OAK RIDGE NATIONAL LABORATORY LIBRARIES
3 4456 0550587 9

CENTRAL RESEARCH LIBRARY

ORNL-TM-4822

Cy 49

The Pb(n,xγ) Reaction for Incident Neutron Energies Between 0.6 and 20.0 MeV

G. T. Chapman G. L. Morgan

OAK RIDGE NATIONAL LABORATORY
CENTRAL RESEARCH LIBRARY
DOCUMENT COLLECTION
LIBRARY LOAN COPY
DO NOT TRANSFER TO ANOTHER PERSON
If you wish someone else to see this document, send in name with document and the library will arrange a loan.
UCN-7969
(3 3-67)

OAK RIDGE NATIONAL LABORATORY
OPERATED BY UNION CARBIDE CORPORATION • FOR THE U.S. ATOMIC ENERGY COMMISSION

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the Energy Research and Development Administration, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

ORNL-TM-4822

Contract No. W-7405-Eng-26

Neutron Physics Division

THE Pb(n,xγ) REACTION FOR INCIDENT NEUTRON ENERGIES BETWEEN 0.6 AND 20.0 MeV

G. T. Chapman and G. L. Morgan

FEBRUARY 1975

NOTE: This work funded by Defense Nuclear Agency under Subtask No. PC101

OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830
operated by
UNION CARBIDE CORPORATION
for the
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

OAK RIDGE NATIONAL LABORATORY LIBRARIES

3 4456 0550587 9

ABSTRACT

Numerical values of the differential cross sections for gamma rays produced by neutron reactions with natural lead have been measured for neutron energies between 0.6 and 20 MeV. The data were obtained using an electron linac as a neutron source in conjunction with a NaI spectrometer located at an angle of 125°. The data consist of the doubly differential cross section, $d^2\sigma/d\Omega dE$, for gamma rays between 0.3 and 10.5 MeV for coarse intervals in incident neutron energy and the integrated yield of gamma rays of energy greater than 0.3 MeV with high resolution in the incident neutron energy. The measured results are compared with the current ENDF/B data.

INTRODUCTION

As part of a continuing program[1] for determining numerical values of gamma-ray production cross sections for neutron-induced reactions, we have measured the absolute differential cross sections for gamma rays produced by neutron interactions with natural lead. The data are presented in this report in tabular and graphical form and are compared to the current evaluated data file for lead (ENDF/B 1288).[2]

Two methods of data analysis were employed. One gives the detailed gamma-ray spectra for a series of coarse intervals in incident neutron energy while the second method uses integral quantities to illustrate the detailed behavior of the cross sections as a function of the incident neutron energy. The second approach is used to facilitate comparison of the experimental and evaluated data in the region of the thresholds for the (n,2n) and (n,3n) reactions.

EXPERIMENTAL PROCEDURE

Details of the experimental procedure are given elsewhere[3] and only a brief description will be given here. Neutrons were produced by photonuclear processes due to bremsstrahlung from the impact on a tantalum target of electrons from the Oak Ridge Electron Linear Accelerator (ORELA). The present experiment employed an electron beam energy of 140 MeV with a repetition rate of 750 pulses per second and a pulse width of 30 ns. The total electron beam power was 40 kW.

Neutrons produced at the linac target traversed a 47.35 m flight path and were incident on a thin slab of natural lead oriented 45° with respect to the incident beam. The slab was 30 cm by 30 cm with a

thickness of 0.011 atoms/barn. Gamma rays originating in the sample were detected by a heavily shielded 12.5 cm by 12.5 cm NaI detector at 125° with respect to the incident neutron beam. For each event in the detector data were recorded in a two-parameter array containing gamma-ray pulse height as a function of time-of-flight for the incident neutron.

The neutron flux at the sample position was determined using calibrated thick organic scintillators. During the course of the gamma-ray measurements the flux was monitored using a small plastic scintillator in the edge of the neutron beam 30 m from the source.

DATA REDUCTION

Two methods of data reduction were employed. In the first, the pulse height spectra were integrated over intervals of neutron time-of-flight to form pulse height spectra for specific incident neutron energy ranges. These intervals ranged in width from 0.5 MeV at energies below 5 MeV to 2.5 MeV in the range 10 to 20 MeV. The spectra so formed were then unfolded using the code FERD and measured response functions of the NaI detector. The results were the gamma-ray spectra defined by 146 points covering the gamma-ray energy range from 0.3 to 10.6 MeV. After correction for self-absorption and neutron self-shielding in the sample, these spectra were normalized to cross sections using the measured neutron flux and sample thickness.

These results are presented in the first set of graphs at the end of this report. The first graph is a three-dimensional representation of the data giving cross section versus gamma-ray and incident neutron energy. The following graphs present the detailed gamma-ray spectra for

each incident neutron energy interval. These are compared to cross sections generated[4] from the evaluation (ENDF/B 1288) by averaging over the appropriate neutron energy interval.

The data described above provide detailed information about the secondary gamma-ray spectra, but because the unfolding technique requires good statistical accuracy the data must be binned over large neutron energy intervals. Therefore a second type of data reduction, pulse height weighting[5,6] was also used. This technique provided only integral information about the secondary gamma spectra (e.g., total yield, average energy), but because the demands on statistical accuracy are less it allowed better resolution in the incident neutron energy. In this work the pulse height weighting analysis was applied to spectra formed by integration over time-of-flight intervals corresponding to ΔE_n = 0.1 MeV at E_n = 1 MeV increasing to ΔE_n = 1.0 MeV at E_n = 20 MeV. The results of this analysis for the total yield and average secondary gamma-ray energy as a function of the incident neutron energy are presented in the last four graphs. Two values of the lower cut-off in gamma-ray energy were used, 0.3 and 0.7 MeV. Comparisons are made for the same quantities calculated from the evaluated data.

The data shown in the graphs are given in the tables contained in the last section of the report. The values shown in the graphs and presented in the tables do not include an uncertainty of 10% in overall normalization due mainly to the determination of the incident neutron flux.

ACKNOWLEDGEMENTS

We wish to thank J. W. McConnell for help with the electronics, J. G. Craven for aid with the computers and H. A. Todd and the ORELA staff for operation of the accelerator. Special thanks are due J. K. Dickens for helpful discussions regarding this work. We appreciate the help of W. E. Ford in generating cross sections from the evaluated data and of T. A. Love in obtaining the lead sample.

REFERENCES

1. G. L. Morgan, T. A. Love, J. K. Dickens and F. G. Perey, "Gamma-Ray Production Cross Sections of Tantalum and Carbon for Incident Neutron Energies Between 0.007 and 20.0 MeV," ORNL-TM-3702 (February 1972).

J. K. Dickens, G. L. Morgan and F. G. Perey, "Gamma-Ray Production Due to Interactions with Iron for Incident Neutron Energies Between 0.8 and 20 MeV: Tabulated Differential Cross Sections," ORNL-4798 (August 1972).

J. K. Dickens, T. A. Love and G. L. Morgan, "Gamma-Ray Production Due to Neutron Interactions with Tungsten for Incident Neutron Energies Between 1.0 and 20 MeV: Tabulated Differential Cross Sections," ORNL-4847 (January 1973).

J. K. Dickens, T. A. Love and G. L. Morgan, "Gamma-Ray Production Due to Neutron Interactions with Copper for Incident Neutron Energies Between 2.0 and 20 MeV: Tabulated Differential Cross Sections," ORNL-4846 (January 1973).

J. K. Dickens, T. A. Love and G. L. Morgan, "Gamma-Ray Production Due to Neutron Interactions with Nitrogen for Incident Neutron Energies Between 2.0 and 20 MeV: Tabulated Differential Cross Sections," ORNL-4864 (April 1973).

J. K. Dickens, T. A. Love and G. L. Morgan, "Gamma-Ray Production Due to Neutron Interactions with Aluminum for Incident Neutron Energies Between 0.85 and 20 MeV: Tabulated Differential Cross Sections," ORNL-TM-4232 (July 1973).

J. K. Dickens, T. A. Love and G. L. Morgan, "Gamma-Ray Production Due to Neutron Interactions with Calcium for Incident Neutron Energies Between 0.85 and 20 MeV: Tabulated Differential Cross Sections," ORNL-TM-4252 (July 1973).

J. K. Dickens, T. A. Love and G. L. Morgan, "Gamma-Ray Production Due to Neutron Interactions with Nickel for Incident Neutron Energies Between 1.0 and 20 MeV: Tabulated Differential Cross Sections," ORNL-TM-4379 (November 1973).

J. K. Dickens, T. A. Love and G. L. Morgan, "Gamma-Ray Production from Neutron Interactions with Silicon for Incident Neutron Energies Between 1.0 and 20 MeV: Tabulated Differential Cross Sections," ORNL-TM-4389 (December 1973).

J. K. Dickens, T. A. Love and G. L. Morgan, "Gamma-Ray Production Due to Neutron Interactions with Tin for Incident Neutron Energies Between 0.75 and 20 MeV: Tabulated Differential Cross Sections," ORNL-TM-4406 (November 1973).

J. K. Dickens, T. A. Love and G. L. Morgan, "Gamma-Ray Production Due to Neutron Interactions with Zinc for Incident Neutron Energies Between 0.85 and 20 MeV: TAbulated Differential Cross Sections," ORNL-TM-4464 (February 1974).

J. K. Dickens, T. A. Love and G. L. Morgan, "Gamma-Ray Production Due to Neutron Interactions with Fluorine and Lithium for Incident Neutron Energies Between 0.55 and 20 MeV: Tabulated Differential Cross Sections," ORNL-TM-4538 (April 1974).

J. K. Dickens, T. A. Love, and G. L. Morgan, "Gamma-Ray Production Due to Neutron Interactions with Magnesium for Incident Neutron Energies between 0.8 and 20 MeV: Tabulated Differential Cross Sections," ORNL-TM-4544 (May 1974).

G. L. Morgan and J. K. Dickens, "Production of Low Energy Gamma Rays by Neutron Interactions with Fluorine for Incident Neutron Energies between 0.1 and 20 MeV," ORNL-TM-4823 (February 1975).

2. C. Y. Fu and F. G. Perey, "An Evaluation of Neutron and Gamma-Ray-Production Cross Sections for Lead," ORNL-4765 (March 1972).

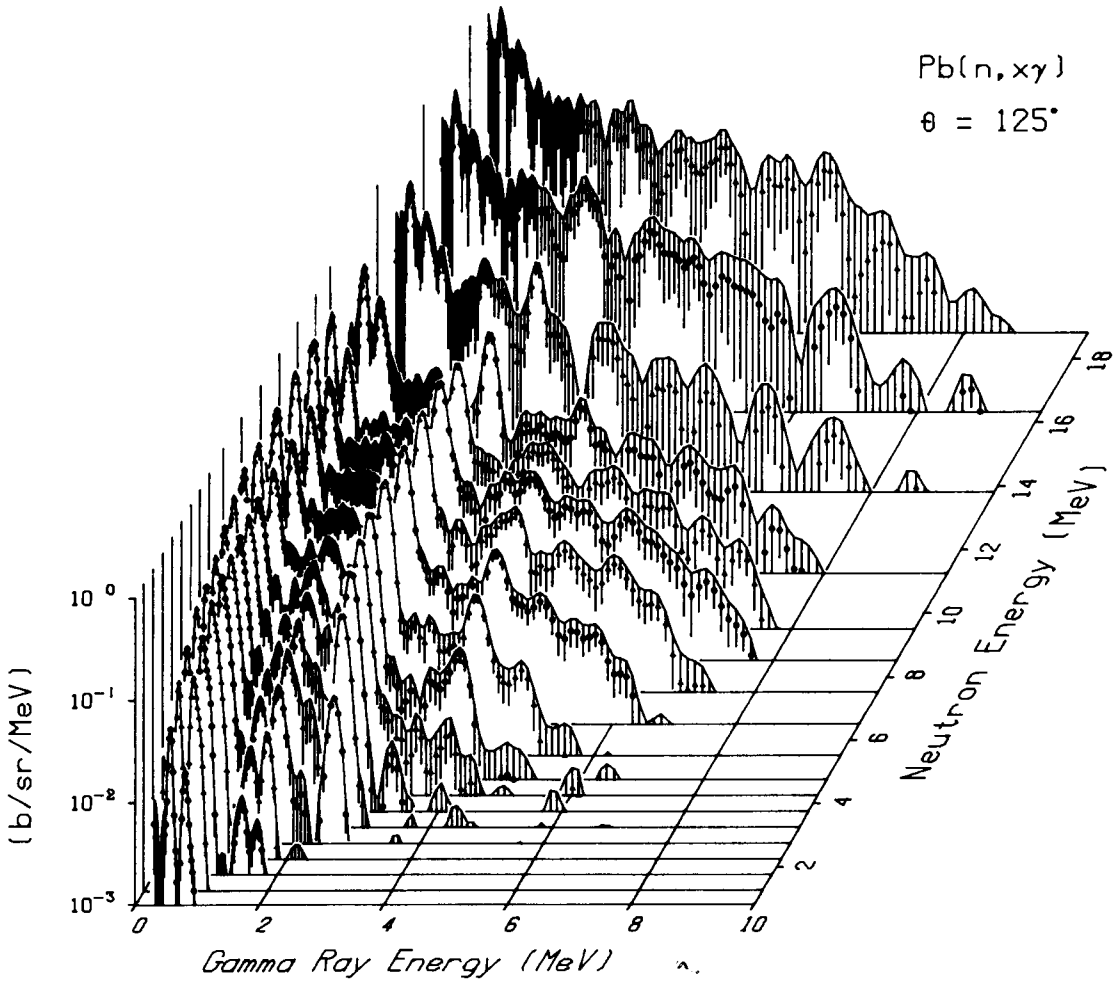
3. J. K. Dickens, G. L. Morgan, and F. G. Perey, Nucl. Sci. Eng. 50, 311-336 (1973).

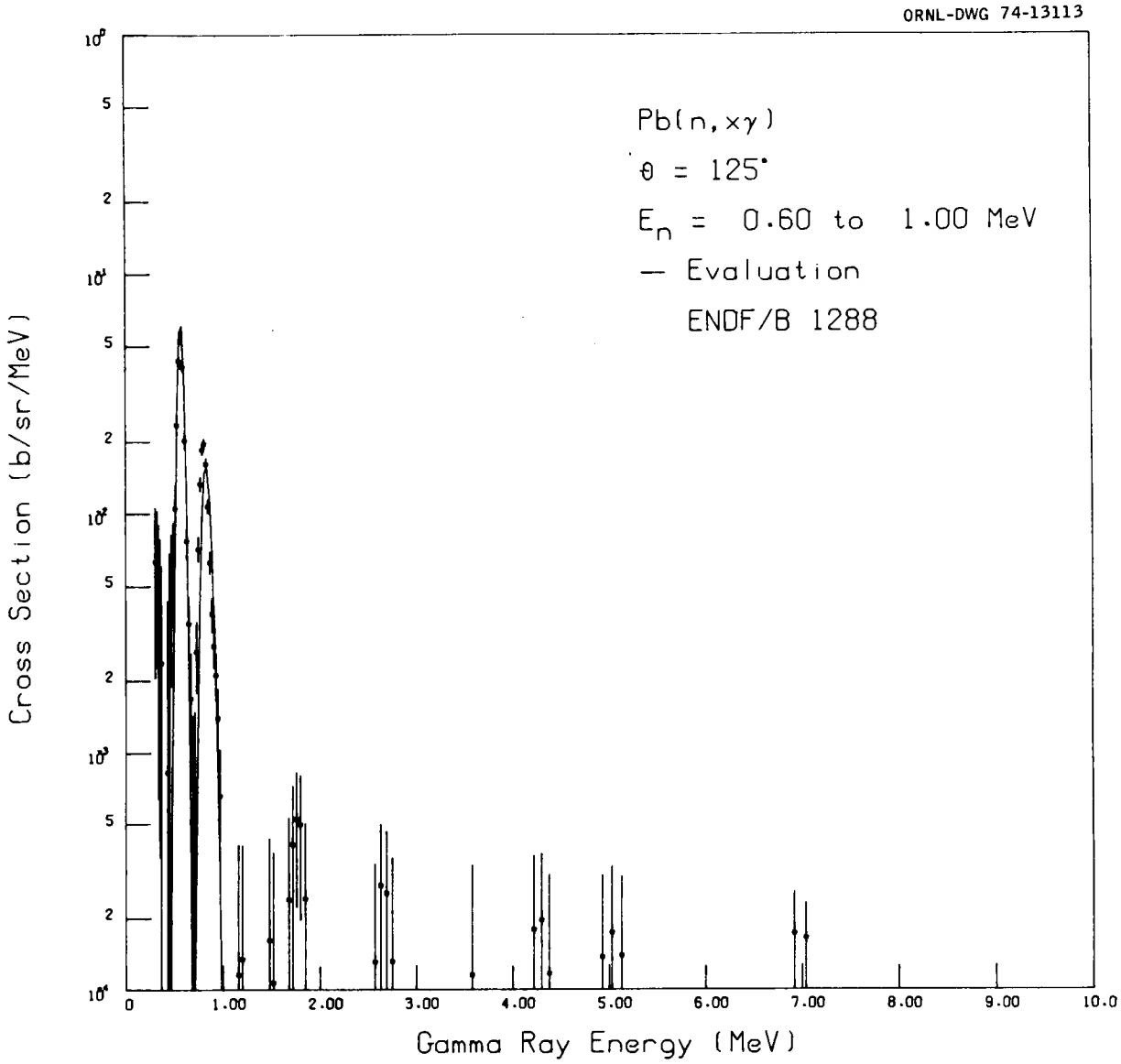
4. W. E. Ford obtained these results from the evaluation of Ref. 2 using the Code AMPX.

5. Frances Pleasonton, Robert L. Ferguson, and H. W. Schmitt, Phys. Rev. C 6, 1023 (1972).

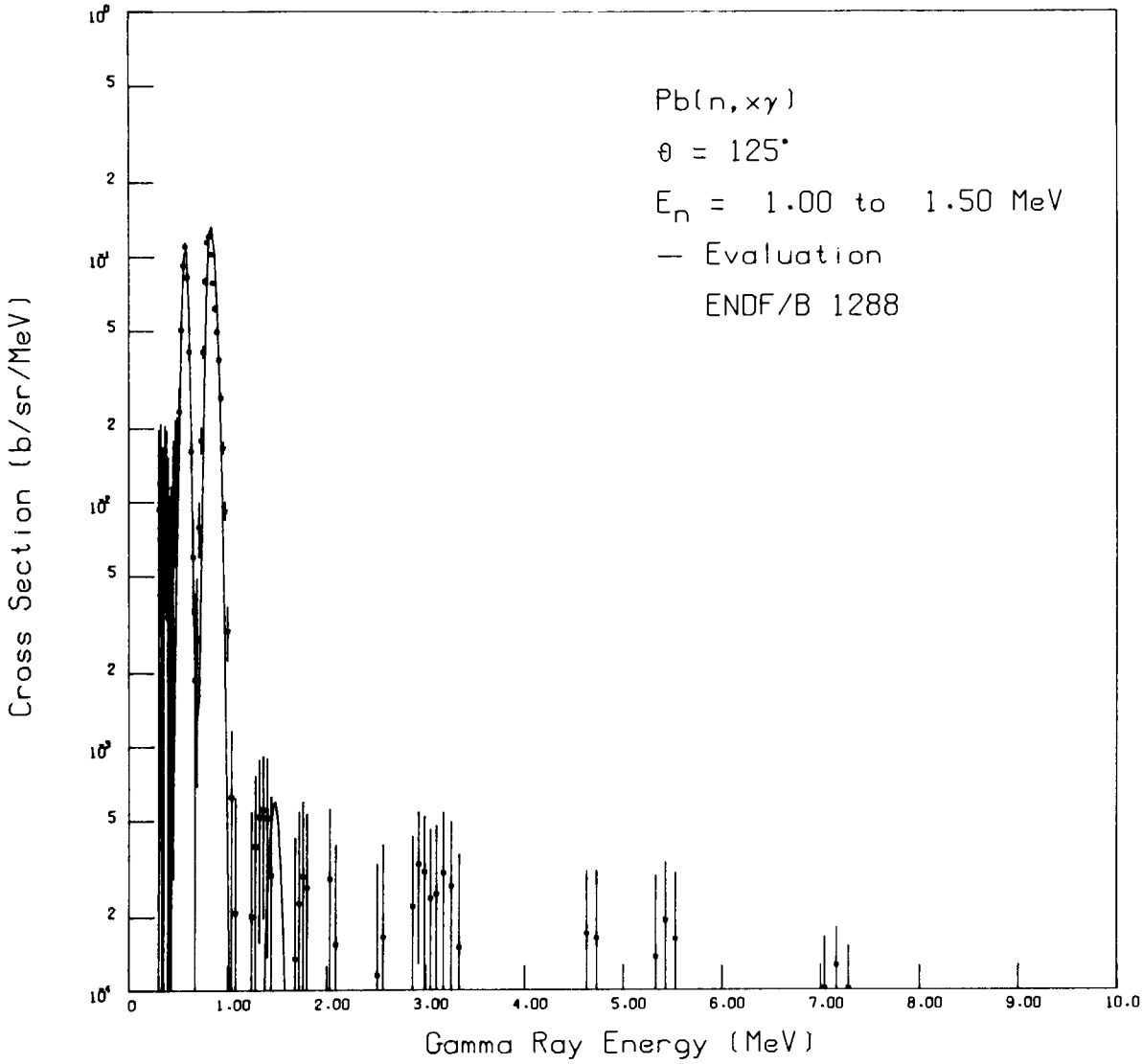
6. G. L. Morgan, T. A. Love, and F. G. Perey, "Integral Neutron Scattering Measurements on Carbon from 1 to 20 MeV," ORNL-TM-4157 (April 1973).

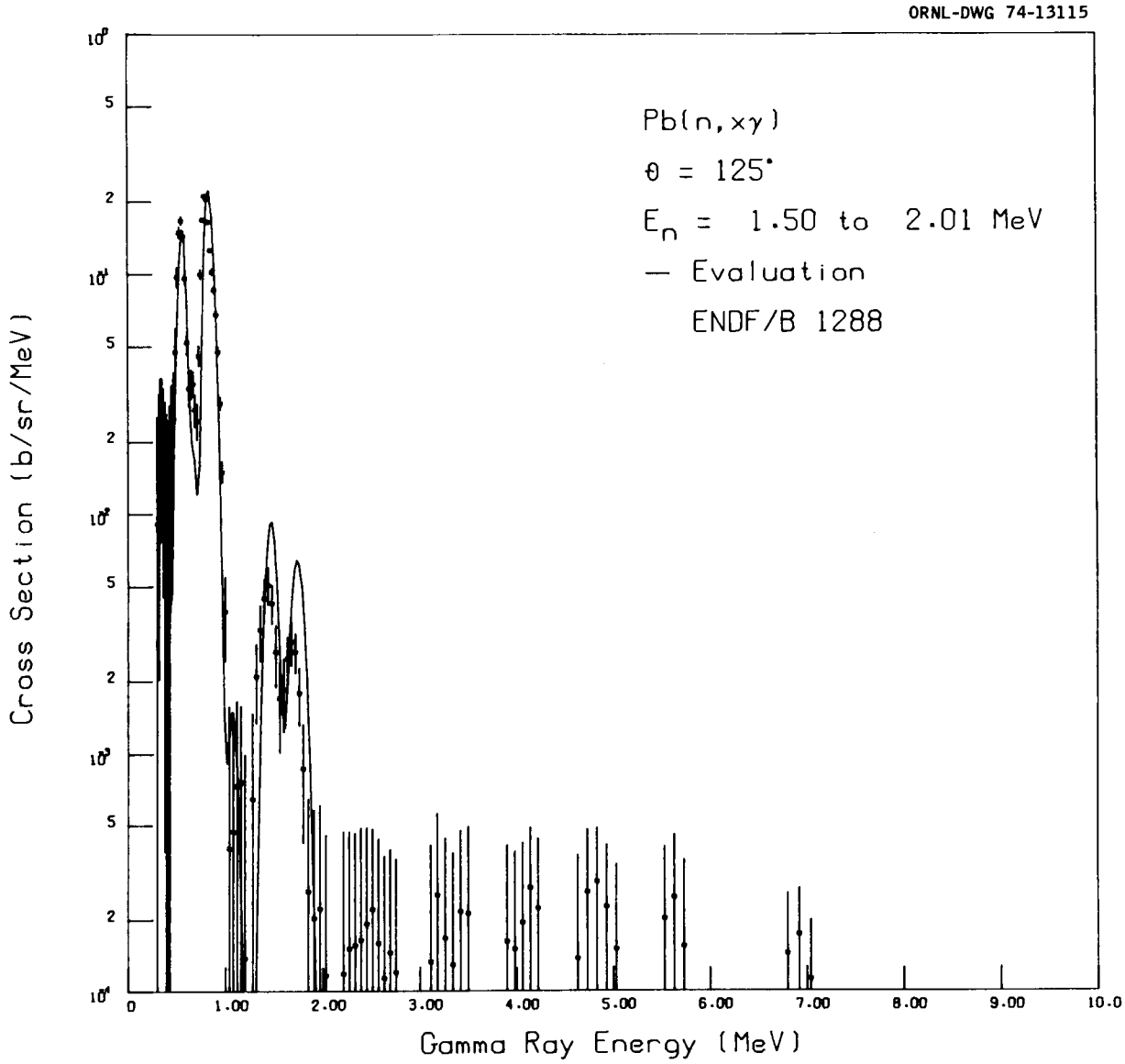
ORNL-DWG 74-13112



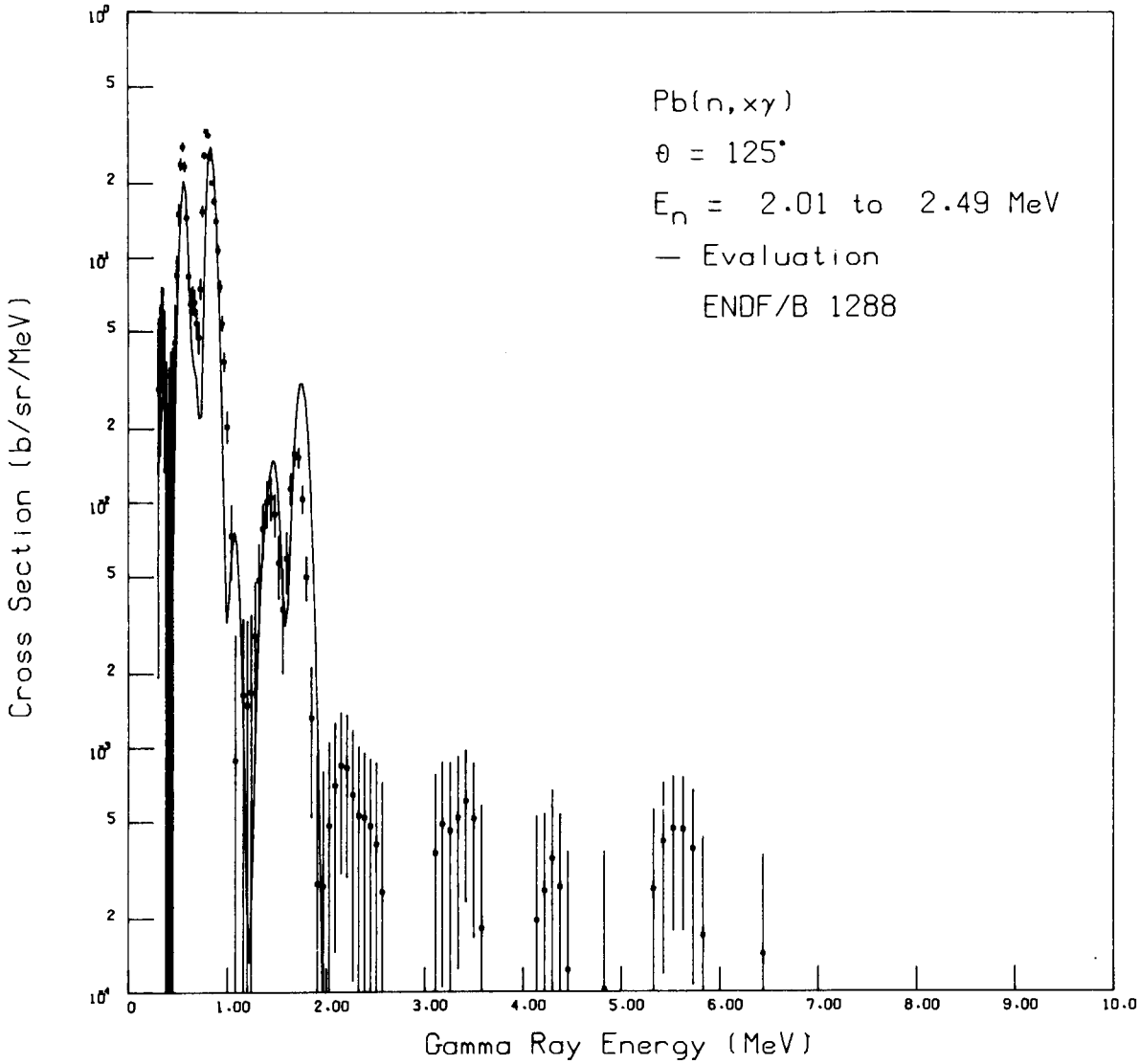

ORNL-DWG 74-13113
Pb(n,xγ)
θ = 125°
E_n = 0.60 to 1.00 MeV
— Evaluation
ENDF/B 1288
Cross Section (b/sr/MeV)
Gamma Ray Energy (MeV)
0
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.0

