2.003e-12	2.398e-12	3.643e-12
1.520e-02	2.642e-12	1.583e-12	1.899e-12	2.893e-12
1.570e-02	2.489e-12	1.483e-12	1.779e-12	2.711e-12
1.640e-02	2.394e-12	1.424e-12	1.708e-12	2.602e-12
1.700e-02	2.276e-12	1.351e-12	1.619e-12	2.467e-12
1.720e-02	2.196e-12	1.301e-12	1.559e-12	2.374e-12
1.810e-02	2.072e-12	1.224e-12	1.467e-12	2.233e-12
1.900e-02	1.846e-12	1.084e-12	1.299e-12	1.976e-12
1.970e-02	1.619e-12	9.436e-13	1.130e-12	1.717e-12
2.010e-02	1.452e-12	8.404e-13	1.005e-12	1.527e-12
2.100e-02	1.400e-12	8.094e-13	9.674e-13	1.468e-12
2.170e-02	1.372e-12	7.940e-13	9.481e-13	1.436e-12
2.230e-02	1.345e-12	7.788e-13	9.291e-13	1.406e-12
2.310e-02	1.310e-12	7.596e-13	9.053e-13	1.368e-12
2.550e-02	1.212e-12	7.043e-13	8.371e-13	1.259e-12
2.920e-02	9.550e-13	5.592e-13	6.591e-13	9.790e-13
3.320e-02	6.589e-13	3.938e-13	4.557e-13	6.575e-13
3.750e-02	5.747e-13	3.550e-13	4.046e-13	5.687e-13
4.200e-02	4.657e-13	3.038e-13	3.381e-13	4.555e-13
4.740e-02	4.190e-13	2.885e-13	3.146e-13	4.078e-13
4.850e-02	3.920e-13	2.806e-13	3.018e-13	3.808e-13
5.020e-02	3.775e-13	2.757e-13	2.945e-13	3.663e-13
5.500e-02	3.674e-13	2.767e-13	2.928e-13	3.565e-13

ESM
Gray cm²/s

Energy-MeV	A-150 Plastic	Nylon 6.6/6	Lucite	Liq. Nuc. Eq.
6.100e-02	3.553e-13	2.809e-13	2.928e-13	3.453e-13
6.750e-02	3.557e-13	2.929e-13	3.018e-13	3.465e-13
6.950e-02	3.612e-13	3.035e-13	3.111e-13	3.525e-13
7.350e-02	3.633e-13	3.100e-13	3.165e-13	3.551e-13
7.840e-02	3.640e-13	3.184e-13	3.229e-13	3.566e-13
8.070e-02	3.630e-13	3.243e-13	3.271e-13	3.564e-13
8.550e-02	3.701e-13	3.340e-13	3.361e-13	3.639e-13
8.800e-02	3.787e-13	3.446e-13	3.461e-13	3.727e-13
9.050e-02	3.840e-13	3.515e-13	3.525e-13	3.783e-13
9.230e-02	3.883e-13	3.572e-13	3.579e-13	3.829e-13
9.600e-02	3.933e-13	3.643e-13	3.644e-13	3.883e-13
1.000e-01	3.997e-13	3.737e-13	3.730e-13	3.951e-13
1.050e-01	4.256e-13	4.017e-13	4.000e-13	4.214e-13
1.100e-01	4.707e-13	4.473e-13	4.448e-13	4.666e-13
1.150e-01	5.145e-13	4.919e-13	4.885e-13	5.106e-13
1.210e-01	5.613e-13	5.396e-13	5.352e-13	5.576e-13
1.350e-01	6.420e-13	6.226e-13	6.164e-13	6.389e-13
1.490e-01	7.469e-13	7.319e-13	7.230e-13	7.449e-13
1.640e-01	8.526e-13	8.409e-13	8.295e-13	8.515e-13
1.800e-01	9.662e-13	9.553e-13	9.420e-13	9.656e-13
1.980e-01	1.082e-12	1.072e-12	1.072e-12	1.082e-12
2.180e-01	1.206e-12	1.198e-12	1.180e-12	1.207e-12
2.390e-01	1.340e-12	1.332e-12	1.312e-12	1.341e-12
2.630e-01	1.476e-12	1.468e-12	1.446e-12	1.477e-12
2.900e-01	1.616e-12	1.609e-12	1.584e-12	1.618e-12
3.190e-01	1.758e-12	1.752e-12	1.725e-12	1.761e-12
3.510e-01	1.917e-12	1.910e-12	1.881e-12	1.920e-12
3.860e-01	2.075e-12	2.069e-12	2.037e-12	2.079e-12
4.240e-01	2.234e-12	2.228e-12	2.193e-12	2.238e-12
4.670e-01	2.410e-12	2.403e-12	2.366e-12	2.414e-12
5.130e-01	2.588e-12	2.581e-12	2.541e-12	2.592e-12
5.650e-01	2.854e-12	2.847e-12	2.803e-12	2.860e-12
6.210e-01	3.153e-12	3.145e-12	3.096e-12	3.159e-12
6.830e-01	3.470e-12	3.462e-12	3.408e-12	3.477e-12
7.510e-01	3.790e-12	3.781e-12	3.722e-12	3.797e-12
8.260e-01	4.100e-12	4.090e-12	4.026e-12	4.108e-12
9.090e-01	4.438e-12	4.428e-12	4.359e-12	4.446e-12
1.000e+00	4.775e-12	4.764e-12	4.689e-12	4.784e-12
1.120e+00	5.227e-12	5.215e-12	5.133e-12	5.237e-12
1.270e+00	5.826e-12	5.813e-12	5.722e-12	5.837e-12

