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LOS ALAMOS SCIENTIFIC LABORATORY
of the
University of California
LOS ALAMOS • NEW MEXICO

**Calculation of Neutron Polarizations Using
A Local Optical Potential with Average Parameters**

UNITED STATES
ATOMIC ENERGY COMMISSION
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CALCULATION OF NEUTRON POLARIZATIONS USING
A LOCAL OPTICAL POTENTIAL WITH AVERAGE PARAMETERS

by

Jerome G. Beery, Katherine H. Harper,
Virginia M. Stovall and Louis Rosen

ABSTRACT

Polarizations resulting from the elastic scattering of neutrons by complex nuclei have been calculated for a number of nuclides at energies between 0 and 16 MeV. Comparison is made with experimental data where such are available. The elements and energies were selected on the basis of the AEC's Nuclear Cross Sections Advisory Group request compilation.

INTRODUCTION

This report is a sequel to LA-3538-MS, Volumes I and II, which presented the results of calculations of differential elastic scattering and total cross sections for neutrons for a large number of elements and over the energy region from 0 to 16 MeV. The purpose of the report was to provide calculated cross sections required for various AEC programs and listed in the Nuclear Cross Sections Advisory Group request compilation, WASH-1057.

The data for the present report were a by-product of the earlier calculations. As a result of numerous requests for predicted neutron polarizations resulting from elastic scattering by complex nuclei, it was decided to publish herein the angular dependence of the polarization for the nuclides and energies treated in LA-3538-MS.

Neutron polarizations have intrinsic interest as a manifestation of the spin-dependence of the interrelation between neutrons and complex nuclei. On the practical side, neutron polarizations imply left-right asymmetry for multiply scattered neutrons and therefore have some influence on the behavior of nuclear energy systems. A theory of neutron transport which includes polarization effects has been developed by Bell and Goad.¹ This theory predicts changes in diffusion length due to polarization to be several percent in the region where p-wave scattering is

important.

Another application of neutron polarization effects relates to measurements of neutron cross sections. Since most neutron sources give rise to polarized neutrons, especially at low and intermediate energies, and since elastic (and probably inelastic) scattering also gives rise to polarization, one must use some caution in experiments with primary neutrons which carry some degree of polarization. It is usually true that the most convenient arrangement for measuring neutron scattering cross sections is one in which the initial and final neutron directions are in the same plane, and this is precisely the plane in which a left-right asymmetry may reveal itself and introduce significant error in a cross-section measurement; such an error can, of course, be avoided by making measurements to the right and to the left and taking the average.

CALCULATIONS

All the calculations were made with a local optical model potential, using average parameters. The parameters were obtained from a systematic study of the elastic scattering of polarized protons and from the fitting of 14-MeV neutron elastic scattering data.² The potential so deduced contains six parameters and consists of a real and imaginary central potential and a spin-orbit potential of the

Thomas type. The potential has the form:

$$V(r) = -V_f(r) - iW_g(r) - V_s h(r) \vec{\sigma} \cdot \vec{l}.$$

The real central potential is assumed to have a radial dependence of the type proposed by Saxon and Woods³ and is characterized by a radius, R, and a diffuseness, a:

$$f(r) = \left[1 + \exp \left(\frac{r - R}{a} \right) \right]^{-1},$$

where $R = r_0 A^{1/3}$. The imaginary part of the potential is peaked at the surface and is characterized by a radius, R, and a width, b. It is of the form:

$$g(r) = -4b \frac{d}{dr} \left[1 + \exp \left(\frac{r - R}{b} \right) \right]^{-1}.$$

The form of the spin-orbit term is taken as:

$$h(r) = -\chi_{\pi}^2 \frac{1}{r} \frac{df(r)}{dr},$$

where χ_{π} is the pion (Compton wavelength); and $\vec{\sigma}$ is the Pauli matrix for the nucleon, with $s = (\hbar/2)\vec{\sigma}$; and $\vec{l}$ is the orbital angular momentum in units of $\hbar$.

More complete details of the calculational method and the origin of the parameters herein used are given in Ref. 2.

The parameters used are as follows:

$V = 49.3 - 0.33E$ (MeV); where E is the neutron energy in the center-of-mass system

$W = 5.75$ MeV

$r_0 = 1.25$ F

$a = 0.65$ F

$b = 0.70$ F

$V_s = 5.5$ MeV

Wherever energy levels are known below the incident neutron energy, compound elastic scattering calculations were performed. They are based on the Hauser-Feshbach theory,⁴ and the penetrabilities given by the above potential.

RESULTS

Polarizations for shape-elastic scattering were calculated at about 1 MeV intervals in the energy

region 0 to 16 MeV. Below 5 MeV, compound elastic scattering was taken into account under the assumption that no polarization arises therefrom.

To the extent that compound elastic scattering does give rise to polarization, the calculated polarization will be in error for energies below ~ 5 MeV. The predicted polarizations are also unreliable for light nuclei ($A < 30$) since the optical model may not be applicable to these, especially at energies below 5 MeV, and for those nuclei for which the level structure is not completely known. In general, this latter situation will lead to lower predicted values than are revealed by measurement, because one is including too much compound elastic scattering.

The results are plotted in Figs. 1 - 155 and are presented in tabular form on the pages facing the graphs. Below 5 MeV, the curves represent the polarization including compound elastic effects on the assumption that the position and quantum states of all levels below the incident neutron energy are known. Since the levels are seldom known accurately, the curves represent a lower limit to the polarization amplitude. For 5 MeV and above, the curves represent the polarization expected on the basis of shape-elastic scattering only. The energy levels and level parameters used for the compound-elastic scattering calculations are listed for each nuclide. When experimental data are available, they are plotted as asterisks. The experimental references are listed below the curves.

REFERENCES

1. G. I. Bell and W. B. Goad, Nucl. Sci. Eng. **23**, 380 (1965).
2. L. Rosen, J. G. Beery, A. S. Goldhaber, and E. H. Auerbach, Ann. Phys. (N.Y.) **34**, 96 (1965).
3. R. D. Woods and D. S. Saxon, Phys. Rev. **95**, 577 (1954).
4. W. Hauser and H. Feshbach, Phys. Rev. **87**, 366 (1952).

List of Elements

	Page		Page
⁶ Li	7	⁵⁹ Co	253
⁷ Li	19	⁶² Ni	259
⁹ Be	31	⁶⁹ Ga	263
¹⁰ B	43	⁸⁰ Se	271
¹¹ B	55	⁸⁹ Y	275
¹² C	67	⁹³ Nb	285
¹⁴ N	79	¹¹⁴ Cd	297
¹⁶ O	87	¹¹⁵ In	301
²³ Na	99	¹¹⁸ Sn	305
²⁴ Mg	109	¹²⁷ I	311
²⁷ Al	119	¹⁸⁴ W	315
²⁸ Si	131	²⁰⁸ Pb	327
³⁵ Cl	145	²⁰⁹ Bi	339
³⁹ K	157	²³⁴ U	343
⁴⁰ Ca	169	²³⁵ U	351
⁴⁸ Ti	177	²³⁶ U	359
⁵¹ V	191	²³⁷ U	367
⁵² Cr	203	²³⁸ U	375
⁵⁵ Mn	217	²³⁹ Pu	383
⁵⁶ Fe	229	²⁴⁰ Pu	391
⁵⁸ Ni	241		

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Energy (MeV)	Energy Levels*	
1.00	G.S.	1^+
2.00	2.184	3^+
3.00	3.560	0^+
4.00	4.520	2^+
5.00	5.350	1^+
6.00	6.630	$[1^+]$
7.00	7.400	$[1^+]$
8.00	8.370	$[1^+]$
9.00	9.300	$[1^+]$
10.00	12.500	$[1^+]$
11.00		
12.00		
13.00		
14.00		
15.00		
16.00		

*Energy levels obtained from NRC 61-5, 6-23, except [] values which are assumed.

LI 6

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE	TOTAL	SHAPE	TOTAL
	ELASTIC 1 MEV	ELASTIC + 1 MEV	ELASTIC 3 MEV	ELASTIC 0 3 MEV
1.00	-0.	-0.	-0.	-0.
0.90	-7.3362	-3.6012	-2.8379	-2.1180
0.80	-10.8178	-5.0619	-5.0944	-3.6571
0.70	-13.8359	-6.1236	-7.7134	-5.2787
0.60	-16.7139	-6.9335	-10.8222	-6.9784
0.50	-19.5902	-7.5360	-14.5439	-8.7014
0.40	-22.5526	-7.9436	-19.0422	-10.3551
0.30	-25.6733	-8.1560	-24.5573	-11.8034
0.20	-29.0244	-8.1678	-31.4562	-12.8596
0.10	-32.6874	-7.9730	-40.3180	-13.2865
0.	-36.7621	-7.5694	-52.0576	-12.8184
-0.10	-41.3778	-6.9616	-67.9499	-11.2203
-0.20	-46.7060	-6.1646	-88.0477	-8.3938
-0.30	-52.9714	-5.2065	-95.1181	-4.4980
-0.40	-60.4339	-4.1298	-0.2752	-0.0081
-0.50	-69.1885	-2.9922	97.2410	4.3674
-0.60	-77.8802	-1.8651	88.0020	7.8955
-0.70	-75.2240	-0.8332	64.5841	10.0135
-0.80	0.4952	0.0024	44.9282	10.3634
-0.90	94.0637	0.4998	27.7402	8.5433
-1.00	0.0000	0.0000	0.0000	0.0000

LI 6

Figure 1

LI 6

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE	TOTAL	SHAPE	TOTAL
	ELASTIC 2 MEV	ELASTIC + 2 MEV	ELASTIC 4 MEV	ELASTIC 0 4 MEV
1.00	-0.	-0.	-0.	-0.
0.90	-5.4771	-3.4503	-0.2600	-0.2094
0.80	-8.5347	-5.1516	-1.5966	-1.2417
0.70	-11.5167	-6.5966	-3.6944	-2.7492
0.60	-14.6659	-7.8759	-6.5957	-4.6417
0.50	-18.1210	-8.9870	-10.4205	-6.8268
0.40	-22.0117	-9.8900	-15.3668	-9.1731
0.30	-26.4931	-10.5219	-21.7438	-11.4812
0.20	-31.7726	-10.8035	-30.0359	-13.4556
0.10	-38.1436	-10.6483	-41.0050	-14.6869
0.	-46.0264	-9.9773	-55.7790	-14.6725
-0.10	-55.9816	-8.7416	-75.3454	-12.9215
-0.20	-68.4296	-6.9506	-94.7839	-9.1763
-0.30	-81.2964	-4.6988	-68.8143	-3.6875
-0.40	-74.6516	-2.1762	51.7752	2.6714
-0.50	18.8262	0.3473	95.5487	8.6470
-0.60	97.8411	2.5631	81.8110	13.0930
-0.70	82.6427	4.1716	62.3637	15.3148
-0.80	55.9394	4.8974	44.9901	15.0295
-0.90	33.0623	4.3930	28.5554	11.9065
-1.00	0.0000	0.0000	0.0000	0.0000

LI 6

Figure 2

LI 6

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.90	1.6746	2.3911	0.8751	0.6179
0.80	1.2417	3.1194	0.9670	0.1334
0.70	-0.1927	3.2375	0.8646	-0.6714
0.60	-2.6619	2.5975	0.6460	-1.4415
0.50	-6.3263	0.8540	0.3537	-1.5097
0.40	-11.4390	-2.4857	0.0402	0.4405
0.30	-18.3616	-7.9238	-0.1543	6.1700
0.20	-27.5967	-15.5203	0.1354	15.3630
0.10	-39.7788	-23.9013	1.4982	23.3010
0.	-55.3384	-29.1003	4.3477	26.5550
-0.10	-72.3583	-25.2061	8.7539	26.6550
-0.20	-76.5216	-8.6584	14.8749	26.2020
-0.30	-25.5666	17.4830	23.1657	26.9420
-0.40	60.0120	45.1280	34.1682	30.1780
-0.50	88.6573	66.4057	48.0003	37.2890
-0.60	80.9460	76.9833	63.3708	49.7380
-0.70	65.2474	76.2684	76.2065	67.6540
-0.80	48.8263	65.7955	79.3027	85.0210
-0.90	31.7271	46.6822	64.5467	82.7550
-1.00	0.0000	0.0000	0.0000	0.0000

LI 6

Figure 3

LI 6

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.90	2.6464	1.8372	0.6349	0.7908
0.80	2.9152	2.4313	0.4859	0.2211
0.70	2.1696	2.6219	0.1435	-0.7695
0.60	0.3212	2.3114	-0.2167	-1.7452
0.50	-2.8759	1.2231	-0.3485	-1.8264
0.40	-7.7649	-1.0728	0.1785	0.7841
0.30	-14.7610	-5.0082	1.9917	8.3843
0.20	-24.2759	-10.4562	5.4227	19.9520
0.10	-36.4307	-15.6792	9.5667	28.9180
0.	-50.0205	-17.0236	13.0398	31.7640
-0.10	-59.2753	-11.2126	15.8969	30.8710
-0.20	-47.9721	1.9657	19.2746	29.1690
-0.30	0.1312	20.2216	24.3686	28.4340
-0.40	56.2688	40.5146	32.2228	29.9540
-0.50	81.3751	59.4226	43.6398	35.2010
-0.60	80.8612	73.0143	58.4995	46.0940
-0.70	69.5147	77.6006	73.9564	64.0720
-0.80	54.1848	71.0456	82.1264	85.0850
-0.90	36.0833	52.4731	70.6949	88.3150
-1.00	0.0000	0.0000	0.0000	0.0000

LI 6

Figure 4

LI 6

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.90	2.7739	1.2888	0.5627	1.0435
0.80	3.4267	1.6401	0.2182	0.4356
0.70	3.2332	1.7299	-0.3683	-0.6998
0.60	2.0503	1.5432	-0.9277	-1.8490
0.50	-0.4496	0.9418	-1.0029	-1.9192
0.40	-4.7115	-0.3167	0.2646	1.3733
0.30	-11.2103	-2.4556	4.0628	10.7600
0.20	-20.1956	-5.2003	10.5149	24.2400
0.10	-31.0220	-7.0571	16.8601	33.7270
0.	-40.6928	-5.7429	20.3781	36.1250
-0.10	-41.8978	-0.1360	21.7404	34.4980
-0.20	-24.5806	9.3027	22.9482	31.8830
-0.30	12.0068	21.8256	25.5856	30.0000
-0.40	50.5495	36.8389	30.8970	30.0860
-0.50	73.8519	53.2174	40.0655	33.6430
-0.60	79.6954	68.3005	53.8879	42.8930
-0.70	73.4829	77.4996	71.0123	60.3620
-0.80	60.0569	75.5663	84.0319	84.2290
-0.90	41.1626	58.4052	76.8142	93.1560
-1.00	0.0000	0.0000	0.0000	0.0000

LI 6

Figure 5

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Energy (MeV)	Energy Levels*
1.00	G.S. $3/2^-$
2.00	0.478 $1/2^-$
3.00	4.63 $[3/2^-]$
4.00	6.54 $[3/2^-]$
5.00	7.47 $5/2^-$
6.00	9.60 $[3/2^-]$
7.00	10.80 $[3/2^-]$
8.00	12.40 $[3/2^-]$
9.00	14.00 $[3/2^-]$
10.00	
11.00	
12.00	
13.00	
14.00	
15.00	
16.00	

*Energy levels from NRC 61-5, 6-35, except [] values which are assumed.