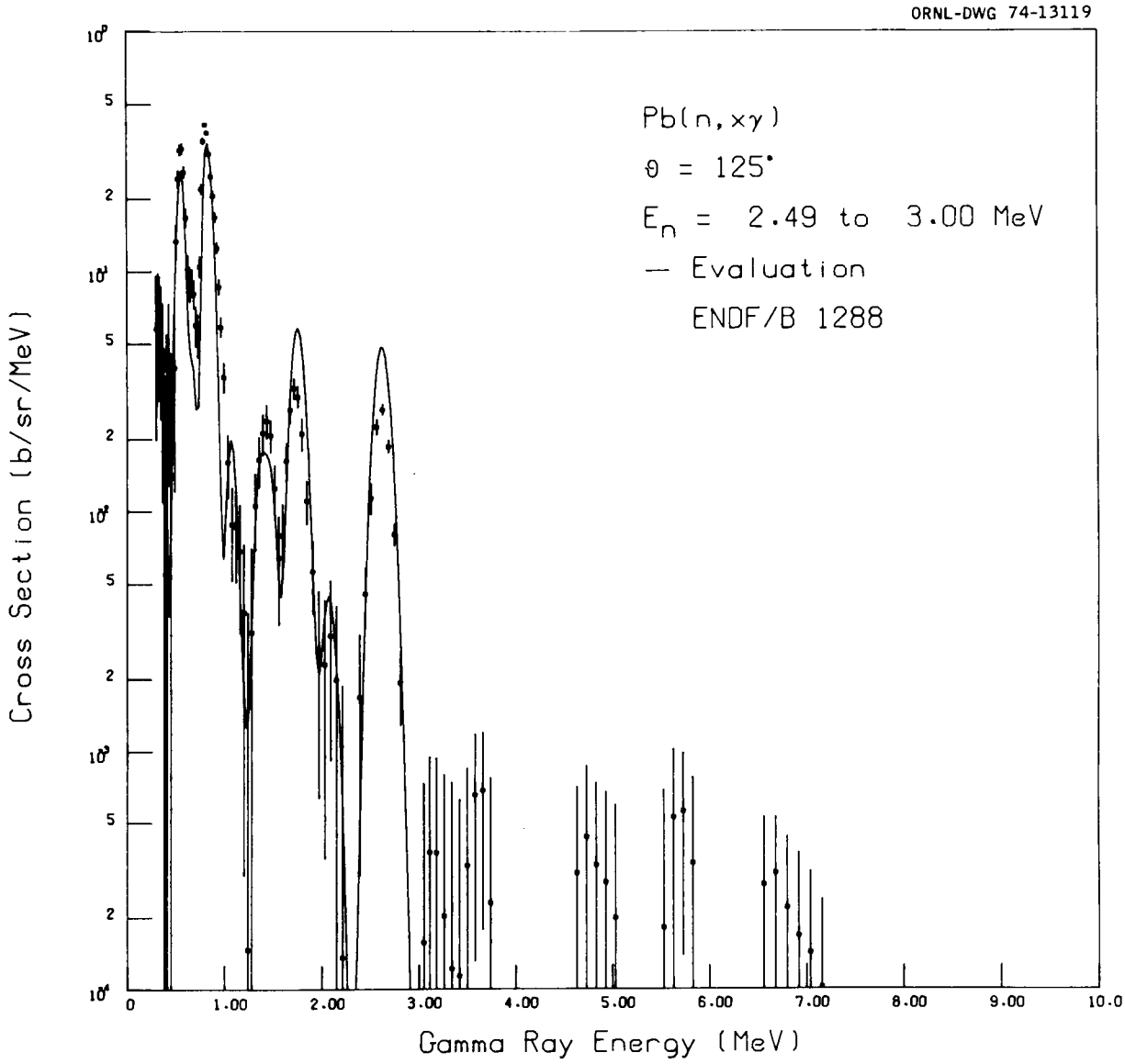
ORNL-DWG 74-13114

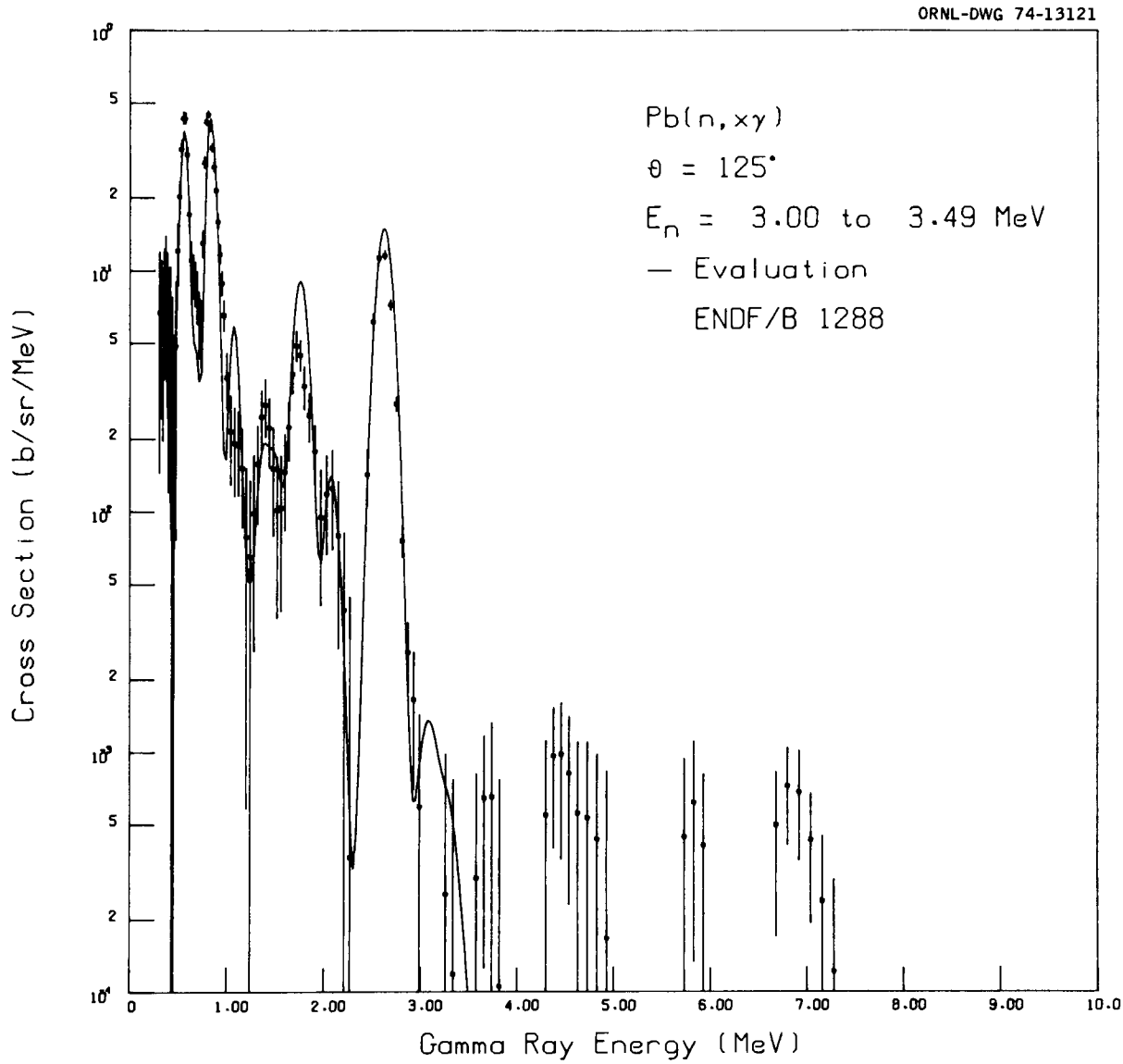


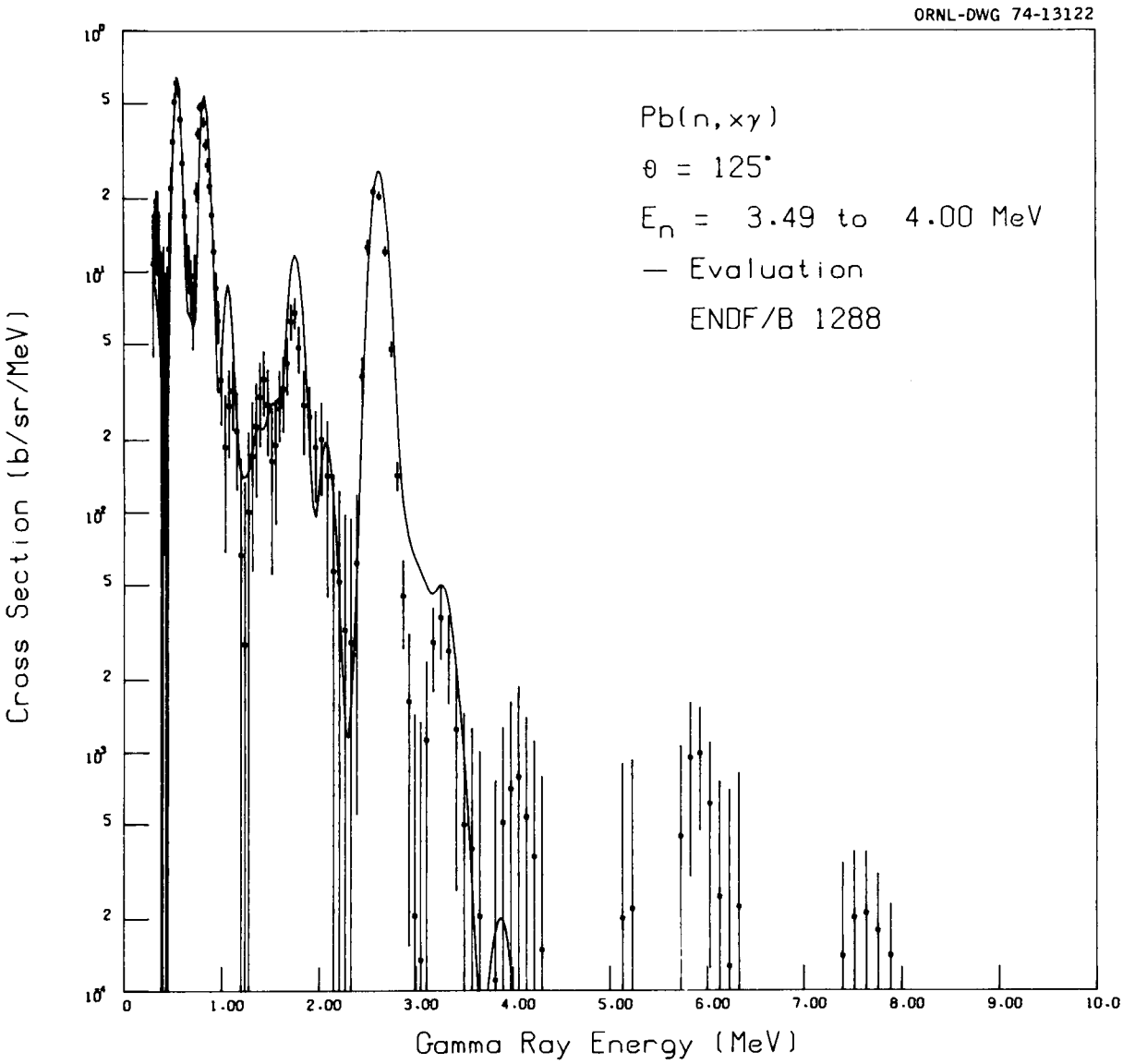

ORNL-DWG 74-13115
Pb(n,xγ)
θ = 125°
En = 1.50 to 2.01 MeV
— Evaluation
ENDF/B 1288
Cross Section (b/sr/MeV)
Gamma Ray Energy (MeV)
0
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.0

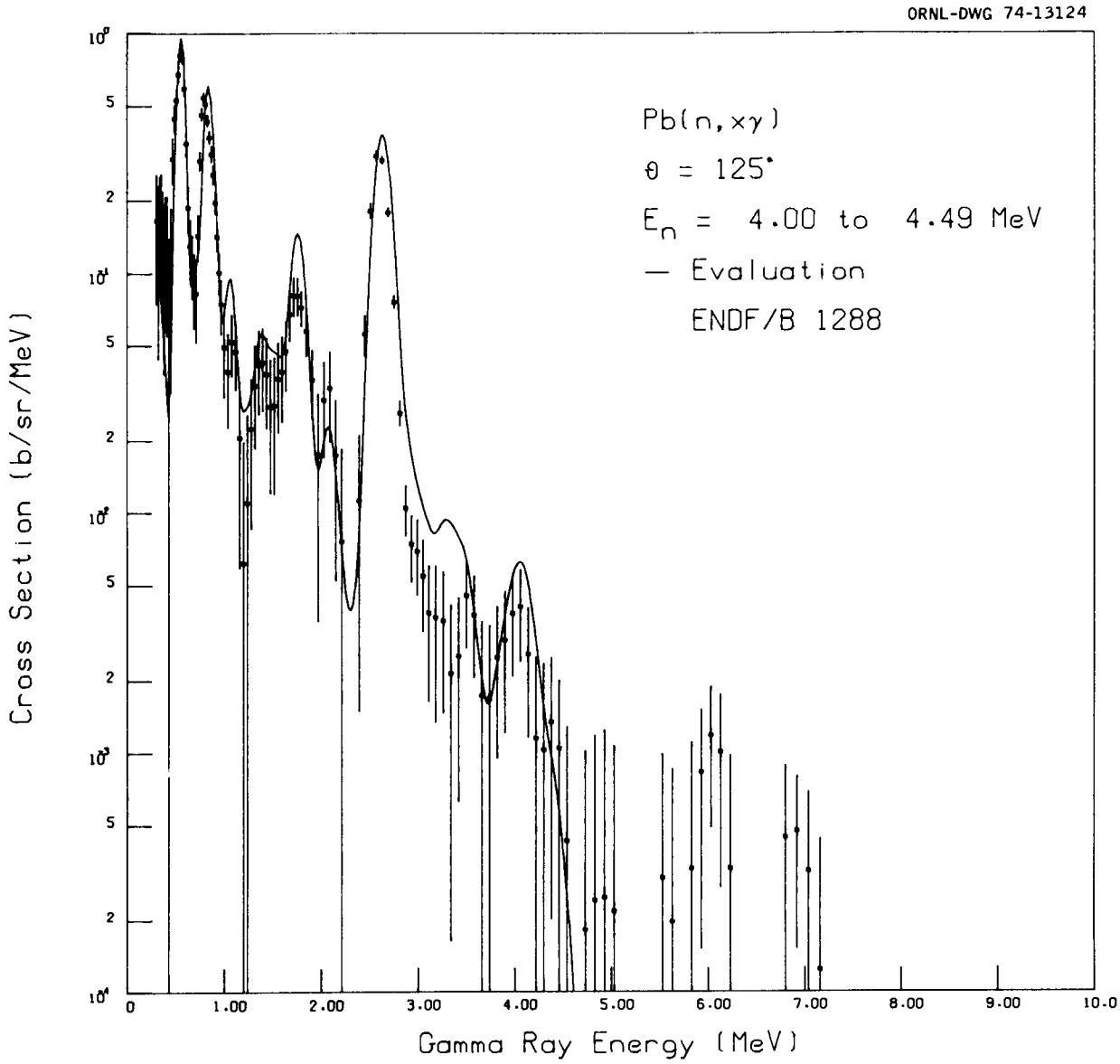
ORNL-DWG 74-13117



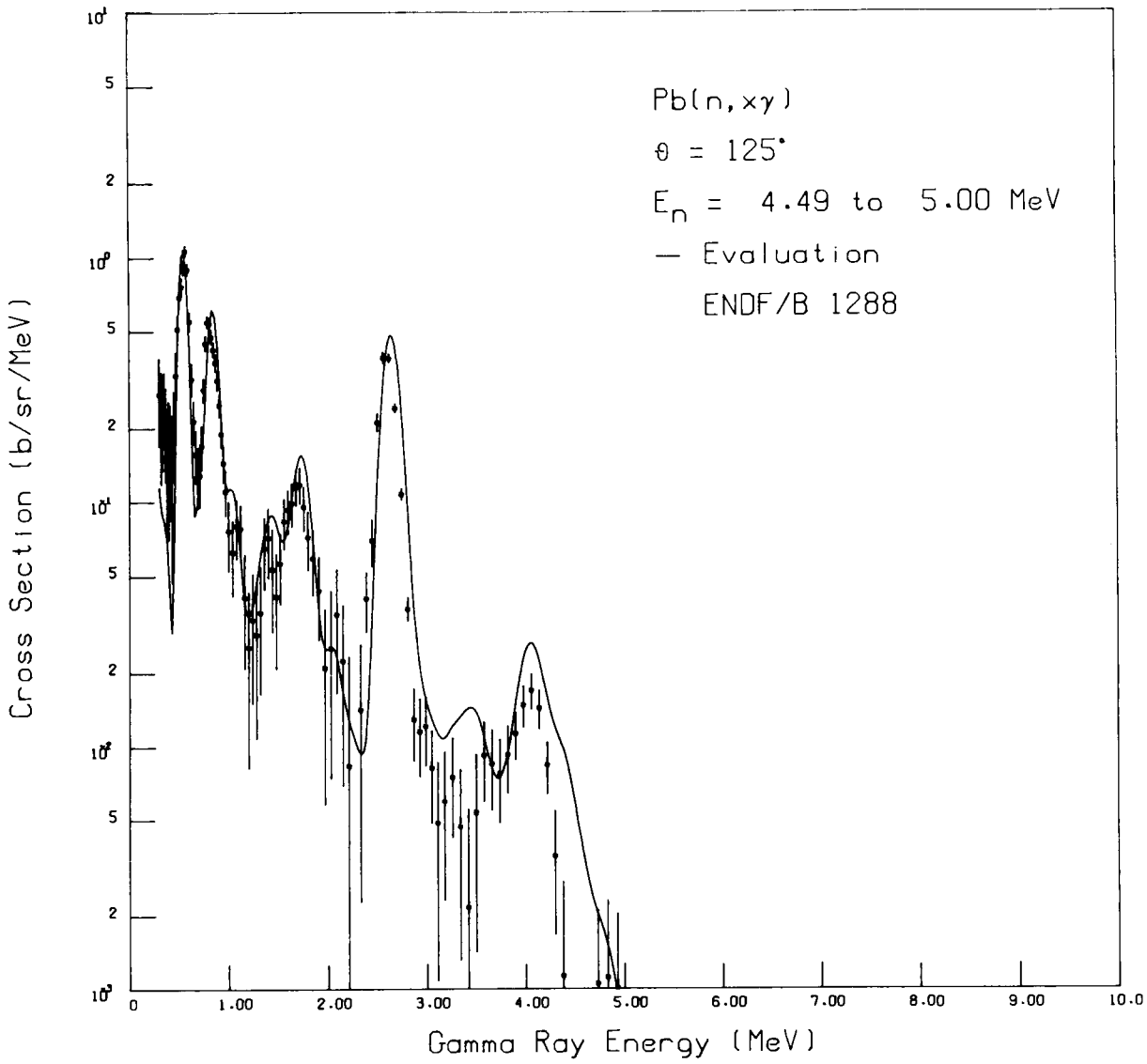

ORNL-DWG 74-13119
Pb(n,xγ)
θ = 125°
E_n = 2.49 to 3.00 MeV
— Evaluation
ENDF/B 1288
Cross Section (b/sr/MeV)
Gamma Ray Energy (MeV)
0
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.0


ORNL-DWG 74-13121
Pb(n,xγ)
θ = 125°
E_n = 3.00 to 3.49 MeV
— Evaluation
ENDF/B 1288
Cross Section (b/sr/MeV)
Gamma Ray Energy (MeV)
0
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.0

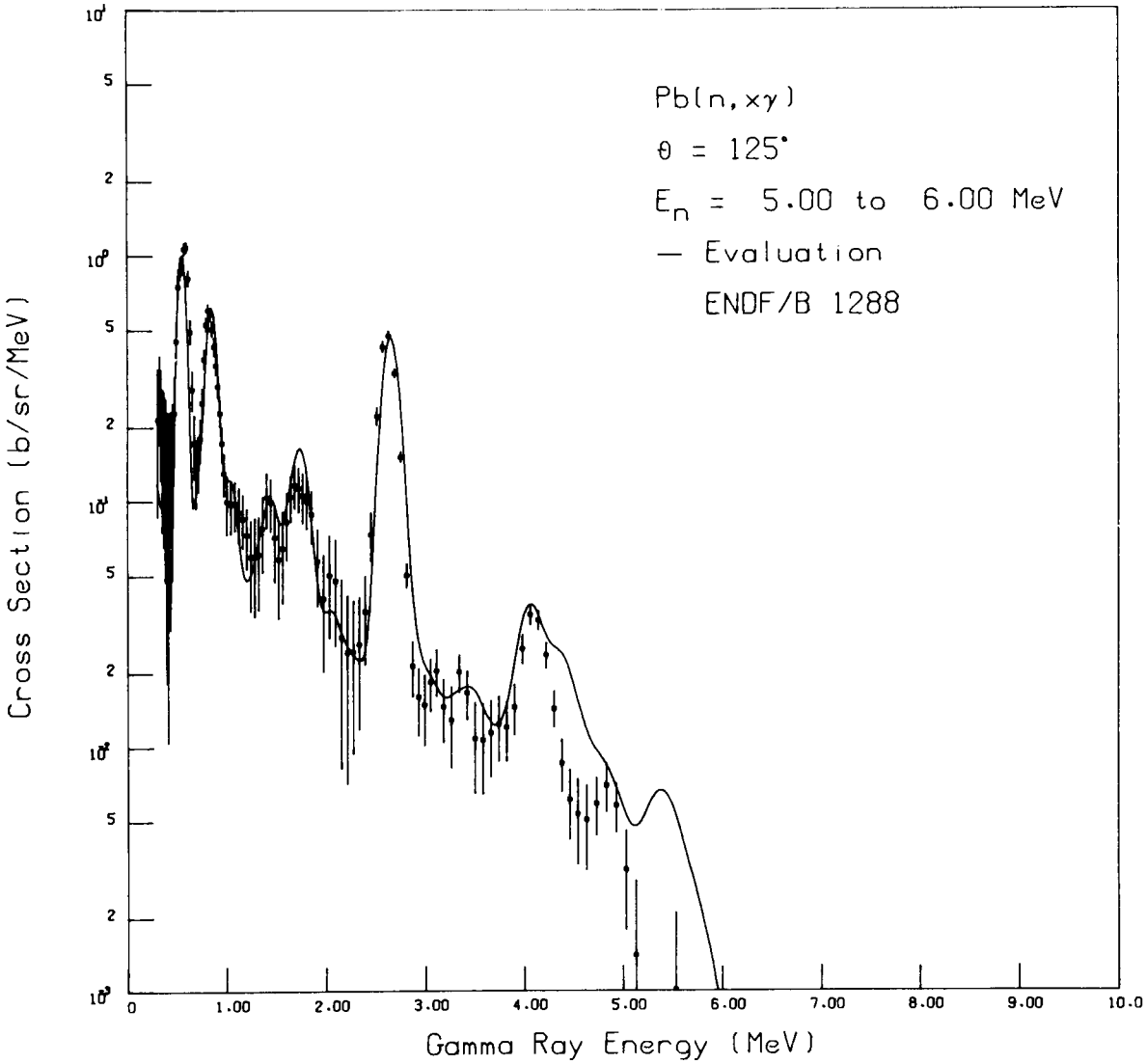

ORNL-DWG 74-13122
Pb(n,xγ)
θ = 125°
E_n = 3.49 to 4.00 MeV
— Evaluation
ENDF/B 1288
Cross Section (b/sr/MeV)
Gamma Ray Energy (MeV)
0
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.0

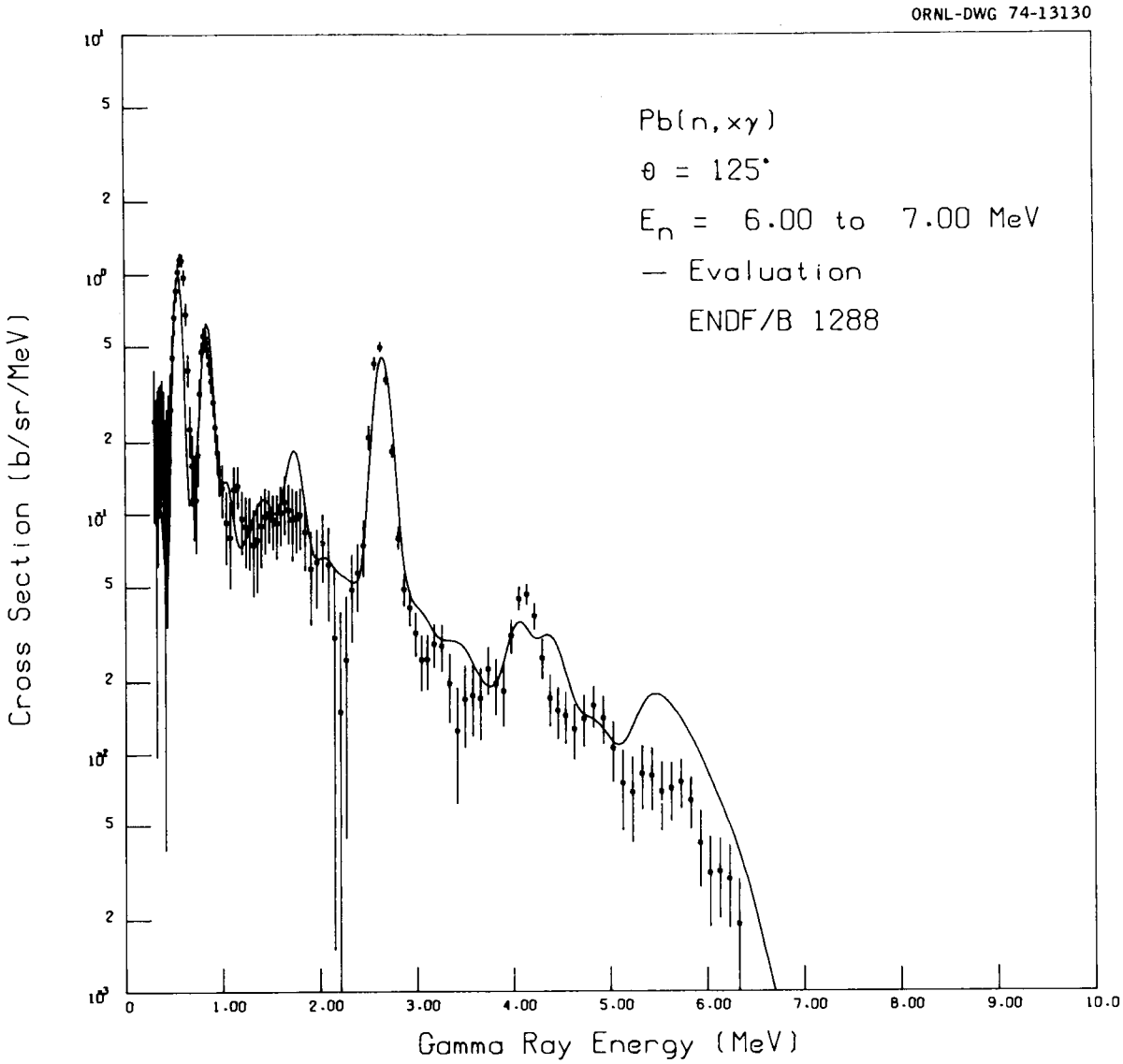

ORNL-DWG 74-13124
Pb(n,xγ)
θ = 125°
E_n = 4.00 to 4.49 MeV
— Evaluation
ENDF/B 1288
Cross Section (b/sr/MeV)
Gamma Ray Energy (MeV)
0
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.0