RESULTS
Gray cm²/s

Energy-MeV	A-150 Plastic	Dylon 6.6/6	Lucite	Liq. Mass. Eq.
1.420e+00	6.363e-12	6.369e-12	6.269e-12	6.396e-12
1.600e+00	6.895e-12	6.879e-12	6.772e-12	6.909e-12
1.800e+00	7.513e-12	7.497e-12	7.300e-12	7.531e-12
2.030e+00	8.101e-12	8.003e-12	7.939e-12	8.124e-12
2.200e+00	8.839e-12	8.819e-12	8.686e-12	8.869e-12
2.570e+00	9.675e-12	9.653e-12	9.510e-12	9.716e-12
2.890e+00	1.044e-11	1.042e-11	1.027e-11	1.050e-11
3.250e+00	1.117e-11	1.114e-11	1.099e-11	1.124e-11
3.650e+00	1.208e-11	1.205e-11	1.189e-11	1.218e-11
4.110e+00	1.293e-11	1.290e-11	1.274e-11	1.307e-11
4.620e+00	1.397e-11	1.394e-11	1.378e-11	1.416e-11
5.200e+00	1.506e-11	1.502e-11	1.487e-11	1.530e-11
5.850e+00	1.624e-11	1.621e-11	1.606e-11	1.656e-11
6.580e+00	1.755e-11	1.751e-11	1.737e-11	1.795e-11
7.410e+00	1.913e-11	1.909e-11	1.897e-11	1.964e-11
8.330e+00	2.068e-11	2.063e-11	2.053e-11	2.132e-11
9.370e+00	2.259e-11	2.254e-11	2.247e-11	2.340e-11
1.060e+01	2.474e-11	2.468e-11	2.465e-11	2.576e-11
1.190e+01	2.725e-11	2.719e-11	2.721e-11	2.850e-11
1.340e+01	2.990e-11	2.983e-11	2.991e-11	3.142e-11
2.000e+01	3.739e-11	3.731e-11	3.760e-11	3.982e-11
3.000e+01	5.429e-11	5.417e-11	5.497e-11	5.883e-11
4.000e+01	7.504e-11	7.488e-11	7.638e-11	8.240e-11
5.000e+01	9.691e-11	9.672e-11	9.900e-11	1.073e-10
7.500e+01	1.370e-10	1.367e-10	1.404e-10	1.530e-10
1.000e+02	1.974e-10	1.971e-10	2.030e-10	2.221e-10

**Kilham
Gray cmw2**

Energy-keV	Water	Acetylene	Dry Air	Water Sat. Air
1.000e-04				
1.000e-04	8.949e-10	4.017e-10	7.624e-10	7.644e-10
1.140e-04	8.714e-10	3.903e-10	7.428e-10	7.447e-10
1.360e-04	7.893e-10	3.519e-10	6.722e-10	6.739e-10
1.560e-04	6.087e-10	2.692e-10	5.133e-10	5.147e-10
1.700e-04	5.267e-10	2.320e-10	4.426e-10	4.438e-10
1.840e-04	4.829e-10	2.123e-10	4.038e-10	4.069e-10
1.910e-04	4.416e-10	1.942e-10	3.708e-10	3.719e-10
2.140e-04	3.881e-10	1.703e-10	3.256e-10	3.265e-10
2.240e-04	3.681e-10	1.603e-10	3.091e-10	3.099e-10
2.410e-04	3.530e-10	1.529e-10	2.967e-10	2.975e-10
2.470e-04	3.372e-10	1.449e-10	2.861e-10	2.869e-10
2.630e-04	3.188e-10	1.359e-10	3.021e-10	3.023e-10
2.750e-04	2.918e-10	1.228e-10	2.765e-10	2.767e-10
2.820e-04	2.710e-10	1.128e-10	2.552e-10	2.555e-10
2.960e-04	2.451e-10	1.752e-09	2.327e-10	2.328e-10
3.180e-04	2.136e-10	1.848e-09	2.053e-10	2.054e-10
3.550e-04	1.967e-10	1.740e-09	1.924e-10	1.925e-10
3.610e-04	1.818e-10	1.638e-09	1.791e-10	1.791e-10
3.700e-04	1.757e-10	1.595e-09	1.735e-10	1.735e-10
3.830e-04	1.660e-10	1.527e-09	1.646e-10	1.646e-10
4.030e-04	1.499e-10	1.412e-09	2.454e-10	2.440e-10
4.150e-04	1.400e-10	1.337e-09	1.495e-09	1.476e-09
4.300e-04	1.360e-10	1.301e-09	1.465e-09	1.446e-09
4.500e-04	1.300e-10	1.246e-09	1.417e-09	1.399e-09
4.810e-04	1.196e-10	1.150e-09	1.333e-09	1.316e-09
5.160e-04	1.043e-10	1.012e-09	1.207e-09	1.191e-09
5.470e-04	7.455e-10	9.314e-10	1.294e-09	1.286e-09
5.550e-04	1.429e-09	8.864e-10	1.425e-09	1.425e-09
5.930e-04	1.402e-09	8.247e-10	1.352e-09	1.353e-09
5.980e-04	1.373e-09	7.615e-10	1.277e-09	1.279e-09
6.250e-04	1.341e-09	7.328e-10	1.237e-09	1.238e-09
6.540e-04	1.274e-09	6.932e-10	1.172e-09	1.174e-09
6.750e-04	1.205e-09	6.527e-10	1.107e-09	1.108e-09
6.980e-04	1.136e-09	6.127e-10	1.042e-09	1.043e-09
7.110e-04	1.085e-09	5.822e-10	9.925e-10	9.939e-10
7.250e-04	1.064e-09	5.686e-10	9.717e-10	9.731e-10
7.710e-04	1.011e-09	5.348e-10	9.202e-10	9.215e-10
7.940e-04	9.429e-10	4.912e-10	8.531e-10	8.545e-10
8.180e-04	8.974e-10	4.630e-10	8.093e-10	8.106e-10
8.380e-04	8.675e-10	4.462e-10	7.819e-10	7.831e-10
8.600e-04	8.369e-10	4.293e-10	7.541e-10	7.553e-10