LI 7

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE ELASTIC	TOTAL ELASTIC	SHAPE ELASTIC	TOTAL ELASTIC
	1 MEV	+ 1 MEV	3 MEV	0 3 MEV
1.00	-0.	-0.	-0.	-0.
0.90	-2.3392	-1.2044	2.2120	1.5888
0.80	-3.5182	-1.7293	2.1065	1.4523
0.70	-4.5618	-2.1252	1.1236	0.7350
0.60	-5.5496	-2.4299	-0.6626	-0.4052
0.50	-6.5004	-2.6495	-3.3107	-1.8559
0.40	-7.4095	-2.7801	-6.9646	-3.4866
0.30	-8.2540	-2.8146	-11.8713	-5.1217
0.20	-8.9897	-2.7449	-18.4311	-6.5236
0.10	-9.5411	-2.5648	-27.2804	-7.3908
0.	-9.7840	-2.2713	-39.3237	-7.3869
-0.10	-9.5159	-1.8676	-54.8941	-6.2221
-0.20	-8.4112	-1.3645	-65.1029	-3.7882
-0.30	-5.9666	-0.7828	-9.1007	-0.2944
-0.40	-1.4825	-0.1548	90.4812	3.7033
-0.50	5.7366	0.4756	91.3896	7.4501
-0.60	15.5537	1.0517	70.5259	10.2430
-0.70	25.4256	1.5029	52.6149	11.6075
-0.80	30.1593	1.7362	37.9168	11.2798
-0.90	25.4010	1.5942	24.1878	8.9248
-1.00	0.0000	0.0000	0.0000	0.0000

LI 7

+ 1 MEV

o 3 MEV

Figure 6

LI 7

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE	TOTAL	SHAPE	TOTAL
	ELASTIC 2 MEV	ELASTIC + 2 MEV	ELASTIC 4 MEV	ELASTIC 0 4 MEV
1.00	-0.	-0.	-0.	-0.
0.90	-0.4599	-0.3013	4.0913	3.1033
0.80	-1.3457	-0.8454	4.9161	3.5680
0.70	-2.5647	-1.5291	4.5788	3.1373
0.60	-4.1048	-2.2934	3.0833	1.9597
0.50	-5.9755	-3.0793	0.2282	0.1315
0.40	-8.1973	-3.8178	-4.3381	-2.1960
0.30	-10.7920	-4.4258	-11.1681	-4.7639
0.20	-13.7629	-4.8051	-21.1444	-7.1760
0.10	-17.0362	-4.8474	-35.7083	-8.9038
0.	-20.2855	-4.4484	-57.0043	-9.3556
-0.10	-22.3861	-3.5331	-85.5030	-8.0370
-0.20	-19.7746	-2.0918	-95.7993	-4.7843
-0.30	-3.0954	-0.2139	1.0544	0.0421
-0.40	36.1460	1.8985	85.0572	5.5667
-0.50	68.0108	3.9545	88.7081	10.6724
-0.60	66.5943	5.6316	74.3308	14.3782
-0.70	52.0780	6.6349	58.8414	16.0654
-0.80	37.1269	6.7091	44.0947	15.4270
-0.90	23.1163	5.5143	28.8530	12.0708
-1.00	0.0000	0.0000	0.0000	0.0000

LI 7

+ 2 MEV

o 4 MEV

Figure 7

LI 7

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.90	4.3216	0.4730	-1.3772	-0.6931
0.80	5.7337	0.7995	-2.5857	-2.3270
0.70	6.1367	1.1835	-3.7874	-4.4545
0.60	5.3771	1.5788	-4.6265	-6.4032
0.50	3.0387	1.7660	-4.2908	-6.3742
0.40	-1.5150	1.1933	-1.2354	-0.5991
0.30	-9.1630	-1.1070	5.9456	13.5478
0.20	-21.0035	-5.7580	14.5050	28.3883
0.10	-37.9994	-10.9673	18.2373	34.0501
0.	-59.0869	-12.8686	16.8690	32.1048
-0.10	-74.0915	-9.5545	14.0533	27.2771
-0.20	-53.9429	-1.4666	12.1951	22.1394
-0.30	9.9106	10.7597	12.5803	17.9554
-0.40	61.8034	26.7054	16.4209	15.8682
-0.50	79.0480	45.1921	25.3499	17.7234
-0.60	76.6399	62.9673	41.1448	26.8717
-0.70	66.1694	74.3695	63.3394	48.1895
-0.80	52.1490	73.4716	82.8864	81.1408
-0.90	35.1082	56.7050	78.5353	95.6691
-1.00	0.0000	0.0000	0.0000	0.0000

LI 7

Figure 8

LI 7

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.90	3.1711	-0.5339	-1.3175	-0.2437
0.80	4.5510	-0.8380	-2.7810	-1.8469
0.70	5.3765	-0.9948	-4.3932	-4.1043
0.60	5.4317	-0.9040	-5.6836	-6.2443
0.50	4.2121	-0.4496	-5.5045	-6.1351
0.40	0.9170	0.4009	-1.5294	0.6170
0.30	-5.5090	1.3160	8.3597	16.3207
0.20	-15.9872	1.4084	19.9053	31.6765
0.10	-30.0117	0.3406	24.7322	37.3195
0.	-43.0094	-0.4956	22.9859	35.4840
-0.10	-44.6296	0.4671	19.0800	30.6308
-0.20	-25.4210	4.0337	15.6671	25.1164
-0.30	9.6484	10.8328	14.0718	20.1222
-0.40	43.6362	21.6086	15.5061	16.7424
-0.50	64.6588	36.8081	21.7654	16.8014
-0.60	71.2604	55.2511	35.4263	23.8270
-0.70	66.9611	72.0153	58.2067	43.7169
-0.80	55.4393	77.9893	83.4052	78.7253
-0.90	38.2721	64.0453	85.1915	98.6008
-1.00	0.0000	0.0000	0.0000	0.0000

LI 7

Figure 9

LI 7

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.90	1.8276	-1.1418	-1.0717	0.2472
0.80	2.8006	-1.9667	-2.6660	-1.2914
0.70	3.5852	-2.6746	-4.5799	-3.6296
0.60	4.0013	-3.0311	-6.2403	-5.8829
0.50	3.5750	-2.5683	-6.1751	-5.5629
0.40	1.4261	-0.5255	-1.3154	2.2619
0.30	-3.6925	3.6223	10.8840	19.1580
0.20	-12.5045	8.2786	24.4860	34.4413
0.10	-22.8286	10.1329	29.9109	39.8682
0.	-28.4611	9.1960	27.9843	38.2104
-0.10	-24.0195	8.0110	23.4456	33.5238
-0.20	-9.6498	8.3976	18.9814	27.8855
-0.30	11.1340	11.4718	15.9042	22.3561
-0.40	34.2924	18.3483	15.3967	17.9561
-0.50	55.4816	30.2787	19.3037	16.4648
-0.60	70.0826	47.8156	30.6865	21.5199
-0.70	74.5084	68.1110	53.0533	39.7888
-0.80	67.5492	81.1061	82.7598	75.7872
-0.90	49.3609	71.3950	91.0680	99.6664
-1.00	0.0000	0.0000	0.0000	0.0000

LI 7

Figure 10

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^9Be

Energy (MeV)

Energy Levels*

3.1	G.S.	$3/2^-$
4.00	1.75	$1/2^{(+)}$
7.00	2.43	$(5/2^-)$
8.00	3.04	$(3/2^+)$
9.00	4.74	$[3/2^-]$
10.00	6.76	$[3/2^-]$
11.00	7.94	$[3/2^-]$
12.00	9.10	$[3/2^-]$
13.00		
14.00		
15.00		
16.00		

*Energy levels obtained from NRC 61-5, 6-71, except [] values which are assumed.

BE 9

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 3.1 MEV	ELASTIC 3.1 MEV
1.00	-0.	-0.
0.90	5.2884	3.6847
0.80	7.9924	5.1826
0.70	10.3039	6.0656
0.60	12.2724	6.3440
0.50	13.7532	5.9732
0.40	14.4663	4.9787
0.30	13.9894	3.5315
0.20	11.8115	1.9748
0.10	7.9984	0.7760
0.	8.2161	0.4035
-0.10	42.5015	1.1742
-0.20	95.0413	3.1383
-0.30	96.8326	6.0481
-0.40	84.9634	9.4123
-0.50	73.4603	12.6093
-0.60	62.9136	15.0128
-0.70	52.5375	16.0784
-0.80	41.4957	15.3339
-0.90	28.4080	12.1098
-1.00	0.0000	0.0000

BE 9

Figure 11

BE 9

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 4 MEV	ELASTIC + 4 MEV
1.00	-0.	-0.
0.95	1.1359	0.9077
0.90	1.8716	1.4585
0.85	2.6361	1.9933
0.80	3.4611	2.5235
0.75	4.3540	3.0375
0.70	5.3123	3.5128
0.65	6.3238	3.9184
0.60	7.3643	4.2162
0.55	8.3912	4.3641
0.50	9.3338	4.3200
0.45	10.0751	4.0491
0.40	10.4213	3.5323
0.35	10.0473	2.7756
0.30	8.3954	1.8169
0.25	4.4902	0.7278
0.20	-3.3848	-0.3914
0.15	-18.0886	-1.4238
0.10	-43.1410	-2.2510
0.05	-76.8756	-2.7684
0.	-98.1996	-2.8952
-0.05	-82.1612	-2.5803
-0.10	-44.6381	-1.8027
-0.15	-10.3399	-0.5690
-0.20	14.7180	1.0903
-0.25	32.3767	3.1237
-0.30	44.9909	5.4617
-0.35	54.1131	8.0190
-0.40	60.6434	10.6955
-0.45	65.0916	13.3798
-0.50	67.7528	15.9513
-0.55	68.8106	18.2846
-0.60	68.3924	20.2543
-0.65	66.5974	21.7390
-0.70	63.5043	22.6240
-0.75	59.1664	22.8006
-0.80	53.5891	22.1567
-0.85	46.6802	20.5523
-0.90	38.1152	17.7471
-0.95	26.8194	13.1228
-1.00	0.0000	0.0000

BE 9

Figure 12

BE 9

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.90	-6.2309	-5.1447	-2.0836	-0.0589
0.80	-9.5959	-9.5646	-5.6807	-2.6619
0.70	-12.5823	-14.7804	-10.8790	-6.9384
0.60	-15.0133	-20.2089	-16.4960	-10.8520
0.50	-15.7361	-22.5728	-16.9510	-6.9994
0.40	-11.0205	-11.9169	-1.9077	9.9952
0.30	5.2036	16.2421	22.1520	26.9590
0.20	18.5302	33.2107	35.1910	35.1520
0.10	12.3161	30.8567	36.5150	37.1760
0.	2.6675	22.0632	32.0690	35.7500
-0.10	-3.8699	12.6364	24.9320	31.0460
-0.20	-6.9875	4.0045	16.2810	25.5770
-0.30	-6.4902	-3.2684	6.7685	16.9090
-0.40	-1.3926	-8.2355	-2.6587	6.4203
-0.50	10.0187	-8.6643	-9.7287	-3.2388
-0.60	29.1940	0.3786	-8.5991	-4.3356
-0.70	53.8529	27.3624	13.8540	18.3130
-0.80	72.6101	72.7089	67.6360	68.5450
-0.90	67.5016	92.3549	98.9310	94.2560
-1.00	0.0000	0.0000	0.0000	0.0000

BE 9

Figure 13

BE 9

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC		
	+ 8 MEV	0 11 MEV	X 14 MEV
1.00	-0.	-0.	-0.
0.90	-6.4881	-4.0840	-1.2656
0.80	-10.5774	-8.3315	-4.4997
0.70	-14.6682	-13.7200	-9.4350
0.60	-18.4789	-19.4730	-14.6520
0.50	-20.1961	-21.5260	-13.8830
0.40	-13.5339	-9.1156	2.0682
0.30	9.6987	18.5380	23.8080
0.20	26.4934	34.4550	35.2280
0.10	21.1441	33.6060	37.0850
0.	10.7567	26.2100	33.8890
-0.10	2.1283	17.2460	27.8580
-0.20	-3.9231	8.2251	19.8250
-0.30	-7.0904	-0.1858	10.2790
-0.40	-6.3618	-7.0418	0.1102
-0.50	0.4439	-10.1510	-8.3008
-0.60	16.7158	-4.2963	-8.6083
-0.70	44.3955	20.9930	13.2950
-0.80	73.8790	70.9840	66.9360
-0.90	76.7381	97.0180	97.5920
-1.00	0.0000	0.0000	0.0000

BE 9

Figure 14

BE 9

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC		
	+ 9 MEV	0 12 MEV	X 15 MEV
1.00	-0.	-0.	-0.
0.90	-6.0248	-3.0442	-0.5941
0.80	-10.4215	-6.9910	-3.4958
0.70	-15.2222	-12.3490	-8.1161
0.60	-20.0100	-18.1500	-12.7500
0.50	-22.2657	-19.5620	-10.5160
0.40	-13.5733	-5.7098	6.0777
0.30	13.3568	20.4160	25.3860
0.20	30.8126	34.9920	35.1530
0.10	26.8773	35.4150	37.2220
0.	16.9919	29.5360	35.0480
-0.10	7.6005	21.3850	30.1330
-0.20	-0.1081	12.3850	22.9350
-0.30	-5.7016	3.2410	13.6980
-0.40	-8.2098	-5.0873	3.1817
-0.50	-5.3705	-10.3930	-6.1071
-0.60	7.2336	-7.1837	-7.1880
-0.70	35.2723	16.4860	14.7950
-0.80	73.7631	69.1460	67.2370
-0.90	85.3337	99.0450	95.8130
-1.00	0.0000	0.0000	0.0000

BE 9

Figure 15

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Energy (MeV)	Energy Levels*	
1.00	G.S.	3^+
2.00	0.717	1^+
3.00	1.74	0^+
4.00	2.15	1^+
5.00	3.59	2^+
6.00	4.77	(2^+)
7.00	5.11	(2^-)
8.00	5.16	(2^+)
9.00	5.18	$1^{(+)}$
10.00	5.92	2^+
11.00	6.04	4^+
12.00	6.88	1^-
13.00	6.97	$[3^+]$
14.00	7.48	2^+
15.00	7.56	0^+
16.00	7.78	2^-
	8.89	2^+
	9.70	$[3^+]$
	10.70	$[3^+]$

*Energy levels obtained from NRC 61-5, 6-91, except [] values which are assumed.