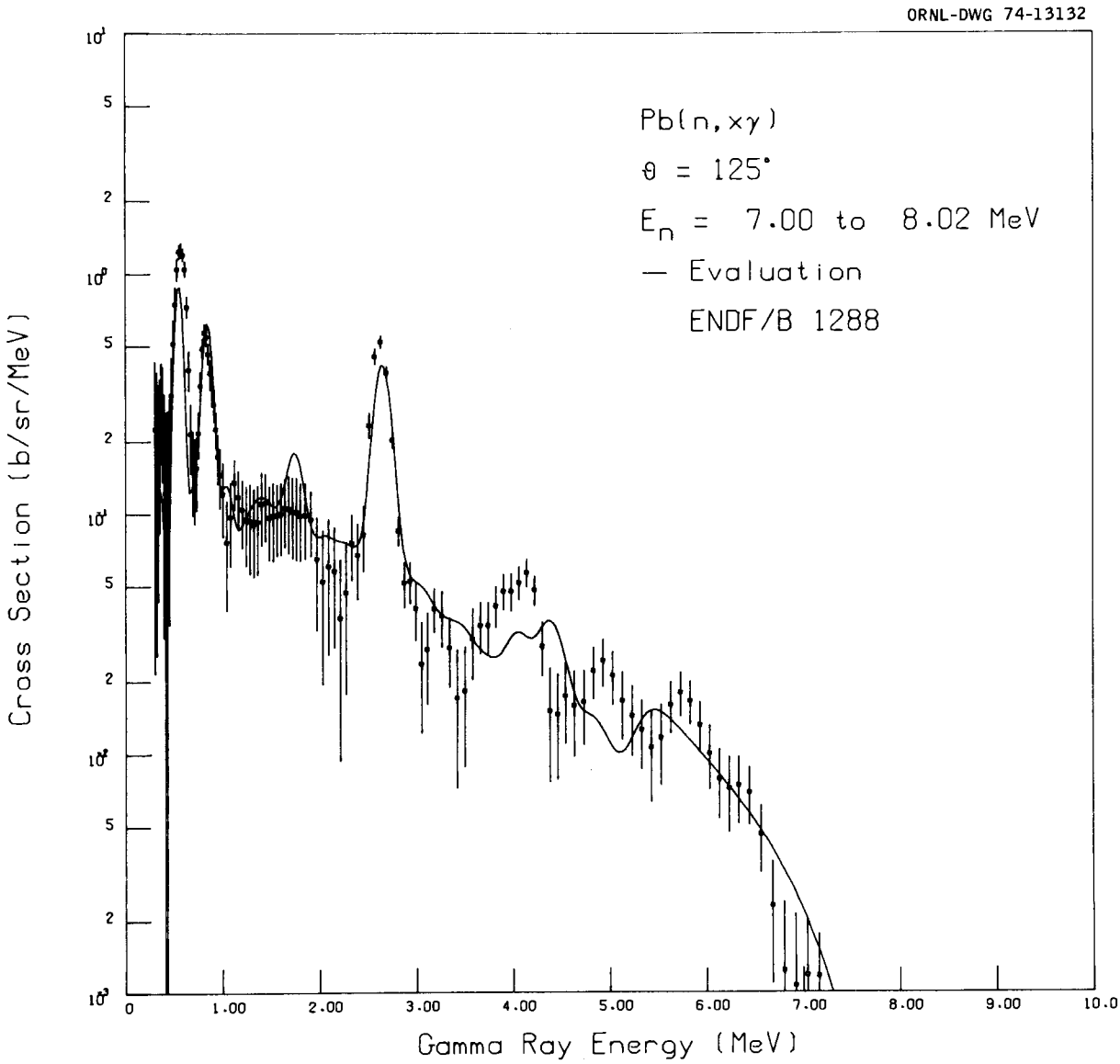
ORNL-DWG 74-13126

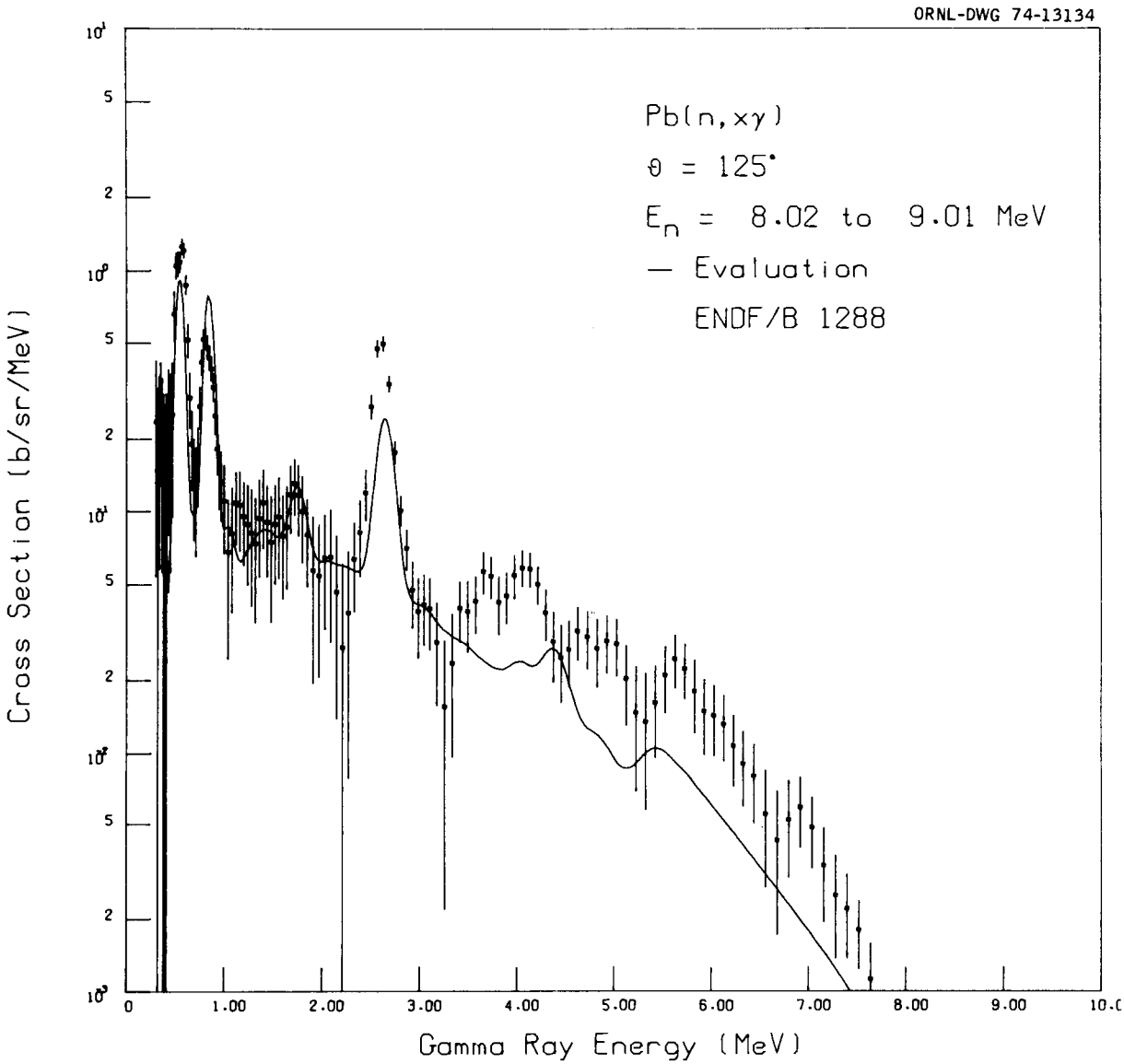


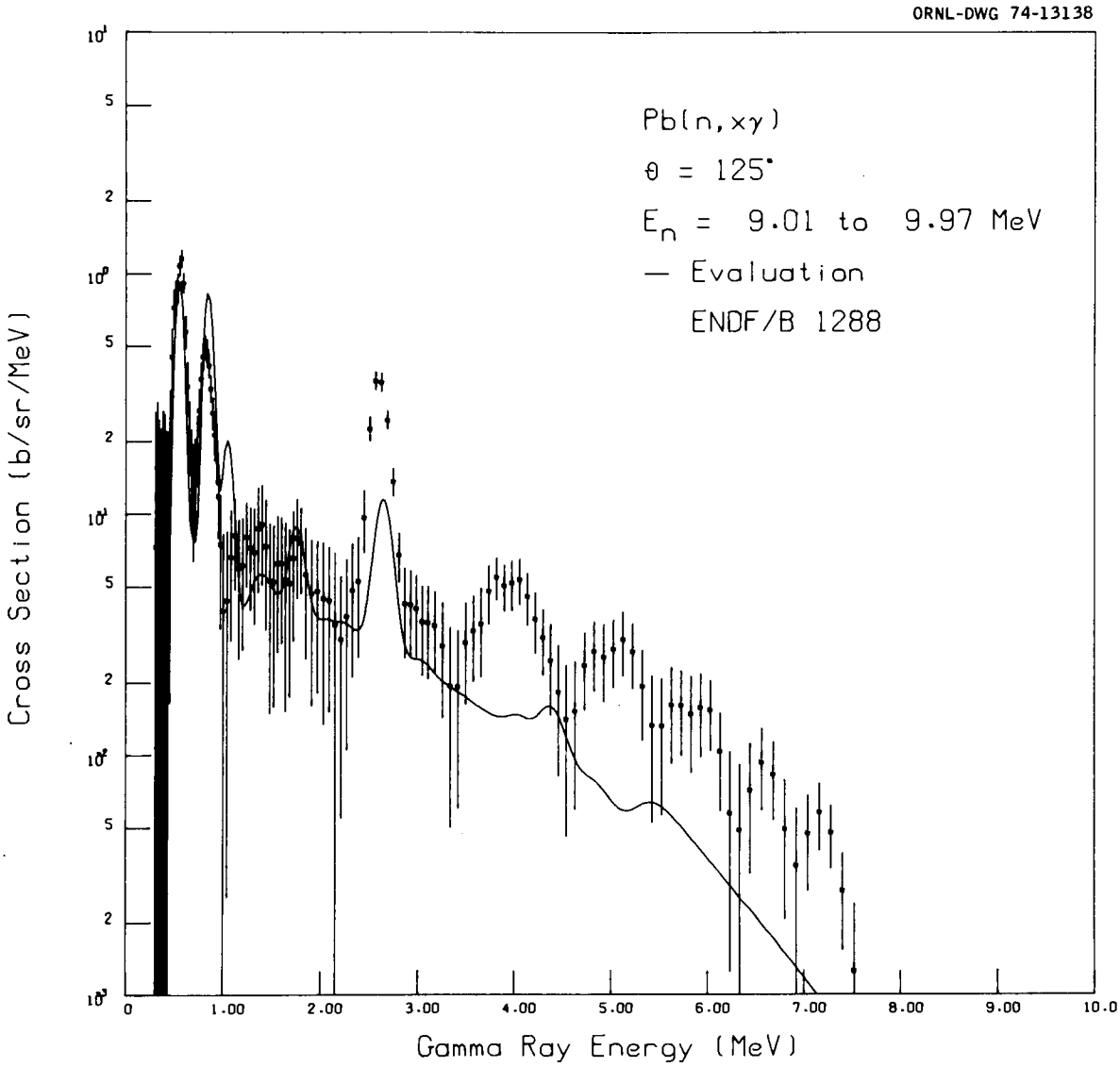
ORNL-DWG 74-13128

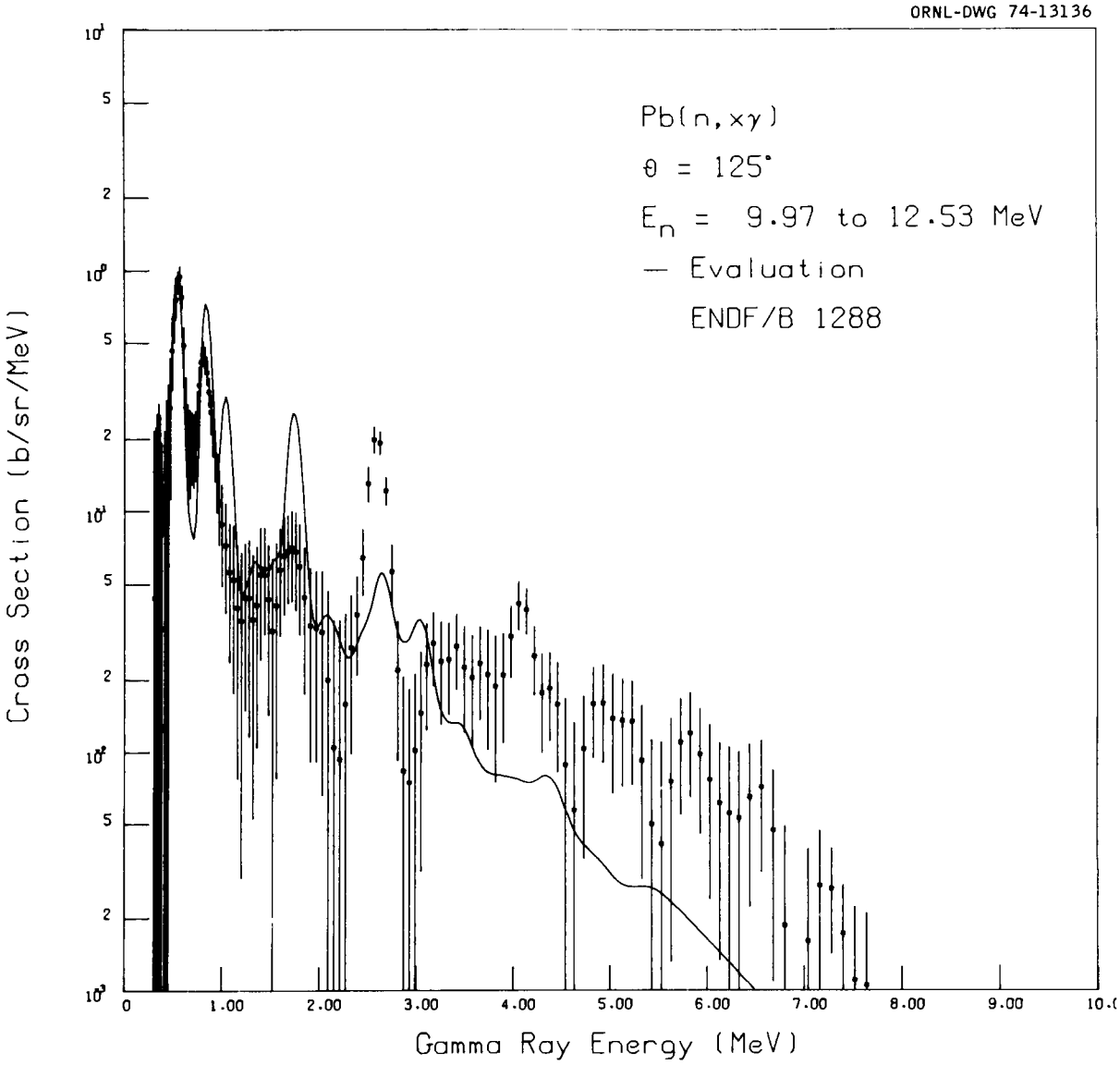


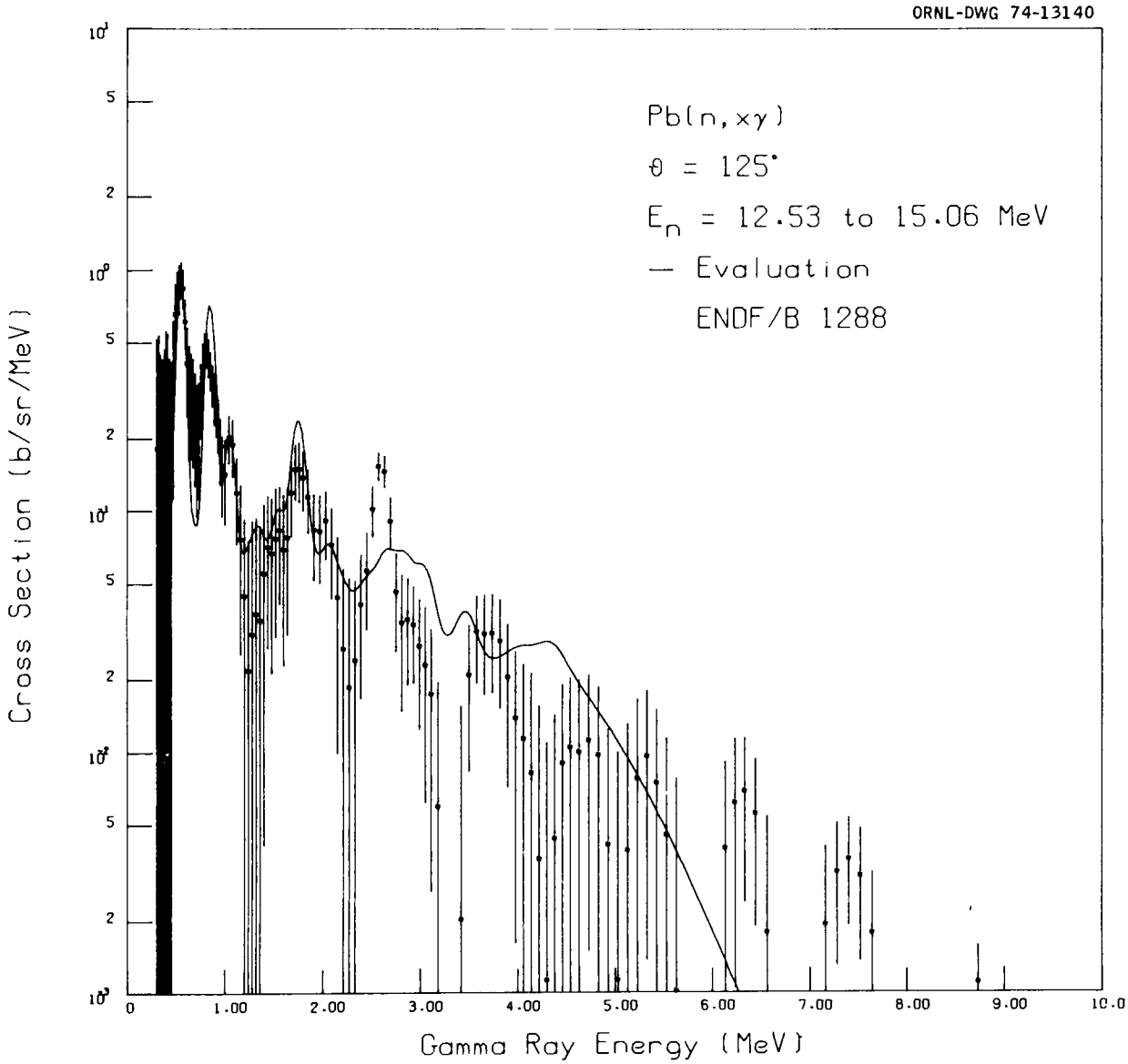

ORNL-DWG 74-13130
Pb(n,xγ)
θ = 125°
E_n = 6.00 to 7.00 MeV
— Evaluation
ENDF/B 1288
Cross Section (b/sr/MeV)
Gamma Ray Energy (MeV)
0
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.0

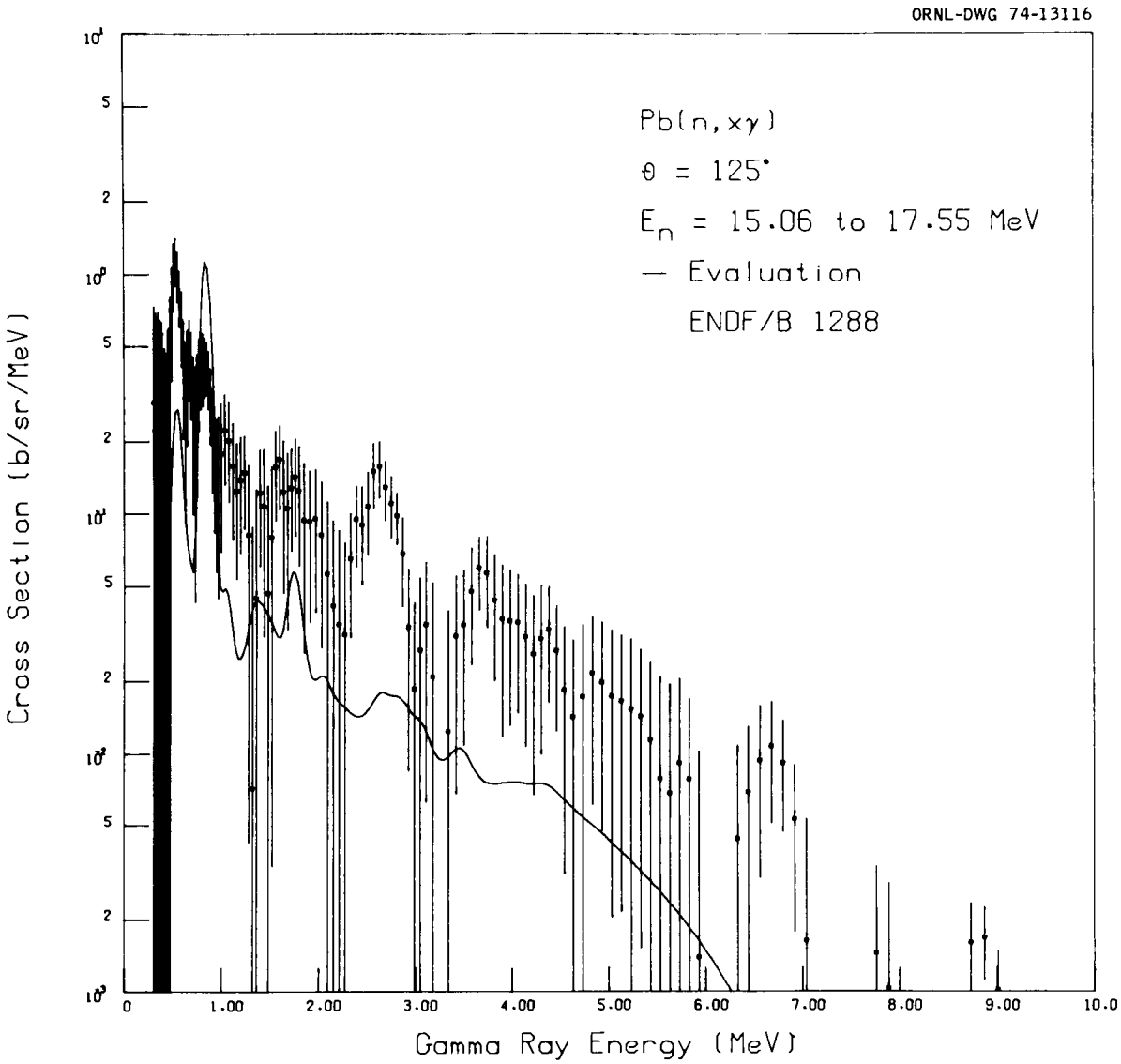

ORNL-DWG 74-13132
Pb(n,xγ)
θ = 125°
E_n = 7.00 to 8.02 MeV
— Evaluation
ENDF/B 1288
Cross Section (b/sr/MeV)
Gamma Ray Energy (MeV)
0
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.0

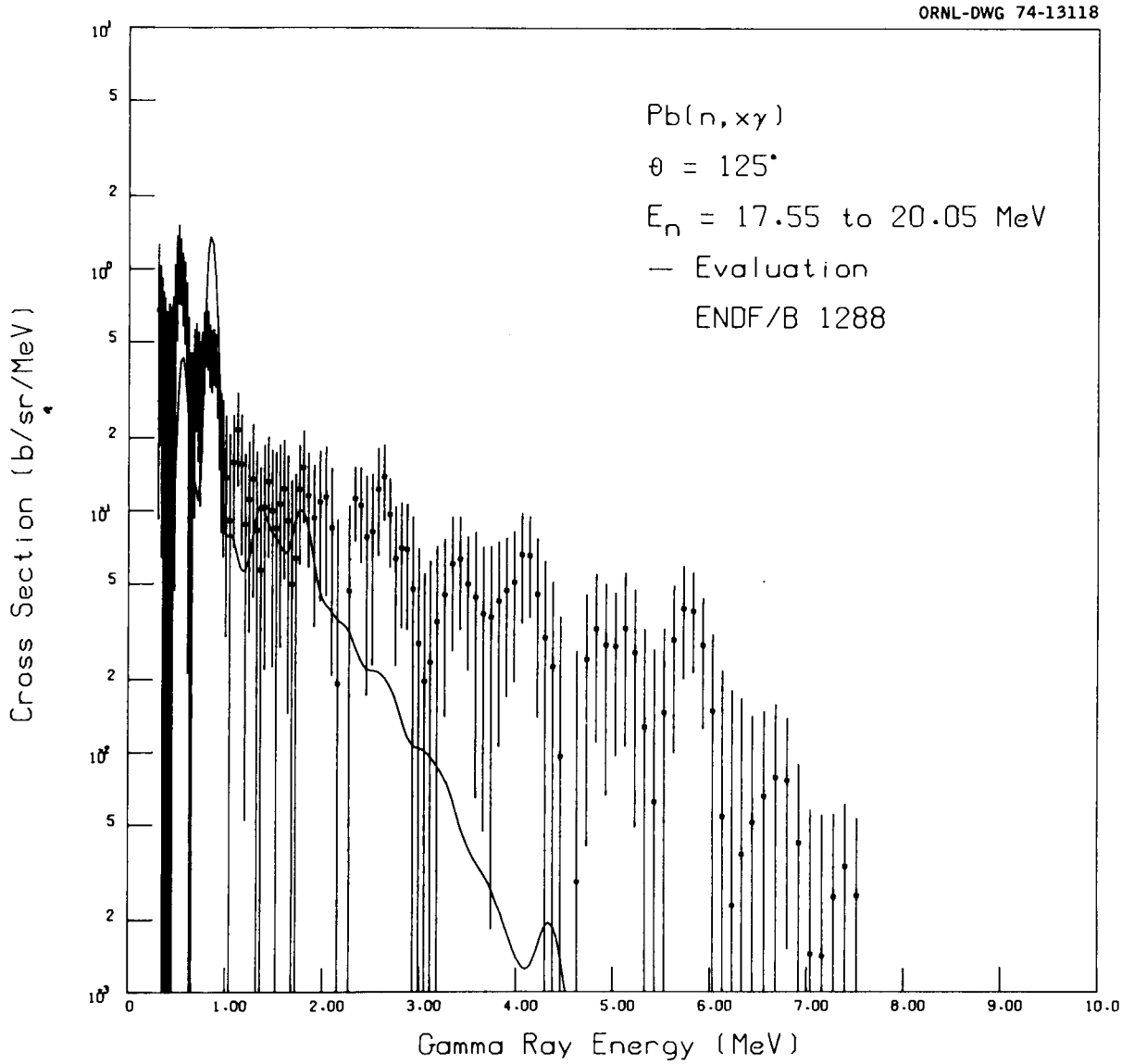

ORNL-DWG 74-13134
Pb(n,xγ)
θ = 125°
E_n = 8.02 to 9.01 MeV
— Evaluation
ENDF/B 1288
Cross Section (b/sr/MeV)
Gamma Ray Energy (MeV)
0
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00

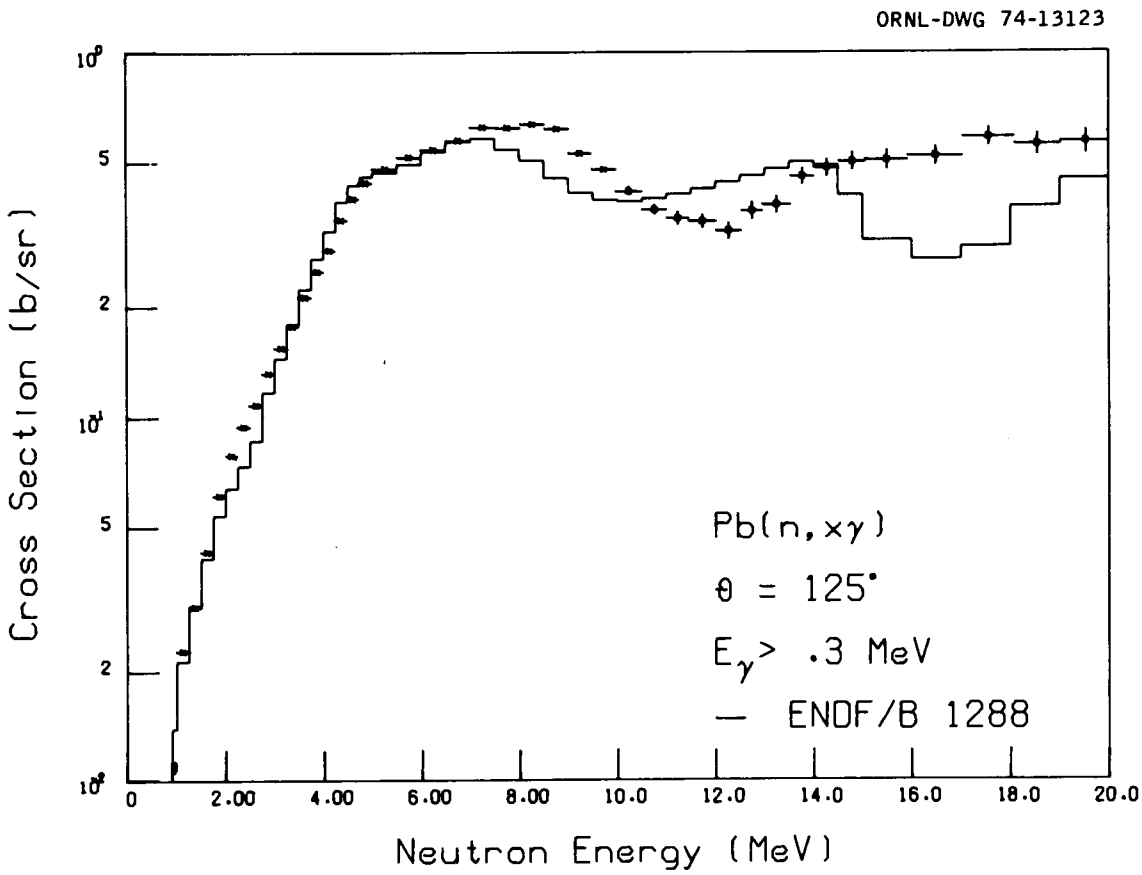

ORNL-DWG 74-13138
Pb(n,xγ)
θ = 125°
E_n = 9.01 to 9.97 MeV
— Evaluation
ENDF/B 1288
Cross Section (b/sr/MeV)
Gamma Ray Energy (MeV)
0
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.0

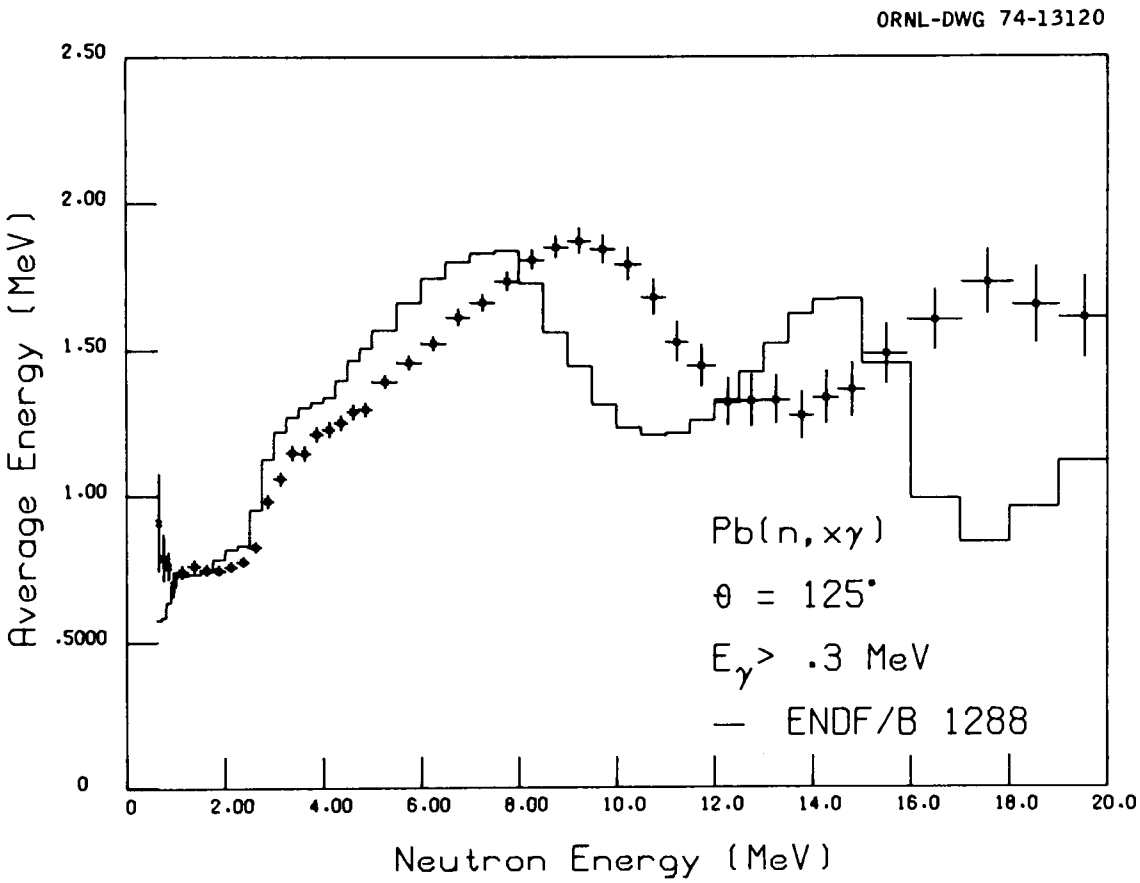

ORNL-DWG 74-13136
Pb(n,xγ)
θ = 125°
E_n = 9.97 to 12.53 MeV
— Evaluation
ENDF/B 1288
Cross Section (b/sr/MeV)
Gamma Ray Energy (MeV)
0
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00


ORNL-DWG 74-13140
Pb(n,xγ)
θ = 125°
E_n = 12.53 to 15.06 MeV
— Evaluation
ENDF/B 1288
Cross Section (b/sr/MeV)
Gamma Ray Energy (MeV)
0
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.0

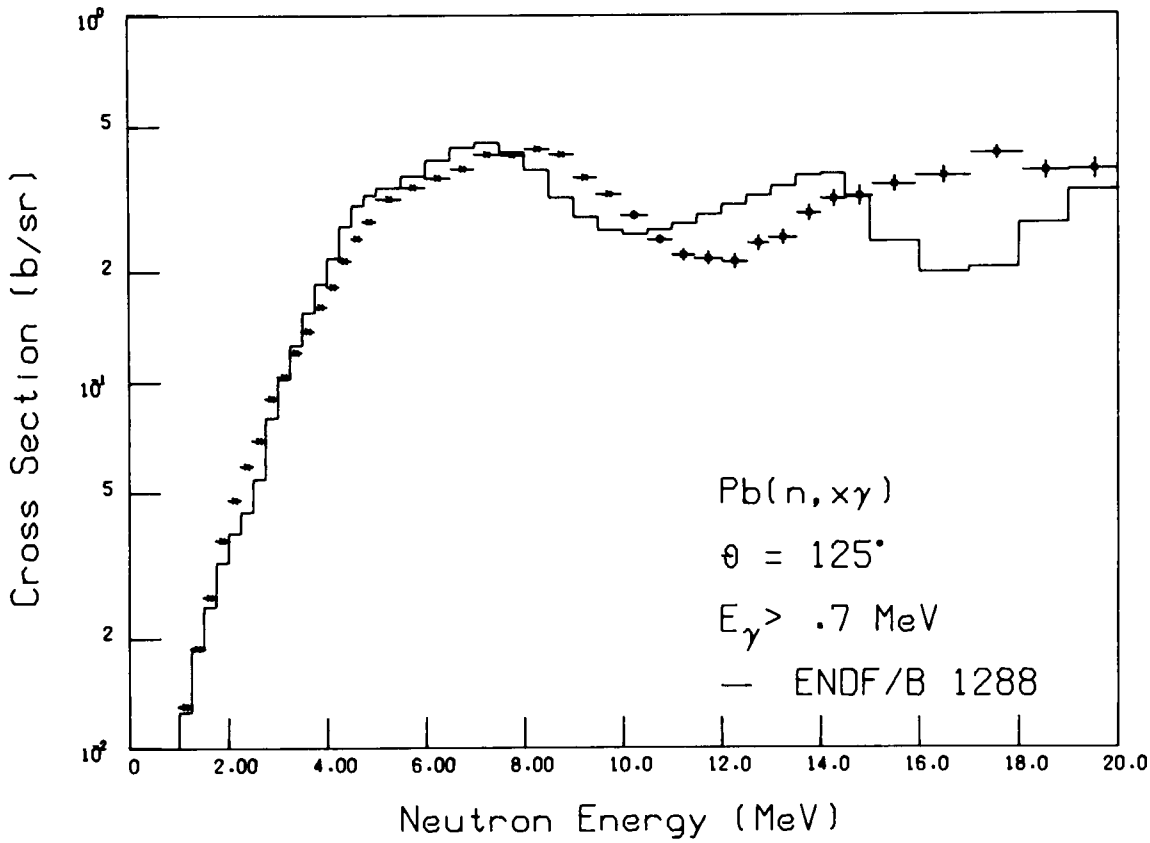

ORNL-DWG 74-13116
Pb(n,xγ)
θ = 125°
E_n = 15.06 to 17.55 MeV
— Evaluation
ENDF/B 1288
Cross Section (b/sr/MeV)
Gamma Ray Energy (MeV)
0
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.0

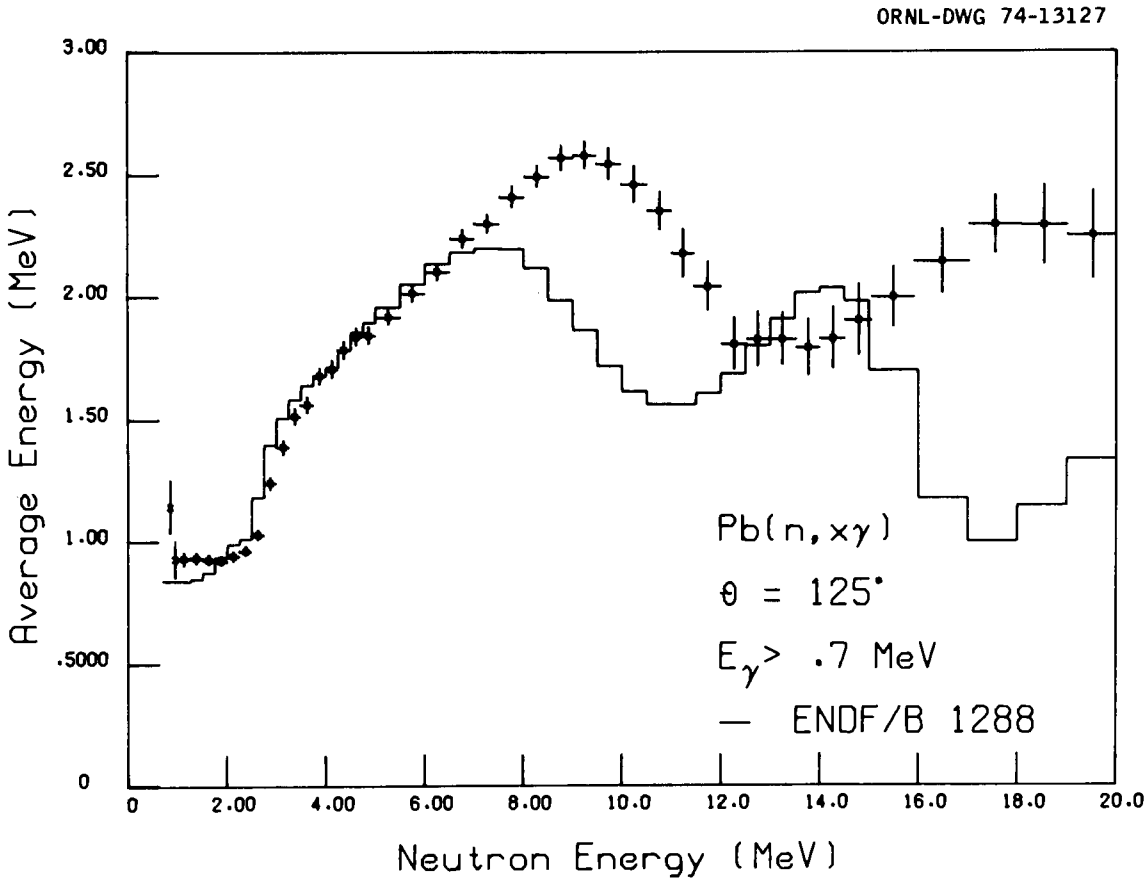

ORNL-DWG 74-13118
Pb(n,xγ)
θ = 125°
E_n = 17.55 to 20.05 MeV
— Evaluation
ENDF/B 1288
Cross Section (b/sr/MeV)
Gamma Ray Energy (MeV)
0
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.0


ORNL-DWG 74-13123
Cross Section (b/sr)
Neutron Energy (MeV)
Pb(n,xγ)
θ = 125°
Eγ> .3 MeV
— ENDF/B 1288
0
2.00
4.00
6.00
8.00
10.0
12.0
14.0
16.0
18.0
20.0


ORNL-DWG 74-13120
Average Energy (MeV)
2.50
2.00
1.50
1.00
.5000
0
0
2.00
4.00
6.00
8.00
10.0
12.0
14.0
16.0
18.0
20.0
Neutron Energy (MeV)
Pb(n,xγ)
θ = 125°
Eγ> .3 MeV
— ENDF/B 1288

ORNL-DWG 74-13125




ORNL-DWG 74-13127
3.00
2.50
2.00
1.50
1.00
.5000
0
Average Energy (MeV)
0
2.00
4.00
6.00
8.00
10.0
12.0
14.0
16.0
18.0
20.0
Neutron Energy (MeV)
Pb(n,xγ)
θ = 125°
Eγ> .7 MeV
— ENDF/B 1288

ORNL-DWG 74-13133

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 0.60 TO 1.00 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	6.317E-03	4.274E-03	2.810E 00	-2.978E-05	2.332E-04
3.175E-01	6.239E-03	3.964E-03	2.870E 00	-1.111E-04	2.168E-04
3.325E-01	4.787E-03	4.153E-03	2.930E 00	-9.694E-05	1.983E-04
3.475E-01	4.080E-03	3.722E-03	2.990E 00	2.332E-05	2.117E-04
3.625E-01	2.376E-03	3.636E-03	3.050E 00	9.740E-05	2.133E-04
3.775E-01	-6.182E-04	3.697E-03	3.110E 00	8.224E-05	2.109E-04
3.925E-01	-2.334E-03	3.787E-03	3.180E 00	1.386E-05	2.040E-04
4.100E-01	-1.610E-03	3.613E-03	3.260E 00	-5.527E-05	1.667E-04
4.300E-01	8.276E-04	3.469E-03	3.340E 00	-6.826E-05	1.897E-04
4.500E-01	3.373E-03	3.485E-03	3.420E 00	6.414E-06	1.922E-04
4.700E-01	5.035E-03	3.186E-03	3.500E 00	9.962E-05	2.226E-04
4.900E-01	6.233E-03	2.860E-03	3.580E 00	1.150E-04	2.175E-04
5.100E-01	1.053E-02	2.610E-03	3.660E 00	1.759E-05	2.101E-04
5.300E-01	2.347E-02	2.256E-03	3.740E 00	-5.453E-05	1.907E-04
5.500E-01	4.338E-02	2.115E-03	3.820E 00	-3.424E-05	1.886E-04
5.700E-01	5.308E-02	1.953E-03	3.900E 00	4.308E-05	1.937E-04
5.900E-01	4.084E-02	1.782E-03	3.980E 00	6.349E-05	2.208E-04
6.100E-01	2.023E-02	1.532E-03	4.060E 00	4.979E-05	2.241E-04
6.300E-01	7.692E-03	1.266E-03	4.140E 00	8.975E-05	2.015E-04
6.500E-01	3.462E-03	1.034E-03	4.220E 00	1.788E-04	1.848E-04
6.700E-01	1.691E-03	9.008E-04	4.300E 00	1.959E-04	1.738E-04
6.900E-01	5.154E-04	9.062E-04	4.380E 00	1.164E-04	1.857E-04
7.100E-01	5.790E-04	9.023E-04	4.460E 00	-1.295E-05	1.766E-04
7.300E-01	2.646E-03	8.728E-04	4.540E 00	-1.145E-04	1.639E-04
7.500E-01	7.124E-03	8.570E-04	4.630E 00	-1.373E-04	1.636E-04
7.700E-01	1.329E-02	9.124E-04	4.730E 00	-7.555E-05	1.643E-04
7.900E-01	1.852E-02	8.804E-04	4.830E 00	3.630E-05	1.730E-04
8.100E-01	1.964E-02	8.796E-04	4.930E 00	1.369E-04	1.639E-04
8.300E-01	1.617E-02	7.973E-04	5.030E 00	1.741E-04	1.556E-04
8.500E-01	1.072E-02	7.167E-04	5.130E 00	1.385E-04	1.587E-04
8.700E-01	6.248E-03	6.561E-04	5.230E 00	8.192E-05	1.609E-04
8.900E-01	3.821E-03	6.279E-04	5.330E 00	5.000E-05	1.571E-04
9.100E-01	2.793E-03	5.282E-04	5.430E 00	5.981E-05	1.434E-04
9.300E-01	2.121E-03	4.730E-04	5.530E 00	6.737E-05	1.548E-04
9.500E-01	1.397E-03	4.457E-04	5.630E 00	4.743E-05	1.525E-04
9.700E-01	6.579E-04	3.709E-04	5.730E 00	-8.283E-06	1.400E-04
1.000E 00	-2.812E-05	3.328E-04	5.830E 00	-5.103E-05	1.315E-04
1.040E 00	-3.085E-04	3.443E-04	5.930E 00	-7.760E-05	1.177E-04
1.080E 00	-2.691E-04	4.141E-04	6.030E 00	-6.969E-05	1.244E-04
1.120E 00	-9.606E-05	3.186E-04	6.130E 00	-3.605E-05	1.273E-04
1.160E 00	1.152E-04	2.898E-04	6.230E 00	2.204E-05	1.195E-04
1.200E 00	1.342E-04	2.695E-04	6.330E 00	7.726E-05	1.106E-04
1.240E 00	4.650E-06	2.700E-04	6.440E 00	8.213E-05	1.076E-04
1.280E 00	-1.796E-04	2.802E-04	6.560E 00	8.337E-05	1.082E-04
1.320E 00	-3.253E-04	2.874E-04	6.680E 00	2.726E-05	9.766E-05
1.360E 00	-2.985E-04	3.057E-04	6.800E 00	9.414E-05	8.815E-05
1.400E 00	-1.223E-04	2.919E-04	6.920E 00	1.726E-04	8.490E-05
1.440E 00	9.069E-05	2.885E-04	7.040E 00	1.644E-04	6.613E-05
1.480E 00	1.613E-04	2.714E-04	7.160E 00	8.862E-05	5.324E-05
1.520E 00	1.068E-04	2.675E-04	7.280E 00	2.753E-05	4.254E-05
1.560E 00	-1.200E-05	3.030E-04	7.400E 00	2.664E-05	3.582E-05
1.600E 00	-7.819E-05	2.764E-04	7.520E 00	5.485E-05	3.355E-05
1.640E 00	5.111E-05	3.189E-04	7.640E 00	7.212E-05	2.667E-05
1.680E 00	2.404E-04	2.894E-04	7.760E 00	6.420E-05	2.221E-05
1.720E 00	8.088E-04	3.131E-04	7.890E 00	4.424E-05	1.746E-05
1.760E 00	5.237E-04	3.014E-04	8.030E 00	2.522E-05	1.045E-05
1.800E 00	4.964E-04	3.009E-04	8.170E 00	1.159E-05	9.298E-06
1.850E 00	2.426E-04	2.564E-04	8.310E 00	2.956E-06	9.238E-06
1.910E 00	4.000E-05	2.418E-04	8.450E 00	-7.543E-07	6.550E-06
1.970E 00	3.496E-05	2.377E-04	8.590E 00	-1.291E-06	3.261E-06
2.030E 00	9.363E-06	2.399E-04	8.730E 00	4.450E-08	2.388E-06
2.090E 00	-4.637E-05	2.267E-04	8.870E 00	6.237E-07	2.548E-06
2.150E 00	-3.887E-05	2.441E-04	9.010E 00	1.278E-06	2.050E-06
2.210E 00	7.461E-08	2.438E-04	9.150E 00	1.383E-06	1.684E-06
2.270E 00	-1.053E-05	2.584E-04	9.300E 00	6.679E-07	1.275E-06
2.330E 00	-3.308E-05	2.561E-04	9.460E 00	3.080E-07	9.664E-07
2.390E 00	-8.575E-05	2.422E-04	9.620E 00	2.387E-07	6.938E-07
2.450E 00	-1.377E-04	2.283E-04	9.780E 00	1.283E-07	3.895E-07
2.510E 00	-4.703E-05	2.278E-04	9.940E 00	1.900E-07	2.787E-07
2.570E 00	1.306E-04	2.067E-04	1.010E 01	2.163E-07	2.554E-07
2.630E 00	2.751E-04	2.184E-04	1.026E 01	1.124E-07	3.834E-07
2.690E 00	2.553E-04	2.064E-04	1.042E 01	2.201E-07	2.626E-07
2.750E 00	1.312E-04	2.263E-04	1.058E 01	2.521E-07	2.859E-07