**KIRK
Gray cm²**

Energy-MeV	Water	Acetylene	Dry Air	Water Sat. Air
8.900e-04	7.006e-10	4.023e-10	7.100e-10	7.112e-10
9.200e-04	7.448e-10	3.700e-10	6.702e-10	6.713e-10
9.400e-04	7.264e-10	3.671e-10	6.536e-10	6.547e-10
9.500e-04	7.093e-10	3.572e-10	6.304e-10	6.394e-10
9.800e-04	6.093e-10	3.453e-10	6.201e-10	6.211e-10
9.900e-04	6.710e-10	3.347e-10	6.036e-10	6.046e-10
1.000e-03	6.590e-10	3.282e-10	5.934e-10	5.944e-10
1.000e-03	6.439e-10	3.193e-10	5.787e-10	5.797e-10
1.140e-03	6.203e-10	3.067e-10	5.570e-10	5.579e-10
1.360e-03	5.448e-10	2.667e-10	4.871e-10	4.880e-10
1.560e-03	3.818e-10	1.816e-10	3.375e-10	3.382e-10
1.700e-03	3.113e-10	1.453e-10	2.732e-10	2.737e-10
1.840e-03	2.772e-10	1.284e-10	2.425e-10	2.430e-10
1.910e-03	2.456e-10	1.127e-10	2.141e-10	2.146e-10
2.140e-03	2.054e-10	9.289e-11	1.781e-10	1.785e-10
2.240e-03	1.908e-10	8.582e-11	1.651e-10	1.655e-10
2.410e-03	1.807e-10	8.102e-11	1.562e-10	1.565e-10
2.470e-03	1.704e-10	7.612e-11	1.471e-10	1.474e-10
2.630e-03	1.585e-10	7.052e-11	1.366e-10	1.369e-10
2.750e-03	1.412e-10	6.238e-11	1.214e-10	1.217e-10
2.820e-03	1.279e-10	5.615e-11	1.097e-10	1.100e-10
2.960e-03	1.116e-10	4.852e-11	9.540e-11	9.563e-11
3.180e-03	9.194e-11	3.934e-11	7.810e-11	7.831e-11
3.550e-03	8.226e-11	3.497e-11	7.708e-11	7.715e-11
3.610e-03	7.393e-11	3.124e-11	6.985e-11	6.990e-11
3.700e-03	7.056e-11	2.974e-11	6.672e-11	6.677e-11
3.830e-03	6.525e-11	2.737e-11	6.180e-11	6.184e-11
4.030e-03	5.657e-11	2.350e-11	5.373e-11	5.377e-11
4.150e-03	5.130e-11	2.117e-11	4.883e-11	4.886e-11
4.300e-03	4.929e-11	2.029e-11	4.693e-11	4.696e-11
4.500e-03	4.633e-11	1.901e-11	4.414e-11	4.416e-11
4.810e-03	4.128e-11	1.683e-11	3.937e-11	3.940e-11
5.160e-03	3.420e-11	1.379e-11	3.269e-11	3.271e-11
5.470e-03	3.048e-11	1.220e-11	2.916e-11	2.918e-11
5.550e-03	2.854e-11	1.139e-11	2.732e-11	2.734e-11
5.930e-03	2.591e-11	1.028e-11	2.483e-11	2.485e-11
5.980e-03	2.324e-11	9.165e-12	2.231e-11	2.232e-11
6.250e-03	2.229e-11	8.768e-12	2.140e-11	2.141e-11
6.540e-03	2.129e-11	8.358e-12	2.045e-11	2.046e-11
6.750e-03	2.026e-11	7.936e-12	1.947e-11	1.948e-11
6.980e-03	1.923e-11	7.516e-12	1.850e-11	1.850e-11
7.110e-03	1.832e-11	7.142e-12	1.762e-11	1.763e-11