B 10

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE	TOTAL	SHAPE	TOTAL
	ELASTIC 1 MEV	ELASTIC + 1 MEV	ELASTIC 3 MEV	ELASTIC 0 3 MEV
1.00	-0.	-0.	-0.	-0.
0.90	4.0801	2.1791	0.8552	0.5669
0.80	5.6891	2.9380	1.9331	1.1596
0.70	6.8648	3.4179	3.3623	1.7623
0.60	7.8057	3.7363	5.1720	2.2609
0.50	8.5913	3.9432	7.4234	2.5468
0.40	9.2645	4.0679	10.2820	2.5613
0.30	9.8521	4.1307	14.2650	2.3426
0.20	10.3721	4.1469	21.1168	2.0453
0.10	10.8355	4.1287	36.4315	1.9068
0.	11.2466	4.0855	68.4179	2.1725
-0.10	11.6018	4.0237	92.3434	3.0200
-0.20	11.8875	3.9468	88.4096	4.5112
-0.30	12.0773	3.8542	79.8555	6.5747
-0.40	12.1293	3.7411	73.3287	9.0092
-0.50	11.9837	3.5967	67.7627	11.4950
-0.60	11.5584	3.4024	61.7963	13.6125
-0.70	10.7395	3.1273	54.4849	14.8608
-0.80	9.3485	2.7166	45.0193	14.6387
-0.90	6.9962	2.0460	31.9617	12.0106
-1.00	0.0000	0.0000	0.0000	0.0000

B 10

Figure 16

B 10

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE	TOTAL	SHAPE	TOTAL
	ELASTIC 2 MEV	ELASTIC + 2 MEV	ELASTIC 4 MEV	ELASTIC 0 4 MEV
1.00	-0.	-0.	-0.	-0.
0.90	4.9396	2.9423	-4.3508	-3.1877
0.80	7.2963	4.0411	-5.8612	-3.8709
0.70	9.2952	4.7176	-6.6691	-3.7717
0.60	11.1315	5.0931	-6.8956	-3.0866
0.50	12.8971	5.2262	-6.5163	-2.0461
0.40	14.6846	5.1752	-5.4852	-1.0031
0.30	16.6329	5.0127	-4.0499	-0.3179
0.20	18.9602	4.8262	-6.8845	-0.1250
0.10	21.9644	4.7094	-87.8251	-0.2238
0.	25.9187	4.7480	-10.9583	-0.2116
-0.10	30.7701	5.0027	5.8041	0.3089
-0.20	35.7675	5.4939	17.3516	1.6137
-0.30	39.5788	6.1905	28.8395	3.8252
-0.40	41.1349	7.0071	40.5044	6.8952
-0.50	40.2509	7.8080	51.1985	10.5663
-0.60	37.3492	8.4159	58.9652	14.3204
-0.70	32.8808	8.6165	61.5814	17.3408
-0.80	26.9680	8.1375	57.1154	18.4897
-0.90	19.0224	6.5091	43.5482	16.0744
-1.00	0.0000	0.0000	0.0000	0.0000

B 10

Figure 17

B 10

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE ELASTIC			
	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.90	-7.8721	-8.1289	-3.6376	-0.8809
0.80	-11.7100	-14.2768	-8.6272	-4.3140
0.70	-15.0712	-21.5744	-15.9882	-10.1470
0.60	-18.2799	-30.2827	-25.0585	-16.4800
0.50	-21.4404	-38.1404	-28.9099	-13.5690
0.40	-24.2712	-29.3756	-9.7956	5.7054
0.30	-22.4290	18.5951	22.1843	23.9060
0.20	10.2615	38.8371	35.7578	32.3280
0.10	1.7968	28.5896	34.7975	34.4090
0.	-7.5500	15.4227	28.1676	32.7950
-0.10	-9.6317	4.1278	19.2382	28.2860
-0.20	-7.5191	-5.2171	9.0619	20.8820
-0.30	-1.5811	-12.5981	-1.8384	10.4950
-0.40	8.5716	-17.2301	-12.6266	-2.2667
-0.50	23.0507	-16.8497	-21.0884	-14.4920
-0.60	40.3956	-6.4750	-21.0142	-17.2760
-0.70	56.1554	21.7144	2.9379	8.2456
-0.80	63.0868	65.7982	64.2158	67.6810
-0.90	53.7719	84.0673	99.0383	96.2360
-1.00	0.0000	0.0000	0.0000	0.0000

B 10

Figure 18

B 10

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.90	-9.2939	-6.6582	-2.4521	-0.4031
0.80	-14.5945	-12.6041	-6.8738	-3.5296
0.70	-19.9144	-20.2037	-13.8170	-8.8013
0.60	-25.7061	-29.4569	-22.2530	-13.7680
0.50	-31.8437	-36.5492	-23.9880	-8.4495
0.40	-34.4603	-22.6861	-4.1300	9.9120
0.30	-4.8376	20.9124	22.6240	24.7000
0.20	35.2964	38.1176	34.4980	31.5260
0.10	17.3804	31.6339	35.1790	33.6600
0.	2.2689	20.5269	30.5720	32.9440
-0.10	-6.4513	9.5482	23.0790	29.7210
-0.20	-10.9338	-0.6068	13.5250	23.6280
-0.30	-11.6233	-9.6951	2.3764	14.2000
-0.40	-7.7199	-16.9525	-9.5199	1.7729
-0.50	2.4620	-20.1935	-19.7860	-10.4570
-0.60	20.5579	-13.9395	-21.5760	-12.3300
-0.70	44.9488	12.9222	2.0417	14.7790
-0.80	65.3347	65.3254	64.4890	70.3900
-0.90	63.7273	92.2476	98.6830	95.4360
-1.00	0.0000	0.0000	0.0000	0.0000

B 10

+ 6 MEV
O 9 MEV
X 12 MEV
• 15 MEV

B 10

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.90	-9.1757	-5.0803	-1.5428	-0.1087
0.80	-15.1752	-10.6018	-5.4281	-2.9115
0.70	-21.7643	-18.1959	-11.8360	-7.6143
0.60	-29.3693	-27.5443	-19.3380	-11.1100
0.50	-37.0316	-33.2249	-18.8030	-3.4867
0.40	-34.5383	-15.9940	1.0054	13.9000
0.30	12.0352	21.7656	23.1800	25.7970
0.20	38.6972	37.0526	33.3340	31.0270
0.10	24.2191	33.6997	35.0000	32.8370
0.	9.4425	24.8331	32.0940	32.6190
-0.10	-1.3705	14.6847	26.1220	30.4320
-0.20	-9.0667	4.2789	17.5170	25.6680
-0.30	-13.8655	-5.9523	6.5294	17.5380
-0.40	-14.9251	-15.2193	-6.0584	6.0885
-0.50	-10.0140	-21.3732	-17.6160	-5.2233
-0.60	4.7554	-18.6148	-20.3720	-5.2009
-0.70	32.7366	6.5560	3.8683	23.0350
-0.80	65.9409	64.6371	65.6460	73.3650
-0.90	74.0313	97.2578	97.4610	95.1430
-1.00	0.0000	0.0000	0.0000	0.0000

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Figure 20

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Energy (MeV)	Energy Levels*			
1.00	G.S.	$3/2^-$	11.00	$[3/2^-]$
2.00	2.14	$1/2^-$	11.46	$[3/2^-]$
3.00	4.46	$5/2^-$	11.68	$(5/2^+)$
4.00	5.03	$(1/2)^-$	11.97	$(3/2^-)$
5.00	6.76	$(7/2^-)$	12.20	$[3/2^-]$
6.00	6.81	$(3/2^+)$	13.16	$[3/2^-]$
7.00	7.30	$(5/2)^{-}$	14.02	$[3/2^-]$
8.00	7.99	$[3/2^-]$	14.55	$[3/2^-]$
9.00	8.57	$(5/2)^{-}$	15.09	$[3/2^-]$
10.00	8.92	$5/2^{(-)}$		
11.00	9.19	$7/2^+$		
12.00	9.28	$5/2^+$		
13.00	9.87	$[3/2^-]$		
14.00	10.26	$[3/2^-]$		
15.00	10.32	$[3/2^-]$		
16.00	10.61	$[3/2^-]$		

* Energy levels obtained from NRC 61-5, 6-107, except [] values which are assumed.

8 11

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE	TOTAL	SHAPE	TOTAL
	ELASTIC 1 MEV	ELASTIC + 1 MEV	ELASTIC 3 MEV	ELASTIC 0 3 MEV
1.00	-0.	-0.	-0.	-0.
0.90	3.3808	1.9145	-5.0244	-3.2293
0.80	4.7908	2.6437	-6.7682	-3.9217
0.70	5.8706	3.1476	-7.7149	-3.8772
0.60	6.7732	3.5191	-7.9653	-3.2965
0.50	7.5576	3.7957	-7.3238	-2.3337
0.40	8.2540	3.9989	-5.1823	-1.1710
0.30	8.8803	4.1435	0.0275	0.0040
0.20	9.4476	4.2407	11.9118	1.0656
0.10	9.9617	4.2995	34.4981	2.0023
0.	10.4237	4.3267	57.8080	2.9122
-0.10	10.8280	4.3267	64.6906	3.9459
-0.20	11.1617	4.3011	62.5593	5.2369
-0.30	11.4013	4.2477	60.3924	6.8486
-0.40	11.5104	4.1600	59.6262	8.7410
-0.50	11.4360	4.0254	59.2994	10.7498
-0.60	11.1026	3.8231	58.1033	12.5755
-0.70	10.3989	3.5196	54.7669	13.7762
-0.80	9.1412	3.0552	47.9994	13.7385
-0.90	6.9221	2.2947	35.8039	11.4574
-1.00	0.0000	0.0000	0.0000	0.0000

B 11

Figure 21

B 11

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE	TOTAL	SHAPE	TOTAL
	ELASTIC 2 MEV	ELASTIC + 2 MEV	ELASTIC 4 MEV	ELASTIC 0 4 MEV
1.00	-0.	-0.	-0.	-0.
0.90	1.1294	0.6591	-9.7999	-6.8846
0.80	2.1489	1.1671	-14.5501	-9.1152
0.70	3.3802	1.6823	-18.7858	-9.8875
0.60	4.8760	2.1869	-23.0462	-9.2793
0.50	6.7048	2.6632	-27.7705	-7.3832
0.40	8.9705	3.1050	-33.6050	-4.6700
0.30	11.8227	3.5217	-40.6146	-1.9914
0.20	15.4446	3.9390	-12.1317	-0.1240
0.10	19.9835	4.3939	44.3727	0.7090
0.	25.3887	4.9253	17.2613	0.8314
-0.10	31.2093	5.5614	8.7619	0.7854
-0.20	36.5683	6.3074	8.2507	1.0696
-0.30	40.5052	7.1357	12.4874	2.0407
-0.40	42.4349	7.9797	20.4358	3.8849
-0.50	42.2718	8.7320	31.1717	6.5818
-0.60	40.1935	9.2449	42.8790	9.8325
-0.70	36.3457	9.3260	52.3191	12.9693
-0.80	30.6059	8.7111	55.0936	14.8713
-0.90	22.1224	6.9152	46.1808	13.7286
-1.00	0.0000	0.0000	0.0000	0.0000

B 11

Figure 22

B 11

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.90	-11.5932	-7.5874	-2.3649	-0.6472
0.80	-18.2163	-14.7323	-7.3595	-4.0295
0.70	-25.1182	-24.6315	-16.1339	-10.2588
0.60	-33.4395	-38.7647	-28.5421	-16.6864
0.50	-45.0981	-55.6514	-33.1615	-10.1632
0.40	-65.3924	-42.1236	-7.1983	8.8135
0.30	-96.2322	30.1555	22.5436	21.7540
0.20	86.2810	43.6330	33.6225	27.8061
0.10	25.3338	31.7606	33.9674	30.2792
0.	3.4878	18.4689	29.3319	30.3883
-0.10	-6.7205	6.3246	21.6258	28.0052
-0.20	-11.5598	-4.8359	11.4058	22.3317
-0.30	-12.2424	-15.1037	-1.0315	12.4286
-0.40	-8.3158	-23.9180	-14.9755	-1.6986
-0.50	1.4303	-29.2380	-28.0721	-16.3974
-0.60	17.8808	-25.3965	-32.7437	-19.2009
-0.70	39.0190	0.4781	-8.3687	11.4894
-0.80	56.3973	57.2888	62.3042	71.5298
-0.90	55.8402	89.7751	98.6349	96.7843
-1.00	0.0000	0.0000	0.0000	0.0000

B 11

Figure 23

B 11

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.90	-11.2437	-5.4977	-1.4570	-0.5191
0.80	-18.6788	-12.0114	-5.7624	-3.6675
0.70	-27.2902	-21.8493	-13.7108	-9.1394
0.60	-38.6455	-36.0745	-24.4316	-13.2050
0.50	-55.3833	-49.4911	-24.9031	-3.0320
0.40	-77.5272	-26.3997	-0.8410	12.7285
0.30	14.2751	26.6726	21.7671	22.3303
0.20	59.0673	39.7036	31.2702	26.7521
0.10	26.7414	33.4466	33.1054	28.8403
0.	7.5489	23.1948	30.6383	29.4354
-0.10	-4.7745	12.1265	24.8659	28.2458
-0.20	-13.3084	0.7530	15.9007	24.2746
-0.30	-18.7890	-10.7421	3.7606	16.1867
-0.40	-20.5419	-21.7637	-10.9185	3.5383
-0.50	-16.4422	-30.3270	-25.3818	-9.7043
-0.60	-2.7454	-30.3966	-30.6336	-9.8121
-0.70	23.8322	-6.0655	-4.3747	21.6230
-0.80	56.3029	58.4864	65.0827	74.5423
-0.90	66.9800	96.3499	97.7565	96.9834
-1.00	0.0000	0.0000	0.0000	0.0000

B 11

Figure 24

B 11

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.90	-9.6514	-3.7088	-0.9223	-0.4503
0.80	-17.1629	-9.4668	-4.6899	-3.4765
0.70	-26.7014	-18.8972	-11.7671	-8.2924
0.60	-39.9431	-32.4962	-20.4532	-9.9865
0.50	-58.3406	-41.5453	-17.1932	1.8225
0.40	-62.7027	-15.3193	4.3715	16.2490
0.30	32.8604	24.1061	21.5375	23.2034
0.20	49.2022	36.4303	29.3120	26.1292
0.10	29.4063	34.1649	31.7729	27.5803
0.	13.1064	26.8764	30.8883	28.2395
-0.10	0.4384	17.3440	26.9490	27.8396
-0.20	-9.9020	6.3024	19.5594	25.4146
-0.30	-18.3183	-5.9106	8.2841	19.4709
-0.40	-24.2042	-18.6286	-6.4799	9.2070
-0.50	-25.3769	-29.7676	-21.5188	-1.3253
-0.60	-16.7005	-32.7153	-26.1242	1.7000
-0.70	10.5764	-9.0378	2.5020	31.9129
-0.80	56.5118	60.0922	68.2419	77.0135
-0.90	79.1444	98.7481	97.0398	97.4423
-1.00	0.0000	0.0000	0.0000	0.0000

B 11

Figure 25

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^{12}C

Energy (MeV)	Energy Levels*	
3.1	G.S.	0^+
4.00	4.433	2^+
5.00	7.656	0^+
6.00	9.640	3^-
7.00	10.100	(0^+)
8.00	10.840	(1^-)
9.00	11.830	(1^-)
10.00	12.710	(1^+)
11.00	13.340	$[0^+]$
12.00	14.080	$[0^+]$
13.00	14.710	$[0^+]$
14.00	15.110	1^+
15.00		
16.00		

*Energy levels obtained from NRC 61-5, 6-133, except [] values which are assumed.