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	2.823E-04	3.864E-04
4.000E-01 - 5.000E-01	2.845E-04	3.307E-04
5.000E-01 - 6.000E-01	3.418E-03	2.140E-04
6.000E-01 - 7.000E-01	6.894E-04	1.128E-04
7.000E-01 - 8.000E-01	8.410E-04	8.857E-05
8.000E-01 - 1.000E 00	1.271E-03	1.166E-04
1.000E 00 - 1.200E 00	-2.112E-05	6.709E-05
1.200E 00 - 1.400E 00	-3.295E-05	5.707E-05
1.400E 00 - 1.600E 00	1.091E-05	5.674E-05
1.600E 00 - 1.800E 00	5.810E-05	6.050E-05
1.800E 00 - 2.000E 00	2.782E-05	5.017E-05
2.000E 00 - 2.500E 00	-2.202E-05	1.206E-04
2.500E 00 - 3.000E 00	3.237E-05	1.076E-04
3.000E 00 - 3.500E 00	6.830E-06	9.851E-05
3.500E 00 - 4.000E 00	1.482E-05	1.020E-04
4.000E 00 - 4.500E 00	5.044E-05	9.612E-05
4.500E 00 - 5.000E 00	-9.800E-06	8.290E-05
5.000E 00 - 6.000E 00	4.306E-05	1.467E-04
6.000E 00 - 7.000E 00	5.422E-05	1.058E-04
7.000E 00 - 8.000E 00	6.339E-05	3.515E-05
8.000E 00 - 9.000E 00	4.305E-06	5.822E-06
9.000E 00 - 1.000E 01	5.103E-07	9.637E-07

ORNL-DWG 74-13135

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 1.00 TO 1.50 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	9.322E-03	1.033E-02	2.810E 00	6.178E-05	2.109E-04
3.175E-01	1.181E-02	8.959E-03	2.870E 00	2.204E-04	2.076E-04
3.325E-01	7.409E-03	9.298E-03	2.930E 00	3.316E-04	2.045E-04
3.475E-01	8.060E-03	8.558E-03	2.990E 00	3.080E-04	2.095E-04
3.625E-01	1.201E-02	8.447E-03	3.050E 00	2.404E-04	2.177E-04
3.775E-01	1.138E-02	8.106E-03	3.110E 00	2.496E-04	2.244E-04
3.925E-01	6.760E-03	8.361E-03	3.180E 00	3.050E-04	2.321E-04
4.100E-01	2.249E-03	8.237E-03	3.260E 00	2.688E-04	2.231E-04
4.300E-01	2.801E-03	8.740E-03	3.340E 00	1.495E-04	2.132E-04
4.500E-01	9.039E-03	8.751E-03	3.420E 00	6.459E-05	2.052E-04
4.700E-01	1.350E-02	8.077E-03	3.500E 00	1.962E-05	1.838E-04
4.900E-01	1.518E-02	7.054E-03	3.580E 00	-5.224E-05	1.851E-04
5.100E-01	2.342E-02	5.729E-03	3.660E 00	-1.409E-04	1.878E-04
5.300E-01	5.049E-02	4.397E-03	3.740E 00	-1.842E-04	1.907E-04
5.500E-01	9.240E-02	3.698E-03	3.820E 00	-4.176E-05	2.092E-04
5.700E-01	1.106E-01	3.605E-03	3.900E 00	3.114E-05	1.990E-04
5.900E-01	8.290E-02	3.289E-03	3.980E 00	2.834E-05	1.844E-04
6.100E-01	4.117E-02	3.125E-03	4.060E 00	5.162E-05	1.840E-04
6.300E-01	1.614E-02	2.793E-03	4.140E 00	4.992E-05	1.623E-04
6.500E-01	5.963E-03	2.519E-03	4.220E 00	1.913E-05	1.593E-04
6.700E-01	1.863E-03	2.322E-03	4.300E 00	-3.797E-05	1.743E-04
6.900E-01	2.778E-03	2.094E-03	4.380E 00	-4.070E-05	1.652E-04
7.100E-01	7.902E-03	1.998E-03	4.460E 00	2.199E-05	1.854E-04
7.300E-01	1.790E-02	2.195E-03	4.540E 00	8.340E-05	1.502E-04
7.500E-01	4.104E-02	2.273E-03	4.630E 00	1.708E-04	1.377E-04
7.700E-01	7.975E-02	2.322E-03	4.730E 00	1.632E-04	1.473E-04
7.900E-01	1.146E-01	2.230E-03	4.830E 00	8.751E-05	1.789E-04
8.100E-01	1.216E-01	2.133E-03	4.930E 00	-2.145E-05	1.568E-04
8.300E-01	1.028E-01	1.996E-03	5.030E 00	-2.247E-05	1.310E-04
8.500E-01	7.885E-02	1.742E-03	5.130E 00	-1.481E-06	1.298E-04
8.700E-01	6.174E-02	1.742E-03	5.230E 00	4.241E-05	1.571E-04
8.900E-01	4.961E-02	1.531E-03	5.330E 00	1.357E-04	1.501E-04
9.100E-01	3.811E-02	1.279E-03	5.430E 00	1.934E-04	1.421E-04
9.300E-01	2.669E-02	1.043E-03	5.530E 00	1.612E-04	1.424E-04
9.500E-01	1.667E-02	9.450E-04	5.630E 00	7.956E-05	1.642E-04
9.700E-01	9.203E-03	7.930E-04	5.730E 00	-9.663E-06	1.540E-04
1.000E 00	2.984E-03	7.514E-04	5.830E 00	-4.333E-05	1.313E-04
1.040E 00	6.211E-04	5.357E-04	5.930E 00	3.228E-05	1.360E-04
1.080E 00	2.081E-04	4.062E-04	6.030E 00	7.207E-05	1.510E-04
1.120E 00	1.257E-05	3.568E-04	6.130E 00	8.698E-05	1.421E-04
1.160E 00	-2.718E-05	3.214E-04	6.230E 00	7.254E-05	1.295E-04
1.200E 00	4.331E-05	3.205E-04	6.330E 00	1.575E-08	1.123E-04
1.240E 00	2.014E-04	3.375E-04	6.440E 00	-4.105E-05	1.208E-04
1.280E 00	3.928E-04	3.649E-04	6.560E 00	-8.236E-05	1.059E-04
1.320E 00	5.176E-04	3.620E-04	6.680E 00	-7.868E-05	9.851E-05
1.360E 00	5.550E-04	3.577E-04	6.800E 00	-4.484E-05	9.210E-05
1.400E 00	5.130E-04	3.773E-04	6.920E 00	3.007E-05	7.605E-05
1.440E 00	2.997E-04	3.219E-04	7.040E 00	1.013E-04	6.322E-05
1.480E 00	-2.566E-06	3.344E-04	7.160E 00	1.258E-04	5.441E-05
1.520E 00	-1.887E-04	3.456E-04	7.280E 00	1.014E-04	4.885E-05
1.560E 00	-2.144E-04	3.216E-04	7.400E 00	7.065E-05	4.085E-05
1.600E 00	-9.949E-05	2.906E-04	7.520E 00	5.970E-05	3.846E-05
1.640E 00	2.651E-05	2.711E-04	7.640E 00	6.283E-05	3.195E-05
1.680E 00	1.345E-04	2.910E-04	7.760E 00	5.068E-05	2.400E-05
1.720E 00	2.283E-04	3.117E-04	7.890E 00	3.875E-05	2.119E-05
1.760E 00	2.951E-04	3.002E-04	8.030E 00	1.330E-05	1.826E-05
1.800E 00	2.658E-04	2.650E-04	8.170E 00	1.308E-07	1.396E-05
1.850E 00	7.383E-05	2.907E-04	8.310E 00	5.055E-07	1.066E-05
1.910E 00	-1.031E-04	2.789E-04	8.450E 00	5.511E-06	9.105E-06
1.970E 00	9.720E-05	2.825E-04	8.590E 00	7.729E-06	7.814E-06
2.030E 00	2.886E-04	2.642E-04	8.730E 00	7.753E-06	6.900E-06
2.090E 00	1.535E-04	2.434E-04	8.870E 00	6.528E-06	6.693E-06
2.150E 00	-9.601E-05	2.769E-04	9.010E 00	4.101E-06	7.102E-06
2.210E 00	-1.266E-04	2.893E-04	9.150E 00	2.343E-06	6.691E-06
2.270E 00	-4.534E-05	2.694E-04	9.300E 00	7.442E-07	6.361E-06
2.330E 00	7.865E-06	2.251E-04	9.460E 00	5.457E-07	6.292E-06
2.390E 00	-1.983E-05	2.216E-04	9.620E 00	1.029E-06	5.716E-06
2.450E 00	1.107E-05	2.114E-04	9.780E 00	2.120E-06	4.136E-06
2.510E 00	1.140E-04	2.185E-04	9.940E 00	2.817E-06	4.080E-06
2.570E 00	1.642E-04	2.322E-04	1.010E 01	3.545E-06	4.729E-06
2.630E 00	9.459E-05	2.255E-04	1.026E 01	4.696E-06	5.340E-06
2.690E 00	1.107E-05	2.262E-04	1.042E 01	5.375E-06	6.212E-06
2.750E 00	-2.210E-05	2.144E-04	1.058E 01	5.401E-06	6.883E-06

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	9.610E-04	8.761E-04
4.000E-01 - 5.000E-01	8.750E-04	8.173E-04
5.000E-01 - 6.000E-01	7.185E-03	4.151E-04
6.000E-01 - 7.000E-01	1.398E-03	2.571E-04
7.000E-01 - 8.000E-01	5.198E-03	2.208E-04
8.000E-01 - 1.000E 00	1.017E-02	2.791E-04
1.000E 00 - 1.200E 00	8.446E-05	8.545E-05
1.200E 00 - 1.400E 00	7.871E-05	7.098E-05
1.400E 00 - 1.600E 00	2.510E-06	6.623E-05
1.600E 00 - 1.800E 00	3.140E-05	5.817E-05
1.800E 00 - 2.000E 00	7.872E-06	5.620E-05
2.000E 00 - 2.500E 00	1.108E-05	1.243E-04
2.500E 00 - 3.000E 00	6.949E-05	1.083E-04
3.000E 00 - 3.500E 00	9.900E-05	1.082E-04
3.500E 00 - 4.000E 00	-2.582E-05	9.626E-05
4.000E 00 - 4.500E 00	5.838E-06	8.565E-05
4.500E 00 - 5.000E 00	4.653E-05	7.714E-05
5.000E 00 - 6.000E 00	5.812E-05	1.448E-04
6.000E 00 - 7.000E 00	-2.581E-06	1.104E-04
7.000E 00 - 8.000E 00	7.401E-05	3.860E-05
8.000E 00 - 9.000E 00	5.385E-06	9.917E-06
9.000E 00 - 1.000E 01	1.744E-06	5.667E-06

ORNL-DWG 74-13137

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 1.50 TO 2.01 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	9.090E-03	1.616E-02	2.810E 00	-5.613E-06	2.372E-04
3.175E-01	1.678E-02	1.476E-02	2.870E 00	-1.653E-04	2.497E-04
3.325E-01	2.240E-02	1.468E-02	2.930E 00	-1.896E-04	2.498E-04
3.475E-01	2.216E-02	1.452E-02	2.990E 00	-1.337E-04	2.663E-04
3.625E-01	1.884E-02	1.438E-02	3.050E 00	1.930E-05	3.271E-04
3.775E-01	1.884E-02	1.445E-02	3.110E 00	1.323E-04	2.773E-04
3.925E-01	1.098E-02	1.504E-02	3.180E 00	2.530E-04	3.008E-04
4.100E-01	9.035E-03	1.531E-02	3.260E 00	1.664E-04	2.701E-04
4.300E-01	1.298E-02	1.535E-02	3.340E 00	1.287E-04	2.527E-04
4.500E-01	1.953E-02	1.489E-02	3.420E 00	2.155E-04	2.575E-04
4.700E-01	2.485E-02	1.398E-02	3.500E 00	2.118E-04	2.807E-04
4.900E-01	4.741E-02	1.208E-02	3.580E 00	-1.932E-05	2.790E-04
5.100E-01	9.731E-02	9.330E-03	3.660E 00	-2.307E-04	2.525E-04
5.300E-01	1.487E-01	8.078E-03	3.740E 00	-1.586E-04	2.549E-04
5.500E-01	1.668E-01	7.084E-03	3.820E 00	2.581E-05	2.440E-04
5.700E-01	1.439E-01	6.595E-03	3.900E 00	1.617E-04	2.477E-04
5.900E-01	9.609E-02	5.998E-03	3.980E 00	1.502E-04	2.358E-04
6.100E-01	5.193E-02	5.959E-03	4.060E 00	1.943E-04	2.240E-04
6.300E-01	3.345E-02	5.665E-03	4.140E 00	2.721E-04	2.159E-04
6.500E-01	3.499E-02	4.974E-03	4.220E 00	2.226E-04	2.129E-04
6.700E-01	3.497E-02	4.245E-03	4.300E 00	1.954E-05	2.076E-04
6.900E-01	2.713E-02	4.204E-03	4.380E 00	-1.765E-04	1.976E-04
7.100E-01	2.444E-02	4.203E-03	4.460E 00	-2.081E-04	1.949E-04
7.300E-01	4.568E-02	4.397E-03	4.540E 00	-7.776E-05	1.971E-04
7.500E-01	9.957E-02	4.452E-03	4.630E 00	1.369E-04	2.364E-04
7.700E-01	1.683E-01	4.495E-03	4.730E 00	2.602E-04	2.173E-04
7.900E-01	2.121E-01	4.161E-03	4.830E 00	2.081E-04	1.981E-04
8.100E-01	2.057E-01	3.798E-03	4.930E 00	2.263E-04	1.842E-04
8.300E-01	1.653E-01	3.493E-03	5.030E 00	1.498E-04	1.896E-04
8.500E-01	1.258E-01	3.148E-03	5.130E 00	6.100E-05	2.358E-04
8.700E-01	1.019E-01	3.119E-03	5.230E 00	-3.973E-05	1.996E-04
8.900E-01	8.578E-02	2.823E-03	5.330E 00	-4.942E-05	1.750E-04
9.100E-01	6.799E-02	2.383E-03	5.430E 00	6.492E-05	1.703E-04
9.300E-01	4.769E-02	2.045E-03	5.530E 00	2.015E-04	2.022E-04
9.500E-01	2.895E-02	1.851E-03	5.630E 00	2.482E-04	2.032E-04
9.700E-01	1.502E-02	1.607E-03	5.730E 00	1.542E-04	2.013E-04
1.000E 00	3.930E-03	1.516E-03	5.830E 00	-3.904E-06	1.770E-04
1.040E 00	3.975E-04	1.165E-03	5.930E 00	-9.300E-05	1.375E-04
1.080E 00	4.677E-04	1.006E-03	6.030E 00	-1.197E-04	1.710E-04
1.120E 00	7.318E-04	9.111E-04	6.130E 00	-9.249E-05	1.820E-04
1.160E 00	7.629E-04	8.066E-04	6.230E 00	-7.420E-05	1.872E-04
1.200E 00	1.375E-04	8.508E-04	6.330E 00	-1.048E-05	1.364E-04
1.240E 00	-2.574E-04	8.425E-04	6.440E 00	3.259E-05	1.301E-04
1.280E 00	6.468E-04	8.210E-04	6.560E 00	2.568E-05	1.219E-04
1.320E 00	2.096E-03	7.628E-04	6.680E 00	5.985E-05	1.205E-04
1.360E 00	3.278E-03	8.732E-04	6.800E 00	1.436E-04	1.133E-04
1.400E 00	4.842E-03	9.076E-04	6.920E 00	1.729E-04	9.580E-05
1.440E 00	5.064E-03	9.017E-04	7.040E 00	1.123E-04	8.624E-05
1.480E 00	4.246E-03	7.962E-04	7.160E 00	3.455E-05	6.819E-05
1.520E 00	2.651E-03	7.688E-04	7.280E 00	-2.954E-06	6.197E-05
1.560E 00	1.698E-03	6.942E-04	7.400E 00	6.716E-06	5.303E-05
1.600E 00	1.851E-03	6.242E-04	7.520E 00	2.123E-05	4.390E-05
1.640E 00	2.486E-03	5.710E-04	7.640E 00	3.645E-05	4.225E-05
1.680E 00	2.931E-03	6.152E-04	7.760E 00	3.731E-05	3.976E-05
1.720E 00	2.646E-03	5.071E-04	7.890E 00	2.888E-05	3.579E-05
1.760E 00	1.787E-03	4.858E-04	8.030E 00	1.110E-05	2.429E-05
1.800E 00	8.665E-04	4.500E-04	8.170E 00	5.695E-06	1.928E-05
1.850E 00	2.620E-04	3.849E-04	8.310E 00	8.317E-06	1.923E-05
1.910E 00	2.025E-04	3.732E-04	8.450E 00	1.210E-05	1.595E-05
1.970E 00	2.221E-04	3.825E-04	8.590E 00	1.358E-05	1.348E-05
2.030E 00	1.165E-04	3.353E-04	8.730E 00	1.644E-05	1.191E-05
2.090E 00	4.661E-05	3.244E-04	8.870E 00	1.936E-05	1.001E-05
2.150E 00	6.084E-05	3.162E-04	9.010E 00	1.540E-05	7.914E-06
2.210E 00	1.182E-04	3.504E-04	9.150E 00	9.415E-06	7.472E-06
2.270E 00	1.508E-04	3.168E-04	9.300E 00	2.649E-06	5.412E-06
2.330E 00	1.558E-04	3.025E-04	9.460E 00	4.498E-08	3.819E-06
2.390E 00	1.634E-04	3.227E-04	9.620E 00	-2.041E-07	2.226E-06
2.450E 00	1.979E-04	2.958E-04	9.780E 00	-6.976E-08	1.078E-06
2.510E 00	2.208E-04	2.584E-04	9.940E 00	4.384E-07	6.888E-07
2.570E 00	1.592E-04	2.755E-04	1.010E 01	6.638E-07	6.822E-07
2.630E 00	1.138E-04	2.540E-04	1.026E 01	7.325E-07	6.048E-07
2.690E 00	1.452E-04	2.475E-04	1.042E 01	7.938E-07	6.212E-07
2.750E 00	1.194E-04	2.389E-04	1.058E 01	8.254E-07	6.650E-07

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	1.690E-03	1.477E-03
4.000E-01 - 5.000E-01	2.332E-03	1.430E-03
5.000E-01 - 6.000E-01	1.303E-02	7.856E-04
6.000E-01 - 7.000E-01	3.700E-03	5.006E-04
7.000E-01 - 8.000E-01	1.097E-02	4.344E-04
8.000E-01 - 1.000E 00	1.698E-02	5.160E-04
1.000E 00 - 1.200E 00	1.668E-04	2.012E-04
1.200E 00 - 1.400E 00	3.161E-04	1.672E-04
1.400E 00 - 1.600E 00	6.733E-04	1.571E-04
1.600E 00 - 1.800E 00	4.554E-04	1.089E-04
1.800E 00 - 2.000E 00	5.818E-05	7.713E-05
2.000E 00 - 2.500E 00	6.462E-05	1.595E-04
2.500E 00 - 3.000E 00	1.335E-05	1.263E-04
3.000E 00 - 3.500E 00	7.659E-05	1.390E-04
3.500E 00 - 4.000E 00	-2.071E-06	1.276E-04
4.000E 00 - 4.500E 00	2.998E-05	1.049E-04
4.500E 00 - 5.000E 00	8.827E-05	1.034E-04
5.000E 00 - 6.000E 00	6.389E-05	1.895E-04
6.000E 00 - 7.000E 00	2.755E-05	1.320E-04
7.000E 00 - 8.000E 00	3.140E-05	5.165E-05
8.000E 00 - 9.000E 00	1.258E-05	1.545E-05
9.000E 00 - 1.000E 01	2.947E-06	3.788E-06

ORNL-DWG 74-13139

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 2.01 TO 2.49 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	2.908E-02	2.716E-02	2.890E 00	-5.609E-04	4.025E-04
3.175E-01	3.968E-02	2.427E-02	2.870E 00	-4.785E-04	4.438E-04
3.325E-01	5.208E-02	2.340E-02	2.930E 00	-3.385E-04	3.950E-04
3.475E-01	5.164E-02	2.387E-02	2.990E 00	-1.359E-04	3.999E-04
3.625E-01	3.716E-02	2.343E-02	3.050E 00	9.722E-05	4.042E-04
3.775E-01	1.354E-02	2.233E-02	3.110E 00	3.713E-04	4.016E-04
3.925E-01	1.662E-03	2.359E-02	3.180E 00	4.069E-04	3.833E-04
4.100E-01	1.191E-02	2.361E-02	3.260E 00	4.591E-04	4.032E-04
4.300E-01	1.931E-02	2.200E-02	3.340E 00	5.180E-04	3.987E-04
4.500E-01	2.002E-02	2.258E-02	3.420E 00	6.038E-04	3.709E-04
4.700E-01	4.478E-02	1.926E-02	3.500E 00	5.119E-04	3.470E-04
4.900E-01	8.530E-02	1.628E-02	3.580E 00	1.812E-04	3.975E-04
5.100E-01	1.504E-01	1.486E-02	3.660E 00	-1.282E-04	3.813E-04
5.300E-01	2.401E-01	1.298E-02	3.740E 00	-2.810E-04	3.436E-04
5.500E-01	2.831E-01	1.185E-02	3.820E 00	-3.701E-04	3.257E-04
5.700E-01	2.350E-01	1.087E-02	3.900E 00	-3.701E-04	3.084E-04
5.900E-01	1.459E-01	9.850E-03	3.980E 00	-2.650E-04	3.176E-04
6.100E-01	8.376E-02	9.693E-03	4.060E 00	5.886E-06	3.405E-04
6.300E-01	6.482E-02	9.534E-03	4.140E 00	1.962E-04	3.254E-04
6.500E-01	6.740E-02	8.840E-03	4.220E 00	2.604E-04	2.730E-04
6.700E-01	6.583E-02	8.032E-03	4.300E 00	3.539E-04	3.089E-04
6.900E-01	5.391E-02	7.460E-03	4.380E 00	2.706E-04	2.603E-04
7.100E-01	4.784E-02	7.109E-03	4.460E 00	1.226E-04	2.535E-04
7.300E-01	7.495E-02	7.285E-03	4.540E 00	-1.408E-05	2.741E-04
7.500E-01	1.545E-01	7.468E-03	4.630E 00	-3.368E-05	2.973E-04
7.700E-01	2.613E-01	7.600E-03	4.730E 00	7.762E-05	2.810E-04
7.900E-01	3.292E-01	6.964E-03	4.830E 00	1.016E-04	2.750E-04
8.100E-01	3.168E-01	6.436E-03	4.930E 00	-1.996E-06	2.562E-04
8.300E-01	2.559E-01	5.965E-03	5.030E 00	-1.887E-04	2.629E-04
8.500E-01	2.025E-01	5.475E-03	5.130E 00	-1.805E-04	3.013E-04
8.700E-01	1.702E-01	5.583E-03	5.230E 00	-2.255E-06	2.842E-04
8.900E-01	1.413E-01	5.113E-03	5.330E 00	2.659E-04	2.922E-04
9.100E-01	1.076E-01	4.414E-03	5.430E 00	4.153E-04	2.979E-04
9.300E-01	7.666E-02	3.983E-03	5.530E 00	4.673E-04	2.914E-04
9.500E-01	5.391E-02	3.725E-03	5.630E 00	4.635E-04	2.869E-04
9.700E-01	3.761E-02	3.260E-03	5.730E 00	3.066E-04	2.816E-04
1.000E 00	2.044E-02	2.948E-03	5.830E 00	1.699E-04	2.607E-04
1.040E 00	7.324E-03	2.465E-03	5.930E 00	-9.682E-06	2.347E-04
1.080E 00	8.867E-04	1.968E-03	6.030E 00	-1.251E-04	2.445E-04
1.120E 00	8.946E-05	1.882E-03	6.130E 00	-1.193E-04	2.397E-04
1.160E 00	1.643E-03	1.701E-03	6.230E 00	-2.830E-05	2.271E-04
1.200E 00	1.490E-03	1.788E-03	6.330E 00	4.464E-05	1.865E-04
1.240E 00	1.686E-03	1.801E-03	6.440E 00	1.417E-04	2.224E-04
1.280E 00	2.854E-03	1.872E-03	6.560E 00	8.199E-05	1.806E-04
1.320E 00	4.831E-03	1.984E-03	6.680E 00	4.048E-06	1.573E-04
1.360E 00	7.851E-03	2.005E-03	6.800E 00	-8.733E-05	1.597E-04
1.400E 00	1.002E-02	2.155E-03	6.920E 00	-9.717E-05	1.471E-04
1.440E 00	1.053E-02	2.090E-03	7.040E 00	-6.817E-05	1.141E-04
1.480E 00	9.008E-03	1.761E-03	7.160E 00	-8.712E-06	8.737E-05
1.520E 00	5.675E-03	1.635E-03	7.280E 00	3.653E-05	7.400E-05
1.560E 00	3.660E-03	1.657E-03	7.400E 00	4.786E-05	7.488E-05
1.600E 00	5.920E-03	1.662E-03	7.520E 00	4.094E-05	7.525E-05
1.640E 00	1.143E-02	1.671E-03	7.640E 00	3.740E-05	6.159E-05
1.680E 00	1.586E-02	1.692E-03	7.760E 00	2.979E-05	4.437E-05
1.720E 00	1.532E-02	1.440E-03	7.890E 00	2.405E-05	3.955E-05
1.760E 00	1.036E-02	1.340E-03	8.030E 00	1.358E-05	3.740E-05
1.800E 00	5.000E-03	1.037E-03	8.170E 00	5.534E-06	3.338E-05
1.850E 00	1.323E-03	8.066E-04	8.310E 00	4.729E-06	3.086E-05
1.910E 00	2.787E-04	6.470E-04	8.450E 00	5.661E-06	3.090E-05
1.970E 00	2.748E-04	5.248E-04	8.590E 00	2.481E-06	2.774E-05
2.030E 00	4.823E-04	5.664E-04	8.730E 00	-2.454E-06	2.512E-05
2.090E 00	7.027E-04	5.582E-04	8.870E 00	-3.333E-06	2.017E-05
2.150E 00	8.464E-04	5.403E-04	9.010E 00	4.075E-06	1.315E-05
2.210E 00	8.284E-04	5.339E-04	9.150E 00	1.372E-05	1.142E-05
2.270E 00	6.436E-04	5.335E-04	9.300E 00	2.009E-05	1.018E-05
2.330E 00	5.305E-04	4.751E-04	9.460E 00	1.632E-05	8.572E-06
2.390E 00	5.209E-04	4.283E-04	9.620E 00	8.806E-06	5.373E-06
2.450E 00	4.817E-04	4.153E-04	9.780E 00	3.314E-06	2.458E-06
2.510E 00	4.057E-04	4.553E-04	9.940E 00	1.583E-06	1.427E-06
2.570E 00	2.586E-04	4.621E-04	1.010E 01	9.684E-07	1.275E-06
2.630E 00	3.289E-06	4.962E-04	1.026E 01	6.877E-07	1.239E-06
2.690E 00	-3.129E-04	4.185E-04	1.042E 01	6.888E-07	1.283E-06
2.750E 00	-4.865E-04	4.149E-04	1.058E 01	8.631E-07	1.347E-06

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	3.246E-03	2.378E-03
4.000E-01 - 5.000E-01	3.680E-03	2.071E-03
5.000E-01 - 6.000E-01	2.110E-02	1.209E-03
6.000E-01 - 7.000E-01	6.792E-03	8.714E-04
7.000E-01 - 8.000E-01	1.730E-02	7.287E-04
8.000E-01 - 1.000E 00	2.771E-02	9.396E-04
1.000E 00 - 1.200E 00	7.866E-04	4.123E-04
1.200E 00 - 1.400E 00	9.126E-04	3.832E-04
1.400E 00 - 1.600E 00	1.464E-03	3.615E-04
1.600E 00 - 1.800E 00	2.383E-03	3.016E-04
1.800E 00 - 2.000E 00	2.109E-04	1.398E-04
2.000E 00 - 2.500E 00	3.104E-04	2.517E-04
2.500E 00 - 3.000E 00	-1.053E-04	2.160E-04
3.000E 00 - 3.500E 00	2.138E-04	1.947E-04
3.500E 00 - 4.000E 00	-7.617E-05	1.738E-04
4.000E 00 - 4.500E 00	9.273E-05	1.475E-04
4.500E 00 - 5.000E 00	1.114E-05	1.382E-04
5.000E 00 - 6.000E 00	1.803E-04	2.795E-04
6.000E 00 - 7.000E 00	-1.719E-05	1.912E-04
7.000E 00 - 8.000E 00	1.963E-05	6.835E-05
8.000E 00 - 9.000E 00	3.157E-06	2.812E-05
9.000E 00 - 1.000E 01	1.034E-05	7.080E-06