WISDOM
Gray cm²/s

Energy-eV	Water	Acetylene	Dry Air	Water Sat. Air
7.250e-03	1.750e-11	6.841e-12	1.692e-11	1.693e-11
7.710e-03	1.570e-11	6.106e-12	1.520e-11	1.521e-11
7.940e-03	1.349e-11	5.175e-12	1.302e-11	1.302e-11
8.180e-03	1.216e-11	4.640e-12	1.176e-11	1.176e-11
8.300e-03	1.174e-11	4.472e-12	1.136e-11	1.136e-11
8.600e-03	1.135e-11	4.315e-12	1.098e-11	1.098e-11
8.900e-03	1.072e-11	4.067e-12	1.038e-11	1.038e-11
9.200e-03	1.003e-11	3.794e-12	9.718e-12	9.721e-12
9.400e-03	9.506e-12	3.586e-12	9.213e-12	9.216e-12
9.560e-03	9.027e-12	3.397e-12	8.755e-12	8.757e-12
9.800e-03	8.465e-12	3.175e-12	8.215e-12	8.217e-12
1.000e-02	7.812e-12	2.918e-12	7.588e-12	7.590e-12
1.040e-02	7.430e-12	2.768e-12	7.222e-12	7.223e-12
1.080e-02	7.258e-12	2.703e-12	7.057e-12	7.058e-12
1.110e-02	7.080e-12	2.635e-12	6.885e-12	6.887e-12
1.190e-02	6.740e-12	2.506e-12	6.557e-12	6.559e-12
1.270e-02	6.135e-12	2.276e-12	5.973e-12	5.974e-12
1.300e-02	5.643e-12	2.089e-12	5.497e-12	5.498e-12
1.390e-02	5.019e-12	1.852e-12	4.894e-12	4.895e-12
1.470e-02	4.010e-12	1.470e-12	3.919e-12	3.919e-12
1.520e-02	3.186e-12	1.158e-12	3.122e-12	3.122e-12
1.570e-02	2.986e-12	1.084e-12	2.929e-12	2.929e-12
1.640e-02	2.866e-12	1.042e-12	2.811e-12	2.812e-12
1.700e-02	2.717e-12	9.882e-13	2.666e-12	2.666e-12
1.720e-02	2.615e-12	9.519e-13	2.566e-12	2.566e-12
1.810e-02	2.459e-12	8.963e-13	2.414e-12	2.415e-12
1.900e-02	2.175e-12	7.946e-13	2.137e-12	2.137e-12
1.970e-02	1.890e-12	6.923e-13	1.859e-12	1.859e-12
2.010e-02	1.681e-12	6.172e-13	1.655e-12	1.655e-12
2.100e-02	1.616e-12	5.953e-13	1.591e-12	1.591e-12
2.170e-02	1.581e-12	5.850e-13	1.556e-12	1.556e-12
2.230e-02	1.547e-12	5.747e-13	1.523e-12	1.523e-12
2.310e-02	1.505e-12	5.616e-13	1.481e-12	1.481e-12
2.550e-02	1.384e-12	5.234e-13	1.362e-12	1.362e-12
2.920e-02	1.074e-12	4.218e-13	1.056e-12	1.056e-12
3.320e-02	7.176e-13	3.068e-13	7.041e-13	7.042e-13
3.750e-02	6.178e-13	2.839e-13	6.037e-13	6.038e-13
4.200e-02	4.908e-13	2.524e-13	4.762e-13	4.764e-13
4.740e-02	4.360e-13	2.471e-13	4.199e-13	4.201e-13
4.850e-02	4.048e-13	2.452e-13	3.875e-13	3.877e-13
5.020e-02	3.882e-13	2.433e-13	3.705e-13	3.707e-13