C 12

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 3.1 MEV	ELASTIC 3.1 MEV
1.00	-0.	-0.
0.90	-9.4109	-5.3065
0.80	-13.3748	-7.1317
0.70	-16.2462	-7.8869
0.60	-18.1630	-7.6114
0.50	-18.7108	-6.3091
0.40	-16.7514	-4.1880
0.30	-9.9344	-1.7166
0.20	4.6676	0.5557
0.10	24.3660	2.2852
0.	37.1076	3.4605
-0.10	39.3964	4.3081
-0.20	38.2563	5.1233
-0.30	38.2235	6.1381
-0.40	40.2251	7.4359
-0.50	43.6616	8.8973
-0.60	47.2323	10.1902
-0.70	49.1264	10.8347
-0.80	47.0628	10.3191
-0.90	37.8073	8.0823
-1.00	0.0000	0.0000

C 12

+ 3.1 MEV

* 3.1 MEV MC CORMAC, ET AL, PHYS. REV. 108, 116 (1957)

Figure 26

C 12

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE ELASTIC 4 MEV	TOTAL ELASTIC + 4 MEV
1.00	-0.	-0.
0.95	-8.1576	-5.0036
0.90	-11.9392	-7.1355
0.85	-15.1385	-8.7357
0.80	-18.1055	-9.9735
0.75	-20.9764	-10.8737
0.70	-23.8218	-11.4127
0.65	-26.6801	-11.5474
0.60	-29.5630	-11.2340
0.55	-32.4416	-10.4474
0.50	-35.2034	-9.2018
0.45	-37.5422	-7.5691
0.40	-38.6870	-5.6839
0.35	-36.7847	-3.7289
0.30	-27.9514	-1.9004
0.25	-7.5997	-0.3654
0.20	18.7311	0.7701
0.15	32.5963	1.4721
0.10	30.7606	1.7695
0.05	22.9950	1.7335
0.	15.1333	1.4561
-0.05	8.7660	1.0344
-0.10	4.0257	0.5605
-0.15	0.7373	0.1171
-0.20	-1.2701	-0.2237
-0.25	-2.1035	-0.4011
-0.30	-1.8089	-0.3659
-0.35	-0.3882	-0.0819
-0.40	2.1789	0.4715
-0.45	5.9103	1.2949
-0.50	10.7888	2.3643
-0.55	16.7203	3.6271
-0.60	23.4855	4.9999
-0.65	30.6894	6.3705
-0.70	37.7260	7.6044
-0.75	43.7752	8.5550
-0.80	47.8415	9.0735
-0.85	48.8081	9.0113
-0.90	45.3844	8.1942
-0.95	35.4381	6.2898
-1.00	0.0000	0.0000

C 12

+ 4 MEV

* 4.0 MEV G.V. GORLOV, SOVIET PHYSICS-DOKLADY 9, 806 (1965)

Figure 27

C 12

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE ELASTIC			
	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.90	-11.8780	-5.1471	-0.9436	-0.8723
0.80	-19.2903	-11.9766	-5.3296	-4.2615
0.70	-27.4874	-23.2762	-14.7630	-10.5251
0.60	-37.7685	-42.5617	-30.1811	-15.4960
0.50	-52.0182	-70.8968	-33.2919	-4.6380
0.40	-70.1895	-42.8131	-3.3298	10.6909
0.30	1.2541	37.5519	20.2870	18.5889
0.20	70.5110	43.4045	29.5126	22.5962
0.10	28.8771	32.9363	31.5819	25.0777
0.	6.6386	21.0864	29.4950	26.5167
-0.10	-6.6026	9.2514	23.8968	26.3810
-0.20	-15.2561	-2.7114	14.6616	23.3276
-0.30	-20.4318	-14.9109	1.6138	15.4336
-0.40	-21.6351	-26.9787	-14.7836	1.6195
-0.50	-17.0699	-37.1809	-31.8280	-13.8414
-0.60	-3.9060	-39.5623	-39.7317	-14.9229
-0.70	19.4674	-16.6604	-12.2496	18.4988
-0.80	46.3321	52.1691	64.5847	74.2379
-0.90	55.8197	93.9124	98.0068	98.3572
-1.00	0.0000	0.0000	0.0000	0.0000

C 12

Figure 28

C 12

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.90	-10.0859	-3.1084	-0.6725	-1.0463
0.80	-17.8120	-9.1016	-4.5126	-4.4388
0.70	-27.7078	-20.1932	-12.8252	-9.8865
0.60	-42.1456	-39.5099	-25.0061	-11.3590
0.50	-66.3262	-59.8882	-21.9789	1.9280
0.40	-98.9720	-22.5429	2.2961	14.1200
0.30	81.3761	28.0478	18.9214	19.2099
0.20	61.7573	37.8077	26.5134	21.5960
0.10	29.3592	33.6463	29.4914	23.2700
0.	10.1636	25.4692	29.3435	24.6532
-0.10	-3.4146	15.3518	25.9864	25.3567
-0.20	-14.1536	3.6878	18.6937	24.1841
-0.30	-22.8363	-9.3864	6.7024	19.0669
-0.40	-28.9939	-23.4125	-9.8400	8.3539
-0.50	-30.5439	-36.5677	-27.5849	-3.8246
-0.60	-22.5637	-42.2366	-34.3535	-1.6734
-0.70	3.1166	-19.5722	-3.4007	29.1386
-0.80	46.4120	56.2490	68.4180	75.8480
-0.90	69.8594	97.9183	97.7262	98.8899
-1.00	0.0000	0.0000	0.0000	0.0000

C 12

Figure 29

C 12

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.90	-7.6182	-1.7085	-0.7014	-1.1420
0.80	-15.0813	-6.8460	-4.2231	-4.6218
0.70	-25.9974	-17.2699	-11.4534	-9.4026
0.60	-43.5993	-35.1947	-20.0575	-7.6413
0.50	-73.8683	-46.3036	-12.4940	7.3995
0.40	-77.9465	-10.9322	6.8344	17.1868
0.30	55.7472	23.0019	18.4361	20.1591
0.20	50.8455	33.2365	24.2072	21.1300
0.10	31.2552	33.0846	27.2046	21.8770
0.	15.7001	28.2663	28.1917	22.8589
-0.10	2.6969	20.3169	26.7013	23.9444
-0.20	-8.9835	9.5799	21.5505	24.3412
-0.30	-19.7909	-3.8031	11.3121	22.2835
-0.40	-29.3625	-19.2982	-4.4233	15.8391
-0.50	-35.8279	-34.7442	-21.7216	8.1855
-0.60	-33.5838	-42.2737	-26.0859	12.5860
-0.70	-9.1140	-17.9609	7.1601	38.4096
-0.80	48.6027	60.4309	71.6560	76.5078
-0.90	84.1550	98.4569	97.8738	99.2122
-1.00	0.0000	0.0000	0.0000	0.0000

C 12

Figure 30

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^{14}N

Energy (MeV)	Energy Levels ^{*†}			
7.00	G.S.	1 ⁺	7.60	[1 ⁺]
8.00	2.311	0 ⁺	7.97	2 ⁻
9.00	3.945	1 ⁺	8.06	1 ⁻
10.00	4.91	(0 ⁻)	8.47	[1 ⁺]
11.00	5.10	2 ⁽⁻⁾	8.63	0 ⁺
12.00	5.69	1 ⁽⁻⁾	8.71	0 ⁻
13.00	5.83	3 ⁽⁻⁾	8.91	3 ⁻
14.00	6.05	[1 ⁺]	8.99	1 ⁺
15.00	6.21	1 ⁽⁺⁾	9.17	2 ⁺
16.00	6.44	3 ⁽⁻⁾	9.41	[1 ⁺]
	6.70	[1 ⁺]	9.51	2 ⁻
	7.03	(2) ^[+]	9.71	1 ⁺
	7.40	[1 ⁺]		

* Energy levels obtained from NRC 61-5, 6-185, except [] values which are assumed.

† Only 25 levels accommodated in program.

N 14

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.90	0.6992	0.9062	-2.2775	-3.1316
0.80	-2.4590	-1.7016	-6.2930	-8.5496
0.70	-10.0930	-11.1277	-13.3780	-13.4210
0.60	-27.3730	-36.9651	-15.1960	-0.3924
0.50	-68.0155	-39.8280	0.5819	15.3820
0.40	16.8523	-2.2659	8.5452	16.9750
0.30	59.7674	15.1916	11.2370	14.7230
0.20	44.8208	22.9610	13.1240	12.2730
0.10	32.0413	26.7204	15.3840	10.6540
0.	20.6453	27.4692	18.2000	10.6320
-0.10	9.2612	24.6822	21.0850	13.2440
-0.20	-2.8807	17.2450	22.4320	19.7300
-0.30	-16.2057	4.0121	18.8870	29.9100
-0.40	-30.7594	-15.2844	6.6098	37.5040
-0.50	-45.4557	-37.6556	-10.6860	33.8710
-0.60	-54.6375	-49.7590	-12.9850	28.1820
-0.70	-35.6651	-16.7653	18.2070	35.9920
-0.80	47.3811	67.9668	70.6900	62.3550
-0.90	92.3482	97.8356	99.9720	96.3190
-1.00	0.0000	0.0000	0.0000	0.0000

N 14

Figure 31

N 14

COSINE THETA C.M.	POLARIZATION (PERCENT)		
	SHAPE ELASTIC		
	+ 8 MEV	0 11 MEV	X 14 MEV
1.00	-0.	-0.	-0.
0.90	1.7240	-0.2507	-2.8612
0.80	-1.1362	-3.1610	-7.4324
0.70	-10.2893	-11.8820	-13.7470
0.60	-36.3699	-30.0410	-9.2702
0.50	-94.6248	-20.7460	6.9397
0.40	-7.6883	1.6688	11.6220
0.30	33.7561	12.3410	12.0020
0.20	36.4697	18.3670	12.1300
0.10	32.4611	22.5180	13.0330
0.	25.7106	25.0410	15.0780
-0.10	16.6278	25.0060	18.2720
-0.20	5.0677	20.6250	21.7730
-0.30	-9.1569	9.6749	22.7290
-0.40	-25.9721	-9.0283	16.2650
-0.50	-44.0447	-31.5490	3.7302
-0.60	-56.3956	-40.5890	2.3024
-0.70	-34.8808	-4.0616	26.1190
-0.80	56.5875	70.5640	68.7300
-0.90	96.3306	98.6530	99.7790
-1.00	0.0000	0.0000	0.0000

N 14

Figure 32

N 14

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC		
	+ 9 MEV	0 12 MEV	X 15 MEV
1.00	-0.	-0.	-0.
0.90	1.6925	-1.3783	-3.1283
0.80	-0.9187	-4.8020	-8.1793
0.70	-10.6154	-12.7000	-13.7760
0.60	-39.9911	-22.2670	-4.4291
0.50	-68.4152	-8.1496	11.7090
0.40	-6.3830	5.2556	14.4330
0.30	21.1537	11.2390	13.2200
0.20	28.9846	15.1430	11.9000
0.10	30.3720	18.5950	11.4750
0.	27.9466	21.6810	12.5140
-0.10	21.9321	23.5410	15.5430
-0.20	11.9695	22.2070	20.7090
-0.30	-2.3199	14.5810	26.3090
-0.40	-20.8371	-1.8348	26.7610
-0.50	-41.5685	-22.6580	19.1070
-0.60	-54.9237	-27.9300	-16.2590
-0.70	-27.9670	7.9333	31.8550
-0.80	63.3643	71.3620	65.8380
-0.90	97.2396	99.4840	98.6350
-1.00	0.0000	0.0000	0.0000

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Figure 33

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Energy (MeV)	Energy Levels*†			
1.00	G.S.	0 ⁺	12.53	2 ⁻
2.00	6.05	0 ⁺	12.79	0 ⁻
3.00	6.13	3 ⁻	12.97	2 ⁻
4.00	6.92	2 ⁺	13.10	1 ⁻
5.00	7.12	1 ⁻	13.26	3 ⁻
6.00	8.88	2 ⁻	13.66	1 ⁺
7.00	9.59	1 ⁻	13.89	(4 ⁺)
8.00	9.85	2 ⁺	13.98	2 ⁻
9.00	10.36	4 ⁺	14.72	[0 ⁺]
10.00	10.95	0 ⁻		
11.00	11.08	3 ⁺		
12.00	11.26	0 ⁺		
13.00	11.52	2 ⁺		
14.00	11.63	3 ⁻		
15.00	12.02	[0 ⁺]		
16.00	12.44	1 ⁻		

* Energy levels obtained from NRC 61-5, 6-229, except [] values which are assumed.

† Only 25 levels accommodated in program.

0 16

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE	TOTAL	SHAPE	TOTAL
	ELASTIC 1 MEV	ELASTIC + 1 MEV	ELASTIC 3 MEV	ELASTIC 0 3 MEV
1.00	-0.	-0.	-0.	-0.
0.90	0.6397	0.3961	1.8815	1.1788
0.80	1.3109	0.8223	3.2586	1.9662
0.70	2.1274	1.3454	5.0356	2.8662
0.60	3.0837	1.9565	7.3903	3.8794
0.50	4.1713	2.6413	10.3290	4.8904
0.40	5.3789	3.3814	13.5508	5.6848
0.30	6.6912	4.1537	16.2858	6.0052
0.20	8.0880	4.9306	17.3558	5.6567
0.10	9.5422	5.6802	15.7162	4.6080
0.	11.0192	6.3666	11.2196	3.0238
-0.10	12.4748	6.9513	4.8189	1.2125
-0.20	13.8536	7.3939	-1.9663	-0.4634
-0.30	15.0871	7.6549	-7.6081	-1.6637
-0.40	16.0899	7.6978	-10.6731	-2.1243
-0.50	16.7541	7.4920	-9.6624	-1.7097
-0.60	16.9377	7.0138	-3.1287	-0.4827
-0.70	16.4381	6.2432	9.1257	1.2239
-0.80	14.9202	5.1480	23.3038	2.7891
-0.90	11.6393	3.6154	29.6394	3.3455
-1.00	0.0000	0.0000	0.0000	0.0000

+ 1 MEV

o 3 MEV

Figure 34

0 16

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE	TOTAL	SHAPE	TOTAL
	ELASTIC 2 MEV	ELASTIC + 2 MEV	ELASTIC 4 MEV	ELASTIC 0 4 MEV
1.00	-0.	-0.	-0.	-0.
0.90	-0.1365	-0.0852	4.5798	2.8757
0.80	0.3657	0.2259	7.0090	4.1112
0.70	1.2526	0.7583	9.9501	5.2209
0.60	2.5128	1.4752	14.2444	6.3578
0.50	4.1403	2.3310	20.4363	7.4190
0.40	6.1111	3.2625	27.5843	8.0590
0.30	8.3698	4.1905	31.5910	7.8456
0.20	10.8244	5.0316	27.8948	6.5396
0.10	13.3526	5.7141	17.5881	4.2441
0.	15.8247	6.1951	5.1409	1.3132
-0.10	18.1408	6.4707	-6.8321	-1.8155
-0.20	20.2665	6.5730	-17.7433	-4.7118
-0.30	22.2448	6.5552	-27.5960	-6.9558
-0.40	24.1585	6.4671	-36.0363	-8.1136
-0.50	26.0379	6.3308	-41.4215	-7.7585
-0.60	27.7253	6.1217	-39.0149	-5.6331
-0.70	28.7141	5.7593	-19.0129	-2.0194
-0.80	27.9461	5.0994	22.4008	1.8815
-0.90	23.2658	3.8751	48.8252	4.0762
-1.00	0.0000	0.0000	0.0000	0.0000

0 16

Figure 35

0 16

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.90	6.7420	4.3493	-3.4111	-5.4692
0.80	9.8497	6.0835	-7.5881	-13.3192
0.70	13.4792	5.1966	-16.9678	-21.6193
0.60	19.9408	-13.6403	-25.1269	0.4007
0.50	33.0532	-71.4108	-2.5271	13.7967
0.40	51.5325	7.9900	2.3675	11.1835
0.30	54.4363	20.5174	3.9891	6.9630
0.20	39.2091	25.4267	6.0051	3.4268
0.10	22.9114	27.5126	9.0797	1.3149
0.	9.4996	26.8697	13.2700	1.6057
-0.10	-2.2341	22.7032	17.9438	5.8762
-0.20	-13.5411	13.9475	20.9925	15.9884
-0.30	-25.1961	-0.4267	17.7900	30.8389
-0.40	-37.4839	-20.9177	2.6433	38.3178
-0.50	-49.5850	-45.7438	-20.9023	26.4149
-0.60	-56.5461	-63.1935	-28.3817	12.7680
-0.70	-38.5761	-30.6065	5.2371	18.3499
-0.80	34.1174	68.9710	66.2990	49.6112
-0.90	74.7779	95.3187	99.1720	93.7820
-1.00	0.0000	0.0000	0.0000	0.0000

0 16

Figure 36

0 16

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.90	7.5804	1.4199	-4.7426	-5.1851
0.80	10.8853	1.3226	-10.5463	-13.5193
0.70	14.2712	-3.0902	-20.4106	-20.3957
0.60	21.5473	-42.8344	-12.8041	4.1028
0.50	48.9614	-37.7997	5.0859	16.3915
0.40	91.3684	-0.4725	5.2972	13.7789
0.30	65.5352	10.2383	4.0645	9.0268
0.20	42.9158	16.5138	3.8251	4.4829
0.10	29.2833	21.1745	5.1037	1.0471
0.	18.4433	24.0961	8.2660	-0.0026
-0.10	7.8048	24.0465	13.4157	3.6230
-0.20	-3.8251	19.0222	19.5041	15.2597
-0.30	-17.1579	6.6805	22.2910	35.3442
-0.40	-32.6282	-14.3893	13.7705	49.2987
-0.50	-49.8039	-41.0472	-5.5639	39.4750
-0.60	-63.5389	-55.7419	-12.8059	22.2779
-0.70	-45.9692	-16.6229	11.6665	20.2862
-0.80	51.1010	70.8274	61.4236	43.6754
-0.90	88.8957	97.0637	98.7742	88.9120
-1.00	0.0000	0.0000	0.0000	0.0000

Figure 37

0 16

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.90	6.7012	-1.3182	-5.3726	-4.6989
0.80	9.6129	-3.5179	-12.3962	-13.2180
0.70	11.5238	-11.0469	-21.7787	-18.4740
0.60	13.1877	-40.6177	-4.8329	6.9029
0.50	42.1648	-14.8994	10.2032	18.2530
0.40	57.0159	-0.0356	8.3152	15.9940
0.30	41.6950	5.6456	5.2094	11.1420
0.20	35.8406	10.0980	3.1069	5.9781
0.10	31.1012	14.5817	2.5975	1.5249
0.	25.1916	18.9222	4.3565	-0.6344
-0.10	17.0672	21.9410	9.2369	2.5327
-0.20	6.0263	21.1490	17.5915	15.7210
-0.30	-8.4989	12.7000	26.5430	40.0860
-0.40	-26.8722	-6.6960	26.0739	58.2580
-0.50	-48.3254	-32.9554	10.9944	49.7890
-0.60	-65.5607	-43.4782	1.1787	30.0360
-0.70	-42.0446	-4.0675	15.7536	21.8790
-0.80	63.0549	69.6983	55.6758	38.0760
-0.90	93.3342	98.4914	97.0324	82.5070
-1.00	0.0000	0.0000	0.0000	0.0000

0 16

Figure 38

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^{23}Na

Energy (MeV)	Energy Levels*
4.00	G.S. $3/2^+$
5.00	0.438 $5/2^+$
6.00	2.08 $(7/2^+)$
7.00	2.39 $[3/2^+]$
8.00	2.64 $[5/2^+]$
9.00	2.70 $[7/2^+]$
10.00	2.98 $[3/2^+]$
11.00	3.68 $[5/2^+]$
12.00	3.85 $[7/2^+]$
13.00	3.92 $[3/2^+]$
14.00	4.43 $[5/2^+]$
15.00	4.78 $[7/2^+]$
16.00	

*Energy levels obtained from NRC 59-4-24, except [] values which are assumed.