ORNL-DWG 74-13098

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN FE. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 2.49 TO 3.00 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	5.781E-02	3.804E-02	2.810E 00	1.928E-03	6.526E-04
3.175E-01	6.391E-02	3.427E-02	2.870E 00	-4.573E-05	5.409E-04
3.325E-01	6.192E-02	3.308E-02	2.930E 00	-3.659E-04	5.021E-04
3.475E-01	5.511E-02	3.104E-02	2.990E 00	-1.687E-04	5.307E-04
3.625E-01	4.220E-02	3.136E-02	3.050E 00	1.560E-04	5.713E-04
3.775E-01	1.804E-02	2.986E-02	3.110E 00	3.745E-04	5.672E-04
3.925E-01	5.458E-03	3.067E-02	3.180E 00	3.736E-04	5.601E-04
4.100E-01	2.552E-02	2.904E-02	3.260E 00	2.020E-04	5.840E-04
4.300E-01	4.290E-02	3.013E-02	3.340E 00	1.215E-04	6.099E-04
4.500E-01	1.427E-02	3.123E-02	3.420E 00	1.131E-04	5.059E-04
4.700E-01	-3.409E-03	3.122E-02	3.500E 00	3.300E-04	5.138E-04
4.900E-01	3.972E-02	2.764E-02	3.580E 00	6.526E-04	5.228E-04
5.100E-01	1.336E-01	2.240E-02	3.660E 00	6.831E-04	5.068E-04
5.300E-01	2.429E-01	2.084E-02	3.740E 00	2.295E-04	5.384E-04
5.500E-01	3.202E-01	1.700E-02	3.820E 00	-2.031E-04	6.113E-04
5.700E-01	3.249E-01	1.693E-02	3.900E 00	-3.375E-04	5.693E-04
5.900E-01	2.592E-01	1.509E-02	3.980E 00	-2.427E-04	4.669E-04
6.100E-01	1.672E-01	1.444E-02	4.060E 00	-6.505E-05	4.442E-04
6.300E-01	1.029E-01	1.365E-02	4.140E 00	-3.572E-05	4.749E-04
6.500E-01	8.703E-02	1.268E-02	4.220E 00	-1.313E-04	5.092E-04
6.700E-01	9.013E-02	1.187E-02	4.300E 00	-3.250E-04	4.697E-04
6.900E-01	8.073E-02	1.085E-02	4.380E 00	-4.452E-04	3.784E-04
7.100E-01	5.979E-02	1.127E-02	4.460E 00	-2.957E-04	3.391E-04
7.300E-01	5.479E-02	1.120E-02	4.540E 00	-3.252E-05	3.903E-04
7.500E-01	1.048E-01	1.065E-02	4.630E 00	3.060E-04	3.982E-04
7.700E-01	2.210E-01	1.042E-02	4.730E 00	4.339E-04	4.301E-04
7.900E-01	3.507E-01	9.933E-03	4.830E 00	3.309E-04	4.009E-04
8.100E-01	4.110E-01	1.019E-02	4.930E 00	2.799E-04	3.891E-04
8.300E-01	3.809E-01	1.029E-02	5.030E 00	1.988E-04	3.902E-04
8.500E-01	3.100E-01	9.291E-03	5.130E 00	8.966E-05	4.957E-04
8.700E-01	2.488E-01	9.686E-03	5.230E 00	-1.261E-04	4.343E-04
8.900E-01	2.066E-01	8.831E-03	5.330E 00	-2.569E-04	4.573E-04
9.100E-01	1.681E-01	7.590E-03	5.430E 00	-1.911E-04	5.013E-04
9.300E-01	1.255E-01	6.502E-03	5.530E 00	1.806E-04	5.035E-04
9.500E-01	8.622E-02	6.531E-03	5.630E 00	5.237E-04	4.916E-04
9.700E-01	5.877E-02	5.526E-03	5.730E 00	5.575E-04	4.200E-04
1.000E 00	3.632E-02	5.197E-03	5.830E 00	3.366E-04	4.204E-04
1.040E 00	1.606E-02	4.720E-03	5.930E 00	9.077E-05	4.169E-04
1.080E 00	8.824E-03	3.722E-03	6.030E 00	-1.585E-04	4.012E-04
1.120E 00	8.669E-03	3.643E-03	6.130E 00	-3.088E-04	3.223E-04
1.160E 00	6.846E-03	3.758E-03	6.230E 00	-3.367E-04	3.089E-04
1.200E 00	3.805E-03	3.506E-03	6.330E 00	-2.253E-04	3.070E-04
1.240E 00	1.463E-04	3.616E-03	6.440E 00	4.788E-05	2.899E-04
1.280E 00	3.127E-03	3.871E-03	6.560E 00	2.735E-04	2.512E-04
1.320E 00	1.056E-02	3.735E-03	6.660E 00	3.062E-04	2.215E-04
1.360E 00	1.645E-02	3.941E-03	6.800E 00	2.192E-04	2.158E-04
1.400E 00	2.123E-02	4.115E-03	6.920E 00	1.668E-04	2.069E-04
1.440E 00	2.393E-02	3.886E-03	7.040E 00	1.418E-04	1.691E-04
1.480E 00	2.080E-02	3.193E-03	7.160E 00	1.017E-04	1.351E-04
1.520E 00	1.253E-02	3.048E-03	7.280E 00	1.064E-05	1.161E-04
1.560E 00	6.429E-03	3.087E-03	7.400E 00	-3.535E-05	1.021E-04
1.600E 00	7.958E-03	2.780E-03	7.520E 00	-4.373E-05	7.561E-05
1.640E 00	1.626E-02	3.003E-03	7.640E 00	-1.143E-05	5.572E-05
1.680E 00	2.652E-02	3.137E-03	7.760E 00	2.724E-05	4.929E-05
1.720E 00	3.265E-02	3.206E-03	7.890E 00	4.677E-05	4.810E-05
1.760E 00	3.011E-02	3.114E-03	8.030E 00	4.820E-05	4.632E-05
1.800E 00	2.104E-02	3.288E-03	8.170E 00	3.928E-05	4.076E-05
1.850E 00	1.109E-02	2.299E-03	8.310E 00	2.732E-05	3.708E-05
1.910E 00	5.625E-03	1.897E-03	8.450E 00	2.007E-05	3.486E-05
1.970E 00	2.633E-03	2.005E-03	8.590E 00	8.609E-06	3.337E-05
2.030E 00	2.301E-03	1.949E-03	8.730E 00	5.101E-06	2.851E-05
2.090E 00	3.035E-03	2.123E-03	8.870E 00	2.205E-06	2.670E-05
2.150E 00	1.985E-03	2.046E-03	9.010E 00	5.154E-06	2.687E-05
2.210E 00	1.353E-04	1.732E-03	9.150E 00	1.024E-05	2.588E-05
2.270E 00	-1.428E-03	1.562E-03	9.300E 00	1.468E-05	2.464E-05
2.330E 00	-8.871E-04	1.381E-03	9.460E 00	1.614E-05	2.332E-05
2.390E 00	1.681E-03	1.382E-03	9.620E 00	1.706E-05	2.316E-05
2.450E 00	4.526E-03	1.294E-03	9.780E 00	1.340E-05	2.493E-05
2.510E 00	1.136E-02	1.670E-03	9.940E 00	1.372E-05	2.441E-05
2.570E 00	2.252E-02	1.674E-03	1.010E 01	1.553E-05	1.961E-05
2.630E 00	2.656E-02	1.363E-03	1.026E 01	1.314E-05	2.561E-05
2.690E 00	1.866E-02	1.147E-03	1.042E 01	1.394E-05	3.174E-05
2.750E 00	8.009E-03	8.163E-04	1.058E 01	1.624E-05	3.420E-05

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	4.309E-03	3.226E-03
4.000E-01 - 5.000E-01	2.466E-03	2.987E-03
5.000E-01 - 6.000E-01	2.554E-02	1.858E-03
6.000E-01 - 7.000E-01	1.060E-02	1.272E-03
7.000E-01 - 8.000E-01	1.579E-02	1.070E-03
8.000E-01 - 1.000E 00	4.065E-02	1.593E-03
1.000E 00 - 1.200E 00	2.351E-03	8.062E-04
1.200E 00 - 1.400E 00	1.678E-03	7.594E-04
1.400E 00 - 1.600E 00	3.131E-03	6.664E-04
1.600E 00 - 1.800E 00	4.877E-03	6.196E-04
1.800E 00 - 2.000E 00	1.577E-03	4.351E-04
2.000E 00 - 2.500E 00	8.883E-04	8.395E-04
2.500E 00 - 3.000E 00	5.147E-03	4.901E-04
3.000E 00 - 3.500E 00	1.062E-04	2.800E-04
3.500E 00 - 4.000E 00	8.333E-05	2.688E-04
4.000E 00 - 4.500E 00	-1.073E-04	2.185E-04
4.500E 00 - 5.000E 00	1.358E-04	2.004E-04
5.000E 00 - 6.000E 00	1.382E-04	4.557E-04
6.000E 00 - 7.000E 00	2.324E-05	2.709E-04
7.000E 00 - 8.000E 00	2.960E-05	8.936E-05
8.000E 00 - 9.000E 00	1.938E-05	3.434E-05
9.000E 00 - 1.000E 01	1.361E-05	2.447E-05

ORNL-DWG 74-13099

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 3.00 TO 3.49 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	6.702E-02	5.264E-02	2.810E 00	7.576E-03	1.120E-03
3.175E-01	6.720E-02	4.286E-02	2.870E 00	2.607E-03	8.466E-04
3.325E-01	5.985E-02	4.026E-02	2.930E 00	1.652E-03	9.571E-04
3.475E-01	7.917E-02	4.373E-02	2.990E 00	5.920E-04	8.338E-04
3.625E-01	9.368E-02	4.540E-02	3.050E 00	-2.344E-04	8.215E-04
3.775E-01	7.312E-02	4.594E-02	3.110E 00	-5.009E-04	8.675E-04
3.925E-01	5.708E-02	4.509E-02	3.180E 00	-1.552E-04	7.329E-04
4.100E-01	6.833E-02	4.310E-02	3.260E 00	2.557E-04	7.213E-04
4.300E-01	3.490E-02	4.352E-02	3.340E 00	1.178E-04	6.472E-04
4.500E-01	7.818E-03	4.603E-02	3.420E 00	-1.752E-04	6.643E-04
4.700E-01	4.874E-02	4.114E-02	3.500E 00	-8.466E-05	5.893E-04
4.900E-01	1.215E-01	3.525E-02	3.580E 00	2.991E-04	5.103E-04
5.100E-01	2.029E-01	3.144E-02	3.660E 00	6.432E-04	5.187E-04
5.300E-01	3.207E-01	2.945E-02	3.740E 00	6.524E-04	6.665E-04
5.500E-01	4.309E-01	2.580E-02	3.820E 00	1.050E-04	6.620E-04
5.700E-01	4.304E-01	2.475E-02	3.900E 00	-6.870E-04	6.274E-04
5.900E-01	3.053E-01	2.128E-02	3.980E 00	-1.146E-03	6.081E-04
6.100E-01	1.716E-01	2.137E-02	4.060E 00	-1.072E-03	6.036E-04
6.300E-01	1.107E-01	2.122E-02	4.140E 00	-6.578E-04	5.314E-04
6.500E-01	9.631E-02	1.985E-02	4.220E 00	-5.685E-05	5.694E-04
6.700E-01	8.975E-02	1.905E-02	4.300E 00	5.473E-04	5.660E-04
6.900E-01	8.078E-02	1.821E-02	4.380E 00	9.636E-04	5.670E-04
7.100E-01	6.118E-02	1.800E-02	4.460E 00	9.800E-04	6.231E-04
7.300E-01	5.744E-02	1.817E-02	4.540E 00	8.152E-04	5.835E-04
7.500E-01	1.304E-01	1.711E-02	4.630E 00	5.574E-04	5.410E-04
7.700E-01	2.817E-01	1.681E-02	4.730E 00	5.326E-04	5.632E-04
7.900E-01	4.170E-01	1.562E-02	4.830E 00	4.354E-04	5.437E-04
8.100E-01	4.472E-01	1.466E-02	4.930E 00	1.669E-04	6.661E-04
8.300E-01	3.918E-01	1.408E-02	5.030E 00	-1.583E-04	6.042E-04
8.500E-01	3.245E-01	1.281E-02	5.130E 00	-2.733E-04	5.872E-04
8.700E-01	2.706E-01	1.332E-02	5.230E 00	-2.636E-04	6.424E-04
8.900E-01	2.159E-01	1.258E-02	5.330E 00	-4.818E-04	5.029E-04
9.100E-01	1.693E-01	1.185E-02	5.430E 00	-4.847E-04	4.806E-04
9.300E-01	1.175E-01	1.065E-02	5.530E 00	-3.029E-04	5.381E-04
9.500E-01	8.904E-02	1.043E-02	5.630E 00	5.481E-05	5.039E-04
9.700E-01	6.550E-02	9.525E-03	5.730E 00	4.453E-04	4.864E-04
1.000E 00	3.608E-02	9.342E-03	5.830E 00	6.178E-04	4.851E-04
1.040E 00	2.161E-02	8.793E-03	5.930E 00	4.095E-04	3.949E-04
1.080E 00	1.926E-02	7.740E-03	6.030E 00	4.891E-05	4.318E-04
1.120E 00	1.884E-02	7.275E-03	6.130E 00	-3.408E-04	4.405E-04
1.160E 00	1.523E-02	6.695E-03	6.230E 00	-5.789E-04	4.141E-04
1.200E 00	7.866E-03	7.284E-03	6.330E 00	-5.640E-04	3.845E-04
1.240E 00	6.505E-03	6.892E-03	6.440E 00	-3.149E-04	4.030E-04
1.280E 00	9.866E-03	7.246E-03	6.560E 00	7.659E-05	3.988E-04
1.320E 00	1.578E-02	6.903E-03	6.680E 00	4.968E-04	3.279E-04
1.360E 00	2.486E-02	7.015E-03	6.800E 00	7.223E-04	3.183E-04
1.400E 00	2.791E-02	7.631E-03	6.920E 00	6.804E-04	3.295E-04
1.440E 00	2.239E-02	7.232E-03	7.040E 00	4.311E-04	2.402E-04
1.480E 00	1.512E-02	7.258E-03	7.160E 00	2.398E-04	2.078E-04
1.520E 00	1.019E-02	6.605E-03	7.280E 00	1.208E-04	1.730E-04
1.560E 00	1.044E-02	6.592E-03	7.400E 00	3.211E-05	1.523E-04
1.600E 00	1.465E-02	6.339E-03	7.520E 00	-2.684E-05	1.187E-04
1.640E 00	2.248E-02	6.235E-03	7.640E 00	-5.899E-05	9.061E-05
1.680E 00	3.753E-02	6.636E-03	7.760E 00	-4.516E-05	7.418E-05
1.720E 00	4.906E-02	7.057E-03	7.890E 00	-1.718E-05	7.171E-05
1.760E 00	4.486E-02	6.469E-03	8.030E 00	1.506E-05	6.883E-05
1.800E 00	3.337E-02	6.767E-03	8.170E 00	4.303E-05	5.840E-05
1.850E 00	2.525E-02	5.805E-03	8.310E 00	5.739E-05	5.833E-05
1.910E 00	1.783E-02	5.006E-03	8.450E 00	6.601E-05	5.277E-05
1.970E 00	9.499E-03	5.441E-03	8.590E 00	4.690E-05	5.459E-05
2.030E 00	1.184E-02	5.220E-03	8.730E 00	1.863E-05	5.442E-05
2.090E 00	1.245E-02	5.545E-03	8.870E 00	5.872E-06	4.870E-05
2.150E 00	7.988E-03	5.299E-03	9.010E 00	1.093E-05	3.534E-05
2.210E 00	3.908E-03	4.251E-03	9.150E 00	2.412E-05	2.886E-05
2.270E 00	3.654E-04	4.067E-03	9.300E 00	3.150E-05	2.488E-05
2.330E 00	-1.410E-03	3.929E-03	9.460E 00	2.523E-05	2.071E-05
2.390E 00	-7.736E-04	3.722E-03	9.620E 00	1.427E-05	1.343E-05
2.450E 00	1.832E-02	3.815E-03	9.780E 00	6.272E-06	6.540E-06
2.510E 00	6.169E-02	4.706E-03	9.940E 00	3.940E-06	3.782E-06
2.570E 00	1.138E-01	5.406E-03	1.010E 01	2.668E-06	3.464E-06
2.630E 00	1.165E-01	4.992E-03	1.026E 01	1.923E-06	3.307E-06
2.690E 00	7.231E-02	3.343E-03	1.042E 01	1.881E-06	3.367E-06
2.750E 00	2.815E-02	1.910E-03	1.058E 01	2.323E-06	3.551E-06

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	7.137E-03	4.461E-03
4.000E-01 - 5.000E-01	5.467E-03	4.184E-03
5.000E-01 - 6.000E-01	3.376E-02	2.667E-03
6.000E-01 - 7.000E-01	1.109E-02	1.995E-03
7.000E-01 - 8.000E-01	1.887E-02	1.716E-03
8.000E-01 - 1.000E 00	4.285E-02	2.383E-03
1.000E 00 - 1.200E 00	3.856E-03	1.586E-03
1.200E 00 - 1.400E 00	2.987E-03	1.418E-03
1.400E 00 - 1.600E 00	3.134E-03	1.388E-03
1.600E 00 - 1.800E 00	7.200E-03	1.315E-03
1.800E 00 - 2.000E 00	3.855E-03	1.102E-03
2.000E 00 - 2.500E 00	3.937E-03	2.245E-03
2.500E 00 - 3.000E 00	2.339E-02	1.383E-03
3.000E 00 - 3.500E 00	-3.978E-05	3.645E-04
3.500E 00 - 4.000E 00	1.414E-05	2.979E-04
4.000E 00 - 4.500E 00	3.367E-05	2.879E-04
4.500E 00 - 5.000E 00	2.333E-04	2.895E-04
5.000E 00 - 6.000E 00	-3.720E-05	5.193E-04
6.000E 00 - 7.000E 00	6.243E-05	3.760E-04
7.000E 00 - 8.000E 00	7.154E-05	1.349E-04
8.000E 00 - 9.000E 00	3.562E-05	5.483E-05
9.000E 00 - 1.000E 01	1.731E-05	1.780E-05

ORNL-DWG 74-13100

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 3.49 TO 4.00 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	1.081E-01	6.403E-02	2.810E 00	1.616E-02	1.944E-03
3.175E-01	1.438E-01	5.498E-02	2.870E 00	4.460E-03	1.786E-03
3.325E-01	1.601E-01	5.561E-02	2.930E 00	1.624E-03	1.472E-03
3.475E-01	1.554E-01	5.913E-02	2.990E 00	2.048E-04	1.215E-03
3.625E-01	1.138E-01	6.204E-02	3.050E 00	1.338E-04	1.188E-03
3.775E-01	5.875E-02	6.150E-02	3.110E 00	1.125E-03	1.230E-03
3.925E-01	5.063E-02	6.637E-02	3.180E 00	2.863E-03	1.093E-03
4.100E-01	6.643E-02	5.979E-02	3.260E 00	3.630E-03	1.227E-03
4.300E-01	3.709E-02	6.119E-02	3.340E 00	2.626E-03	1.050E-03
4.500E-01	4.421E-02	6.049E-02	3.420E 00	1.239E-03	9.796E-04
4.700E-01	1.240E-01	5.041E-02	3.500E 00	4.942E-04	9.465E-04
4.900E-01	2.215E-01	4.743E-02	3.580E 00	3.920E-04	8.576E-04
5.100E-01	3.461E-01	4.015E-02	3.660E 00	2.043E-04	7.953E-04
5.300E-01	5.064E-01	3.968E-02	3.740E 00	4.370E-05	7.296E-04
5.500E-01	6.055E-01	3.448E-02	3.820E 00	1.100E-04	6.454E-04
5.700E-01	5.618E-01	3.225E-02	3.900E 00	5.051E-04	7.546E-04
5.900E-01	4.206E-01	3.187E-02	3.980E 00	7.003E-04	9.093E-04
6.100E-01	2.821E-01	2.954E-02	4.060E 00	7.883E-04	1.078E-03
6.300E-01	1.696E-01	2.871E-02	4.140E 00	5.323E-04	8.536E-04
6.500E-01	1.171E-01	2.561E-02	4.220E 00	3.624E-04	7.394E-04
6.700E-01	1.045E-01	2.315E-02	4.300E 00	1.482E-04	6.386E-04
6.900E-01	8.938E-02	2.152E-02	4.380E 00	-6.229E-05	6.842E-04
7.100E-01	6.803E-02	2.088E-02	4.460E 00	-6.449E-05	7.853E-04
7.300E-01	5.591E-02	2.123E-02	4.540E 00	-8.146E-05	7.397E-04
7.500E-01	2.140E-01	1.967E-02	4.630E 00	1.888E-07	6.403E-04
7.700E-01	3.737E-01	1.887E-02	4.730E 00	-1.421E-04	6.818E-04
7.900E-01	4.813E-01	1.863E-02	4.830E 00	-2.742E-05	6.494E-04
8.100E-01	4.852E-01	1.858E-02	4.930E 00	6.448E-05	7.563E-04
8.300E-01	4.154E-01	1.706E-02	5.030E 00	1.586E-05	6.180E-04
8.500E-01	3.360E-01	1.720E-02	5.130E 00	2.007E-04	6.910E-04
8.700E-01	2.763E-01	1.783E-02	5.230E 00	2.196E-04	7.024E-04
8.900E-01	2.256E-01	1.620E-02	5.330E 00	-2.066E-04	5.941E-04
9.100E-01	1.712E-01	1.427E-02	5.430E 00	-5.152E-04	6.632E-04
9.300E-01	1.212E-01	1.274E-02	5.530E 00	-7.668E-04	6.046E-04
9.500E-01	8.587E-02	1.322E-02	5.630E 00	-3.313E-04	6.238E-04
9.700E-01	6.269E-02	1.247E-02	5.730E 00	4.397E-04	6.146E-04
1.000E 00	3.551E-02	1.246E-02	5.830E 00	9.457E-04	6.481E-04
1.040E 00	1.869E-02	1.189E-02	5.930E 00	9.871E-04	5.237E-04
1.080E 00	2.784E-02	1.103E-02	6.030E 00	6.042E-04	4.814E-04
1.120E 00	3.203E-02	1.083E-02	6.130E 00	2.466E-04	4.999E-04
1.160E 00	2.182E-02	9.508E-03	6.230E 00	1.256E-04	5.656E-04
1.200E 00	6.637E-03	1.004E-02	6.330E 00	2.234E-04	5.909E-04
1.240E 00	2.824E-03	1.049E-02	6.440E 00	8.826E-05	4.858E-04
1.280E 00	1.006E-02	1.143E-02	6.560E 00	5.237E-05	5.050E-04
1.320E 00	1.718E-02	1.152E-02	6.680E 00	-8.408E-05	4.061E-04
1.360E 00	2.284E-02	1.133E-02	6.800E 00	-1.801E-04	4.052E-04
1.400E 00	3.014E-02	1.147E-02	6.920E 00	-1.946E-04	3.774E-04
1.440E 00	3.502E-02	1.069E-02	7.040E 00	-1.457E-04	3.234E-04
1.480E 00	2.806E-02	1.095E-02	7.160E 00	-2.786E-05	2.556E-04
1.520E 00	1.626E-02	1.075E-02	7.280E 00	6.794E-05	2.355E-04
1.560E 00	1.904E-02	1.017E-02	7.400E 00	1.388E-04	2.003E-04
1.600E 00	2.906E-02	9.449E-03	7.520E 00	2.016E-04	1.784E-04
1.640E 00	3.262E-02	1.115E-02	7.640E 00	2.098E-04	1.679E-04
1.680E 00	4.167E-02	1.102E-02	7.760E 00	1.776E-04	1.279E-04
1.720E 00	6.225E-02	1.038E-02	7.890E 00	1.399E-04	8.962E-05
1.760E 00	6.761E-02	9.672E-03	8.030E 00	7.041E-05	6.643E-05
1.800E 00	4.828E-02	1.055E-02	8.170E 00	2.630E-05	5.373E-05
1.850E 00	2.790E-02	1.064E-02	8.310E 00	-4.621E-06	3.245E-05
1.910E 00	2.509E-02	8.135E-03	8.450E 00	-8.510E-06	2.473E-05
1.970E 00	1.862E-02	7.652E-03	8.590E 00	-3.939E-06	2.187E-05
2.030E 00	2.011E-02	8.397E-03	8.730E 00	5.118E-06	1.853E-05
2.090E 00	1.416E-02	9.753E-03	8.870E 00	1.893E-05	1.745E-05
2.150E 00	5.678E-03	8.652E-03	9.010E 00	3.351E-05	2.030E-05
2.210E 00	5.126E-03	7.044E-03	9.150E 00	4.113E-05	2.354E-05
2.270E 00	3.225E-03	6.482E-03	9.300E 00	3.493E-05	2.372E-05
2.330E 00	2.863E-03	6.469E-03	9.460E 00	2.230E-05	1.830E-05
2.390E 00	6.147E-03	5.603E-03	9.620E 00	9.538E-06	1.151E-05
2.450E 00	3.657E-02	7.029E-03	9.780E 00	5.010E-06	7.635E-06
2.510E 00	1.256E-01	8.629E-03	9.940E 00	4.343E-06	5.731E-06
2.570E 00	2.138E-01	9.251E-03	1.010E 01	3.976E-06	5.533E-06
2.630E 00	2.045E-01	8.069E-03	1.026E 01	4.960E-06	6.303E-06
2.690E 00	1.200E-01	5.115E-03	1.042E 01	6.510E-06	7.256E-06
2.750E 00	4.738E-02	3.391E-03	1.058E 01	7.369E-06	7.585E-06

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	1.136E-02	6.007E-03
4.000E-01 - 5.000E-01	9.887E-03	5.587E-03
5.000E-01 - 6.000E-01	4.889E-02	3.579E-03
6.000E-01 - 7.000E-01	1.533E-02	2.575E-03
7.000E-01 - 8.000E-01	2.460E-02	1.988E-03
8.000E-01 - 1.000E 00	4.439E-02	3.054E-03
1.000E 00 - 1.200E 00	4.870E-03	2.144E-03
1.200E 00 - 1.400E 00	2.812E-03	2.223E-03
1.400E 00 - 1.600E 00	5.131E-03	2.122E-03
1.600E 00 - 1.800E 00	9.810E-03	2.090E-03
1.800E 00 - 2.000E 00	5.319E-03	1.787E-03
2.000E 00 - 2.500E 00	7.712E-03	3.732E-03
2.500E 00 - 3.000E 00	4.205E-02	2.263E-03
3.000E 00 - 3.500E 00	9.262E-04	5.568E-04
3.500E 00 - 4.000E 00	1.611E-04	3.937E-04
4.000E 00 - 4.500E 00	1.511E-04	3.996E-04
4.500E 00 - 5.000E 00	-2.712E-06	3.436E-04
5.000E 00 - 6.000E 00	1.153E-04	6.277E-04
6.000E 00 - 7.000E 00	6.462E-05	4.682E-04
7.000E 00 - 8.000E 00	1.017E-04	1.872E-04
8.000E 00 - 9.000E 00	1.377E-05	3.141E-05
9.000E 00 - 1.000E 01	2.099E-05	1.556E-05

ORNL-DWG 74-13101

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 4.00 TO 4.49 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	1.650E-01	9.097E-02	2.810E 00	2.621E-02	3.198E-03
3.175E-01	1.362E-01	9.243E-02	2.870E 00	1.046E-02	2.520E-03
3.325E-01	1.671E-01	8.378E-02	2.930E 00	7.419E-03	2.316E-03
3.475E-01	1.785E-01	7.965E-02	2.990E 00	6.925E-03	2.427E-03
3.625E-01	1.395E-01	7.815E-02	3.050E 00	5.444E-03	2.262E-03
3.775E-01	1.144E-01	7.663E-02	3.110E 00	3.816E-03	2.187E-03
3.925E-01	1.322E-01	7.480E-02	3.180E 00	3.669E-03	2.342E-03
4.100E-01	1.315E-01	7.686E-02	3.260E 00	3.550E-03	2.091E-03
4.300E-01	6.430E-02	7.415E-02	3.340E 00	2.133E-03	1.971E-03
4.500E-01	1.085E-01	7.689E-02	3.420E 00	2.518E-03	1.896E-03
4.700E-01	2.993E-01	6.530E-02	3.500E 00	4.500E-03	1.799E-03
4.900E-01	4.422E-01	6.203E-02	3.580E 00	3.732E-03	1.691E-03
5.100E-01	5.264E-01	5.777E-02	3.660E 00	1.729E-03	1.766E-03
5.300E-01	6.730E-01	5.219E-02	3.740E 00	1.684E-03	1.690E-03
5.500E-01	8.109E-01	4.790E-02	3.820E 00	2.492E-03	1.549E-03
5.700E-01	7.873E-01	4.270E-02	3.900E 00	2.942E-03	1.741E-03
5.900E-01	5.897E-01	4.067E-02	3.980E 00	3.796E-03	1.724E-03
6.100E-01	3.462E-01	4.108E-02	4.060E 00	4.063E-03	1.681E-03
6.300E-01	1.873E-01	4.084E-02	4.140E 00	2.575E-03	1.423E-03
6.500E-01	1.296E-01	3.637E-02	4.220E 00	1.146E-03	1.348E-03
6.700E-01	1.105E-01	3.293E-02	4.300E 00	1.027E-03	1.313E-03
6.900E-01	8.927E-02	3.053E-02	4.380E 00	1.342E-03	1.140E-03
7.100E-01	8.241E-02	3.122E-02	4.460E 00	1.041E-03	9.585E-04
7.300E-01	1.431E-01	3.062E-02	4.540E 00	4.297E-04	8.444E-04
7.500E-01	2.937E-01	2.755E-02	4.630E 00	7.847E-05	7.788E-04
7.700E-01	4.596E-01	2.726E-02	4.730E 00	1.799E-04	8.353E-04
7.900E-01	5.383E-01	2.616E-02	4.830E 00	2.424E-04	9.347E-04
8.100E-01	5.076E-01	2.435E-02	4.930E 00	2.484E-04	9.888E-04
8.300E-01	4.332E-01	2.344E-02	5.030E 00	2.185E-04	8.424E-04
8.500E-01	3.684E-01	2.277E-02	5.130E 00	2.664E-05	6.959E-04
8.700E-01	3.139E-01	2.381E-02	5.230E 00	-2.470E-04	7.645E-04
8.900E-01	2.569E-01	2.353E-02	5.330E 00	-3.036E-04	8.374E-04
9.100E-01	1.965E-01	2.140E-02	5.430E 00	2.333E-05	7.723E-04
9.300E-01	1.421E-01	1.910E-02	5.530E 00	3.010E-04	6.813E-04
9.500E-01	1.011E-01	2.000E-02	5.630E 00	1.972E-04	6.556E-04
9.700E-01	7.432E-02	1.884E-02	5.730E 00	3.298E-05	6.582E-04
1.000E 00	4.937E-02	1.903E-02	5.830E 00	3.289E-04	7.662E-04
1.040E 00	3.915E-02	1.652E-02	5.930E 00	8.298E-04	6.802E-04
1.080E 00	5.208E-02	1.497E-02	6.030E 00	1.180E-03	6.954E-04
1.120E 00	4.713E-02	1.460E-02	6.130E 00	1.004E-03	7.303E-04
1.160E 00	2.057E-02	1.475E-02	6.230E 00	3.303E-04	6.371E-04
1.200E 00	6.156E-03	1.356E-02	6.330E 00	-2.075E-04	6.119E-04
1.240E 00	1.101E-02	1.459E-02	6.440E 00	-5.848E-04	5.891E-04
1.280E 00	2.246E-02	1.391E-02	6.560E 00	-3.359E-04	5.515E-04
1.320E 00	3.420E-02	1.569E-02	6.680E 00	7.148E-05	4.784E-04
1.360E 00	4.158E-02	1.591E-02	6.800E 00	4.855E-04	4.317E-04
1.400E 00	4.271E-02	1.613E-02	6.920E 00	4.719E-04	3.215E-04
1.440E 00	3.816E-02	1.562E-02	7.040E 00	3.214E-04	3.624E-04
1.480E 00	2.775E-02	1.572E-02	7.160E 00	1.237E-04	3.124E-04
1.520E 00	2.817E-02	1.624E-02	7.280E 00	4.969E-05	2.324E-04
1.560E 00	3.643E-02	1.485E-02	7.400E 00	5.282E-05	1.673E-04
1.600E 00	3.914E-02	1.524E-02	7.520E 00	4.850E-05	1.689E-04
1.640E 00	4.763E-02	1.541E-02	7.640E 00	3.599E-05	1.661E-04
1.680E 00	6.756E-02	1.551E-02	7.760E 00	-2.099E-06	1.667E-04
1.720E 00	8.103E-02	1.502E-02	7.890E 00	1.416E-05	1.210E-04
1.760E 00	8.088E-02	1.446E-02	8.030E 00	3.057E-05	1.080E-04
1.800E 00	7.202E-02	1.205E-02	8.170E 00	6.198E-05	1.282E-04
1.850E 00	5.747E-02	1.260E-02	8.310E 00	5.276E-05	1.091E-04
1.910E 00	3.611E-02	1.172E-02	8.450E 00	4.722E-05	7.110E-05
1.970E 00	1.751E-02	1.398E-02	8.590E 00	5.825E-05	5.297E-05
2.030E 00	2.978E-02	1.279E-02	8.730E 00	5.398E-05	4.906E-05
2.090E 00	3.346E-02	1.365E-02	8.870E 00	3.814E-05	4.397E-05
2.150E 00	1.743E-02	1.226E-02	9.010E 00	1.730E-05	4.379E-05
2.210E 00	7.611E-03	1.090E-02	9.150E 00	3.030E-06	4.518E-05
2.270E 00	-2.862E-03	1.088E-02	9.300E 00	-5.065E-06	3.642E-05
2.330E 00	-2.208E-03	1.017E-02	9.460E 00	-7.795E-06	2.073E-05
2.390E 00	1.128E-02	9.795E-03	9.620E 00	-1.884E-06	1.380E-05
2.450E 00	5.590E-02	1.074E-02	9.780E 00	3.426E-06	1.049E-05
2.510E 00	1.615E-01	1.335E-02	9.940E 00	7.485E-06	8.691E-06
2.570E 00	3.077E-01	1.415E-02	1.010E 01	1.169E-05	9.635E-06
2.630E 00	2.952E-01	1.181E-02	1.026E 01	1.619E-05	1.210E-05
2.690E 00	1.788E-01	7.743E-03	1.042E 01	1.892E-05	1.398E-05
2.750E 00	7.577E-02	4.592E-03	1.058E 01	1.854E-05	1.423E-05

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	1.457E-02	8.205E-03
4.000E-01 - 5.000E-01	2.082E-02	7.082E-03
5.000E-01 - 6.000E-01	6.764E-02	4.826E-03
6.000E-01 - 7.000E-01	1.746E-02	3.639E-03
7.000E-01 - 8.000E-01	3.029E-02	2.855E-03
8.000E-01 - 1.000E 00	4.897E-02	4.322E-03
1.000E 00 - 1.200E 00	7.492E-03	3.081E-03
1.200E 00 - 1.400E 00	5.370E-03	2.997E-03
1.400E 00 - 1.600E 00	6.824E-03	3.118E-03
1.600E 00 - 1.800E 00	1.339E-02	2.974E-03
1.800E 00 - 2.000E 00	8.178E-03	2.510E-03
2.000E 00 - 2.500E 00	1.208E-02	5.738E-03
2.500E 00 - 3.000E 00	6.250E-02	3.397E-03
3.000E 00 - 3.500E 00	1.794E-03	1.050E-03
3.500E 00 - 4.000E 00	1.397E-03	8.508E-04
4.000E 00 - 4.500E 00	9.694E-04	6.625E-04
4.500E 00 - 5.000E 00	1.161E-04	4.389E-04
5.000E 00 - 6.000E 00	1.567E-04	7.319E-04
6.000E 00 - 7.000E 00	2.244E-04	5.468E-04
7.000E 00 - 8.000E 00	7.037E-05	2.034E-04
8.000E 00 - 9.000E 00	4.865E-05	7.751E-05
9.000E 00 - 1.000E 01	8.554E-07	2.418E-05