CHINA
Gray area2

Energy-MeV	Water	Acetylene	Dry Air	Water Sec. Air
5.500e-02	3.761e-13	2.476e-13	3.572e-13	3.574e-13
6.100e-02	3.615e-13	2.564e-13	3.405e-13	3.400e-13
6.750e-02	3.606e-13	2.714e-13	3.371e-13	3.374e-13
6.950e-02	3.657e-13	2.833e-13	3.406e-13	3.409e-13
7.350e-02	3.674e-13	2.909e-13	3.412e-13	3.416e-13
7.840e-02	3.675e-13	3.012e-13	3.397e-13	3.401e-13
8.070e-02	3.660e-13	3.089e-13	3.369e-13	3.373e-13
8.550e-02	3.731e-13	3.191e-13	3.427e-13	3.431e-13
8.800e-02	3.817e-13	3.300e-13	3.501e-13	3.505e-13
9.050e-02	3.870e-13	3.372e-13	3.546e-13	3.550e-13
9.230e-02	3.914e-13	3.432e-13	3.582e-13	3.586e-13
9.600e-02	3.964e-13	3.507e-13	3.623e-13	3.628e-13
1.000e-01	4.028e-13	3.607e-13	3.674e-13	3.679e-13
1.050e-01	4.290e-13	3.887e-13	3.905e-13	3.911e-13
1.100e-01	4.745e-13	4.336e-13	4.313e-13	4.319e-13
1.150e-01	5.187e-13	4.776e-13	4.709e-13	4.715e-13
1.210e-01	5.659e-13	5.247e-13	5.130e-13	5.138e-13
1.350e-01	6.475e-13	6.068e-13	5.859e-13	5.867e-13
1.490e-01	7.537e-13	7.152e-13	6.804e-13	6.815e-13
1.640e-01	8.607e-13	8.230e-13	7.759e-13	7.771e-13
1.800e-01	9.756e-13	9.356e-13	8.789e-13	8.803e-13
1.980e-01	1.093e-12	1.051e-12	9.837e-13	9.853e-13
2.180e-01	1.218e-12	1.174e-12	1.097e-12	1.099e-12
2.390e-01	1.354e-12	1.306e-12	1.218e-12	1.220e-12
2.630e-01	1.491e-12	1.439e-12	1.342e-12	1.344e-12
2.900e-01	1.633e-12	1.578e-12	1.469e-12	1.471e-12
3.190e-01	1.777e-12	1.719e-12	1.599e-12	1.601e-12
3.510e-01	1.937e-12	1.874e-12	1.743e-12	1.745e-12
3.860e-01	2.098e-12	2.030e-12	1.887e-12	1.890e-12
4.240e-01	2.259e-12	2.186e-12	2.031e-12	2.034e-12
4.670e-01	2.436e-12	2.358e-12	2.191e-12	2.194e-12
5.130e-01	2.616e-12	2.532e-12	2.353e-12	2.356e-12
5.650e-01	2.885e-12	2.794e-12	2.595e-12	2.599e-12
6.210e-01	3.187e-12	3.086e-12	2.866e-12	2.871e-12
6.830e-01	3.508e-12	3.397e-12	3.155e-12	3.160e-12
7.510e-01	3.831e-12	3.710e-12	3.445e-12	3.451e-12
8.260e-01	4.145e-12	4.014e-12	3.727e-12	3.733e-12
9.090e-01	4.487e-12	4.345e-12	4.035e-12	4.041e-12
1.000e+00	4.827e-12	4.675e-12	4.341e-12	4.347e-12
1.120e+00	5.284e-12	5.118e-12	4.752e-12	4.759e-12
1.270e+00	5.890e-12	5.704e-12	5.296e-12	5.305e-12
1.420e+00	6.453e-12	6.250e-12	5.804e-12	5.813e-12

**ICRU
Gray cm²/g**

Energy-MeV	Water	Acetylene	Dry Air	Water Sat. Air
1.400e+00	6.971e-12	6.730e-12	6.270e-12	6.200e-12
1.600e+00	7.599e-12	7.356e-12	6.836e-12	6.847e-12
2.030e+00	8.190e-12	7.930e-12	7.378e-12	7.389e-12
2.200e+00	8.931e-12	8.631e-12	8.059e-12	8.071e-12
2.570e+00	9.007e-12	9.468e-12	8.836e-12	8.850e-12
2.890e+00	1.060e-11	1.021e-11	9.555e-12	9.570e-12
3.250e+00	1.135e-11	1.092e-11	1.025e-11	1.027e-11
3.450e+00	1.230e-11	1.181e-11	1.112e-11	1.114e-11
4.110e+00	1.321e-11	1.264e-11	1.196e-11	1.198e-11
4.620e+00	1.431e-11	1.365e-11	1.298e-11	1.300e-11
5.200e+00	1.547e-11	1.470e-11	1.407e-11	1.409e-11
5.850e+00	1.675e-11	1.585e-11	1.526e-11	1.528e-11
6.580e+00	1.816e-11	1.711e-11	1.659e-11	1.661e-11
7.410e+00	1.988e-11	1.864e-11	1.821e-11	1.824e-11
8.330e+00	2.160e-11	2.013e-11	1.985e-11	1.988e-11
9.370e+00	2.372e-11	2.197e-11	2.188e-11	2.190e-11
1.060e+01	2.613e-11	2.403e-11	2.420e-11	2.422e-11
1.190e+01	2.893e-11	2.644e-11	2.687e-11	2.690e-11
1.340e+01	3.191e-11	2.898e-11	2.975e-11	2.978e-11
2.000e+01	4.052e-11	3.615e-11	3.813e-11	3.817e-11
3.000e+01	5.999e-11	5.229e-11	5.715e-11	5.719e-11
4.000e+01	8.416e-11	7.207e-11	8.089e-11	8.093e-11
5.000e+01	1.097e-10	9.292e-11	1.061e-10	1.061e-10
7.500e+01	1.566e-10	1.311e-10	1.522e-10	1.523e-10
1.000e+02	2.274e-10	1.887e-10	2.220e-10	2.221e-10