NA 23

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 4 MEV	ELASTIC + 4 MEV
1.00	0.	0.
0.95	1.0658	1.0186
0.90	1.8325	1.7378
0.85	2.6653	2.5038
0.80	3.5884	3.3322
0.75	4.6073	4.2187
0.70	5.7194	5.1489
0.65	6.9144	6.0997
0.60	8.1725	7.0385
0.55	9.4612	7.9238
0.50	10.7332	8.7062
0.45	11.9240	9.3321
0.40	12.9533	9.7485
0.35	13.7283	9.9095
0.30	14.1516	9.7810
0.25	14.1301	9.3437
0.20	13.5831	8.5922
0.15	12.4450	7.5319
0.10	10.6631	6.1742
0.05	8.1887	4.5329
0.	4.9656	2.6229
-0.05	0.9177	0.4610
-0.10	-4.0624	-1.9297
-0.15	-10.1242	-4.5124
-0.20	-17.4684	-7.2265
-0.25	-26.3530	-9.9740
-0.30	-37.0844	-12.6022
-0.35	-49.9621	-14.8851
-0.40	-65.0689	-16.5058
-0.45	-81.6049	-17.0521
-0.50	-95.9905	-16.0440
-0.55	-97.7791	-13.0210
-0.60	-68.0533	-7.7093
-0.65	-2.1870	-0.2489
-0.70	62.0718	8.6269
-0.75	93.2504	17.6107
-0.80	97.1001	25.1071
-0.85	87.1493	29.6218
-0.90	70.5794	29.9285
-0.95	48.6845	24.5372
-1.00	0.0000	0.0000

NA 23

Figure 39

NA 23

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	0.	0.	0.	0.
0.95	-1.6706	-4.5006	-0.8896	-0.1887
0.90	-1.8798	-6.7413	-2.9610	-2.4357
0.85	-1.5970	-8.4805	-6.7019	-8.0286
0.80	-0.8764	-9.4566	-13.6510	-22.3960
0.75	0.2961	-8.7025	-28.7680	-54.2180
0.70	1.9515	-3.8078	-59.5240	-31.4600
0.65	4.1086	9.0372	51.9450	1.3889
0.60	6.7389	24.3640	34.4620	9.7069
0.55	9.7251	22.8510	22.4640	11.7220
0.50	12.8286	10.8750	14.8140	11.8110
0.45	15.7040	0.1232	8.7759	10.9730
0.40	17.9884	-7.8110	3.3096	9.4281
0.35	19.4348	-13.7360	-2.0325	7.1757
0.30	19.9985	-18.3320	-7.4525	4.1388
0.25	19.8111	-21.9760	-13.0180	0.2371
0.20	19.0768	-24.8390	-18.6920	-4.5426
0.15	17.9710	-26.9610	-24.3280	-10.0410
0.10	16.5863	-28.2880	-29.6320	-15.7660
0.05	14.9209	-28.6910	-34.0980	-20.7090
0.	12.8862	-27.9660	-36.9110	-23.2480
-0.05	10.3155	-25.8350	-36.8330	-21.4140
-0.10	6.9672	-21.9690	-32.1620	-13.6980
-0.15	2.5190	-16.0510	-21.0030	-0.1397
-0.20	-3.4447	-7.9709	-2.3618	17.2310
-0.25	-11.4474	1.7207	21.7570	35.1370
-0.30	-22.1198	11.0700	44.9230	50.3570
-0.35	-36.1270	16.2600	58.9670	60.5620
-0.40	-53.8412	13.2040	59.7830	64.4510
-0.45	-74.2456	1.7210	49.3470	61.5470
-0.50	-91.9782	-12.7440	32.5560	52.0410
-0.55	-92.6305	-23.2990	13.9520	36.8030
-0.60	-57.5201	-25.7940	-3.1984	17.5350
-0.65	6.2150	-19.0590	-16.4460	-3.0270
-0.70	62.0741	-3.7011	-23.4110	-20.9260
-0.75	91.2664	18.3730	-21.1840	-30.9150
-0.80	98.7236	43.6290	-6.2364	-26.7060
-0.85	92.9685	66.4990	24.0370	-2.3181
-0.90	78.7579	79.5020	65.4590	43.1440
-0.95	56.4725	73.0370	94.1920	91.0140
-1.00	0.0000	0.0000	0.0000	0.0000

NA 23

NA 23

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	0.	0.	0.	0.
0.95	-3.9246	-3.3847	-0.1803	-0.6165
0.90	-5.1713	-5.6649	-2.1833	-3.1635
0.85	-5.6591	-7.9869	-6.6363	-9.1675
0.80	-5.4330	-10.0870	-16.8350	-23.5300
0.75	-4.3731	-10.5010	-46.5610	-43.6340
0.70	-2.2971	-2.4039	-92.5510	-17.7490
0.65	0.9232	35.0150	11.0340	2.6856
0.60	5.1181	54.5160	19.8240	8.5941
0.55	9.4909	30.1480	17.6290	10.2810
0.50	12.6490	12.4980	14.3730	10.5300
0.45	13.4810	1.5223	10.8180	10.0570
0.40	12.0940	-6.2471	6.9300	9.0276
0.35	9.5197	-12.3980	2.6083	7.4277
0.30	6.7863	-17.6240	-2.2208	5.1689
0.25	4.4804	-22.2210	-7.5762	2.1484
0.20	2.8139	-26.2870	-13.3960	-1.6813
0.15	1.7958	-29.7940	-19.4920	-6.1879
0.10	1.3448	-32.6060	-25.4830	-10.8630
0.05	1.3346	-34.4710	-30.6960	-14.6070
0.	1.6019	-34.9950	-34.0420	-15.7240
-0.05	1.9318	-33.5960	-33.9340	-12.4790
-0.10	2.0299	-29.4700	-28.4020	-4.1496
-0.15	1.4808	-21.6440	-15.7320	8.2923
-0.20	-0.3052	-9.3033	4.1205	22.6730
-0.25	-4.1506	7.2137	27.9320	36.7080
-0.30	-11.1390	24.6940	49.4230	48.6620
-0.35	-22.4900	36.4410	62.3920	57.3350
-0.40	-38.9220	36.2940	64.1480	61.7960
-0.45	-58.7600	24.6500	55.9250	61.1830
-0.50	-74.4950	7.7742	40.9520	54.7250
-0.55	-72.2190	-7.8410	22.6540	42.0490
-0.60	-43.5830	-18.1900	4.0004	23.7520
-0.65	0.7503	-21.1590	-12.3660	2.1569
-0.70	42.3260	-15.4660	-23.6530	-18.1530
-0.75	71.3630	-0.3954	-26.3610	-30.5340
-0.80	86.6460	23.4050	-15.9440	-27.6450
-0.85	89.8240	52.0740	12.2700	-4.0442
-0.90	82.1710	76.3080	57.5420	39.4590
-0.95	62.5550	79.8990	97.2390	85.3570
-1.00	0.0000	0.0000	0.0000	0.0000

NA 23

Figure 41

NA 23

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	0.	0.	0.	0.
0.95	-4.8413	-2.0336	0.0152	-1.1040
0.90	-6.7791	-4.2203	-2.0395	-4.0069
0.85	-7.9489	-7.2166	-7.1157	-10.3310
0.80	-8.2689	-11.2880	-20.0380	-23.5740
0.75	-7.3260	-16.0530	-57.4220	-32.6440
0.70	-4.4130	-9.1788	-55.4510	-8.9862
0.65	1.1425	94.5630	2.2431	4.6219
0.60	8.4218	56.9580	12.8000	8.5663
0.55	13.0270	28.0020	14.0910	9.5839
0.50	11.1670	14.1960	13.2120	9.5787
0.45	5.0773	5.3563	11.4020	9.0695
0.40	-1.4665	-1.5216	8.8940	8.1842
0.35	-6.8696	-7.5191	5.6873	6.9141
0.30	-10.9350	-13.0810	1.7291	5.1937
0.25	-13.8370	-18.3820	-3.0167	2.9459
0.20	-15.7610	-23.4480	-8.5114	0.1471
0.15	-16.8250	-28.1910	-14.5650	-3.0485
0.10	-17.0880	-32.3990	-20.7250	-6.1104
0.05	-16.5690	-35.7050	-26.1360	-7.9539
0.	-15.2700	-37.5220	-29.4200	-7.0996
-0.05	-13.2070	-36.9520	-28.7040	-2.4587
-0.10	-10.4460	-32.7130	-22.0500	5.7726
-0.15	-7.1844	-23.2270	-8.4614	16.1880
-0.20	-3.8582	-7.2514	10.8960	27.1380
-0.25	-1.3247	14.4070	32.3210	37.4360
-0.30	-1.0497	36.6380	50.8740	46.3780
-0.35	-5.0590	50.8370	62.5220	53.4440
-0.40	-14.9790	51.2320	65.4330	57.9980
-0.45	-29.5300	39.5690	59.8740	59.1030
-0.50	-42.3420	21.9830	47.4200	55.4950
-0.55	-44.9640	4.0703	30.2670	45.8240
-0.60	-33.6900	-10.5830	10.9050	29.4280
-0.65	-11.3630	-19.6730	-7.8754	7.7565
-0.70	16.2720	-21.2060	-22.7540	-14.1740
-0.75	43.6120	-13.0330	-29.5150	-28.0260
-0.80	66.0400	6.7418	-22.7780	-25.3660
-0.85	79.8280	37.6170	3.2086	-2.0772
-0.90	81.7620	71.8190	49.5220	38.6360
-0.95	67.5750	87.6250	95.7530	80.5390
-1.00	0.0000	0.0000	0.0000	0.0000

NA 23

Figure 42

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^{24}Mg

Energy (MeV)	Energy Levels*
3.25	G.S. 0+
5.00	1.368 2 ⁺
6.00	4.12 4 ⁺
7.00	4.24 2 ⁺
8.00	5.22 3 ⁺
9.00	6.30 (1 ⁻)
10.00	7.50 (1) ⁺
11.00	
12.00	
13.00	
14.00	
15.00	
16.00	

* Energy levels obtained from NRC 59-6-10a, except [] values which are assumed.

MG 24

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 3.25 MEV	ELASTIC 3.25 MEV
1.00	-0.	-0.
0.90	1.2443	1.1285
0.80	2.2073	1.9764
0.70	3.1892	2.7972
0.60	4.1081	3.4953
0.50	4.8138	3.9265
0.40	5.0769	3.9143
0.30	4.5664	3.2722
0.20	2.8275	1.8449
0.10	-0.7435	-0.4306
0.	-6.9430	-3.4507
-0.10	-16.8645	-6.8700
-0.20	-32.0938	-10.0381
-0.30	-54.7637	-11.9792
-0.40	-84.8695	-11.5024
-0.50	-97.0885	-7.6383
-0.60	-8.0922	-0.5225
-0.70	78.5534	7.8065
-0.80	81.6632	13.9009
-0.90	57.4597	14.4687
-1.00	0.0000	0.0000

MG 24

Figure 43

MG 24

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE ELASTIC			
	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.95	-2.9488	-2.2484	1.4723	0.1570
0.90	-3.7064	-3.3246	1.0991	-1.5264
0.85	-3.8462	-3.8707	-0.3819	-6.3286
0.80	-3.4772	-3.3944	-3.4640	-21.3710
0.75	-2.6093	-0.7749	-8.3978	-63.5120
0.70	-1.2314	5.9797	28.7920	-20.8020
0.65	0.6531	17.9050	55.7200	2.6499
0.60	2.9916	27.1964	30.4780	7.6366
0.55	5.6481	22.6211	20.5430	8.9655
0.50	8.3813	10.5896	14.4660	9.1436
0.45	10.8643	-0.5991	9.4915	8.6976
0.40	12.7610	-9.4185	4.6915	7.7051
0.35	13.8368	-16.4346	-0.3411	6.0936
0.30	14.0362	-22.2519	-5.8077	3.7228
0.25	13.4749	-27.2343	-11.7910	0.4323
0.20	12.3590	-31.5516	-18.2670	-3.8860
0.15	10.8897	-35.2338	-25.0750	-9.1463
0.10	9.1990	-38.1957	-31.8480	-14.8250
0.05	7.3237	-40.2352	-37.8960	-19.6750
0.	5.2001	-41.0098	-42.0520	-21.6830
-0.05	2.6637	-39.9953	-42.5130	-18.7320
-0.10	-0.5577	-36.4414	-36.8950	-9.9197
-0.15	-4.8651	-29.3839	-22.9520	3.6030
-0.20	-10.8229	-17.8973	-0.4666	19.2790
-0.25	-19.2025	-1.9982	26.4790	34.4890
-0.30	-30.9946	15.4888	49.9430	47.2980
-0.35	-47.2294	27.7216	62.8160	56.4250
-0.40	-68.0301	27.7920	63.0540	60.9250
-0.45	-89.3401	16.0999	53.1150	59.9700
-0.50	-96.2369	-0.1245	36.9730	52.8730
-0.55	-66.0692	-13.7813	18.1780	39.3650
-0.60	-4.5537	-20.9856	-0.5015	20.1250
-0.65	50.7830	-20.1207	-16.6750	-2.5248
-0.70	82.4330	-10.6546	-27.7010	-24.0200
-0.75	95.0292	6.9978	-30.0230	-37.4730
-0.80	95.8131	30.7007	-18.7770	-34.6630
-0.85	88.9625	55.4566	11.0050	-8.7883
-0.90	75.9086	72.8250	57.5690	39.5890
-0.95	55.2674	70.9138	94.9790	89.2140
-1.00	0.0000	0.0000	0.0000	0.0000