ORNL-DWG 74-13102

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 4.49 TO 5.00 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	2.767E-01	1.086E-01	2.810E 00	3.648E-02	4.106E-03
3.175E-01	2.281E-01	1.106E-01	2.870E 00	1.296E-02	4.269E-03
3.325E-01	2.317E-01	9.797E-02	2.930E 00	1.155E-02	4.058E-03
3.475E-01	2.513E-01	8.521E-02	2.990E 00	1.211E-02	3.794E-03
3.625E-01	2.061E-01	8.584E-02	3.050E 00	8.104E-03	3.378E-03
3.775E-01	1.535E-01	8.691E-02	3.110E 00	4.827E-03	3.749E-03
3.925E-01	1.635E-01	9.366E-02	3.180E 00	5.909E-03	3.612E-03
4.100E-01	1.664E-01	8.260E-02	3.260E 00	7.494E-03	3.313E-03
4.300E-01	1.366E-01	8.977E-02	3.340E 00	4.651E-03	3.349E-03
4.500E-01	2.019E-01	8.094E-02	3.420E 00	2.961E-03	3.291E-03
4.700E-01	3.308E-01	7.955E-02	3.500E 00	5.322E-03	3.919E-03
4.900E-01	5.107E-01	7.187E-02	3.580E 00	9.220E-03	3.360E-03
5.100E-01	6.891E-01	7.292E-02	3.660E 00	8.512E-03	3.108E-03
5.300E-01	7.605E-01	6.477E-02	3.740E 00	7.730E-03	2.927E-03
5.500E-01	9.008E-01	6.069E-02	3.820E 00	9.263E-03	2.826E-03
5.700E-01	1.065E 00	5.868E-02	3.900E 00	1.131E-02	2.511E-03
5.900E-01	8.965E-01	4.894E-02	3.980E 00	1.476E-02	2.845E-03
6.100E-01	5.804E-01	4.923E-02	4.060E 00	1.696E-02	2.813E-03
6.300E-01	3.190E-01	4.046E-02	4.140E 00	1.436E-02	2.586E-03
6.500E-01	2.152E-01	4.291E-02	4.220E 00	8.394E-03	2.036E-03
6.700E-01	1.574E-01	3.855E-02	4.300E 00	3.518E-03	1.860E-03
6.900E-01	1.308E-01	3.612E-02	4.380E 00	1.128E-03	1.608E-03
7.100E-01	1.209E-01	3.426E-02	4.460E 00	5.782E-04	1.345E-03
7.300E-01	1.694E-01	3.435E-02	4.540E 00	5.121E-04	1.369E-03
7.500E-01	2.077E-01	3.335E-02	4.630E 00	7.510E-04	1.163E-03
7.700E-01	8.468E-01	3.162E-02	4.730E 00	1.049E-03	1.047E-03
7.900E-01	5.456E-01	2.986E-02	4.830E 00	1.110E-03	1.196E-03
8.100E-01	5.365E-01	3.162E-02	4.930E 00	1.005E-03	1.022E-03
8.300E-01	4.758E-01	3.168E-02	5.030E 00	9.617E-04	9.674E-04
8.500E-01	4.200E-01	2.930E-02	5.130E 00	7.292E-04	8.554E-04
8.700E-01	3.726E-01	2.992E-02	5.230E 00	4.192E-04	7.894E-04
8.900E-01	3.147E-01	2.889E-02	5.330E 00	1.074E-04	7.926E-04
9.100E-01	2.887E-01	2.665E-02	5.430E 00	-1.062E-04	8.095E-04
9.300E-01	1.900E-01	2.407E-02	5.530E 00	-7.902E-05	8.211E-04
9.500E-01	1.844E-01	2.499E-02	5.630E 00	-6.782E-06	7.407E-04
9.700E-01	1.107E-01	2.335E-02	5.730E 00	1.733E-04	7.139E-04
1.000E 00	7.605E-02	2.413E-02	5.830E 00	1.956E-04	7.250E-04
1.040E 00	6.239E-02	2.126E-02	5.930E 00	8.012E-05	7.028E-04
1.080E 00	7.985E-02	2.145E-02	6.030E 00	1.562E-05	7.027E-04
1.120E 00	7.799E-02	1.894E-02	6.130E 00	2.914E-05	7.088E-04
1.160E 00	4.082E-02	2.002E-02	6.230E 00	1.562E-04	6.853E-04
1.200E 00	2.544E-02	1.731E-02	6.330E 00	5.487E-04	6.753E-04
1.240E 00	3.292E-02	1.794E-02	6.440E 00	7.678E-04	6.536E-04
1.280E 00	2.876E-02	1.798E-02	6.560E 00	6.985E-04	5.276E-04
1.320E 00	3.525E-02	1.887E-02	6.680E 00	3.846E-04	5.156E-04
1.360E 00	6.475E-02	2.105E-02	6.800E 00	4.858E-05	4.473E-04
1.400E 00	7.184E-02	2.279E-02	6.920E 00	9.326E-05	3.744E-04
1.440E 00	5.337E-02	2.059E-02	7.040E 00	1.638E-04	3.041E-04
1.480E 00	4.185E-02	2.037E-02	7.160E 00	1.158E-04	2.697E-04
1.520E 00	5.629E-02	1.827E-02	7.280E 00	4.621E-05	2.364E-04
1.560E 00	8.343E-02	1.945E-02	7.400E 00	3.897E-05	2.074E-04
1.600E 00	9.277E-02	1.900E-02	7.520E 00	5.115E-05	2.156E-04
1.640E 00	9.920E-02	2.004E-02	7.640E 00	4.204E-05	1.972E-04
1.680E 00	1.156E-01	1.914E-02	7.760E 00	-1.363E-05	1.340E-04
1.720E 00	1.180E-01	2.003E-02	7.890E 00	2.447E-05	1.427E-04
1.760E 00	9.555E-02	1.983E-02	8.030E 00	9.573E-05	1.472E-04
1.800E 00	7.177E-02	1.937E-02	8.170E 00	1.217E-04	1.359E-04
1.850E 00	5.880E-02	1.763E-02	8.310E 00	9.232E-05	9.412E-05
1.910E 00	4.348E-02	1.636E-02	8.450E 00	3.452E-05	9.530E-05
1.970E 00	2.099E-02	1.530E-02	8.590E 00	3.013E-05	9.893E-05
2.030E 00	2.528E-02	1.789E-02	8.730E 00	5.957E-05	8.650E-05
2.090E 00	3.471E-02	1.816E-02	8.870E 00	7.678E-05	6.324E-05
2.150E 00	2.238E-02	1.548E-02	9.010E 00	7.293E-05	4.718E-05
2.210E 00	8.372E-03	1.484E-02	9.150E 00	5.065E-05	4.789E-05
2.270E 00	-1.966E-03	1.248E-02	9.300E 00	2.451E-05	3.392E-05
2.330E 00	1.419E-02	1.192E-02	9.460E 00	7.731E-06	1.963E-05
2.390E 00	4.034E-02	1.116E-02	9.620E 00	5.097E-06	1.367E-05
2.450E 00	6.940E-02	1.484E-02	9.780E 00	6.529E-06	1.070E-05
2.510E 00	2.115E-01	1.841E-02	9.940E 00	7.735E-06	9.011E-06
2.570E 00	3.898E-01	1.998E-02	1.010E 01	9.612E-06	1.032E-05
2.630E 00	3.871E-01	1.513E-02	1.026E 01	1.267E-05	1.290E-05
2.690E 00	2.417E-01	9.754E-03	1.042E 01	1.485E-05	1.483E-05
2.750E 00	1.076E-01	5.789E-03	1.058E 01	1.549E-05	1.547E-05

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	2.115E-02	9.484E-03
4.000E-01 - 5.000E-01	2.689E-02	8.150E-03
5.000E-01 - 6.000E-01	8.592E-02	6.121E-03
6.000E-01 - 7.000E-01	2.768E-02	4.306E-03
7.000E-01 - 8.000E-01	3.189E-02	3.277E-03
8.000E-01 - 1.000E 00	5.792E-02	5.479E-03
1.000E 00 - 1.200E 00	1.247E-02	4.106E-03
1.200E 00 - 1.400E 00	8.828E-03	3.832E-03
1.400E 00 - 1.600E 00	1.254E-02	4.127E-03
1.600E 00 - 1.800E 00	2.055E-02	3.931E-03
1.800E 00 - 2.000E 00	8.937E-03	3.359E-03
2.000E 00 - 2.500E 00	1.649E-02	7.344E-03
2.500E 00 - 3.000E 00	6.137E-02	8.694E-03
3.000E 00 - 3.500E 00	2.781E-03	1.739E-03
3.500E 00 - 4.000E 00	4.787E-03	1.498E-03
4.000E 00 - 4.500E 00	3.901E-03	1.038E-03
4.500E 00 - 5.000E 00	4.538E-04	5.713E-04
5.000E 00 - 6.000E 00	2.284E-04	7.859E-04
6.000E 00 - 7.000E 00	3.098E-04	5.719E-04
7.000E 00 - 8.000E 00	5.544E-05	2.070E-04
8.000E 00 - 9.000E 00	7.262E-05	9.822E-05
9.000E 00 - 1.000E 01	2.084E-05	2.435E-05

ORNL-DWG 74-13103

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 5.00 TO 6.00 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	2.156E-01	1.294E-01	2.610E 00	5.011E-02	5.558E-03
3.175E-01	2.808E-01	1.097E-01	2.870E 00	2.138E-02	5.496E-03
3.325E-01	2.320E-01	1.108E-01	2.930E 00	1.597E-02	4.885E-03
3.475E-01	1.795E-01	1.048E-01	2.990E 00	1.483E-02	4.754E-03
3.625E-01	1.721E-01	1.073E-01	3.050E 00	1.833E-02	4.479E-03
3.775E-01	1.540E-01	1.070E-01	3.110E 00	2.042E-02	4.414E-03
3.925E-01	1.243E-01	1.061E-01	3.180E 00	1.456E-02	4.191E-03
4.100E-01	1.193E-01	1.090E-01	3.260E 00	1.289E-02	4.683E-03
4.300E-01	1.307E-01	1.009E-01	3.340E 00	2.019E-02	3.612E-03
4.500E-01	1.485E-01	1.009E-01	3.420E 00	1.658E-02	3.743E-03
4.700E-01	2.291E-01	9.015E-02	3.500E 00	1.079E-02	4.352E-03
4.900E-01	4.508E-01	8.744E-02	3.580E 00	1.065E-02	4.266E-03
5.100E-01	7.497E-01	8.142E-02	3.660E 00	1.144E-02	3.942E-03
5.300E-01	8.690E-01	6.991E-02	3.740E 00	1.235E-02	3.631E-03
5.500E-01	9.002E-01	6.014E-02	3.820E 00	1.201E-02	3.329E-03
5.700E-01	1.065E 00	5.915E-02	3.900E 00	1.451E-02	3.388E-03
5.900E-01	1.083E 00	5.338E-02	3.980E 00	2.514E-02	3.447E-03
6.100E-01	8.091E-01	5.704E-02	4.060E 00	3.462E-02	3.232E-03
6.300E-01	4.924E-01	5.548E-02	4.140E 00	3.286E-02	2.961E-03
6.500E-01	2.856E-01	5.274E-02	4.220E 00	2.365E-02	2.817E-03
6.700E-01	1.734E-01	5.020E-02	4.300E 00	1.435E-02	2.375E-03
6.900E-01	1.356E-01	4.253E-02	4.380E 00	8.598E-03	2.045E-03
7.100E-01	1.460E-01	3.723E-02	4.460E 00	6.121E-03	1.948E-03
7.300E-01	1.803E-01	3.517E-02	4.540E 00	5.334E-03	2.033E-03
7.500E-01	2.529E-01	3.380E-02	4.630E 00	5.049E-03	1.915E-03
7.700E-01	3.808E-01	3.377E-02	4.730E 00	5.889E-03	1.557E-03
7.900E-01	5.267E-01	3.257E-02	4.830E 00	6.991E-03	1.564E-03
8.100E-01	6.032E-01	3.348E-02	4.930E 00	5.779E-03	1.302E-03
8.300E-01	5.796E-01	3.446E-02	5.030E 00	3.160E-03	1.386E-03
8.500E-01	5.041E-01	3.448E-02	5.130E 00	1.397E-03	1.422E-03
8.700E-01	4.258E-01	3.477E-02	5.230E 00	7.394E-04	1.210E-03
8.900E-01	3.582E-01	3.190E-02	5.330E 00	7.842E-04	1.052E-03
9.100E-01	2.932E-01	3.030E-02	5.430E 00	8.537E-04	1.030E-03
9.300E-01	2.292E-01	2.723E-02	5.530E 00	1.007E-03	1.070E-03
9.500E-01	1.726E-01	2.792E-02	5.630E 00	8.811E-04	9.860E-04
9.700E-01	1.305E-01	2.575E-02	5.730E 00	4.014E-04	9.319E-04
1.000E 00	9.957E-02	2.687E-02	5.830E 00	-2.175E-04	8.204E-04
1.040E 00	9.713E-02	2.412E-02	5.930E 00	-4.022E-04	8.917E-04
1.080E 00	9.797E-02	2.250E-02	6.030E 00	-8.213E-05	7.891E-04
1.120E 00	9.051E-02	2.312E-02	6.130E 00	2.022E-04	7.280E-04
1.160E 00	8.519E-02	2.086E-02	6.230E 00	4.237E-04	6.452E-04
1.200E 00	7.297E-02	2.032E-02	6.330E 00	3.736E-04	6.198E-04
1.240E 00	5.948E-02	2.378E-02	6.440E 00	7.901E-05	5.647E-04
1.280E 00	5.958E-02	2.591E-02	6.560E 00	-5.488E-05	4.881E-04
1.320E 00	6.104E-02	2.506E-02	6.680E 00	-2.485E-04	4.598E-04
1.360E 00	7.767E-02	2.664E-02	6.800E 00	-2.103E-04	4.287E-04
1.400E 00	1.040E-01	2.615E-02	6.920E 00	-7.654E-05	3.108E-04
1.440E 00	9.939E-02	2.430E-02	7.040E 00	9.095E-05	2.700E-04
1.480E 00	7.141E-02	2.464E-02	7.160E 00	1.608E-04	2.569E-04
1.520E 00	5.833E-02	2.508E-02	7.280E 00	1.920E-04	2.250E-04
1.560E 00	6.463E-02	2.624E-02	7.400E 00	2.431E-04	1.578E-04
1.600E 00	8.287E-02	2.520E-02	7.520E 00	2.417E-04	1.768E-04
1.640E 00	1.045E-01	2.226E-02	7.640E 00	1.655E-04	1.496E-04
1.680E 00	1.168E-01	2.362E-02	7.760E 00	1.151E-04	1.263E-04
1.720E 00	1.136E-01	2.373E-02	7.890E 00	8.832E-05	1.122E-04
1.760E 00	1.057E-01	2.449E-02	8.030E 00	7.766E-05	9.707E-05
1.800E 00	1.010E-01	2.409E-02	8.170E 00	4.771E-05	9.389E-05
1.850E 00	8.879E-02	2.155E-02	8.310E 00	1.928E-05	8.393E-05
1.910E 00	5.724E-02	1.975E-02	8.450E 00	2.081E-05	7.791E-05
1.970E 00	4.033E-02	2.014E-02	8.590E 00	3.457E-05	6.411E-05
2.030E 00	5.020E-02	2.239E-02	8.730E 00	5.026E-05	6.020E-05
2.090E 00	4.768E-02	2.202E-02	8.870E 00	5.328E-05	4.938E-05
2.150E 00	2.810E-02	1.993E-02	9.010E 00	4.352E-05	3.922E-05
2.210E 00	2.430E-02	1.723E-02	9.150E 00	2.114E-05	3.801E-05
2.270E 00	2.845E-02	1.507E-02	9.300E 00	6.286E-06	3.492E-05
2.330E 00	2.625E-02	1.450E-02	9.460E 00	2.035E-06	2.386E-05
2.390E 00	3.575E-02	1.419E-02	9.620E 00	8.253E-07	1.111E-05
2.450E 00	7.350E-02	1.637E-02	9.780E 00	3.668E-06	6.835E-06
2.510E 00	2.227E-01	1.871E-02	9.940E 00	4.751E-06	5.273E-06
2.570E 00	4.267E-01	2.158E-02	1.010E 01	4.492E-06	5.307E-06
2.630E 00	4.750E-01	1.852E-02	1.026E 01	4.958E-06	5.722E-06
2.690E 00	3.333E-01	1.229E-02	1.042E 01	5.691E-06	6.379E-06
2.750E 00	1.523E-01	7.125E-03	1.058E 01	6.165E-06	6.697E-06

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	1.945E-02	1.095E-02
4.000E-01 - 5.000E-01	2.178E-02	9.733E-03
5.000E-01 - 6.000E-01	9.268E-02	6.894E-03
6.000E-01 - 7.000E-01	3.801E-02	5.155E-03
7.000E-01 - 8.000E-01	2.971E-02	3.461E-03
8.000E-01 - 1.000E 00	6.793E-02	6.126E-03
1.000E 00 - 1.200E 00	1.834E-02	4.554E-03
1.200E 00 - 1.400E 00	1.370E-02	5.007E-03
1.400E 00 - 1.600E 00	1.537E-02	5.039E-03
1.600E 00 - 1.800E 00	2.141E-02	4.745E-03
1.800E 00 - 2.000E 00	1.318E-02	4.168E-03
2.000E 00 - 2.500E 00	2.240E-02	8.852E-03
2.500E 00 - 3.000E 00	9.925E-02	5.892E-03
3.000E 00 - 3.500E 00	8.289E-03	2.096E-03
3.500E 00 - 4.000E 00	6.783E-03	1.664E-03
4.000E 00 - 4.500E 00	1.016E-07	1.298E-03
4.500E 00 - 5.000E 00	2.880E-03	8.255E-04
5.000E 00 - 6.000E 00	7.844E-04	1.069E-03
6.000E 00 - 7.000E 00	3.500E-05	5.389E-04
7.000E 00 - 8.000E 00	1.587E-04	1.779E-04
8.000E 00 - 9.000E 00	4.189E-05	7.237E-05
9.000E 00 - 1.000E 01	8.880E-06	2.140E-05

ORNL-DWG 74-13104

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 6.00 TO 7.00 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	2.451E-01	1.530E-01
3.175E-01	1.543E-01	1.446E-01
3.325E-01	1.940E-01	1.334E-01
3.475E-01	2.189E-01	1.214E-01
3.625E-01	2.269E-01	1.198E-01
3.775E-01	2.395E-01	1.222E-01
3.925E-01	1.958E-01	1.297E-01
4.100E-01	1.253E-01	1.214E-01
4.300E-01	1.530E-01	1.193E-01
4.500E-01	2.016E-01	1.131E-01
4.700E-01	2.746E-01	1.125E-01
4.900E-01	4.580E-01	1.036E-01
5.100E-01	6.641E-01	1.062E-01
5.300E-01	8.565E-01	9.205E-02
5.500E-01	1.038E 00	8.155E-02
5.700E-01	1.151E 00	6.867E-02
5.900E-01	1.145E 00	6.755E-02
6.100E-01	9.707E-01	7.308E-02
6.300E-01	6.826E-01	7.140E-02
6.500E-01	4.002E-01	6.021E-02
6.700E-01	2.271E-01	5.411E-02
6.900E-01	1.603E-01	5.149E-02
7.100E-01	1.266E-01	4.870E-02
7.300E-01	1.150E-01	4.641E-02
7.500E-01	1.770E-01	4.617E-02
7.700E-01	3.282E-01	4.510E-02
7.900E-01	4.760E-01	4.234E-02
8.100E-01	5.548E-01	3.973E-02
8.300E-01	5.431E-01	3.909E-02
8.500E-01	4.867E-01	3.792E-02
8.700E-01	4.225E-01	4.030E-02
8.900E-01	3.594E-01	3.923E-02
9.100E-01	2.940E-01	3.683E-02
9.300E-01	2.312E-01	3.203E-02
9.500E-01	1.870E-01	3.275E-02
9.700E-01	1.498E-01	3.063E-02
1.000E 00	1.286E-01	3.165E-02
1.040E 00	9.268E-02	3.105E-02
1.080E 00	8.011E-02	3.143E-02
1.120E 00	1.272E-01	3.061E-02
1.160E 00	1.314E-01	2.602E-02
1.200E 00	9.594E-02	2.814E-02
1.240E 00	8.869E-02	2.866E-02
1.280E 00	8.774E-02	2.914E-02
1.320E 00	7.455E-02	2.943E-02
1.360E 00	7.842E-02	3.149E-02
1.400E 00	8.944E-02	2.969E-02
1.440E 00	9.787E-02	2.970E-02
1.480E 00	1.007E-01	2.465E-02
1.520E 00	9.520E-02	2.481E-02
1.560E 00	9.221E-02	2.738E-02
1.600E 00	1.019E-01	2.819E-02
1.640E 00	1.125E-01	3.051E-02
1.680E 00	1.041E-01	2.897E-02
1.720E 00	9.519E-02	3.158E-02
1.760E 00	9.678E-02	2.807E-02
1.800E 00	9.940E-02	2.841E-02
1.850E 00	8.840E-02	2.630E-02
1.910E 00	5.906E-02	2.485E-02
1.970E 00	6.306E-02	2.276E-02
2.030E 00	7.574E-02	2.395E-02
2.090E 00	6.155E-02	2.592E-02
2.150E 00	3.042E-02	2.894E-02
2.210E 00	1.499E-02	2.391E-02
2.270E 00	2.468E-02	2.030E-02
2.330E 00	4.826E-02	1.920E-02
2.390E 00	5.695E-02	1.795E-02
2.450E 00	7.422E-02	1.956E-02
2.510E 00	2.092E-01	2.370E-02
2.570E 00	4.242E-01	2.545E-02
2.630E 00	4.977E-01	2.348E-02
2.690E 00	3.653E-01	1.701E-02
2.750E 00	1.832E-01	1.104E-02
2.810E 00	7.944E-02	8.373E-03
2.870E 00	4.856E-02	7.462E-03
2.930E 00	4.679E-02	6.917E-03
2.990E 00	3.196E-02	6.616E-03
3.050E 00	2.468E-02	6.432E-03
3.110E 00	2.481E-02	6.339E-03
3.180E 00	2.869E-02	5.843E-03
3.260E 00	2.815E-02	6.183E-03
3.340E 00	1.972E-02	6.275E-03
3.420E 00	1.247E-02	6.354E-03
3.500E 00	1.699E-02	6.332E-03
3.580E 00	1.751E-02	5.729E-03
3.660E 00	1.702E-02	5.669E-03
3.740E 00	2.262E-02	5.002E-03
3.820E 00	1.955E-02	5.073E-03
3.900E 00	1.828E-02	5.314E-03
3.980E 00	3.102E-02	4.929E-03
4.060E 00	4.435E-02	4.926E-03
4.140E 00	4.609E-02	4.487E-03
4.220E 00	3.752E-02	4.726E-03
4.300E 00	2.505E-02	4.756E-03
4.380E 00	1.706E-02	4.145E-03
4.460E 00	1.513E-02	3.702E-03
4.540E 00	1.441E-02	3.532E-03
4.630E 00	1.265E-02	3.284E-03
4.730E 00	1.402E-02	3.378E-03
4.830E 00	1.588E-02	3.127E-03
4.930E 00	1.404E-02	3.160E-03
5.030E 00	1.053E-02	2.979E-03
5.130E 00	7.471E-03	2.768E-03
5.230E 00	6.897E-03	2.681E-03
5.330E 00	8.191E-03	2.455E-03
5.430E 00	8.067E-03	2.389E-03
5.530E 00	6.904E-03	2.216E-03
5.630E 00	7.129E-03	1.962E-03
5.730E 00	7.588E-03	1.800E-03
5.830E 00	6.349E-03	1.588E-03
5.930E 00	4.187E-03	1.484E-03
6.030E 00	3.138E-03	1.294E-03
6.130E 00	3.175E-03	1.171E-03
6.230E 00	2.956E-03	1.124E-03
6.330E 00	1.908E-03	1.012E-03
6.440E 00	7.288E-04	8.630E-04
6.560E 00	2.165E-04	7.836E-04
6.680E 00	4.609E-04	6.561E-04
6.800E 00	6.836E-04	5.513E-04
6.920E 00	5.614E-04	4.722E-04
7.040E 00	1.863E-04	3.759E-04
7.160E 00	-9.937E-05	3.183E-04
7.280E 00	-8.975E-05	2.909E-04
7.400E 00	9.014E-05	2.754E-04
7.520E 00	2.192E-04	2.336E-04
7.640E 00	2.721E-04	2.094E-04
7.760E 00	2.543E-04	1.914E-04
7.890E 00	1.917E-04	1.831E-04
8.030E 00	8.224E-05	1.752E-04
8.170E 00	-1.250E-05	1.539E-04
8.310E 00	-3.968E-05	1.271E-04
8.450E 00	-6.339E-06	1.104E-04
8.590E 00	4.217E-05	9.839E-05
8.730E 00	8.074E-05	9.304E-05
8.870E 00	1.155E-04	8.360E-05
9.010E 00	1.334E-04	7.733E-05
9.150E 00	1.271E-04	6.744E-05
9.300E 00	7.004E-05	5.866E-05
9.460E 00	1.409E-05	4.568E-05
9.620E 00	-8.214E-06	2.902E-05
9.780E 00	-2.641E-06	2.030E-05
9.940E 00	9.168E-06	1.558E-05
1.010E 01	1.789E-05	1.451E-05
1.026E 01	2.669E-05	1.486E-05
1.042E 01	3.334E-05	1.947E-05
1.058E 01	3.323E-05	1.994E-05

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	2.071E-02	1.308E-02
4.000E-01 - 5.000E-01	2.440E-02	1.144E-02
5.000E-01 - 6.000E-01	9.659E-02	8.301E-03
6.000E-01 - 7.000E-01	4.878E-02	6.198E-03
7.000E-01 - 8.000E-01	2.427E-02	4.575E-03
8.000E-01 - 1.000E 00	6.699E-02	7.192E-03
1.000E 00 - 1.200E 00	2.171E-02	5.942E-03
1.200E 00 - 1.400E 00	1.683E-02	5.920E-03
1.400E 00 - 1.600E 00	1.925E-02	5.397E-03
1.600E 00 - 1.800E 00	2.040E-02	5.890E-03
1.800E 00 - 2.000E 00	1.426E-02	5.017E-03
2.000E 00 - 2.500E 00	2.680E-02	1.123E-02
2.500E 00 - 3.000E 00	1.093E-01	7.213E-03
3.000E 00 - 3.500E 00	1.129E-02	3.127E-03
3.500E 00 - 4.000E 00	1.002E-02	2.694E-03
4.000E 00 - 4.500E 00	1.550E-02	2.235E-03
4.500E 00 - 5.000E 00	7.043E-03	1.636E-03
5.000E 00 - 6.000E 00	7.173E-03	2.197E-03
6.000E 00 - 7.000E 00	1.365E-03	8.409E-04
7.000E 00 - 8.000E 00	1.222E-04	2.523E-04
8.000E 00 - 9.000E 00	4.006E-05	1.154E-04
9.000E 00 - 1.000E 01	4.171E-05	4.229E-05

ORNL-DWG 74-13105

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 7.00 TO 8.02 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	2.257E-01	2.041E-01	2.810E 00	8.521E-02	1.179E-02
3.175E-01	2.074E-01	1.819E-01	2.870E 00	5.146E-02	1.107E-02
3.325E-01	1.933E-01	1.505E-01	2.930E 00	5.222E-02	1.030E-02
3.475E-01	2.233E-01	1.403E-01	2.990E 00	4.035E-02	1.081E-02
3.625E-01	2.927E-01	1.314E-01	3.050E 00	2.361E-02	1.147E-02
3.775E-01	2.720E-01	1.367E-01	3.110E 00	2.727E-02	1.131E-02
3.925E-01	1.729E-01	1.425E-01	3.180E 00	4.016E-02	8.363E-03
4.100E-01	1.227E-01	1.413E-01	3.260E 00	3.747E-02	9.762E-03
4.300E-01	1.332E-01	1.350E-01	3.340E 00	2.769E-02	8.893E-03
4.500E-01	1.680E-01	1.339E-01	3.420E 00	1.708E-02	9.903E-03
4.700E-01	3.136E-01	1.339E-01	3.500E 00	1.831E-02	9.537E-03
4.900E-01	5.118E-01	1.291E-01	3.580E 00	3.008E-02	9.848E-03
5.100E-01	7.476E-01	1.310E-01	3.660E 00	3.419E-02	8.246E-03
5.300E-01	1.046E 00	1.145E-01	3.740E 00	3.422E-02	8.221E-03
5.500E-01	1.239E 00	8.765E-02	3.820E 00	4.131E-02	8.016E-03
5.700E-01	1.256E 00	8.783E-02	3.900E 00	4.750E-02	8.084E-03
5.900E-01	1.201E 00	7.394E-02	3.980E 00	4.753E-02	8.446E-03
6.100E-01	1.045E 00	7.838E-02	4.060E 00	5.147E-02	8.097E-03
6.300E-01	7.280E-01	7.475E-02	4.140E 00	5.673E-02	7.625E-03
6.500E-01	4.005E-01	7.498E-02	4.220E 00	4.800E-02	6.708E-03
6.700E-01	2.142E-01	6.982E-02	4.300E 00	2.811E-02	7.103E-03
6.900E-01	1.597E-01	6.150E-02	4.380E 00	1.508E-02	7.495E-03
7.100E-01	1.471E-01	5.667E-02	4.460E 00	1.459E-02	6.777E-03
7.300E-01	1.552E-01	5.239E-02	4.540E 00	1.740E-02	6.448E-03
7.500E-01	2.175E-01	4.761E-02	4.630E 00	1.586E-02	6.169E-03
7.700E-01	3.435E-01	4.747E-02	4.730E 00	1.648E-02	5.645E-03
7.900E-01	4.889E-01	4.658E-02	4.830E 00	2.220E-02	5.421E-03
8.100E-01	5.691E-01	4.650E-02	4.930E 00	2.441E-02	5.511E-03
8.300E-01	5.472E-01	4.612E-02	5.030E 00	2.117E-02	5.350E-03
8.500E-01	4.662E-01	4.493E-02	5.130E 00	1.660E-02	5.205E-03
8.700E-01	3.885E-01	4.744E-02	5.230E 00	1.438E-02	4.637E-03
8.900E-01	3.364E-01	4.766E-02	5.330E 00	1.259E-02	4.047E-03
9.100E-01	2.862E-01	4.406E-02	5.430E 00	1.059E-02	4.329E-03
9.300E-01	2.260E-01	3.805E-02	5.530E 00	1.164E-02	4.298E-03
9.500E-01	1.729E-01	4.057E-02	5.630E 00	1.591E-02	3.896E-03
9.700E-01	1.456E-01	4.026E-02	5.730E 00	1.794E-02	3.727E-03
1.000E 00	1.212E-01	4.135E-02	5.830E 00	1.649E-02	3.390E-03
1.040E 00	7.614E-02	3.697E-02	5.930E 00	1.312E-02	3.078E-03
1.080E 00	9.708E-02	3.721E-02	6.030E 00	1.002E-02	2.981E-03
1.120E 00	1.353E-01	3.115E-02	6.130E 00	7.842E-03	2.494E-03
1.160E 00	1.181E-01	3.267E-02	6.230E 00	7.180E-03	2.470E-03
1.200E 00	1.045E-01	3.261E-02	6.330E 00	7.374E-03	2.282E-03
1.240E 00	9.507E-02	3.492E-02	6.440E 00	6.877E-03	1.833E-03
1.280E 00	9.395E-02	3.822E-02	6.560E 00	4.626E-03	1.422E-03
1.320E 00	9.036E-02	3.614E-02	6.680E 00	2.316E-03	1.232E-03
1.360E 00	9.305E-02	3.750E-02	6.800E 00	1.231E-03	1.162E-03
1.400E 00	1.108E-01	3.751E-02	6.920E 00	1.060E-03	1.038E-03
1.440E 00	1.115E-01	3.509E-02	7.040E 00	1.179E-03	8.051E-04
1.480E 00	9.692E-02	3.324E-02	7.160E 00	1.169E-03	5.772E-04
1.520E 00	9.827E-02	3.517E-02	7.280E 00	8.386E-04	4.434E-04
1.560E 00	9.912E-02	3.278E-02	7.400E 00	4.382E-04	3.836E-04
1.600E 00	1.003E-01	3.331E-02	7.520E 00	1.472E-04	2.762E-04
1.640E 00	1.060E-01	3.364E-02	7.640E 00	6.401E-05	2.197E-04
1.680E 00	1.057E-01	3.741E-02	7.760E 00	8.312E-05	1.974E-04
1.720E 00	1.030E-01	3.803E-02	7.890E 00	1.070E-04	1.921E-04
1.760E 00	1.022E-01	3.853E-02	8.030E 00	1.273E-04	1.701E-04
1.800E 00	9.870E-02	3.526E-02	8.170E 00	1.562E-04	1.526E-04
1.850E 00	9.927E-02	3.459E-02	8.310E 00	1.574E-04	1.394E-04
1.910E 00	9.497E-02	2.848E-02	8.450E 00	1.000E-04	1.149E-04
1.970E 00	6.477E-02	3.222E-02	8.590E 00	2.142E-05	1.101E-04
2.030E 00	5.223E-02	3.280E-02	8.730E 00	-3.334E-05	1.137E-04
2.090E 00	6.055E-02	3.471E-02	8.870E 00	-5.984E-05	1.239E-04
2.150E 00	5.784E-02	3.019E-02	9.010E 00	-3.669E-05	1.121E-04
2.210E 00	3.677E-02	2.743E-02	9.150E 00	6.701E-06	1.027E-04
2.270E 00	4.689E-02	2.916E-02	9.300E 00	4.650E-05	8.453E-05
2.330E 00	7.593E-02	2.337E-02	9.460E 00	7.384E-05	8.700E-05
2.390E 00	6.718E-02	2.349E-02	9.620E 00	9.363E-05	8.769E-05
2.450E 00	8.249E-02	2.530E-02	9.780E 00	1.024E-04	9.322E-05
2.510E 00	2.348E-01	2.856E-02	9.940E 00	1.007E-04	8.592E-05
2.570E 00	4.545E-01	3.309E-02	1.010E 01	9.414E-05	7.463E-05
2.630E 00	5.215E-01	3.148E-02	1.026E 01	2.462E-05	1.357E-04
2.690E 00	3.897E-01	2.162E-02	1.042E 01	-6.609E-06	1.688E-04
2.750E 00	2.034E-01	1.658E-02	1.058E 01	-7.031E-06	1.728E-04