123000
Gray cm²

Energy-NeV Carbon Dioxide Ethylene Gas TE, w/Methane

1.000e-04			
1.000e-04	8.314e-10	3.854e-10	6.354e-10
1.140e-04	8.109e-10	3.735e-10	6.181e-10
1.360e-04	7.368e-10	3.351e-10	5.587e-10
1.560e-04	5.682e-10	2.559e-10	4.294e-10
1.700e-04	4.922e-10	2.261e-10	3.709e-10
1.840e-04	4.517e-10	2.013e-10	3.399e-10
1.910e-04	4.132e-10	1.839e-10	3.107e-10
2.140e-04	3.632e-10	1.611e-10	2.729e-10
2.240e-04	3.446e-10	1.517e-10	2.583e-10
2.410e-04	3.305e-10	1.442e-10	2.472e-10
2.470e-04	3.157e-10	1.366e-10	2.355e-10
2.630e-04	2.983e-10	1.280e-10	2.221e-10
2.750e-04	2.726e-10	1.157e-10	2.025e-10
2.820e-04	2.527e-10	1.062e-10	1.874e-10
2.960e-04	7.167e-10	1.627e-09	9.854e-10
3.180e-04	7.197e-10	1.717e-09	1.018e-09
3.550e-04	6.742e-10	1.616e-09	9.560e-10
3.610e-04	6.321e-10	1.521e-09	8.984e-10
3.700e-04	6.144e-10	1.482e-09	8.742e-10
3.830e-04	5.863e-10	1.418e-09	8.356e-10
4.030e-04	5.394e-10	1.311e-09	7.756e-10
4.150e-04	5.091e-10	1.241e-09	7.922e-10
4.300e-04	4.951e-10	1.208e-09	7.711e-10
4.500e-04	4.741e-10	1.157e-09	7.391e-10
4.810e-04	4.373e-10	1.068e-09	6.833e-10
5.160e-04	3.842e-10	9.397e-10	6.024e-10
5.470e-04	8.853e-10	8.648e-10	8.525e-10
5.550e-04	1.431e-09	8.230e-10	1.141e-09
5.930e-04	1.392e-09	7.657e-10	1.095e-09
5.980e-04	1.349e-09	7.071e-10	1.048e-09
6.250e-04	1.315e-09	6.804e-10	1.018e-09
6.540e-04	1.248e-09	6.436e-10	9.650e-10
6.750e-04	1.179e-09	6.060e-10	9.111e-10
6.980e-04	1.111e-09	5.689e-10	8.577e-10
7.110e-04	1.060e-09	5.406e-10	8.174e-10
7.250e-04	1.039e-09	5.279e-10	8.003e-10
7.710e-04	9.860e-10	4.966e-10	7.579e-10
7.940e-04	9.171e-10	4.561e-10	7.027e-10
8.180e-04	8.715e-10	4.299e-10	6.664e-10
8.380e-04	8.420e-10	4.143e-10	6.435e-10
8.600e-04	8.120e-10	3.985e-10	6.202e-10

SEPM
Gray case2

Energy-Hot Carbon Dioxide Ethylene Gas TL, w/Methane

8.900e-04	7.645e-10	3.736e-10	5.834e-10
9.200e-04	7.214e-10	3.509e-10	5.499e-10
9.400e-04	7.032e-10	3.400e-10	5.356e-10
9.560e-04	6.864e-10	3.316e-10	5.224e-10
9.800e-04	6.663e-10	3.206e-10	5.067e-10
9.900e-04	6.483e-10	3.107e-10	4.925e-10
1.000e-03	6.371e-10	3.047e-10	4.838e-10
1.000e-03	6.215e-10	2.964e-10	4.717e-10
1.140e-03	5.986e-10	2.847e-10	4.540e-10
1.360e-03	5.248e-10	2.476e-10	3.973e-10
1.560e-03	3.663e-10	1.686e-10	2.756e-10
1.700e-03	2.978e-10	1.349e-10	2.233e-10
1.840e-03	2.649e-10	1.192e-10	1.982e-10
1.910e-03	2.344e-10	1.046e-10	1.751e-10
2.140e-03	1.956e-10	8.623e-11	1.457e-10
2.240e-03	1.816e-10	7.966e-11	1.351e-10
2.410e-03	1.719e-10	7.521e-11	1.278e-10
2.470e-03	1.620e-10	7.066e-11	1.204e-10
2.630e-03	1.506e-10	6.547e-11	1.118e-10
2.750e-03	1.340e-10	5.791e-11	9.939e-11
2.820e-03	1.213e-10	5.212e-11	8.985e-11
2.960e-03	1.057e-10	4.504e-11	7.816e-11
3.180e-03	8.690e-11	3.652e-11	6.404e-11
3.550e-03	7.768e-11	3.246e-11	5.718e-11
3.610e-03	6.976e-11	2.900e-11	5.129e-11
3.700e-03	6.656e-11	2.761e-11	4.891e-11
3.830e-03	6.151e-11	2.541e-11	4.516e-11
4.030e-03	5.326e-11	2.181e-11	3.903e-11
4.150e-03	4.826e-11	1.965e-11	3.532e-11
4.300e-03	4.635e-11	1.884e-11	3.391e-11
4.500e-03	4.355e-11	1.765e-11	3.184e-11
4.810e-03	3.877e-11	1.563e-11	2.832e-11
5.160e-03	3.208e-11	1.280e-11	2.338e-11
5.470e-03	2.856e-11	1.133e-11	2.079e-11
5.550e-03	2.673e-11	1.057e-11	1.944e-11
5.930e-03	2.425e-11	9.545e-12	1.762e-11
5.980e-03	2.174e-11	8.508e-12	1.578e-11
6.250e-03	2.084e-11	8.140e-12	1.512e-11
6.540e-03	1.990e-11	7.758e-12	1.443e-11
6.750e-03	1.893e-11	7.367e-12	1.373e-11
6.980e-03	1.797e-11	6.977e-12	1.302e-11
7.110e-03	1.711e-11	6.630e-12	1.239e-11