MG 24

Figure 44

MG 24

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.95	-3.9895	-0.6004	1.5054	-0.7021
0.90	-5.2794	-1.3065	0.9274	-3.0917
0.85	-5.7994	-1.8624	-1.5083	-8.9904
0.80	-5.6021	-1.4766	-8.5757	-25.2530
0.75	-4.5985	2.2685	-36.2690	-46.3050
0.70	-2.6811	16.6540	-50.6920	-10.4930
0.65	0.1495	47.3740	15.5690	3.4994
0.60	3.5825	50.5340	16.9490	6.7947
0.55	6.8072	29.2490	15.2070	7.6170
0.50	8.6567	13.1030	13.0490	7.6313
0.45	8.2909	2.2821	10.5250	7.2270
0.40	5.8316	-5.8315	7.4900	6.4704
0.35	2.1663	-12.6120	3.7921	5.3101
0.30	-1.7437	-18.7030	-0.6956	3.6356
0.25	-5.2710	-24.3920	-6.0538	1.3123
0.20	-8.1294	-29.7730	-12.2740	-1.7544
0.15	-10.2423	-34.8040	-19.1810	-5.4770
0.10	-11.6331	-39.3110	-26.3170	-9.3327
0.05	-12.3715	-42.9530	-32.7650	-12.1010
0.	-12.5576	-45.1560	-36.9810	-12.0070
-0.05	-12.3332	-45.0000	-36.7680	-7.6752
-0.10	-11.9140	-41.0970	-29.7360	0.7505
-0.15	-11.6446	-31.6130	-14.5590	11.7030
-0.20	-12.0865	-14.8880	7.3479	23.3450
-0.25	-14.1407	8.5242	31.3130	34.3700
-0.30	-19.1635	32.8300	51.3200	43.9920
-0.35	-28.8338	47.8600	62.9630	51.6200
-0.40	-43.9305	47.3640	64.8350	56.5430
-0.45	-60.5628	34.3550	57.9150	57.7450
-0.50	-66.4022	16.1450	44.3110	53.8900
-0.55	-49.9028	-1.4170	26.4240	43.5790
-0.60	-16.6376	-14.9420	6.6837	26.1300
-0.65	18.8051	-22.3360	-12.3190	3.0110
-0.70	47.8603	-21.7840	-27.4390	-20.5980
-0.75	68.2754	-11.4510	-34.4180	-35.7760
-0.80	80.0294	9.7505	-27.3850	-32.9240
-0.85	83.2665	39.7670	0.3200	-6.8086
-0.90	77.4960	69.4460	49.7830	38.9590
-0.95	60.2560	79.3120	96.7120	84.7850
-1.00	0.0000	0.0000	0.0000	0.0000

MG 24

Figure 45

MG 24

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.95	-3.5833	0.7312	0.9756	-1.4356
0.90	-4.9260	0.2897	-0.0659	-4.5039
0.85	-5.5388	-0.5585	-3.6618	-11.2970
0.80	-5.2679	-1.1730	-15.2710	-26.6970
0.75	-3.7236	1.8583	-65.3960	-31.1740
0.70	-0.4181	31.8210	-37.3740	-3.6510
0.65	4.7371	90.7950	4.5019	5.1987
0.60	10.2110	50.1350	10.4100	7.0044
0.55	12.3740	26.6300	11.4010	7.1012
0.50	8.9450	14.5970	11.0700	6.6613
0.45	1.8784	6.4924	10.0120	5.9772
0.40	-5.7689	-0.1578	8.2869	5.1141
0.35	-12.4880	-6.2962	5.8098	4.0600
0.30	-17.9740	-12.3270	2.4473	2.7713
0.25	-22.3350	-18.4150	-1.9286	1.2037
0.20	-25.7240	-24.5810	-7.3719	-0.6311
0.15	-28.2350	-30.7160	-13.7460	-2.5485
0.10	-29.8910	-36.5560	-20.5390	-4.0092
0.05	-30.6480	-41.6070	-26.6250	-4.0291
0.	-30.4060	-45.0330	-30.1280	-1.5567
-0.05	-29.0130	-45.4820	-28.6840	3.6756
-0.10	-26.2920	-40.9750	-20.4280	10.8310
-0.15	-22.0950	-29.1290	-5.3766	18.7090
-0.20	-16.4350	-8.4715	13.9870	26.5000
-0.25	-9.7933	18.6900	33.6990	33.8610
-0.30	-3.6581	44.2720	50.0200	40.6490
-0.35	-0.9838	58.5130	60.4730	46.6510
-0.40	-5.0956	57.7370	63.9030	51.3970
-0.45	-15.6360	45.5170	60.1290	53.9810
-0.50	-26.1840	27.7060	49.6470	52.9050
-0.55	-29.5210	8.9199	33.5420	46.0890
-0.60	-23.1090	-7.8407	13.5720	31.5110
-0.65	-8.3168	-20.3650	-7.6195	9.2377
-0.70	12.0140	-26.3700	-26.2190	-15.3840
-0.75	34.5350	-22.9350	-36.9010	-31.1620
-0.80	55.4670	-6.5951	-32.7270	-27.3220
-0.85	70.6470	24.5760	-6.4514	-1.2069
-0.90	75.6380	64.4920	43.2940	40.7460
-0.95	64.7720	88.3040	93.9470	81.5860
-1.00	0.0000	0.0000	0.0000	0.0000

MG 24

Figure 46

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^{27}Al

Energy (MeV)	Energy Levels *
1.95	G.S. $5/2^+$
3.25	0.842 $1/2^+$
5.00	1.013 $3/2^+$
6.00	2.21 $3/2^{(-)}$
7.00	2.73 $5/2^{(+)}$
8.00	2.98 $3/2^{[+]}$
9.00	3.00 $3/2^{[+]}$
10.00	3.68 $1/2^{[+]}$
11.00	3.95 $[5/2^+]$
12.00	4.05 $1/2^{[+]}$
13.00	4.40 $[5/2^+]$
14.00	4.50 $[5/2^+]$
15.00	4.58 $[5/2^+]$
16.00	4.81 $[5/2^+]$

* Energy levels obtained from NRC 59-6-43, except [] values which are assumed.

AL 27

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 1.95 MEV	ELASTIC 1.95 MEV
1.00	-0.	-0.
0.90	-0.7497	-0.6496
0.80	-1.2951	-1.0961
0.70	-1.9737	-1.6209
0.60	-2.8690	-2.2667
0.50	-4.0663	-3.0561
0.40	-5.6726	-3.9951
0.30	-7.8333	-5.0653
0.20	-10.7585	-6.2101
0.10	-14.7684	-7.3164
0.	-20.3823	-8.1979
-0.10	-28.4972	-8.5950
-0.20	-40.7536	-8.2145
-0.30	-60.0241	-6.8298
-0.40	-86.5035	-4.4198
-0.50	-55.4735	-1.2667
-0.60	67.1281	2.0761
-0.70	70.9710	4.9328
-0.80	51.8172	6.6378
-0.90	32.9066	6.4411
-1.00	0.0000	0.0000

AL 27

Figure 47

AL 27

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 3.25 MEV	ELASTIC 3.25 MEV
1.00	-0.	-0.
0.90	-1.4706	-1.3273
0.80	-1.3792	-1.2116
0.70	-0.8121	-0.6870
0.60	0.0294	0.0236
0.50	0.9456	0.7075
0.40	1.6589	1.1282
0.30	1.7581	1.0531
0.20	0.6310	0.3199
0.10	-2.6419	-1.0777
0.	-9.4918	-2.9216
-0.10	-22.2663	-4.7546
-0.20	-44.7343	-5.9371
-0.30	-79.0659	-5.7780
-0.40	-89.8676	-3.7395
-0.50	7.0030	0.3013
-0.60	74.9115	5.8178
-0.70	82.4763	11.5586
-0.80	71.1644	15.6750
-0.90	51.2461	15.6793
-1.00	0.0000	0.0000

AL 27

Figure 48

AL 27

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	0.	0.	0.	0.
0.95	-2.1970	3.7334	4.3532	-0.5875
0.90	-2.7661	5.7000	6.8377	-2.0640
0.85	-2.8717	7.9538	10.0740	-5.8117
0.80	-2.6023	11.1420	16.9070	-21.1110
0.75	-1.9838	15.9710	42.3380	-76.9080
0.70	-1.0403	22.7360	92.0230	-1.7947
0.65	0.1794	29.3910	36.4690	2.7633
0.60	1.5786	30.1700	19.8820	3.0984
0.55	2.9959	22.3090	14.5370	2.8857
0.50	4.2006	10.6890	11.6490	2.5461
0.45	4.9156	-0.2230	9.1916	2.1313
0.40	4.8741	-9.4798	6.4312	1.6040
0.35	3.8968	-17.5080	2.9618	0.8787
0.30	1.9544	-24.8410	-1.5168	-0.1784
0.25	-0.8237	-31.8410	-7.2455	-1.7459
0.20	-4.2007	-38.6970	-14.3700	-4.0082
0.15	-7.9149	-45.4500	-22.8300	-7.0073
0.10	-11.7540	-51.9760	-32.1360	-10.3070
0.05	-15.6006	-57.9250	-41.0260	-12.6120
0.	-19.4546	-62.5770	-47.1050	-12.0640
-0.05	-23.4469	-64.5710	-46.9100	-7.6458
-0.10	-27.8651	-61.5140	-37.1710	-0.1020
-0.15	-33.2037	-49.7790	-17.3760	8.9868
-0.20	-40.2491	-25.8150	8.4892	18.4000
-0.25	-50.1586	8.6347	33.6920	27.5050
-0.30	-64.2289	40.8680	52.5600	35.9540
-0.35	-81.8167	55.5890	62.4990	43.3660
-0.40	-91.8027	50.7510	63.4770	49.0970
-0.45	-65.2849	34.8520	56.7160	52.0610
-0.50	-4.8362	15.9940	43.8120	50.6050
-0.55	43.2478	-1.3033	26.4230	42.5900
-0.60	68.2993	-14.7180	6.3208	26.0770
-0.65	80.0350	-22.5690	-14.3290	1.2313
-0.70	85.0588	-23.0030	-32.4420	-26.6570
-0.75	86.0292	-13.9180	-43.1800	-45.7920
-0.80	83.6900	5.9947	-38.9860	-42.6350
-0.85	77.8598	34.4350	-10.3050	-11.2360
-0.90	67.6135	61.6320	45.2190	41.0100
-0.95	50.3959	69.2690	96.3770	89.3470
-1.00	0.0000	0.0000	0.0000	0.0000

AL 27

Figure 49

AL 27

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	0.	0.	0.	0.
0.95	-0.7467	5.0954	2.7526	-1.7597
0.90	-0.7622	7.8102	4.1847	-4.6006
0.85	-0.4097	10.9890	5.9067	-11.2130
0.80	0.3392	15.9160	9.8487	-34.4400
0.75	1.5104	24.8090	39.7590	-36.1210
0.70	3.0597	39.6830	33.7820	1.1035
0.65	4.7867	51.2260	12.3150	3.6063
0.60	6.2408	42.4500	9.5380	3.0552
0.55	6.7039	26.2880	8.7084	2.1286
0.50	5.3877	13.9070	8.1419	1.1775
0.45	1.8553	4.8880	7.3760	0.2637
0.40	-3.6533	-2.5119	6.1417	-0.6038
0.35	-10.3490	-9.3502	4.1868	-1.4278
0.30	-17.3440	-16.1890	1.2339	-2.2111
0.25	-23.9890	-23.3170	-3.0132	-2.9438
0.20	-29.9410	-30.8540	-8.8038	-3.5701
0.15	-35.0670	-38.7620	-16.1680	-3.9173
0.10	-39.3330	-46.8040	-24.5780	-3.6090
0.05	-42.7230	-54.4060	-32.4670	-2.1178
0.	-45.2000	-60.4100	-36.9820	0.8444
-0.05	-46.6740	-62.6820	-34.7800	4.9749
-0.10	-46.9850	-57.7520	-24.1510	9.6980
-0.15	-45.8880	-41.3560	-6.6987	14.6700
-0.20	-43.0390	-11.7940	13.5510	19.8350
-0.25	-38.0580	24.2660	32.5370	25.2440
-0.30	-30.8550	52.6380	47.5510	30.8990
-0.35	-22.5880	63.7450	57.1810	36.6530
-0.40	-16.3230	59.0150	60.7650	42.0950
-0.45	-13.3900	44.8810	58.0040	46.3610
-0.50	-10.0560	26.8570	48.8550	47.8610
-0.55	-2.9937	8.3325	33.6620	43.9890
-0.60	7.9643	-8.5953	13.4470	31.3660
-0.65	21.5910	-22.1410	-9.6513	8.0954
-0.70	36.2890	-30.0340	-31.7630	-20.7270
-0.75	50.2370	-28.9010	-46.5510	-39.8870
-0.80	61.3990	-14.2610	-44.7910	-34.3370
-0.85	67.5740	16.9700	-16.2970	-2.7455
-0.90	66.3210	58.1200	40.4160	44.3550
-0.95	53.9000	81.5400	95.2850	87.3980
-1.00	0.0000	0.0000	0.0000	0.0000

AL 27

Figure 50

AL 27

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	0.	0.	0.	0.
0.95	1.5342	5.2756	0.9765	-2.4823
0.90	2.4799	8.2071	0.9955	-6.4328
0.85	3.6962	11.8440	0.2264	-15.3450
0.80	5.4387	18.3510	-3.7886	-39.0040
0.75	7.8955	33.9120	-62.9510	-18.4010
0.70	11.0320	66.3900	0.0135	4.0360
0.65	14.2060	63.4590	4.1725	5.2089
0.60	15.7740	35.9970	4.7657	3.9321
0.55	13.6590	21.8230	4.9308	2.3399
0.50	7.2597	14.1570	4.9071	0.7492
0.45	-1.7778	8.6511	4.6687	-0.7626
0.40	-11.3050	3.6333	4.1110	-2.1399
0.35	-20.1360	-1.6364	3.0690	-3.2984
0.30	-27.9840	-7.5473	1.3125	-4.0917
0.25	-34.9510	-14.3200	-1.4461	-4.2727
0.20	-41.1980	-22.0450	-5.4941	-3.4559
0.15	-46.8250	-30.6390	-10.9320	-1.1658
0.10	-51.8200	-39.7280	-17.2700	2.8386
0.05	-56.0290	-48.4250	-22.8840	7.9458
0.	-59.0900	-54.9910	-25.0190	12.6760
-0.05	-60.3310	-56.4950	-21.2450	15.9590
-0.10	-58.5800	-49.0230	-11.4750	17.9760
-0.15	-51.9520	-29.5610	2.0364	19.5230
-0.20	-37.9190	0.1637	16.5540	21.2830
-0.25	-14.9140	31.7660	30.1480	23.6520
-0.30	12.8450	55.0930	41.7050	26.8070
-0.35	32.2040	65.1650	50.4660	30.7540
-0.40	32.8250	63.0170	55.6410	35.3090
-0.45	19.6050	52.2320	56.2410	39.9480
-0.50	3.4384	36.2860	51.0980	43.4800
-0.55	-8.8950	17.8140	39.1510	43.4880
-0.60	-14.7120	-1.1557	20.0930	35.8500
-0.65	-13.1040	-18.6660	-4.5357	16.4480
-0.70	-3.9346	-32.1630	-30.0110	-11.0360
-0.75	11.9930	-37.6590	-47.6480	-28.8390
-0.80	32.1840	-28.9330	-46.0890	-21.7240
-0.85	51.7980	1.3227	-16.2710	7.3905
-0.90	63.8430	52.1550	39.2180	47.8700
-0.95	59.5770	91.9930	92.1400	85.8690
-1.00	0.0000	0.0000	0.0000	0.0000

AL 27

Figure 51

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^{28}Si

Energy (MeV)	Energy Levels*	
1.00	G.S.	0^+
2.00	1.78	2^+
3.00	4.62	$(4)^+$
3.25	4.98	$[0^+]$
4.00	6.27	2^+
5.00	6.88	$[0^+]$
6.00	6.89	$[2^+]$
7.00		
8.00		
9.00		
10.00		
11.00		
12.00		
13.00		
14.00		
15.00		
16.00		

*Energy levels obtained from NRC 60-4-3, except [] values which are assumed.