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	2.271E-02	1.527E-02
4.000E-01 - 5.000E-01	2.526E-02	1.347E-02
5.000E-01 - 6.000E-01	1.096E-01	9.920E-03
6.000E-01 - 7.000E-01	5.091E-02	7.176E-03
7.000E-01 - 8.000E-01	2.702E-02	5.021E-03
8.000E-01 - 1.000E 00	6.519E-02	8.729E-03
1.000E 00 - 1.200E 00	2.144E-02	6.998E-03
1.200E 00 - 1.400E 00	1.909E-02	7.292E-03
1.400E 00 - 1.600E 00	2.043E-02	6.847E-03
1.600E 00 - 1.800E 00	2.069E-02	7.300E-03
1.800E 00 - 2.000E 00	1.765E-02	6.356E-03
2.000E 00 - 2.500E 00	3.296E-02	1.416E-02
2.500E 00 - 3.000E 00	1.179E-01	9.761E-03
3.000E 00 - 3.500E 00	1.422E-02	4.944E-03
3.500E 00 - 4.000E 00	1.869E-02	4.275E-03
4.000E 00 - 4.500E 00	1.811E-02	3.677E-03
4.500E 00 - 5.000E 00	9.701E-03	2.899E-03
5.000E 00 - 6.000E 00	1.481E-02	4.150E-03
6.000E 00 - 7.000E 00	4.982E-03	1.779E-03
7.000E 00 - 8.000E 00	4.671E-04	3.648E-04
8.000E 00 - 9.000E 00	5.839E-05	1.293E-04
9.000E 00 - 1.000E 01	6.123E-05	9.182E-05

ORNL-DWG 74-13106

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 8.02 TO 9.01 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	2.368E-01	1.833E-01	2.810E 00	1.010E-01	1.444E-02
3.175E-01	1.479E-01	1.778E-01	2.870E 00	7.039E-02	1.367E-02
3.325E-01	2.101E-01	1.527E-01	2.930E 00	4.720E-02	1.447E-02
3.475E-01	2.706E-01	1.423E-01	2.990E 00	3.063E-02	1.411E-02
3.625E-01	2.063E-01	1.506E-01	3.050E 00	4.119E-02	1.333E-02
3.775E-01	1.495E-01	1.563E-01	3.110E 00	3.959E-02	1.310E-02
3.925E-01	1.320E-01	1.446E-01	3.180E 00	2.869E-02	1.309E-02
4.100E-01	1.515E-01	1.563E-01	3.260E 00	1.555E-02	1.338E-02
4.300E-01	2.333E-01	1.538E-01	3.340E 00	2.356E-02	1.396E-02
4.500E-01	2.139E-01	1.582E-01	3.420E 00	3.989E-02	1.125E-02
4.700E-01	2.531E-01	1.591E-01	3.500E 00	3.860E-02	1.265E-02
4.900E-01	6.613E-01	1.568E-01	3.580E 00	4.237E-02	1.135E-02
5.100E-01	1.048E 00	1.331E-01	3.660E 00	5.659E-02	1.123E-02
5.300E-01	1.066E 00	1.256E-01	3.740E 00	5.390E-02	1.052E-02
5.500E-01	1.087E 00	1.038E-01	3.820E 00	4.202E-02	1.138E-02
5.700E-01	1.258E 00	9.246E-02	3.900E 00	4.470E-02	1.081E-02
5.900E-01	1.212E 00	8.214E-02	3.980E 00	5.436E-02	1.129E-02
6.100E-01	8.728E-01	8.269E-02	4.080E 00	5.846E-02	1.018E-02
6.300E-01	5.165E-01	8.202E-02	4.180E 00	5.775E-02	9.631E-03
6.500E-01	2.985E-01	7.731E-02	4.220E 00	4.993E-02	9.082E-03
6.700E-01	1.916E-01	6.961E-02	4.300E 00	3.800E-02	9.015E-03
6.900E-01	1.374E-01	5.184E-02	4.380E 00	2.890E-02	9.360E-03
7.100E-01	1.236E-01	5.899E-02	4.460E 00	2.481E-02	8.790E-03
7.300E-01	1.637E-01	5.953E-02	4.540E 00	2.684E-02	8.139E-03
7.500E-01	2.740E-01	5.402E-02	4.630E 00	3.798E-02	8.038E-03
7.700E-01	4.167E-01	4.992E-02	4.730E 00	3.027E-02	8.156E-03
7.900E-01	5.170E-01	4.859E-02	4.830E 00	2.698E-02	8.432E-03
8.100E-01	5.266E-01	5.197E-02	4.930E 00	2.902E-02	7.766E-03
8.300E-01	4.808E-01	5.434E-02	5.030E 00	2.811E-02	7.324E-03
8.500E-01	4.342E-01	4.937E-02	5.130E 00	2.032E-02	7.387E-03
8.700E-01	3.907E-01	4.405E-02	5.230E 00	1.478E-02	7.863E-03
8.900E-01	3.288E-01	4.314E-02	5.330E 00	1.351E-02	7.815E-03
9.100E-01	2.500E-01	4.193E-02	5.430E 00	1.616E-02	6.587E-03
9.300E-01	1.816E-01	4.008E-02	5.530E 00	2.103E-02	6.424E-03
9.500E-01	1.445E-01	4.325E-02	5.630E 00	2.447E-02	5.979E-03
9.700E-01	1.332E-01	4.260E-02	5.730E 00	2.229E-02	5.723E-03
1.000E 00	1.111E-01	4.450E-02	5.830E 00	1.804E-02	6.008E-03
1.040E 00	6.778E-02	4.345E-02	5.930E 00	1.492E-02	5.166E-03
1.080E 00	8.142E-02	4.358E-02	6.030E 00	1.435E-02	4.661E-03
1.120E 00	1.089E-01	3.651E-02	6.130E 00	1.320E-02	3.999E-03
1.160E 00	1.069E-01	3.877E-02	6.230E 00	1.072E-02	3.566E-03
1.200E 00	9.565E-02	3.620E-02	6.330E 00	9.042E-03	3.183E-03
1.240E 00	8.881E-02	3.957E-02	6.440E 00	7.904E-03	2.894E-03
1.280E 00	8.167E-02	4.135E-02	6.560E 00	5.533E-03	2.825E-03
1.320E 00	7.381E-02	3.942E-02	6.600E 00	4.282E-03	2.577E-03
1.360E 00	3.391E-02	4.074E-02	6.800E 00	5.234E-03	2.265E-03
1.400E 00	1.091E-01	3.928E-02	6.920E 00	5.862E-03	1.908E-03
1.440E 00	9.039E-02	3.729E-02	7.040E 00	4.835E-03	1.594E-03
1.480E 00	7.494E-02	4.050E-02	7.160E 00	3.356E-03	1.428E-03
1.520E 00	8.859E-02	3.896E-02	7.280E 00	2.517E-03	1.158E-03
1.560E 00	9.502E-02	4.247E-02	7.400E 00	2.209E-03	8.472E-04
1.600E 00	7.958E-02	3.648E-02	7.520E 00	1.797E-03	5.704E-04
1.640E 00	8.683E-02	3.963E-02	7.640E 00	1.118E-03	4.545E-04
1.680E 00	1.174E-01	3.663E-02	7.760E 00	4.610E-04	3.581E-04
1.720E 00	1.303E-01	3.430E-02	7.890E 00	1.377E-04	2.640E-04
1.760E 00	1.168E-01	3.804E-02	8.030E 00	1.110E-04	2.119E-04
1.800E 00	1.001E-01	3.937E-02	8.170E 00	1.468E-04	2.053E-04
1.850E 00	8.032E-02	3.204E-02	8.310E 00	8.018E-05	2.002E-04
1.910E 00	5.700E-02	3.772E-02	8.450E 00	5.625E-05	1.589E-04
1.970E 00	5.426E-02	3.374E-02	8.590E 00	7.622E-05	1.578E-04
2.030E 00	6.441E-02	3.213E-02	8.730E 00	1.269E-04	1.582E-04
2.090E 00	6.489E-02	3.638E-02	8.870E 00	1.428E-04	1.117E-04
2.150E 00	6.643E-02	3.262E-02	9.010E 00	1.219E-04	1.024E-04
2.210E 00	2.732E-02	3.314E-02	9.150E 00	9.378E-05	1.035E-04
2.270E 00	3.796E-02	3.026E-02	9.300E 00	4.816E-05	9.085E-05
2.330E 00	6.380E-02	2.565E-02	9.460E 00	1.661E-05	5.792E-05
2.390E 00	8.197E-02	2.857E-02	9.620E 00	2.989E-06	2.717E-05
2.450E 00	1.199E-01	2.866E-02	9.780E 00	5.525E-06	1.564E-05
2.510E 00	2.731E-01	3.211E-02	9.940E 00	9.443E-06	1.217E-05
2.570E 00	4.735E-01	3.674E-02	1.010E 01	1.112E-05	1.168E-05
2.630E 00	6.972E-01	3.315E-02	1.026E 01	1.372E-05	1.313E-05
2.690E 00	3.391E-01	2.571E-02	1.042E 01	1.627E-05	1.505E-05
2.750E 00	1.761E-01	1.898E-02	1.058E 01	1.697E-05	1.573E-05

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	1.892E-02	1.574E-02
4.000E-01 - 5.000E-01	3.038E-02	1.562E-02
5.000E-01 - 6.000E-01	1.124E-01	1.079E-02
6.000E-01 - 7.000E-01	4.042E-02	7.473E-03
7.000E-01 - 8.000E-01	2.987E-02	5.436E-03
8.000E-01 - 1.000E 00	5.971E-02	9.087E-03
1.000E 00 - 1.200E 00	1.862E-02	8.132E-03
1.200E 00 - 1.400E 00	1.756E-02	7.980E-03
1.400E 00 - 1.600E 00	1.771E-02	7.921E-03
1.600E 00 - 1.800E 00	2.176E-02	7.470E-03
1.800E 00 - 2.000E 00	1.343E-02	7.067E-03
2.000E 00 - 2.500E 00	3.521E-02	1.552E-02
2.500E 00 - 3.000E 00	1.160E-01	1.132E-02
3.000E 00 - 3.500E 00	1.590E-02	6.482E-03
3.500E 00 - 4.000E 00	2.398E-02	5.592E-03
4.000E 00 - 4.500E 00	2.176E-02	4.707E-03
4.500E 00 - 5.000E 00	1.452E-02	4.047E-03
5.000E 00 - 6.000E 00	1.902E-02	6.502E-03
6.000E 00 - 7.000E 00	8.000E-03	2.974E-03
7.000E 00 - 8.000E 00	1.871E-03	7.833E-04
8.000E 00 - 9.000E 00	1.079E-04	1.666E-04
9.000E 00 - 1.000E 01	3.576E-05	5.512E-05

ORNL-DWG 74-13107

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 9.01 TO 9.97 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	7.319E-02	1.913E-01	2.610E 00	6.788E-02	1.581E-02
3.175E-01	1.199E-01	1.706E-01	2.870E 00	4.251E-02	1.717E-02
3.325E-01	7.552E-02	1.701E-01	2.930E 00	4.207E-02	1.626E-02
3.475E-01	3.492E-02	1.545E-01	2.990E 00	4.053E-02	1.494E-02
3.625E-01	6.484E-02	1.613E-01	3.050E 00	3.581E-02	1.442E-02
3.775E-01	1.086E-01	1.631E-01	3.110E 00	3.541E-02	1.466E-02
3.925E-01	9.084E-02	1.691E-01	3.180E 00	3.458E-02	1.279E-02
4.100E-01	5.366E-02	1.663E-01	3.260E 00	2.040E-02	1.420E-02
4.300E-01	6.201E-02	1.569E-01	3.340E 00	1.984E-02	1.446E-02
4.500E-01	1.707E-01	1.543E-01	3.420E 00	1.936E-02	1.338E-02
4.700E-01	4.499E-01	1.373E-01	3.500E 00	2.937E-02	1.322E-02
4.900E-01	7.196E-01	1.328E-01	3.580E 00	3.282E-02	1.265E-02
5.100E-01	7.974E-01	1.349E-01	3.660E 00	3.498E-02	1.392E-02
5.300E-01	8.705E-01	1.221E-01	3.740E 00	4.787E-02	1.328E-02
5.500E-01	1.077E 00	1.038E-01	3.820E 00	5.462E-02	1.102E-02
5.700E-01	1.153E 00	9.280E-02	3.900E 00	5.039E-02	1.109E-02
5.900E-01	9.199E-01	8.595E-02	3.980E 00	5.173E-02	1.235E-02
6.100E-01	5.738E-01	8.946E-02	4.060E 00	5.354E-02	1.168E-02
6.300E-01	3.404E-01	8.584E-02	4.140E 00	4.557E-02	1.129E-02
6.500E-01	2.186E-01	7.420E-02	4.220E 00	3.668E-02	1.026E-02
6.700E-01	1.537E-01	6.937E-02	4.300E 00	3.071E-02	9.322E-03
6.900E-01	1.283E-01	6.504E-02	4.380E 00	2.472E-02	1.010E-02
7.100E-01	1.440E-01	6.029E-02	4.460E 00	1.827E-02	1.015E-02
7.300E-01	1.922E-01	6.235E-02	4.540E 00	1.405E-02	9.490E-03
7.500E-01	2.697E-01	5.933E-02	4.630E 00	1.520E-02	9.283E-03
7.700E-01	3.650E-01	5.887E-02	4.730E 00	2.368E-02	8.417E-03
7.900E-01	4.520E-01	5.781E-02	4.830E 00	2.702E-02	8.649E-03
8.100E-01	4.943E-01	5.547E-02	4.930E 00	2.562E-02	9.056E-03
8.300E-01	4.777E-01	5.280E-02	5.030E 00	2.759E-02	8.619E-03
8.500E-01	4.154E-01	4.724E-02	5.130E 00	3.021E-02	8.920E-03
8.700E-01	3.331E-01	4.201E-02	5.230E 00	2.694E-02	8.107E-03
8.900E-01	2.629E-01	4.035E-02	5.330E 00	1.931E-02	7.876E-03
9.100E-01	2.129E-01	3.829E-02	5.430E 00	1.323E-02	8.019E-03
9.300E-01	1.688E-01	3.685E-02	5.530E 00	1.316E-02	7.565E-03
9.500E-01	1.184E-01	3.931E-02	5.630E 00	1.613E-02	6.964E-03
9.700E-01	7.488E-02	4.183E-02	5.730E 00	1.606E-02	6.175E-03
1.000E 00	3.956E-02	4.276E-02	5.830E 00	1.478E-02	6.378E-03
1.040E 00	4.366E-02	4.111E-02	5.930E 00	1.574E-02	5.970E-03
1.080E 00	6.645E-02	3.686E-02	6.030E 00	1.534E-02	5.011E-03
1.120E 00	8.164E-02	3.354E-02	6.130E 00	1.035E-02	4.504E-03
1.160E 00	5.983E-02	3.484E-02	6.230E 00	5.725E-03	4.492E-03
1.200E 00	6.149E-02	3.427E-02	6.330E 00	4.885E-03	4.182E-03
1.240E 00	8.055E-02	3.098E-02	6.440E 00	7.140E-03	3.947E-03
1.280E 00	7.289E-02	3.331E-02	6.560E 00	9.304E-03	3.445E-03
1.320E 00	6.985E-02	3.522E-02	6.680E 00	8.276E-03	2.934E-03
1.360E 00	8.745E-02	4.056E-02	6.800E 00	4.917E-03	2.871E-03
1.400E 00	9.101E-02	4.052E-02	6.920E 00	3.460E-03	2.536E-03
1.440E 00	7.379E-02	4.078E-02	7.040E 00	4.731E-03	2.031E-03
1.480E 00	5.308E-02	3.822E-02	7.160E 00	5.792E-03	1.805E-03
1.520E 00	5.260E-02	3.679E-02	7.280E 00	4.754E-03	1.395E-03
1.560E 00	6.241E-02	3.570E-02	7.400E 00	2.723E-03	1.194E-03
1.600E 00	6.293E-02	3.398E-02	7.520E 00	1.246E-03	1.151E-03
1.640E 00	5.352E-02	3.038E-02	7.640E 00	6.312E-04	9.494E-04
1.680E 00	5.175E-02	3.435E-02	7.760E 00	4.071E-04	6.129E-04
1.720E 00	6.615E-02	3.646E-02	7.890E 00	3.689E-04	4.745E-04
1.760E 00	7.998E-02	3.544E-02	8.030E 00	2.827E-04	5.258E-04
1.800E 00	7.621E-02	2.974E-02	8.170E 00	2.900E-04	4.308E-04
1.850E 00	5.626E-02	3.110E-02	8.310E 00	2.430E-04	3.201E-04
1.910E 00	4.698E-02	3.096E-02	8.450E 00	2.192E-04	2.327E-04
1.970E 00	4.778E-02	2.966E-02	8.590E 00	1.955E-04	1.936E-04
2.030E 00	4.470E-02	3.136E-02	8.730E 00	1.311E-04	1.674E-04
2.090E 00	4.390E-02	2.881E-02	8.870E 00	4.863E-05	1.472E-04
2.150E 00	3.865E-02	3.430E-02	9.010E 00	-8.632E-06	1.088E-04
2.210E 00	3.039E-02	2.491E-02	9.150E 00	-3.411E-05	6.730E-05
2.270E 00	3.760E-02	2.714E-02	9.300E 00	-2.250E-05	4.922E-05
2.330E 00	4.827E-02	2.719E-02	9.460E 00	-9.882E-06	4.137E-05
2.390E 00	5.283E-02	2.736E-02	9.620E 00	-8.431E-07	3.556E-05
2.450E 00	9.731E-02	2.812E-02	9.780E 00	1.450E-05	3.380E-05
2.510E 00	2.271E-01	2.627E-02	9.940E 00	3.457E-05	3.714E-05
2.570E 00	3.593E-01	3.187E-02	1.010E 01	5.782E-05	4.307E-05
2.630E 00	3.552E-01	3.183E-02	1.026E 01	8.451E-05	5.044E-05
2.690E 00	2.469E-01	2.207E-02	1.042E 01	9.911E-05	6.023E-05
2.750E 00	1.367E-01	1.790E-02	1.058E 01	9.606E-05	6.228E-05

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	8.193E-03	1.670E-02
4.000E-01 - 5.000E-01	2.903E-02	1.494E-02
5.000E-01 - 6.000E-01	9.594E-02	1.079E-02
6.000E-01 - 7.000E-01	2.859E-02	7.671E-03
7.000E-01 - 8.000E-01	2.847E-02	5.984E-03
8.000E-01 - 1.000E 00	5.206E-02	8.744E-03
1.000E 00 - 1.200E 00	1.207E-02	7.393E-03
1.200E 00 - 1.400E 00	1.555E-02	7.098E-03
1.400E 00 - 1.600E 00	1.268E-02	7.556E-03
1.600E 00 - 1.800E 00	1.282E-02	7.091E-03
1.800E 00 - 2.000E 00	1.052E-02	6.114E-03
2.000E 00 - 2.500E 00	2.736E-02	1.425E-02
2.500E 00 - 3.000E 00	8.664E-02	1.087E-02
3.000E 00 - 3.500E 00	1.428E-02	6.967E-03
3.500E 00 - 4.000E 00	2.190E-02	6.217E-03
4.000E 00 - 4.500E 00	1.779E-02	5.269E-03
4.500E 00 - 5.000E 00	1.086E-02	4.477E-03
5.000E 00 - 6.000E 00	1.910E-02	7.400E-03
6.000E 00 - 7.000E 00	7.343E-03	3.687E-03
7.000E 00 - 8.000E 00	2.415E-03	1.183E-03
8.000E 00 - 9.000E 00	1.869E-04	2.674E-04
9.000E 00 - 1.000E 01	-4.198E-06	4.830E-05

ORNL-DWG 74-13108

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 9.97 TO 12.53 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	4.369E-02	1.722E-01	2.810E 00	2.197E-02	1.280E-02
3.175E-01	5.318E-02	1.696E-01	2.870E 00	8.351E-03	1.220E-02
3.325E-01	8.979E-02	1.639E-01	2.930E 00	7.456E-03	1.071E-02
3.475E-01	1.128E-01	1.668E-01	2.990E 00	1.019E-02	1.094E-02
3.625E-01	8.101E-02	1.701E-01	3.050E 00	1.462E-02	1.148E-02
3.775E-01	1.281E-02	1.790E-01	3.110E 00	2.320E-02	1.098E-02
3.925E-01	-1.620E-02	1.800E-01	3.180E 00	2.849E-02	9.606E-03
4.100E-01	3.267E-02	1.825E-01	3.260E 00	2.384E-02	1.004E-02
4.300E-01	1.128E-01	1.760E-01	3.340E 00	2.436E-02	1.002E-02
4.500E-01	1.651E-01	1.703E-01	3.420E 00	2.773E-02	9.558E-03
4.700E-01	2.709E-01	1.590E-01	3.500E 00	2.256E-02	1.053E-02
4.900E-01	4.647E-01	1.467E-01	3.580E 00	2.052E-02	1.001E-02
5.100E-01	6.336E-01	1.347E-01	3.660E 00	2.341E-02	9.772E-03
5.300E-01	7.569E-01	1.204E-01	3.740E 00	2.109E-02	1.092E-02
5.500E-01	8.955E-01	9.835E-02	3.820E 00	1.888E-02	1.142E-02
5.700E-01	9.469E-01	9.085E-02	3.900E 00	2.094E-02	1.007E-02
5.900E-01	7.782E-01	8.853E-02	3.980E 00	3.033E-02	9.991E-03
6.100E-01	4.898E-01	8.084E-02	4.060E 00	4.159E-02	9.533E-03
6.300E-01	2.729E-01	8.758E-02	4.140E 00	3.917E-02	8.459E-03
6.500E-01	1.924E-01	8.604E-02	4.220E 00	2.517E-02	7.923E-03
6.700E-01	1.876E-01	7.487E-02	4.300E 00	1.772E-02	7.814E-03
6.900E-01	1.931E-01	6.432E-02	4.380E 00	1.849E-02	7.372E-03
7.100E-01	1.867E-01	6.395E-02	4.460E 00	1.587E-02	7.637E-03
7.300E-01	1.968E-01	6.402E-02	4.540E 00	8.825E-03	7.878E-03
7.500E-01	2.483E-01	6.669E-02	4.630E 00	5.668E-03	7.891E-03
7.700E-01	3.352E-01	6.366E-02	4.730E 00	1.032E-02	6.771E-03
7.900E-01	4.172E-01	5.793E-02	4.830E 00	1.592E-02	6.501E-03
8.100E-01	4.520E-01	5.101E-02	4.930E 00	1.597E-02	7.024E-03
8.300E-01	4.321E-01	4.688E-02	5.030E 00	1.383E-02	7.214E-03
8.500E-01	3.706E-01	4.447E-02	5.130E 00	1.356E-02	6.441E-03
8.700E-01	3.143E-01	4.211E-02	5.230E 00	1.346E-02	6.243E-03
8.900E-01	2.594E-01	4.343E-02	5.330E 00	9.221E-03	6.313E-03
9.100E-01	2.129E-01	4.121E-02	5.430E 00	4.963E-03	6.229E-03
9.300E-01	1.722E-01	3.841E-02	5.530E 00	4.099E-03	6.812E-03
9.500E-01	1.355E-01	3.737E-02	5.630E 00	7.526E-03	6.222E-03
9.700E-01	1.102E-01	3.779E-02	5.730E 00	1.098E-02	5.584E-03
1.000E 00	8.806E-02	4.005E-02	5.830E 00	1.197E-02	5.578E-03
1.040E 00	7.257E-02	3.487E-02	5.930E 00	9.774E-03	5.264E-03
1.080E 00	5.613E-02	3.268E-02	6.030E 00	7.659E-03	5.271E-03
1.120E 00	5.225E-02	3.468E-02	6.130E 00	6.079E-03	4.752E-03
1.160E 00	3.986E-02	3.214E-02	6.230E 00	5.484E-03	4.879E-03
1.200E 00	3.517E-02	3.221E-02	6.330E 00	5.260E-03	4.716E-03
1.240E 00	4.413E-02	2.926E-02	6.440E 00	6.429E-03	4.215E-03
1.280E 00	4.390E-02	3.239E-02	6.560E 00	7.077E-03	3.972E-03
1.320E 00	3.569E-02	3.050E-02	6.680E 00	4.700E-03	3.629E-03
1.360E 00	4.089E-02	3.049E-02	6.800E 00	1.860E-03	3.018E-03
1.400E 00	5.486E-02	3.078E-02	6.920E 00	6.318E-04	2.300E-03
1.440E 00	5.803E-02	2.732E-02	7.040E 00	1.602E-03	2.282E-03
1.480E 00	4.330E-02	2.905E-02	7.160E 00	2.735E-03	1.926E-03
1.520E 00	3.188E-02	3.167E-02	7.280E 00	2.661E-03	1.287E-03
1.560E 00	4.074E-02	3.300E-02	7.400E 00	1.721E-03	1.025E-03
1.600E 00	5.750E-02	2.716E-02	7.520E 00	1.100E-03	1.113E-03
1.640E 00	6.578E-02	2.867E-02	7.640E 00	1.048E-03	1.032E-03
1.680E 00	6.857E-02	2.728E-02	7.760E 00	9.958E-04	8.061E-04
1.720E 00	7.115E-02	2.898E-02	7.890E 00	7.285E-04	6.202E-04
1.760E 00	6.855E-02	2.989E-02	8.030E 00	2.367E-04	4.608E-04
1.800E 00	5.948E-02	2.892E-02	8.170E 00	-1.400E-04	4.371E-04
1.850E 00	4.412E-02	2.663E-02	8.310E 00	-1.773E-04	3.624E-04
1.910E 00	3.352E-02	2.444E-02	8.450E 00	-1.385E-04	2.362E-04
1.970E 00	3.284E-02	2.375E-02	8.590E 00	-6.782E-05	1.729E-04
2.030E 00	3.159E-02	2.503E-02	8.730E 00	2.949E-05	1.458E-04
2.090E 00	2.003E-02	2.665E-02	8.870E 00	8.813E-05	1.188E-04
2.150E 00	1.045E-02	2.472E-02	9.010E 00	8.823E-05	9.033E-05
2.210E 00	9.340E-03	2.589E-02	9.150E 00	5.905E-05	5.993E-05
2.270E 00	1.593E-02	2.160E-02	9.300E 00	2.971E-05	3.071E-05
2.330E 00	2.729E-02	1.747E-02	9.460E 00	2.053E-05	2.457E-05
2.390E 00	3.729E-02	1.639E-02	9.620E 00	2.009E-05	1.909E-05
2.450E 00	6.855E-02	1.979E-02	9.780E 00	1.475E-05	1.375E-05
2.510E 00	1.307E-01	2.233E-02	9.940E 00	9.750E-06	9.200E-06
2.570E 00	1.997E-01	2.494E-02	1.010E 01	7.768E-06	7.127E-06
2.630E 00	1.933E-01	2.104E-02	1.026E 01	5.528E-06	7.339E-06
2.690E 00	1.220E-01	1.623E-02	1.042E 01	4.986E-06	5.988E-06
2.750E 00	5.641E-02	1.634E-02	1.058E 01	4.764E-06	5.797E-06

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	5.465E-03	1.717E-02
4.000E-01 - 5.000E-01	2.097E-02	1.667E-02
5.000E-01 - 6.000E-01	7.987E-02	1.059E-02
6.000E-01 - 7.000E-01	2.688E-02	8.026E-03
7.000E-01 - 8.000E-01	2.769E-02	6.319E-03
8.000E-01 - 1.000E 00	5.117E-02	8.444E-03
1.000E 00 - 1.200E 00	1.124E-02	6.791E-03
1.200E 00 - 1.400E 00	8.367E-03	6.163E-03
1.400E 00 - 1.600E 00	9.141E-03	6.019E-03
1.600E 00 - 1.800E 00	1.337E-02	5.721E-03
1.800E 00 - 2.000E 00	7.764E-03	5.067E-03
2.000E 00 - 2.500E 00	1.527E-02	1.108E-02
2.500E 00 - 3.000E 00	4.264E-02	8.208E-03
3.000E 00 - 3.500E 00	1.181E-02	5.187E-03
3.500E 00 - 4.000E 00	1.105E-02	5.183E-03
4.000E 00 - 4.500E 00	1.329E-02	4.093E-03
4.500E 00 - 5.000E 00	5.823E-03	3.587E-03
5.000E 00 - 6.000E 00	9.840E-03	6.145E-03
6.000E 00 - 7.000E 00	4.794E-03	3.956E-03
7.000E 00 - 8.000E 00	1.519E-03	1.192E-03
8.000E 00 - 9.000E 00	-3.261E-05	2.584E-04
9.000E 00 - 1.000E 01	3.005E-05	3.073E-05

ORNL-DWG 74-13109

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 12.53 TO 15.06 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	1.824E-01	3.325E-01	2.810E 00	3.445E-02	1.970E-02
3.175E-01	2.355E-01	3.008E-01	2.870E 00	3.571E-02	1.677E-02
3.325E-01	1.945E-01	2.482E-01	2.930E 00	3.390E-02	1.464E-02
3.475E-01	1.090E-01	3.148E-01	2.990E 00	2.763E-02	1.528E-02
3.625E-01	1.156E-01	3.086E-01	3.050E 00	2.302E-02	1.687E-02
3.775E-01	2.080E-01	2.584E-01	3.110E 00	1.749E-02	1.485E-02
3.925E-01	2.701E-01	2.880E-01	3.180E 00	5.976E-03	1.347E-02
4.100E-01	2.429E-01	2.992E-01	3.260E 00	-5.960E-03	1.592E-02
4.300E-01	1.453E-01	2.816E-01	3.340E 00	-8.782E-03	1.511E-02
4.500E-01	1.381E-01	2.766E-01	3.420E 00	2.033E-03	1.344E-02
4.700E-01	3.651E-01	2.529E-01	3.500E 00	2.096E-02	1.267E-02
4.900E-01	6.581E-01	2.138E-01	3.580E 00	3.171E-02	1.250E-02
5.100E-01	7.903E-01	1.928E-01	3.660E 00	3.104E-02	1.386E-02
5.300E-01	8.490E-01	1.965E-01	3.740E 00	3.120E-02	1.369E-02
5.500E-01	9.172E-01	1.578E-01	3.820E 00	2.902E-02	1.389E-02
5.700E-01	8.443E-01	1.546E-01	3.900E 00	2.051E-02	1.340E-02
5.900E-01	6.137E-01	1.388E-01	3.980E 00	1.385E-02	1.226E-02
6.100E-01	4.107E-01	1.655E-01	4.060E 00	1.137E-02	1.175E-02
6.300E-01	3.220E-01	1.610E-01	4.140E 00	8.207E-03	1.301E-02
6.500E-01	3.065E-01	1.425E-01	4.220E 00	3.609E-03	1.184E-02
6.700E-01	2.886E-01	1.373E-01	4.300E 00	1.123E-03	9.751E-03
6.900E-01	2.500E-01	1.233E-01	4.380E 00	6.390E-03	9.774E-03
7.100E-01	2.143E-01	1.203E-01	4.460E 00	8.986E-03	9.939E-03
7.300E-01	2.264E-01	1.143E-01	4.540E 00	1.040E-02	9.888E-03
7.500E-01	3.035E-01	1.033E-01	4.630E 00	1.001E-02	9.838E-03
7.700E-01	4.012E-01	9.205E-02	4.730E 00	1.115E-02	9.671E-03
7.900E-01	4.654E-01	8.081E-02	4.830E 00	9.730E-03	8.765E-03
8.100E-01	4.719E-01	7.647E-02	4.930E 00	4.136E-03	8.243E-03
8.300E-01	4.369E-01	7.850E-02	5.030E 00	1.123E-03	8.830E-03
8.500E-01	3.862E-01	6.976E-02	5.130E 00	3.899E-03	9.126E-03
8.700E-01	3.361E-01	6.576E-02	5.230E 00	7.765E-03	8.656E-03
8.900E-01	3.000E-01	7.284E-02	5.330E 00	9.603E-03	8.253E-03
9.100E-01	2.704E-01	6.836E-02	5.430E 00	7.463E-03	7.460E-03
9.300E-01	2.326E-01	5.884E-02	5.530E 00	4.526E-03	6.819E-03
9.500E-01	1.853E-01	5.726E-02	5.630E 00	1.010E-03	6.725E-03
9.700E-01	1.487E-01	5.420E-02	5.730E 00	-1.521E-03	7.154E-03
1.000E 00	1.426E-01	5.514E-02	5.830E 00	-3.149E-03	6.235E-03
1.040E 00	2.026E-01	4.580E-02	5.930E 00	-2.196E-03	5.082E-03
1.080E 00	1.893E-01	5.161E-02	6.030E 00	6.506E-04	4.781E-03
1.120E 00	1.192E-01	4.674E-02	6.130E 00	3.998E-03	5.034E-03
1.160E 00	7.651E-02	5.111E-02	6.230E 00	6.159E-03	5.127E-03
1.200E 00	4.448E-02	4.779E-02	6.330E 00	6.872E-03	4.498E-03
1.240E 00	2.189E-02	5.331E-02	6.440E 00	5.580E-03	3.709E-03
1.280E 00	3.006E-02	5.977E-02	6.560E 00	1.772E-03	3.611E-03
1.320E 00	3.750E-02	5.563E-02	6.680E 00	-1.040E-03	3.710E-03
1.360E 00	3.534E-02	5.079E-02	6.800E 00	-1.482E-03	2.969E-03
1.400E 00	5.509E-02	5.100E-02	6.920E 00	-3.391E-04	2.498E-03
1.440E 00	7.117E-02	4.423E-02	7.040E 00	7.835E-04	2.294E-03
1.480E 00	6.685E-02	4.571E-02	7.160E 00	1.920E-03	2.136E-03
1.520E 00	7.721E-02	4.723E-02	7.280E 00	3.184E-03	1.898E-03
1.560E 00	8.336E-02	4.283E-02	7.400E 00	3.607E-03	1.718E-03
1.600E 00	6.964E-02	4.684E-02	7.520E 00	3.073E-03	1.732E-03
1.640E 00	7.788E-02	4.723E-02	7.640E 00	1.766E-03	1.407E-03
1.680E 00	1.198E-01	4.104E-02	7.760E 00	8.739E-04	1.227E-03
1.720E 00	1.496E-01	3.855E-02	7.890E 00	1.424E-04	1.267E-03
1.760E 00	1.502E-01	4.164E-02	8.030E 00	-4.131E-04	1.215E-03
1.800E 00	1.379E-01	3.809E-02	8.170E 00	-6.683E-04	9.104E-04
1.850E 00	1.146E-01	3.389E-02	8.310E 00	-4.588E-04	7.900E-04
1.910E 00	8.407E-02	3.270E-02	8.450E 00	3.247E-04	7.295E-04
1.970E 00	8.280E-02	3.298E-02	8.590E 00	9.890E-04	5.963E-04
2.030E 00	9.150E-02	2.857E-02	8.730E 00	1.096E-03	4.642E-04
2.090E 00	7.272E-02	2.950E-02	8.870E 00	7.255E-04	3.678E-04
2.150E 00	4.386E-02	3.399E-02	9.010E 00	2.925E-04	3.370E-04
2.210E 00	2.697E-02	3.031E-02	9.150E 00	4.626E-05	2.150E-04
2.270E 00	1.040E-02	3.393E-02	9.300E 00	-3.258E-05	1.086E-04
2.330E 00	2.405E-02	2.731E-02	9.460E 00	1.143E-06	5.791E-05
2.390E 00	4.117E-02	2.459E-02	9.620E 00	2.484E-05	4.389E-05
2.450E 00	5.675E-02	2.472E-02	9.780E 00	3.516E-05	4.013E-05
2.510E 00	1.021E-01	2.413E-02	9.940E 00	5.005E-05	4.439E-05
2.570E 00	1.540E-01	2.029E-02	1.010E 01	6.975E-05	5.353E-05
2.630E 00	1.468E-01	2.196E-02	1.026E 01	8.622E-05	6.285E-05
2.690E 00	9.119E-02	2.236E-02	1.042E 01	9.494E-05	6.923E-05
2.750E 00	4.632E-02	2.031E-02	1.058E 01	9.629E-05	7.433E-05