12000
Gray cm²

Energy-MeV Carbon Dioxide Ethylene Gas TE, w/Methane

7.250e-03	1.641e-11	6.351e-12	1.109e-11
7.710e-03	1.472e-11	5.669e-12	1.065e-11
7.940e-03	1.257e-11	4.804e-12	9.079e-12
8.100e-03	1.133e-11	4.307e-12	8.175e-12
8.300e-03	1.094e-11	4.152e-12	7.888e-12
8.600e-03	1.057e-11	4.006e-12	7.620e-12
8.900e-03	9.981e-12	3.776e-12	7.194e-12
9.200e-03	9.335e-12	3.523e-12	6.725e-12
9.400e-03	8.842e-12	3.330e-12	6.367e-12
9.560e-03	8.394e-12	3.154e-12	6.042e-12
9.800e-03	7.868e-12	2.948e-12	5.660e-12
1.000e-02	7.257e-12	2.709e-12	5.217e-12
1.040e-02	6.900e-12	2.571e-12	4.958e-12
1.080e-02	6.740e-12	2.510e-12	4.843e-12
1.110e-02	6.573e-12	2.447e-12	4.723e-12
1.190e-02	6.256e-12	2.328e-12	4.495e-12
1.270e-02	5.692e-12	2.115e-12	4.089e-12
1.300e-02	5.233e-12	1.942e-12	3.759e-12
1.390e-02	4.651e-12	1.722e-12	3.340e-12
1.470e-02	3.712e-12	1.368e-12	2.663e-12
1.520e-02	2.944e-12	1.079e-12	2.111e-12
1.570e-02	2.759e-12	1.011e-12	1.978e-12
1.640e-02	2.647e-12	9.715e-13	1.899e-12
1.700e-02	2.508e-12	9.224e-13	1.800e-12
1.720e-02	2.414e-12	8.889e-13	1.733e-12
1.810e-02	2.269e-12	8.377e-13	1.631e-12
1.900e-02	2.006e-12	7.438e-13	1.444e-12
1.970e-02	1.742e-12	6.494e-13	1.256e-12
2.010e-02	1.548e-12	5.800e-13	1.117e-12
2.100e-02	1.487e-12	5.600e-13	1.075e-12
2.170e-02	1.454e-12	5.510e-13	1.053e-12
2.230e-02	1.423e-12	5.418e-13	1.032e-12
2.310e-02	1.384e-12	5.301e-13	1.005e-12
2.550e-02	1.273e-12	4.956e-13	9.285e-13
2.920e-02	9.854e-13	4.031e-13	7.288e-13
3.320e-02	6.562e-13	2.986e-13	5.006e-13
3.750e-02	5.639e-13	2.797e-13	4.417e-13
4.200e-02	4.468e-13	2.529e-13	3.655e-13
4.740e-02	3.961e-13	2.506e-13	3.371e-13
4.850e-02	3.673e-13	2.506e-13	3.215e-13
5.020e-02	3.520e-13	2.495e-13	3.127e-13
5.500e-02	3.407e-13	2.552e-13	3.095e-13

K2HNA
Grey cmw2

Energy-MeV Carbon Dioxide Ethylene Gas TE, w/Nethane

6.100e-02	3.271e-13	2.460e-13	3.074e-13
6.750e-02	3.259e-13	2.830e-13	3.151e-13
6.950e-02	3.303e-13	2.961e-13	3.239e-13
7.350e-02	3.318e-13	3.045e-13	3.288e-13
7.840e-02	3.317e-13	3.161e-13	3.345e-13
8.070e-02	3.302e-13	3.248e-13	3.379e-13
8.550e-02	3.366e-13	3.359e-13	3.468e-13
8.800e-02	3.443e-13	3.476e-13	3.567e-13
9.050e-02	3.491e-13	3.553e-13	3.631e-13
9.230e-02	3.530e-13	3.618e-13	3.683e-13
9.600e-02	3.575e-13	3.699e-13	3.747e-13
1.000e-01	3.632e-13	3.808e-13	3.832e-13
1.050e-01	3.867e-13	4.106e-13	4.105e-13
1.100e-01	4.276e-13	4.584e-13	4.561e-13
1.150e-01	4.675e-13	5.051e-13	5.005e-13
1.210e-01	5.099e-13	5.551e-13	5.480e-13
1.350e-01	5.833e-13	6.425e-13	6.305e-13
1.490e-01	6.789e-13	7.578e-13	7.388e-13
1.640e-01	7.752e-13	8.724e-13	8.470e-13
1.800e-01	8.786e-13	9.919e-13	9.615e-13
1.980e-01	9.838e-13	1.114e-12	1.078e-12
2.180e-01	1.097e-12	1.245e-12	1.204e-12
2.390e-01	1.219e-12	1.385e-12	1.338e-12
2.630e-01	1.343e-12	1.527e-12	1.475e-12
2.900e-01	1.471e-12	1.673e-12	1.616e-12
3.190e-01	1.601e-12	1.823e-12	1.759e-12
3.510e-01	1.745e-12	1.988e-12	1.918e-12
3.860e-01	1.889e-12	2.153e-12	2.077e-12
4.240e-01	2.034e-12	2.318e-12	2.237e-12
4.670e-01	2.194e-12	2.501e-12	2.413e-12
5.130e-01	2.356e-12	2.686e-12	2.591e-12
5.650e-01	2.599e-12	2.963e-12	2.858e-12
6.210e-01	2.870e-12	3.273e-12	3.157e-12
6.830e-01	3.159e-12	3.603e-12	3.475e-12
7.510e-01	3.450e-12	3.935e-12	3.795e-12
8.260e-01	3.732e-12	4.257e-12	4.106e-12
9.090e-01	4.040e-12	4.609e-12	4.445e-12
1.000e+00	4.347e-12	4.959e-12	4.782e-12
1.120e+00	4.759e-12	5.428e-12	5.235e-12
1.270e+00	5.304e-12	6.050e-12	5.835e-12
1.420e+00	5.812e-12	6.629e-12	6.394e-12
1.600e+00	6.279e-12	7.159e-12	6.906e-12