SI 28

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE ELASTIC	TOTAL ELASTIC	SHAPE ELASTIC	TOTAL ELASTIC
	1 MEV	+ 1 MEV	3 MEV	0 3 MEV
1.00	0.	0.	0.	0.
0.95	-1.9598	-1.4150	-1.1489	-1.0505
0.90	-2.8809	-2.0793	-1.4408	-1.3131
0.85	-3.6691	-2.6436	-1.5367	-1.3941
0.80	-4.4078	-3.1657	-1.5119	-1.3633
0.75	-5.1296	-3.6668	-1.4018	-1.2541
0.70	-5.8520	-4.1570	-1.2311	-1.0905
0.65	-6.5867	-4.6413	-1.0213	-0.8937
0.60	-7.3421	-5.1224	-0.7944	-0.6847
0.55	-8.1255	-5.6009	-0.5747	-0.4863
0.50	-8.9435	-6.0762	-0.3903	-0.3230
0.45	-9.8025	-6.5462	-0.2748	-0.2214
0.40	-10.7092	-7.0076	-0.2689	-0.2098
0.35	-11.6706	-7.4557	-0.4224	-0.3170
0.30	-12.6944	-7.8840	-0.7963	-0.5708
0.25	-13.7893	-8.2842	-1.4671	-0.9950
0.20	-14.9652	-8.6460	-2.5304	-1.6066
0.15	-16.2336	-8.9569	-4.1086	-2.4109
0.10	-17.6076	-9.2022	-6.3602	-3.3961
0.05	-19.1031	-9.3654	-9.4942	-4.5284
0.	-20.7386	-9.4281	-13.7913	-5.7460
-0.05	-22.5357	-9.3717	-19.6331	-6.9557
-0.10	-24.5204	-9.1786	-27.5370	-8.0332
-0.15	-26.7224	-8.8342	-38.1755	-8.8277
-0.20	-29.1745	-8.3292	-52.2744	-9.1758
-0.25	-31.9098	-7.6627	-69.9927	-8.9217
-0.30	-34.9511	-6.8442	-88.4965	-7.9454
-0.35	-38.2847	-5.8946	-95.7218	-6.1911
-0.40	-41.7884	-4.8468	-69.0582	-3.6897
-0.45	-45.0354	-3.7427	-10.1098	-0.5674
-0.50	-46.7489	-2.6301	41.4192	2.9655
-0.55	-43.3124	-1.5581	68.0236	6.6416
-0.60	-25.6351	-0.5726	77.4565	10.1739
-0.65	19.1667	0.2878	78.3533	13.2899
-0.70	74.2764	0.9928	75.2079	15.7563
-0.75	92.1068	1.5209	69.9492	17.3867
-0.80	79.1057	1.8569	63.2779	18.0311
-0.85	59.7466	1.9871	55.2618	17.5434
-0.90	42.0256	1.8885	45.4557	15.7015
-0.95	25.8822	1.4931	32.3754	11.9341
-1.00	0.0000	0.0000	0.0000	0.0000

SI 28

Figure 52

SI 28

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 3.25 MEV	ELASTIC 3.25 MEV
1.00	-0.	-0.
0.90	-1.7286	-1.5818
0.80	-1.7675	-1.5994
0.70	-1.3050	-1.1586
0.60	-0.5459	-0.4704
0.50	0.3101	0.2556
0.40	0.9827	0.7584
0.30	1.0465	0.7348
0.20	-0.1551	-0.0953
0.10	-3.6595	-1.8592
0.	-11.1933	-4.3559
-0.10	-25.8121	-6.9034
-0.20	-52.5756	-8.3404
-0.30	-89.8282	-7.3434
-0.40	-59.0090	-3.1190
-0.50	50.4510	3.8466
-0.60	83.4422	11.6737
-0.70	80.9314	17.9053
-0.80	68.6173	20.5006
-0.90	49.6660	17.8690
-1.00	0.0000	0.0000

SI 28

Figure 53

SI 28

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE	TOTAL	SHAPE	TOTAL
	ELASTIC 2 MEV	ELASTIC + 2 MEV	ELASTIC 4 MEV	ELASTIC 0 4 MEV
1.00	0.	0.	0.	0.
0.95	-0.7183	-0.6093	-1.8312	-1.6920
0.90	-1.0548	-0.8916	-2.2986	-2.1150
0.85	-1.3543	-1.1392	-2.4169	-2.2106
0.80	-1.6550	-1.3834	-2.2838	-2.0719
0.75	-1.9761	-1.6388	-1.9379	-1.7393
0.70	-2.3320	-1.9152	-1.4028	-1.2415
0.65	-2.7352	-2.2204	-0.7007	-0.6092
0.60	-3.1985	-2.5607	0.1407	0.1196
0.55	-3.7355	-2.9418	1.0840	0.8961
0.50	-4.3613	-3.3686	2.0780	1.6600
0.45	-5.0929	-3.8450	3.0550	2.3415
0.40	-5.9506	-4.3733	3.9292	2.8662
0.35	-6.9583	-4.9540	4.5965	3.1629
0.30	-8.1446	-5.5850	4.9361	3.1735
0.25	-9.5449	-6.2604	4.8138	2.8618
0.20	-11.2034	-6.9689	4.0848	2.2209
0.15	-13.1757	-7.6932	2.5946	1.2748
0.10	-15.5339	-8.4073	0.1745	0.0764
0.05	-18.3724	-9.0756	-3.3717	-1.2978
0.	-21.8176	-9.6517	-8.2919	-2.7548
-0.05	-26.0421	-10.0788	-14.9243	-4.1893
-0.10	-31.2847	-10.2922	-23.7441	-5.4867
-0.15	-37.8803	-10.2251	-35.3988	-6.5228
-0.20	-46.2930	-9.8180	-50.6223	-7.1633
-0.25	-57.1228	-9.0300	-69.6095	-7.2660
-0.30	-70.9189	-7.8518	-89.4261	-6.6883
-0.35	-87.0644	-6.3145	-96.8672	-5.3050
-0.40	-98.9799	-4.4908	-65.7757	-3.0363
-0.45	-82.6500	-2.4882	2.3358	0.1173
-0.50	-16.3698	-0.4333	60.1919	4.0447
-0.55	46.5093	1.5450	88.6892	8.5095
-0.60	68.8073	3.3317	98.1820	13.1653
-0.65	69.2444	4.8342	98.6968	17.5976
-0.70	62.9027	5.9847	95.0593	21.3802
-0.75	55.0402	6.7359	89.1599	24.1232
-0.80	47.0563	7.0519	81.5493	25.4922
-0.85	39.0972	6.8925	72.0899	25.1820
-0.90	30.7947	6.1817	60.0350	22.8061
-0.95	21.1239	4.7018	43.2712	17.4892
-1.00	0.0000	0.0000	0.0000	0.0000

Figure 54

SI 28

COSINE
THETA
C.M.POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	• 14 MEV
1.00	-0.	0.	0.	0.
0.95	-1.1146	5.5825	4.4038	-1.1573
0.90	-1.3200	8.4726	7.3249	-2.8648
0.85	-1.2280	11.4960	11.5740	-6.6276
0.80	-0.8848	15.2580	20.8050	-21.9130
0.75	-0.3107	20.2270	50.4670	-51.8830
0.70	0.4637	26.2380	74.2420	2.2762
0.65	1.3787	31.0280	29.2490	2.3548
0.60	2.3284	30.0540	15.9630	1.4294
0.55	3.1486	21.9540	11.8060	0.5795
0.50	3.6168	10.9250	9.7703	-0.1596
0.45	3.4748	0.5405	8.0994	-0.8180
0.40	2.4793	-8.4567	6.1111	-1.4344
0.35	0.4711	-16.4850	3.3860	-2.0603
0.30	-2.5671	-24.0670	-0.4331	-2.7702
0.25	-6.4971	-31.5730	-5.6835	-3.6662
0.20	-11.0684	-39.2140	-12.6360	-4.8561
0.15	-15.9963	-47.0480	-21.3370	-6.3498
0.10	-21.0380	-54.9500	-31.2830	-7.8132
0.05	-26.0442	-62.5050	-40.9010	-8.3239
0.	-30.9856	-68.7720	-47.1070	-6.7355
-0.05	-35.9675	-71.8370	-45.7860	-2.7142
-0.10	-41.2519	-68.1720	-34.0790	3.0315
-0.15	-47.2965	-52.5230	-13.2260	9.6200
-0.20	-54.7912	-21.0390	11.5050	16.5470
-0.25	-64.5260	20.0430	34.1560	23.6090
-0.30	-76.2236	52.1380	50.8640	30.6650
-0.35	-83.1382	62.4600	60.1460	37.4510
-0.40	-62.6652	54.6950	61.9510	43.4240
-0.45	-7.7133	38.2080	56.8360	47.5680
-0.50	38.2539	19.5400	45.5960	48.1680
-0.55	60.8296	2.0219	29.2200	42.6740
-0.60	71.1537	-12.5280	9.0459	28.1530
-0.65	76.4322	-22.5390	-12.9150	3.4410
-0.70	79.1462	-25.9590	-33.4010	-26.3610
-0.75	79.7807	-20.0150	-46.9630	-47.0810
-0.80	78.0417	-2.0098	-44.8690	-42.8220
-0.85	73.2328	27.4750	-16.0270	-9.2077
-0.90	64.1720	58.7510	42.3740	43.3280
-0.95	48.2249	70.2350	96.5810	90.3250
-1.00	0.0000	0.0000	0.0000	0.0000

SI 28

Figure 55

SI 28

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	0.	0.	0.	0.
0.95	0.9928	6.4491	2.3775	-2.2069
0.90	1.6389	10.0400	3.9736	-5.3820
0.85	2.4148	14.1400	6.5522	-12.6280
0.80	3.3963	19.9720	14.0300	-40.6940
0.75	4.5949	29.2020	67.3590	-23.1450
0.70	5.9286	41.9790	32.3490	3.7636
0.65	7.1608	48.6650	9.9340	3.3807
0.60	7.8382	39.0680	6.7371	1.7740
0.55	7.3053	24.8950	5.9250	0.2066
0.50	4.8924	14.0870	5.5691	-1.2262
0.45	0.2664	6.0698	5.1578	-2.5160
0.40	-6.3085	-0.7045	4.4116	-3.6426
0.35	-14.0789	-7.2148	3.0676	-4.5581
0.30	-22.1895	-14.0150	0.8162	-5.1738
0.25	-30.0007	-21.4170	-2.7088	-5.3393
0.20	-37.1655	-29.5750	-7.8728	-4.8191
0.15	-43.5458	-38.4780	-14.8390	-3.3119
0.10	-49.0970	-47.8680	-23.1110	-0.6317
0.05	-53.7749	-57.0380	-30.8670	2.9160
0.	-57.4659	-64.4480	-34.7550	6.4842
-0.05	-59.9172	-67.1720	-31.3910	9.4510
-0.10	-60.6346	-60.5630	-20.0820	11.9470
-0.15	-58.7118	-39.7770	-3.5354	14.4700
-0.20	-52.5840	-5.2512	14.3870	17.4350
-0.25	-39.9979	32.1450	30.7700	21.0700
-0.30	-19.7245	57.8570	43.9850	25.4440
-0.35	2.5891	66.1750	53.1340	30.4740
-0.40	13.7114	60.6460	57.5420	35.8570
-0.45	11.1943	47.0780	56.5250	40.8890
-0.50	5.4975	29.8210	49.4220	44.1370
-0.55	3.8223	11.5370	35.8290	42.9280
-0.60	7.7338	-6.0057	16.0650	33.1320
-0.65	16.4956	-21.1460	-8.1268	11.1550
-0.70	28.5717	-31.5880	-32.6300	-18.7890
-0.75	41.9049	-33.6300	-49.9950	-38.8840
-0.80	53.9655	-21.7270	-49.3060	-32.0630
-0.85	61.8899	9.4133	-19.4450	0.6082
-0.90	62.5817	54.9110	39.4870	46.8970
-0.95	51.8791	83.6980	94.9750	88.7990
-1.00	0.0000	0.0000	0.0000	0.0000

SI 28

Figure 56

SI 28

COSINE
THETA
C.M.POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	0.	0.	0.
0.95	3.5316	5.9612	0.4191	-2.7738
0.90	5.3268	9.5973	0.3767	-7.1188
0.85	7.1510	14.2600	0.1247	-17.2230
0.80	9.2769	22.2470	-0.3321	-46.4630
0.75	11.8135	38.8480	23.8570	-11.0720
0.70	14.5972	63.4200	5.8637	5.7314
0.65	16.9050	53.3790	3.3603	5.0223
0.60	17.2654	30.9240	2.6673	2.9345
0.55	14.0657	19.5090	2.3474	0.7779
0.50	7.0217	13.3790	2.1267	-1.2941
0.45	-2.3677	8.9589	1.8777	-3.2319
0.40	-12.2260	4.7818	1.4824	-4.9569
0.35	-21.4971	0.1441	0.7888	-6.3195
0.30	-29.9317	-5.3754	-0.4170	-7.0550
0.25	-37.6470	-12.0630	-2.4219	-6.7264
0.20	-44.8258	-20.0850	-5.5490	-4.7031
0.15	-51.5849	-29.4140	-9.9770	-0.3663
0.10	-57.9154	-39.6420	-15.2830	6.1437
0.05	-63.6223	-49.6440	-19.8190	13.0400
0.	-68.2113	-57.0930	-20.8720	17.7850
-0.05	-70.6644	-58.1520	-16.5630	19.5330
-0.10	-69.0443	-48.3210	-7.5616	19.3870
-0.15	-60.0063	-25.6340	3.8713	18.7910
-0.20	-39.1411	5.5109	15.7630	18.6770
-0.25	-5.2572	35.5220	27.0060	19.5050
-0.30	30.4979	56.2200	37.0040	21.4700
-0.35	48.4253	64.9450	45.2390	24.6280
-0.40	43.6493	63.1540	50.9820	28.8940
-0.45	27.1683	53.6090	53.1280	33.9340
-0.50	9.3252	38.8620	50.1650	38.8350
-0.55	-4.9082	20.9440	40.3630	41.4310
-0.60	-13.4954	1.5907	22.4690	37.3270
-0.65	-15.3109	-17.3340	-2.7993	20.7250
-0.70	-9.5082	-33.2080	-30.5540	-6.5613
-0.75	4.1164	-41.7090	-50.3560	-24.8980
-0.80	24.0045	-35.7000	-48.6610	-17.5510
-0.85	45.5003	-5.9449	-16.5830	10.8910
-0.90	60.5572	48.5490	40.2850	49.7930
-0.95	58.7390	93.6160	92.3570	87.1950
-1.00	0.0000	0.0000	0.0000	0.0000

SI 28

Figure 57

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^{35}Cl

Energy (MeV)	Energy Levels*	
1.00	G.S.	$3/2^+$
2.00	1.22	$(1/2)^+$
3.00	1.76	$(1/2)^+$
4.00	2.65	$[3/2^+]$
5.00	2.70	$[3/2^+]$
6.00	3.01	$[3/2^+]$
7.00	3.17	$[3/2^+]$
8.00		
9.00		
10.00		
11.00		
12.00		
13.00		
14.00		
15.00		
16.00		

* Energy levels obtained from NRC 59-6-55, except [] values which are assumed.