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	1.690E-02	2.903E-02
4.000E-01 - 5.000E-01	3.080E-02	2.684E-02
5.000E-01 - 6.000E-01	8.010E-02	1.694E-02
6.000E-01 - 7.000E-01	3.177E-02	1.457E-02
7.000E-01 - 8.000E-01	3.222E-02	1.021E-02
8.000E-01 - 1.000E 00	5.811E-02	1.314E-02
1.000E 00 - 1.200E 00	2.763E-02	9.880E-03
1.200E 00 - 1.400E 00	6.841E-03	1.078E-02
1.400E 00 - 1.600E 00	1.434E-02	9.088E-03
1.600E 00 - 1.800E 00	2.415E-02	8.455E-03
1.800E 00 - 2.000E 00	1.952E-02	6.709E-03
2.000E 00 - 2.500E 00	2.434E-02	1.447E-02
2.500E 00 - 3.000E 00	3.814E-02	9.698E-03
3.000E 00 - 3.500E 00	3.145E-03	7.361E-03
3.500E 00 - 4.000E 00	1.324E-02	6.641E-03
4.000E 00 - 4.500E 00	3.276E-03	5.537E-03
4.500E 00 - 5.000E 00	4.383E-03	4.618E-03
5.000E 00 - 6.000E 00	2.846E-03	7.360E-03
6.000E 00 - 7.000E 00	2.319E-03	3.879E-03
7.000E 00 - 8.000E 00	1.821E-03	1.668E-03
8.000E 00 - 9.000E 00	2.607E-04	6.780E-04
9.000E 00 - 1.000E 01	3.777E-05	1.020E-04

ORNL-DWG 74-13110

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 15.06 TO 17.55 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	2.922E-01	4.395E-01	2.810E 00	9.817E-02	2.399E-02
3.175E-01	2.711E-01	4.188E-01	2.870E 00	6.832E-02	2.754E-02
3.325E-01	2.319E-01	4.088E-01	2.930E 00	3.356E-02	2.512E-02
3.475E-01	2.519E-01	4.480E-01	2.990E 00	1.866E-02	2.371E-02
3.625E-01	2.594E-01	3.823E-01	3.050E 00	2.697E-02	2.694E-02
3.775E-01	2.160E-01	4.120E-01	3.110E 00	3.455E-02	2.829E-02
3.925E-01	1.406E-01	4.283E-01	3.180E 00	2.093E-02	3.063E-02
4.100E-01	5.555E-02	4.319E-01	3.260E 00	4.860E-06	2.863E-02
4.300E-01	9.982E-03	4.555E-01	3.340E 00	1.237E-02	2.693E-02
4.500E-01	1.169E-01	4.717E-01	3.420E 00	3.088E-02	2.413E-02
4.700E-01	3.897E-01	4.086E-01	3.500E 00	3.429E-02	2.351E-02
4.900E-01	7.108E-01	3.549E-01	3.580E 00	4.749E-02	2.413E-02
5.100E-01	1.030E 00	3.115E-01	3.660E 00	5.972E-02	2.021E-02
5.300E-01	1.186E 00	2.579E-01	3.740E 00	5.671E-02	2.350E-02
5.500E-01	9.977E-01	2.391E-01	3.820E 00	4.370E-02	2.370E-02
5.700E-01	8.118E-01	2.161E-01	3.900E 00	3.636E-02	2.468E-02
5.900E-01	6.368E-01	2.066E-01	3.980E 00	3.557E-02	2.259E-02
6.100E-01	4.169E-01	2.125E-01	4.060E 00	3.509E-02	2.046E-02
6.300E-01	3.060E-01	2.149E-01	4.140E 00	3.050E-02	1.997E-02
6.500E-01	3.878E-01	1.957E-01	4.220E 00	2.598E-02	1.927E-02
6.700E-01	4.705E-01	1.728E-01	4.300E 00	3.004E-02	2.015E-02
6.900E-01	4.886E-01	1.623E-01	4.380E 00	3.270E-02	1.656E-02
7.100E-01	2.744E-01	1.757E-01	4.460E 00	2.683E-02	1.851E-02
7.300E-01	2.246E-01	1.820E-01	4.540E 00	1.833E-02	1.524E-02
7.500E-01	2.887E-01	1.710E-01	4.630E 00	1.418E-02	1.537E-02
7.700E-01	3.776E-01	1.581E-01	4.730E 00	1.723E-02	1.684E-02
7.900E-01	4.208E-01	1.489E-01	4.830E 00	2.153E-02	1.544E-02
8.100E-01	4.214E-01	1.408E-01	4.930E 00	1.979E-02	1.514E-02
8.300E-01	4.222E-01	1.178E-01	5.030E 00	1.727E-02	1.524E-02
8.500E-01	4.162E-01	1.043E-01	5.130E 00	1.649E-02	1.435E-02
8.700E-01	3.726E-01	1.015E-01	5.230E 00	1.520E-02	1.454E-02
8.900E-01	2.977E-01	1.047E-01	5.330E 00	1.424E-02	1.273E-02
9.100E-01	2.257E-01	1.037E-01	5.430E 00	1.138E-02	1.236E-02
9.300E-01	1.790E-01	9.689E-02	5.530E 00	7.844E-03	1.286E-02
9.500E-01	1.514E-01	9.464E-02	5.630E 00	6.810E-03	1.255E-02
9.700E-01	1.495E-01	1.055E-01	5.730E 00	9.137E-03	1.119E-02
1.000E 00	1.784E-01	1.094E-01	5.830E 00	7.789E-03	8.954E-03
1.040E 00	2.234E-01	9.139E-02	5.930E 00	1.388E-03	8.747E-03
1.080E 00	2.024E-01	9.145E-02	6.030E 00	-5.607E-03	9.577E-03
1.120E 00	1.582E-01	8.099E-02	6.130E 00	-6.202E-03	9.030E-03
1.160E 00	1.247E-01	7.170E-02	6.230E 00	-6.222E-04	7.638E-03
1.200E 00	1.384E-01	7.046E-02	6.330E 00	4.370E-03	6.320E-03
1.240E 00	1.406E-01	6.260E-02	6.440E 00	6.898E-03	5.989E-03
1.280E 00	8.172E-02	7.758E-02	6.560E 00	9.336E-03	6.357E-03
1.320E 00	7.178E-03	8.067E-02	6.680E 00	1.069E-02	5.610E-03
1.360E 00	4.444E-02	8.125E-02	6.800E 00	9.115E-03	4.482E-03
1.400E 00	1.222E-01	6.237E-02	6.920E 00	5.329E-03	3.567E-03
1.440E 00	1.078E-01	7.733E-02	7.040E 00	1.632E-03	3.661E-03
1.480E 00	4.659E-02	8.389E-02	7.160E 00	-7.540E-05	3.233E-03
1.520E 00	7.990E-02	7.658E-02	7.280E 00	-9.064E-04	2.936E-03
1.560E 00	1.571E-01	6.390E-02	7.400E 00	-1.004E-03	2.765E-03
1.600E 00	1.688E-01	6.498E-02	7.520E 00	-8.768E-05	2.129E-03
1.640E 00	1.237E-01	7.733E-02	7.640E 00	7.470E-04	1.936E-03
1.680E 00	1.058E-01	7.309E-02	7.760E 00	1.444E-03	1.888E-03
1.720E 00	1.287E-01	5.845E-02	7.890E 00	1.030E-03	1.804E-03
1.760E 00	1.420E-01	6.258E-02	8.030E 00	3.908E-04	1.562E-03
1.800E 00	1.258E-01	6.519E-02	8.170E 00	-7.549E-04	1.246E-03
1.850E 00	9.411E-02	6.809E-02	8.310E 00	-1.057E-03	1.235E-03
1.910E 00	9.297E-02	5.803E-02	8.450E 00	-6.156E-04	9.071E-04
1.970E 00	9.550E-02	5.699E-02	8.590E 00	7.642E-04	6.938E-04
2.030E 00	8.158E-02	5.422E-02	8.730E 00	1.598E-03	7.342E-04
2.090E 00	5.616E-02	5.578E-02	8.870E 00	1.679E-03	5.647E-04
2.150E 00	4.122E-02	5.216E-02	9.010E 00	1.015E-03	4.590E-04
2.210E 00	3.448E-02	5.078E-02	9.150E 00	4.079E-04	3.473E-04
2.270E 00	3.130E-02	4.413E-02	9.300E 00	2.124E-05	1.968E-04
2.330E 00	6.513E-02	3.500E-02	9.460E 00	-6.181E-05	1.399E-04
2.390E 00	9.493E-02	3.519E-02	9.620E 00	-3.800E-05	1.102E-04
2.450E 00	9.003E-02	3.965E-02	9.780E 00	8.623E-06	8.826E-05
2.510E 00	1.076E-01	4.069E-02	9.940E 00	7.226E-05	8.735E-05
2.570E 00	1.505E-01	4.514E-02	1.010E 01	1.486E-04	1.061E-04
2.630E 00	1.575E-01	4.188E-02	1.026E 01	2.252E-04	1.293E-04
2.690E 00	1.295E-01	3.609E-02	1.042E 01	2.660E-04	1.495E-04
2.750E 00	1.100E-01	3.177E-02	1.058E 01	2.536E-04	1.533E-04

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	2.383E-02	4.180E-02
4.000E-01 - 5.000E-01	2.588E-02	8.248E-02
5.000E-01 - 6.000E-01	9.200E-02	2.463E-02
6.000E-01 - 7.000E-01	3.985E-02	1.920E-02
7.000E-01 - 8.000E-01	3.179E-02	1.670E-02
8.000E-01 - 1.000E 00	5.605E-02	2.157E-02
1.000E 00 - 1.200E 00	3.875E-02	1.697E-02
1.200E 00 - 1.400E 00	1.621E-02	1.483E-02
1.400E 00 - 1.600E 00	2.134E-02	1.466E-02
1.600E 00 - 1.800E 00	2.579E-02	1.351E-02
1.800E 00 - 2.000E 00	1.941E-02	1.221E-02
2.000E 00 - 2.500E 00	3.188E-02	2.284E-02
2.500E 00 - 3.000E 00	5.026E-02	1.651E-02
3.000E 00 - 3.500E 00	1.071E-02	1.356E-02
3.500E 00 - 4.000E 00	2.315E-02	1.159E-02
4.000E 00 - 4.500E 00	1.520E-02	9.326E-03
4.500E 00 - 5.000E 00	9.152E-03	7.791E-03
5.000E 00 - 6.000E 00	1.036E-02	1.222E-02
6.000E 00 - 7.000E 00	4.314E-03	6.258E-03
7.000E 00 - 8.000E 00	3.443E-04	2.466E-03
8.000E 00 - 9.000E 00	3.218E-04	9.349E-04
9.000E 00 - 1.000E 01	1.295E-04	1.824E-04

ORNL-DWG 74-13111

DIFFERENTIAL CROSS SECTIONS FOR GAMMA RAY PRODUCTION IN PB. THE FIRST SET OF NUMBERS IS THE DOUBLY DIFFERENTIAL CROSS SECTION, WHILE THE SECOND SET IS THE GAMMA RAY PRODUCTION CROSS SECTION FOR THE DESIGNATED GAMMA RAY ENERGY INTERVALS. THIS SECOND SET RESULTS FROM INTEGRATION OF THE DOUBLY DIFFERENTIAL DATA. THE UNCERTAINTIES ARE GIVEN IN THE SAME UNITS AS THE DATA AND DO NOT INCLUDE AN ESTIMATED 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION.

INCIDENT NEUTRON ENERGY = 17.55 TO 20.05 MEV. ANGLE = 125 DEGREES.

PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)	PHOTON ENERGY (MEV)	X-SECTION (B/SR/MEV)	ERROR (B/SR/MEV)
3.025E-01	6.746E-01	5.826E-01	2.810E 00	7.001E-02	3.740E-02
3.175E-01	6.067E-01	4.210E-01	2.870E 00	6.907E-02	3.695E-02
3.325E-01	4.886E-01	4.249E-01	2.930E 00	4.745E-02	4.675E-02
3.475E-01	3.960E-01	4.009E-01	2.990E 00	2.829E-02	4.135E-02
3.625E-01	2.818E-01	4.752E-01	3.050E 00	1.964E-02	3.509E-02
3.775E-01	1.442E-01	5.175E-01	3.110E 00	2.362E-02	3.790E-02
3.925E-01	9.256E-02	5.556E-01	3.180E 00	3.490E-02	3.626E-02
4.100E-01	1.329E-01	5.781E-01	3.260E 00	4.493E-02	3.098E-02
4.300E-01	1.502E-01	5.389E-01	3.340E 00	6.029E-02	3.404E-02
4.500E-01	2.278E-01	5.368E-01	3.420E 00	6.311E-02	3.098E-02
4.700E-01	5.421E-01	4.956E-01	3.500E 00	4.959E-02	2.785E-02
4.900E-01	9.299E-01	4.290E-01	3.580E 00	4.379E-02	3.736E-02
5.100E-01	1.111E 00	3.988E-01	3.660E 00	3.755E-02	3.288E-02
5.300E-01	1.015E 00	3.089E-01	3.740E 00	3.633E-02	3.450E-02
5.500E-01	8.687E-01	2.913E-01	3.820E 00	4.225E-02	3.179E-02
5.700E-01	7.740E-01	2.887E-01	3.900E 00	4.678E-02	2.991E-02
5.900E-01	6.030E-01	2.678E-01	3.980E 00	5.055E-02	3.108E-02
6.100E-01	3.227E-01	3.015E-01	4.060E 00	6.566E-02	3.164E-02
6.300E-01	1.216E-01	3.276E-01	4.140E 00	6.522E-02	2.930E-02
6.500E-01	1.627E-01	2.860E-01	4.220E 00	4.504E-02	3.117E-02
6.700E-01	3.245E-01	2.315E-01	4.300E 00	2.995E-02	3.185E-02
6.900E-01	4.022E-01	1.898E-01	4.380E 00	2.266E-02	2.782E-02
7.100E-01	3.515E-01	1.926E-01	4.460E 00	9.599E-03	2.664E-02
7.300E-01	3.009E-01	1.970E-01	4.540E 00	-1.039E-03	2.578E-02
7.500E-01	3.584E-01	1.859E-01	4.630E 00	2.890E-03	2.330E-02
7.700E-01	4.800E-01	1.768E-01	4.730E 00	2.432E-02	2.027E-02
7.900E-01	5.546E-01	1.596E-01	4.830E 00	3.255E-02	2.161E-02
8.100E-01	5.229E-01	1.416E-01	4.930E 00	2.795E-02	2.138E-02
8.300E-01	4.525E-01	1.301E-01	5.030E 00	2.755E-02	1.796E-02
8.500E-01	4.297E-01	1.232E-01	5.130E 00	3.269E-02	2.217E-02
8.700E-01	4.452E-01	1.146E-01	5.230E 00	2.596E-02	2.110E-02
8.900E-01	4.278E-01	1.049E-01	5.330E 00	1.269E-02	1.948E-02
9.100E-01	3.440E-01	1.036E-01	5.430E 00	6.218E-03	2.030E-02
9.300E-01	2.527E-01	1.057E-01	5.530E 00	1.460E-02	1.779E-02
9.500E-01	1.929E-01	1.122E-01	5.630E 00	2.927E-02	1.981E-02
9.700E-01	1.740E-01	1.102E-01	5.730E 00	3.928E-02	1.923E-02
1.000E 00	1.376E-01	1.075E-01	5.830E 00	3.830E-02	1.700E-02
1.040E 00	9.123E-02	1.146E-01	5.930E 00	2.784E-02	1.534E-02
1.080E 00	1.586E-01	8.831E-02	6.030E 00	1.481E-02	1.583E-02
1.120E 00	2.164E-01	9.029E-02	6.130E 00	5.397E-03	1.680E-02
1.160E 00	1.565E-01	9.124E-02	6.230E 00	2.289E-03	1.563E-02
1.200E 00	8.807E-02	8.268E-02	6.330E 00	3.762E-03	1.291E-02
1.240E 00	1.119E-01	8.056E-02	6.440E 00	5.112E-03	8.923E-03
1.280E 00	1.355E-01	9.179E-02	6.560E 00	6.591E-03	8.150E-03
1.320E 00	8.312E-02	9.127E-02	6.680E 00	7.880E-03	7.874E-03
1.360E 00	5.674E-02	9.400E-02	6.800E 00	7.639E-03	6.138E-03
1.400E 00	1.039E-01	8.199E-02	6.920E 00	4.202E-03	4.630E-03
1.440E 00	1.326E-01	6.885E-02	7.040E 00	1.436E-03	4.301E-03
1.480E 00	1.003E-01	7.771E-02	7.160E 00	1.413E-03	4.064E-03
1.520E 00	8.476E-02	8.920E-02	7.280E 00	2.490E-03	3.018E-03
1.560E 00	1.070E-01	7.987E-02	7.400E 00	3.359E-03	2.719E-03
1.600E 00	1.237E-01	7.176E-02	7.520E 00	2.514E-03	2.774E-03
1.640E 00	9.121E-02	7.675E-02	7.640E 00	8.503E-04	2.488E-03
1.680E 00	4.973E-02	8.340E-02	7.760E 00	-1.884E-04	2.137E-03
1.720E 00	6.362E-02	7.747E-02	7.890E 00	9.250E-05	1.919E-03
1.760E 00	1.228E-01	6.309E-02	8.030E 00	5.510E-04	1.954E-03
1.800E 00	1.514E-01	6.235E-02	8.170E 00	9.163E-04	1.781E-03
1.850E 00	1.156E-01	5.754E-02	8.310E 00	7.732E-04	1.269E-03
1.910E 00	9.373E-02	6.065E-02	8.450E 00	5.489E-04	9.289E-04
1.970E 00	1.090E-01	6.689E-02	8.590E 00	5.158E-04	8.690E-04
2.030E 00	1.141E-01	6.979E-02	8.730E 00	4.351E-04	7.322E-04
2.090E 00	8.497E-02	6.427E-02	8.870E 00	2.426E-04	5.608E-04
2.150E 00	1.921E-02	7.239E-02	9.010E 00	1.155E-04	4.622E-04
2.210E 00	-1.217E-02	7.352E-02	9.150E 00	2.104E-05	3.991E-04
2.270E 00	4.687E-02	5.807E-02	9.300E 00	-2.928E-05	3.367E-04
2.330E 00	1.129E-01	3.837E-02	9.460E 00	-2.530E-05	3.471E-04
2.390E 00	1.056E-01	4.521E-02	9.620E 00	-7.605E-06	4.124E-04
2.450E 00	7.784E-02	6.067E-02	9.780E 00	7.602E-05	4.763E-04
2.510E 00	8.214E-02	5.919E-02	9.940E 00	1.700E-04	5.855E-04
2.570E 00	1.232E-01	5.821E-02	1.010E 01	3.404E-04	6.077E-04
2.630E 00	1.387E-01	4.786E-02	1.026E 01	5.750E-04	5.235E-04
2.690E 00	9.686E-02	3.881E-02	1.042E 01	6.613E-04	5.211E-04
2.750E 00	6.339E-02	4.053E-02	1.058E 01	6.555E-04	6.616E-04

INTEGRATED DATA

PHOTON ENERGY INTERVAL (MEV)	X-SECTION (B/SR)	ERROR (B/SR)
3.000E-01 - 4.000E-01	3.684E-02	4.747E-02
4.000E-01 - 5.000E-01	3.945E-02	5.147E-02
5.000E-01 - 6.000E-01	8.684E-02	3.112E-02
6.000E-01 - 7.000E-01	2.669E-02	2.678E-02
7.000E-01 - 8.000E-01	4.078E-02	1.824E-02
8.000E-01 - 1.000E 00	6.778E-02	2.311E-02
1.000E 00 - 1.200E 00	2.953E-02	1.921E-02
1.200E 00 - 1.400E 00	1.926E-02	1.768E-02
1.400E 00 - 1.600E 00	2.156E-02	1.568E-02
1.600E 00 - 1.800E 00	1.835E-02	1.473E-02
1.800E 00 - 2.000E 00	2.193E-02	1.235E-02
2.000E 00 - 2.500E 00	3.462E-02	3.004E-02
2.500E 00 - 3.000E 00	4.127E-02	2.249E-02
3.000E 00 - 3.500E 00	2.148E-02	1.691E-02
3.500E 00 - 4.000E 00	2.150E-02	1.632E-02
4.000E 00 - 4.500E 00	2.017E-02	1.487E-02
4.500E 00 - 5.000E 00	9.339E-03	1.109E-02
5.000E 00 - 6.000E 00	2.535E-02	1.899E-02
6.000E 00 - 7.000E 00	6.102E-03	1.015E-02
7.000E 00 - 8.000E 00	1.424E-03	2.844E-03
8.000E 00 - 9.000E 00	5.505E-04	1.084E-03
9.000E 00 - 1.000E 01	3.723E-05	4.247E-04

TOTAL SECONDARY GAMMA RAY YIELD AND AVERAGE SECONDARY GAMMA RAY ENERGY FROM PB AS A FUNCTION OF THE INCIDENT NEUTRON ENERGY. THESE DATA RESULT FROM A PULSE HEIGHT WEIGHTING ANALYSIS FOR PULSE HEIGHTS GREATER THAN 0.300 MEV. UNCERTAINTIES ARE GIVEN IN PARENTHIESES IN THE SAME UNITS AS THE DATA. THE UNCERTAINTIES IN TOTAL YIELD DO NOT INCLUDE A 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION. THE ANGLE IS 125 DEGREES.

INC.NT. ENERGY (MEV)	ENERGY SPREAD (MEV)	SECONDARY PHOTON YIELD (B/SR)	AVERAGE ENERGY (MEV)	INC.NT. ENERGY (MEV)	ENERGY SPREAD (MEV)	SECONDARY PHOTON YIELD (B/SR)	AVERAGE ENERGY (MEV)
0.649	0.097	0.281E-02(0.275E-03)	0.910E 00(0.167E 00)	6.758	0.495	0.572E 00(0.801E-02)	0.161E 01(0.267E-01)
0.749	0.103	0.494E-02(0.260E-03)	0.788E 00(0.802E-01)	7.258	0.505	0.620E 00(0.877E-02)	0.166E 01(0.283E-01)
0.852	0.103	0.882E-02(0.314E-03)	0.761E 00(0.459E-01)	7.765	0.508	0.620E 00(0.905E-02)	0.173E 01(0.308E-01)
0.951	0.095	0.108E-01(0.365E-03)	0.698E 00(0.389E-01)	8.270	0.503	0.632E 00(0.920E-02)	0.181E 01(0.323E-01)
1.123	0.249	0.228E-01(0.425E-03)	0.741E 00(0.195E-01)	8.766	0.488	0.615E 00(0.101E-01)	0.185E 01(0.367E-01)
1.374	0.255	0.300E-01(0.583E-03)	0.761E 00(0.193E-01)	9.242	0.463	0.527E 00(0.101E-01)	0.187E 01(0.430E-01)
1.628	0.252	0.426E-01(0.728E-03)	0.746E 00(0.167E-01)	9.723	0.500	0.476E 00(0.101E-01)	0.184E 01(0.474E-01)
1.880	0.253	0.609E-01(0.981E-03)	0.745E 00(0.156E-01)	10.243	0.540	0.416E 00(0.107E-01)	0.179E 01(0.553E-01)
2.130	0.247	0.784E-01(0.125E-02)	0.757E 00(0.156E-01)	10.763	0.499	0.370E 00(0.109E-01)	0.168E 01(0.598E-01)
2.373	0.239	0.941E-01(0.145E-02)	0.774E 00(0.155E-01)	11.235	0.444	0.350E 00(0.124E-01)	0.153E 01(0.682E-01)
2.622	0.258	0.108E 00(0.171E-02)	0.822E 00(0.167E-01)	11.741	0.569	0.344E 00(0.140E-01)	0.144E 01(0.722E-01)
2.876	0.251	0.132E 00(0.216E-02)	0.981E 00(0.200E-01)	12.279	0.508	0.323E 00(0.161E-01)	0.132E 01(0.816E-01)
3.131	0.259	0.155E 00(0.244E-02)	0.106E 01(0.210E-01)	12.748	0.430	0.367E 00(0.200E-01)	0.132E 01(0.887E-01)
3.377	0.233	0.178E 00(0.298E-02)	0.115E 01(0.239E-01)	13.248	0.569	0.382E 00(0.196E-01)	0.133E 01(0.830E-01)
3.623	0.258	0.213E 00(0.329E-02)	0.115E 01(0.224E-01)	13.774	0.483	0.455E 00(0.226E-01)	0.127E 01(0.810E-01)
3.877	0.250	0.250E 00(0.392E-02)	0.121E 01(0.237E-01)	14.270	0.510	0.480E 00(0.258E-01)	0.133E 01(0.899E-01)
4.120	0.235	0.286E 00(0.472E-02)	0.123E 01(0.250E-01)	14.794	0.538	0.500E 00(0.268E-01)	0.136E 01(0.933E-01)
4.366	0.257	0.346E 00(0.508E-02)	0.125E 01(0.229E-01)	15.496	0.865	0.505E 00(0.294E-01)	0.148E 01(0.103E 00)
4.610	0.232	0.396E 00(0.580E-02)	0.129E 01(0.235E-01)	16.482	1.108	0.517E 00(0.289E-01)	0.160E 01(0.104E 00)
4.864	0.277	0.438E 00(0.565E-02)	0.129E 01(0.212E-01)	17.559	1.046	0.582E 00(0.324E-01)	0.173E 01(0.111E 00)
5.257	0.508	0.479E 00(0.585E-02)	0.139E 01(0.209E-01)	18.556	0.947	0.556E 00(0.365E-01)	0.165E 01(0.130E 00)
5.754	0.486	0.514E 00(0.636E-02)	0.146E 01(0.223E-01)	19.542	1.025	0.564E 00(0.411E-01)	0.161E 01(0.140E 00)
6.254	0.514	0.539E 00(0.680E-02)	0.152E 01(0.237E-01)				

ORNL-DWG 74-13129

TOTAL SECONDARY GAMMA RAY YIELD AND AVERAGE SECONDARY GAMMA RAY ENERGY FROM PB AS A FUNCTION OF THE INCIDENT NEUTRON ENERGY. THESE DATA RESULT FROM A PULSE HEIGHT WEIGHTING ANALYSIS FOR PULSE HEIGHTS GREATER THAN 0.700 MEV. UNCERTAINTIES ARE GIVEN IN PARENTHIESES IN THE SAME UNITS AS THE DATA. THE UNCERTAINTIES IN TOTAL YIELD DO NOT INCLUDE A 10 PERCENT ERROR IN ABSOLUTE NORMALIZATION. THE ANGLE IS 125 DEGREES.

INC.NT. ENERGY (MEV)	ENERGY SPREAD (MEV)	SECONDARY PHOTON YIELD (B/SR)	AVERAGE ENERGY (MEV)
0.649	0.097	0.285E-03(0.140E-03)	0.438E 01(0.258E 01)
0.749	0.103	0.470E-03(0.112E-03)	0.316E 01(0.105E 01)
0.852	0.103	0.334E-02(0.143E-03)	0.114E 01(0.109E 00)
0.951	0.095	0.486E-02(0.164E-03)	0.928E 00(0.751E-01)
1.123	0.249	0.130E-01(0.175E-03)	0.929E 00(0.256E-01)
1.374	0.255	0.188E-01(0.242E-03)	0.932E 00(0.216E-01)
1.628	0.252	0.259E-01(0.322E-03)	0.926E 00(0.198E-01)
1.880	0.253	0.371E-01(0.465E-03)	0.92CE 00(0.189E-01)
2.130	0.247	0.478E-01(0.602E-03)	0.939E 00(0.191E-01)
2.373	0.239	0.591E-01(0.763E-03)	0.961E 00(0.196E-01)
2.622	0.258	0.694E-01(0.888E-03)	0.103E 01(0.204E-01)
2.876	0.251	0.902E-01(0.121E-02)	0.124E 01(0.241E-01)
3.131	0.259	0.104E 00(0.151E-02)	0.139E 01(0.284E-01)
3.377	0.233	0.121E 00(0.183E-02)	0.151E 01(0.316E-01)
3.623	0.258	0.138E 00(0.187E-02)	0.156E 01(0.306E-01)
3.877	0.250	0.161E 00(0.234E-02)	0.168E 01(0.336E-01)
4.120	0.235	0.183E 00(0.272E-02)	0.170E 01(0.349E-01)
4.366	0.257	0.215E 00(0.313E-02)	0.178E 01(0.349E-01)
4.610	0.232	0.247E 00(0.344E-02)	0.184E 01(0.349E-01)
4.864	0.277	0.274E 00(0.357E-02)	0.184E 01(0.328E-01)
5.257	0.508	0.316E 00(0.350E-C2)	0.192E 01(0.288E-01)
5.754	0.486	0.341E 00(0.419E-02)	0.201E 01(0.326E-01)
6.254	0.514	0.360E 00(0.431E-02)	0.210E 01(0.336E-01)
6.758	0.495	0.382E 00(0.489E-02)	0.224E 01(0.365E-01)
7.258	0.505	0.418E 00(0.537E-02)	0.230E 01(0.386E-01)
7.765	0.508	0.418E 00(0.568E-02)	0.241E 01(0.428E-01)
8.270	0.503	0.434E 00(0.564E-02)	0.249E 01(0.433E-01)
8.766	0.488	0.419E 00(0.641E-02)	0.257E 01(0.506E-01)
9.242	0.463	0.362E 00(0.622E-02)	0.258E 01(0.572E-01)
9.723	0.500	0.326E 00(0.637E-02)	0.254E 01(0.646E-01)
10.243	0.540	0.285E 00(0.690E-02)	0.246E 01(0.755E-01)
10.763	0.499	0.244E 00(0.618E-02)	0.235E 01(0.789E-01)
11.235	0.444	0.222E 00(0.736E-02)	0.218E 01(0.988E-01)
11.741	0.569	0.217E 00(0.781E-02)	0.204E 01(0.998E-01)
12.279	0.508	0.213E 00(0.881E-02)	0.181E 01(0.106E 00)
12.748	0.430	0.239E 00(0.105E-01)	0.182E 01(0.113E 00)
13.248	0.569	0.248E 00(0.105E-01)	0.182E 01(0.108E 00)
13.774	0.483	0.289E 00(0.132E-01)	0.179E 01(0.116E 00)
14.270	0.510	0.316E 00(0.159E-01)	0.183E 01(0.126E 00)
14.794	0.538	0.321E 00(0.187E-01)	0.190E 01(0.146E 00)
15.496	0.865	0.346E 00(0.159E-01)	0.200E 01(0.124E 00)
16.482	1.108	0.365E 00(0.181E-01)	0.214E 01(0.132E 00)
17.559	1.046	0.421E 00(0.167E-01)	0.229E 01(0.118E 00)
18.556	0.947	0.375E 00(0.200E-01)	0.229E 01(0.163E 00)
19.542	1.025	0.378E 00(0.232E-01)	0.225E 01(0.179E 00)

INTERNAL DISTRIBUTION

1-3. L. S. Abbott
4. R. G. Alsmiller, Jr.
5-19. G. T. Chapman
20. C. E. Clifford
21. J. K. Dickens
22. C. Y. Fu
23. W. E. Kinney
24. D. C. Larson
25. T. A. Love
26. F. C. Maienschein
27. G. L. Morgan
28. F. R. Mynatt
29. E. Newman
30. E. M. Oblow
31. R. W. Peelle
32. F. G. Perey
33-42. R. W. Roussin
43. D. Sundberg
44. A. Zucker
45. H. Feshbach (Consultant)
46. P. F. Fox (Consultant)
47. W. W. Havens, Jr. (Consultant)
48. A. F. Henry (Consultant)
49-50. Central Research Library
51. ORNL — Y-12 Technical Library
52. Laboratory Records, ORNL R.C.
53. ORNL Patent Office
54-55. Laboratory Records

EXTERNAL DISTRIBUTION

56. Norman Francis, Knolls Atomic Power Laboratory, General Electric, Schenectady, NY 12309
57. H. Goldstein, Columbia University, 287A Eng. Terrace Bldg., 520 W. 120th St., New York, NY 10027
58. P. B. Hemmig, Division of Reactor Research and Development, AEC, Washington, DC 20546
59. C. E. Hollandsworth, USA Nuclear Effects Lab., Aberdeen Proving Gound, MD
60. R. J. Howerton, Lawrence Livermore Laboratory, Livermore, CA 94550
61. Director, Reactor Division, ERDA-ORO
62. Vic Orphan, Intelcom Radiation Technology, P.O. Box 608, San Diego, CA 92112
63. S. Pearlstein, Brookhaven National Laboratory, National Neutron Cross Section Center, Upton, NY 11973
64. A. B. Smith, Argonne National Laboratory, Argonne, IL 60440
65. Leona Stewart, Los Alamos Scientific Laboratory, Los Alamos, NM 87544
66. Mendel Beer, MAGI, 3 Westchester Plaza, Elmsford, NY 10523
67. P. G. Young, Los Alamos Scientific Laboratory, Los Alamos, NM 87544
68. Research and Technical Support Division, ERDA, ORO
69-70. Technical Information Center, Oak Ridge
71-204. DNA Radiation Transport Distribution