XXXXX
Gray case?

Energy-MeV Carbon Dioxide Ethylene Gas TE, w/Methane

1.000e+00	6.846e-12	7.801e-12	7.527e-12
2.030e+00	7.388e-12	8.403e-12	8.117e-12
2.280e+00	8.071e-12	9.169e-12	8.858e-12
2.570e+00	8.850e-12	1.003e-11	9.699e-12
2.890e+00	9.572e-12	1.081e-11	1.047e-11
3.250e+00	1.027e-11	1.155e-11	1.121e-11
3.650e+00	1.115e-11	1.248e-11	1.213e-11
4.110e+00	1.199e-11	1.334e-11	1.300e-11
4.620e+00	1.301e-11	1.438e-11	1.405e-11
5.200e+00	1.411e-11	1.547e-11	1.516e-11
5.850e+00	1.531e-11	1.665e-11	1.638e-11
6.580e+00	1.665e-11	1.794e-11	1.771e-11
7.410e+00	1.828e-11	1.931e-11	1.934e-11
8.330e+00	1.993e-11	2.101e-11	2.094e-11
9.370e+00	2.198e-11	2.286e-11	2.291e-11
1.060e+01	2.432e-11	2.492e-11	2.514e-11
1.190e+01	2.702e-11	2.736e-11	2.774e-11
1.340e+01	2.992e-11	2.990e-11	3.050e-11
2.000e+01	3.840e-11	3.698e-11	3.834e-11
3.000e+01	5.762e-11	5.290e-11	5.605e-11
4.000e+01	8.164e-11	7.227e-11	7.788e-11
5.000e+01	1.071e-10	9.264e-11	1.009e-10
7.500e+01	1.538e-10	1.299e-10	1.432e-10
1.000e+02	2.245e-10	1.861e-10	2.069e-10

Weight Fractions of Composite Materials

Tissue Approximation:

Hydrogen	.1002
Carbon	.1493
Nitrogen	.0340
Oxygen	.7157

Bone (Femur):

Hydrogen	.0640
Carbon	.2780
Nitrogen	.0270
Oxygen	.4100
Magnesium	.0020
Phosphorus	.0700
Sulfur	.0020
Calcium	.1470

Muscle (ICRU):

Hydrogen	.1020
Carbon	.1230
Nitrogen	.0350
Oxygen	.7290
Sodium	.0008
Magnesium	.0002
Phosphorus	.0020
Sulfur	.0050
Potassium	.0030
Calcium	.0001

Standard Man:

Hydrogen	.1000
Carbon	.1800
Nitrogen	.0300
Oxygen	.6500
Sodium	.0015
Magnesium	.0005
Phosphorus	.0100
Sulfur	.0025
Chlorine	.0015
Potassium	.0020
Calcium	.0150
Iron	.0070

Weight Fractions of Composite Materials

A-150 Plastic:

Hydrogen	.1015
Carbon	.7754
Nitrogen	.0332
Oxygen	.0321
Flourine	.0174
Calcium	.0184

Nylon Type 6 or 6/6:

Hydrogen	.0980
Carbon	.6368
Nitrogen	.1238
Oxygen	.1414

Lucite:

Hydrogen	.0805
Carbon	.5998
Oxygen	.3196

Liquid, Muscle Equivalent:

Hydrogen	.1020
Carbon	.1201
Nitrogen	.0354
Oxygen	.7425

Water:

Hydrogen	.1119
Oxygen	.8881

Acetylene:

Hydrogen	.0774
Carbon	.9226

Air, Dry:

Carbon	.0001
Nitrogen	.7552
Oxygen	.2318
Argon	.0129

Weight Fractions of Composite Materials

Air, Water Saturated:

Hydrogen	.0016
Carbon	.0001
Nitrogen	.7443
Oxygen	.2413
Argon	.0127

Carbon Dioxide:

Carbon	.2729
Oxygen	.7271

Ethylene:

Hydrogen	.1437
Carbon	.8563

TE Gas, with Methane:

Hydrogen	.1019
Carbon	.4562
Nitrogen	.0352
Oxygen	.4068