CL 35

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE ELASTIC 1 MEV	TOTAL ELASTIC + 1 MEV	SHAPE ELASTIC 3 MEV	TOTAL ELASTIC 0 3 MEV
1.00	0.	0.	0.	0.
0.95	-0.6900	-0.5469	1.6681	1.5060
0.90	-1.0789	-0.8452	2.2585	2.0164
0.85	-1.4562	-1.1259	2.6331	2.3193
0.80	-1.8479	-1.4080	2.8729	2.4894
0.75	-2.2654	-1.6980	3.0056	2.5532
0.70	-2.7158	-1.9985	3.0409	2.5217
0.65	-3.2052	-2.3106	2.9789	2.3990
0.60	-3.7392	-2.6340	2.8128	2.1859
0.55	-4.3240	-2.9678	2.5296	1.8822
0.50	-4.9658	-3.3102	2.1092	1.4882
0.45	-5.6721	-3.6583	1.5227	1.0068
0.40	-6.4514	-4.0087	0.7296	0.4456
0.35	-7.3135	-4.3563	-0.3262	-0.1808
0.30	-8.2700	-4.6953	-1.7238	-0.8487
0.25	-9.3350	-5.0179	-3.5751	-1.5239
0.20	-10.5252	-5.3152	-6.0420	-2.1616
0.15	-11.8608	-5.5762	-9.3621	-2.7090
0.10	-13.3665	-5.7884	-13.8906	-3.1100
0.05	-15.0723	-5.9375	-20.1604	-3.3116
0.	-17.0140	-6.0082	-28.9389	-3.2706
-0.05	-19.2340	-5.9843	-41.0790	-2.9587
-0.10	-21.7792	-5.8501	-55.9388	-2.3651
-0.15	-24.6937	-5.5917	-62.6050	-1.4953
-0.20	-27.9970	-5.1988	-22.7287	-0.3681
-0.25	-31.6236	-4.6667	54.6652	0.9876
-0.30	-35.2648	-3.9982	90.3107	2.5361
-0.35	-37.9776	-3.2052	94.6411	4.2369
-0.40	-37.3771	-2.3096	90.5994	6.0451
-0.45	-28.8979	-1.3429	85.3431	7.9105
-0.50	-8.8302	-0.3442	80.4117	9.7770
-0.55	16.2859	0.6422	75.9433	11.5810
-0.60	33.0309	1.5699	71.7597	13.2499
-0.65	38.2648	2.3941	67.6295	14.7010
-0.70	36.7826	3.0732	63.3225	15.8391
-0.75	32.6561	3.5692	58.6082	16.5528
-0.80	27.7565	3.8462	53.2285	16.7054
-0.85	22.7024	3.8632	46.8400	16.1127
-0.90	17.5201	3.5564	38.8641	14.4791
-0.95	11.7503	2.7744	27.9154	11.1451
-1.00	0.0000	0.0000	0.0000	0.0000

CL 35

Figure 58

CL 35

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE	TOTAL	SHAPE	TOTAL
	ELASTIC 2 MEV	ELASTIC + 2 MEV	ELASTIC 4 MEV	ELASTIC 0 4 MEV
1.00	0.	0.	0.	-0.
0.95	0.7083	0.6110	3.2658	3.0557
0.90	0.9381	0.8002	4.3918	4.0717
0.85	1.0578	0.8903	5.0684	4.6442
0.80	1.0979	0.9100	5.4490	4.9194
0.75	1.0657	0.8676	5.5818	4.9454
0.70	0.9593	0.7650	5.4782	4.7391
0.65	0.7725	0.6013	5.1299	4.3049
0.60	0.4948	0.3744	4.5147	3.6444
0.55	0.1121	0.0820	3.5974	2.7628
0.50	-0.3941	-0.2777	2.3290	1.6779
0.45	-1.0471	-0.7052	0.6456	0.4285
0.40	-1.8769	-1.1988	-1.5349	-0.9166
0.35	-2.9217	-1.7532	-4.3155	-2.2518
0.30	-4.2309	-2.3586	-7.8213	-3.4384
0.25	-5.8695	-2.9986	-12.1939	-4.3215
0.20	-7.9246	-3.6497	-17.5579	-4.7616
0.15	-10.5152	-4.2795	-23.9013	-4.6735
0.10	-13.8080	-4.8462	-30.6679	-4.0543
0.05	-18.0430	-5.3000	-35.4723	-2.9855
0.	-23.5747	-5.5846	-30.8260	-1.6079
-0.05	-30.9368	-5.6426	-2.3571	-0.0825
-0.10	-40.9286	-5.4214	47.8996	1.4463
-0.15	-54.6199	-4.8820	82.2656	2.8731
-0.20	-72.5288	-4.0064	89.1694	4.1395
-0.25	-88.5884	-2.8043	83.8652	5.2325
-0.30	-67.2228	-1.3147	76.1760	6.1765
-0.35	20.7984	0.3963	69.3575	7.0241
-0.40	76.1316	2.2428	64.2065	7.8467
-0.45	83.5490	4.1282	60.7892	8.7234
-0.50	77.2292	5.9552	58.9493	9.7298
-0.55	69.0384	7.6333	58.4242	10.9245
-0.60	61.4552	9.0836	58.8511	12.3332
-0.65	54.7416	10.2398	59.7560	13.9317
-0.70	48.7009	11.0457	60.5566	15.6273
-0.75	43.0667	11.4500	60.5849	17.2412
-0.80	37.5690	11.3964	59.1175	18.4910
-0.85	31.9112	10.8058	55.3705	18.9651
-0.90	25.6733	9.5324	48.3551	18.0524
-0.95	17.9555	7.2025	36.1322	14.6166
-1.00	0.0000	0.0000	0.0000	0.0000

CL 35

Figure 59

CL 35

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	0.	0.	0.	0.
0.95	5.0983	3.9064	-1.0452	-0.3626
0.90	6.9558	6.3834	-0.4487	-1.0642
0.85	8.1326	9.0191	2.1329	0.2886
0.80	8.8374	11.9290	8.4523	36.4670
0.75	9.1128	14.9950	17.1510	39.8980
0.70	8.9363	17.7420	13.9030	9.0598
0.65	8.2426	19.2600	1.7390	-0.4996
0.60	6.9269	18.5890	-6.7048	-6.4285
0.55	4.8416	15.6290	-11.6190	-11.4650
0.50	1.7908	11.3090	-14.7130	-16.2530
0.45	-2.4771	6.5876	-16.8180	-20.8660
0.40	-8.2743	1.7215	-18.2810	-25.0390
0.35	-15.9720	-3.6648	-19.2240	-28.0940
0.30	-25.9750	-10.3220	-19.6600	-28.7320
0.25	-38.6350	-19.2730	-19.5250	-24.8590
0.20	-53.9550	-31.7920	-18.6950	-14.2510
0.15	-70.7040	-49.1040	-17.0510	2.5543
0.10	-83.9440	-70.8040	-14.7470	19.0550
0.05	-80.2480	-89.8150	-12.4180	27.3000
0.	-39.7440	-87.1070	-10.3670	26.1090
-0.05	29.8630	-50.5340	-8.0599	19.5410
-0.10	82.0630	-2.3619	-4.9958	11.4970
-0.15	99.0080	33.1190	-1.0201	4.1322
-0.20	94.8500	52.8800	3.8510	-1.5783
-0.25	82.7260	61.7090	9.5236	-5.1909
-0.30	68.7730	63.5970	15.8170	-6.4416
-0.35	55.3850	60.7750	22.4040	-5.0962
-0.40	43.4950	54.3480	28.7040	-0.9045
-0.45	33.5550	44.8380	33.7240	6.3571
-0.50	25.9260	32.5070	35.8290	16.6560
-0.55	21.0170	17.5630	32.5110	28.9220
-0.60	19.3080	0.3715	20.4340	38.8180
-0.65	21.2320	-18.1970	-3.2280	35.0840
-0.70	26.8860	-36.0360	-36.2330	7.0979
-0.75	35.5650	-48.2730	-63.7800	-22.9530
-0.80	45.2970	-44.8110	-60.3840	-22.5640
-0.85	52.8030	-11.1200	-14.6900	5.3187
-0.90	54.1270	51.2430	51.9970	47.6630
-0.95	44.8950	91.3180	98.0000	91.3950
-1.00	0.0000	0.0000	0.0000	0.0000

CL 35

Figure 60

CL 35

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	0.	0.	0.	0.
0.95	6.1598	1.6808	-1.2270	0.0358
0.90	8.6743	3.5032	-1.0338	-1.4369
0.85	10.4790	6.1167	1.6903	-3.8282
0.80	11.7780	9.7213	11.8820	62.6800
0.75	12.5700	14.0540	26.5170	23.5860
0.70	12.7590	17.5410	11.9680	7.9081
0.65	12.1740	17.4710	-2.4009	1.5414
0.60	10.5630	13.4260	-9.9220	-3.4018
0.55	7.6130	8.2289	-14.6590	-8.2168
0.50	2.9699	3.9664	-18.1950	-13.2210
0.45	-3.6959	0.8559	-21.0370	-18.3550
0.40	-12.6090	-1.6408	-23.2750	-23.1980
0.35	-23.8210	-4.2150	-24.7570	-26.7780
0.30	-37.1810	-7.6632	-25.0750	-27.3140
0.25	-52.3500	-13.0300	-23.4470	-22.2780
0.20	-68.7140	-21.7540	-18.6800	-9.8489
0.15	-84.8990	-35.3920	-9.9434	7.8159
0.10	-97.3330	-53.4000	0.5060	23.7040
0.05	-97.2370	-67.1930	6.6160	31.6930
0.	-69.1450	-61.2700	6.1124	31.2820
-0.05	-6.9038	-36.1210	2.6504	25.4410
-0.10	58.3060	-8.0916	-0.3969	17.2320
-0.15	91.7250	14.0190	-1.7746	8.7141
-0.20	95.8610	29.7360	-1.2688	1.1247
-0.25	85.9770	40.4950	1.0393	-4.7566
-0.30	71.4410	47.3530	5.0052	-8.3509
-0.35	56.1160	50.7450	10.4310	-9.1306
-0.40	41.3480	50.6500	16.9720	-6.5290
-0.45	27.5760	46.7470	23.9470	0.1034
-0.50	15.0150	38.5620	29.9690	11.4150
-0.55	3.9736	25.6220	32.3330	27.4440
-0.60	-4.9262	7.7134	26.3090	45.1080
-0.65	-10.5260	-14.5870	5.9361	52.0590
-0.70	-10.9190	-38.7930	-28.6230	30.6460
-0.75	-3.5437	-58.2600	-57.2480	-2.0806
-0.80	13.4810	-59.1170	-50.2210	-10.8640
-0.85	37.6480	-22.9100	-5.6086	6.5112
-0.90	58.1740	47.5790	53.4230	41.2540
-0.95	59.0520	96.9240	97.0850	85.4820
-1.00	0.0000	0.0000	0.0000	0.0000

CL 35

Figure 61

CL 35

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	0.	0.	0.	0.
0.95	5.7118	-0.0945	-0.8774	0.1557
0.90	8.4850	1.0417	-1.0613	-2.3694
0.85	10.8530	3.5757	1.5364	-12.3120
0.80	12.9630	8.0887	19.9260	-20.2580
0.75	14.7550	13.9360	40.5600	12.1700
0.70	16.0250	15.9740	10.3690	6.9449
0.65	16.4240	10.0370	-2.3998	3.0213
0.60	15.4960	2.0652	-9.1255	-0.8813
0.55	12.8150	-3.5564	-14.0600	-5.1982
0.50	8.2067	-6.9538	-18.2890	-10.0570
0.45	1.8603	-9.0160	-22.0700	-15.3220
0.40	-5.8453	-10.3800	-25.3050	-20.4400
0.35	-14.6720	-11.4990	-27.5880	-24.1390
0.30	-24.7270	-12.8150	-28.0780	-24.1860
0.25	-36.4500	-14.9270	-25.2980	-17.9160
0.20	-50.4400	-18.7270	-17.2710	-4.5230
0.15	-67.0540	-25.1900	-3.3866	12.3620
0.10	-85.1940	-33.6060	11.6230	26.4170
0.05	-98.8590	-38.2680	19.4000	33.6630
0.	-91.5570	-32.9450	17.9580	34.0540
-0.05	-45.2680	-20.8060	11.0880	29.4880
-0.10	20.1480	-7.8525	5.3821	22.0250
-0.15	64.0820	3.6981	0.3265	13.3190
-0.20	80.2010	13.7670	-2.6911	4.6513
-0.25	80.1910	22.6130	-3.5416	-2.9315
-0.30	72.7620	30.2920	-2.2078	-8.4975
-0.35	62.0080	36.5550	1.3083	-11.1480
-0.40	49.6280	40.8230	6.9588	-9.9447
-0.45	36.3090	42.1610	14.5110	-3.8337
-0.50	22.3710	39.2620	23.1950	8.3496
-0.55	8.0858	30.5180	30.8810	27.3720
-0.60	-6.0893	14.3590	32.4650	50.9410
-0.65	-19.1850	-9.7644	18.8510	66.1760
-0.70	-29.1410	-39.0830	-14.1030	50.8780
-0.75	-31.8240	-63.6150	-42.9240	15.9470
-0.80	-20.1900	-63.9710	-36.4070	-1.7695
-0.85	12.4730	-22.3570	1.4638	5.9757
-0.90	57.2730	48.9680	51.9590	33.5220
-0.95	77.3530	98.1390	95.0640	76.9460
-1.00	0.0000	0.0000	0.0000	0.0000

CL 35

Figure 62

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^{39}K

Energy (MeV)	Energy Levels*
1.00	G.S. $3/2^+$
2.00	2.53 $[3/2^+]$
3.00	2.82 $[3/2^+]$
4.00	3.02 $[3/2^+]$
5.00	3.60 $[3/2^+]$
6.00	3.94 $[3/2^+]$
7.00	
8.00	
9.00	
10.00	
11.00	
12.00	
13.00	
14.00	
15.00	
16.00	

* Energy levels obtained from NRC 59-6-77, except [] values which are assumed.

K 39

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE	TOTAL	SHAPE	TOTAL
	ELASTIC 1 MEV	ELASTIC + 1 MEV	ELASTIC 3 MEV	ELASTIC 0 3 MEV
1.00	0.	0.	0.	0.
0.95	0.8986	0.6870	2.3019	2.0278
0.90	1.1559	0.8714	3.0949	2.6817
0.85	1.2658	0.9394	3.5780	3.0380
0.80	1.2775	0.9314	3.8656	3.2012
0.75	1.2089	0.8640	3.9982	3.2106
0.70	1.0678	0.7462	3.9920	3.0860
0.65	0.8574	0.5842	3.8508	2.8397
0.60	0.5781	0.3829	3.5702	2.4831
0.55	0.2284	0.1465	3.1385	2.0295
0.50	-0.1946	-0.1204	2.5358	1.4977
0.45	-0.6953	-0.4130	1.7326	0.9143
0.40	-1.2793	-0.7257	0.6865	0.3151
0.35	-1.9535	-1.0517	-0.6622	-0.2558
0.30	-2.7263	-1.3833	-2.3953	-0.7496
0.25	-3.6073	-1.7108	-4.6183	-1.1194
0.20	-4.6074	-2.0235	-7.4435	-1.3291
0.15	-5.7383	-2.3085	-10.9012	-1.3601
0.10	-7.0114	-2.5516	-14.6050	-1.2137
0.05	-8.4353	-2.7371	-16.7586	-0.9086
0.	-10.0101	-2.8487	-12.6669	-0.4735
-0.05	-11.7161	-2.8701	1.9802	0.0612
-0.10	-13.4893	-2.7864	20.5587	0.6697
-0.15	-15.1728	-2.5858	33.1792	1.3348
-0.20	-16.4218	-2.2611	39.4670	2.0482
-0.25	-16.5404	-1.8115	42.5648	2.8099
-0.30	-14.3018	-1.2444	44.5144	3.6253
-0.35	-8.1021	-0.5759	46.2145	4.5021
-0.40	2.7213	0.1697	47.9867	5.4473
-0.45	15.7194	0.9603	49.8831	6.4636
-0.50	26.1736	1.7590	51.8155	7.5453
-0.55	31.4981	2.5262	53.6093	8.6749
-0.60	32.4608	3.2229	55.0313	9.8184
-0.65	30.8848	3.8118	55.8114	10.9219
-0.70	28.1218	4.2594	55.6638	11.9072
-0.75	24.8820	4.5347	54.3016	12.6668
-0.80	21.4577	4.6062	51.4358	13.0573
-0.85	17.9042	4.4356	46.7328	12.8814
-0.90	14.1047	3.9585	39.6632	11.8369
-0.95	9.6455	3.0165	28.9014	9.3040
-1.00	0.0000	0.0000	0.0000	0.0000

K 39

Figure 63

K 39

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE	TOTAL	SHAPE	TOTAL
	ELASTIC 2 MEV	ELASTIC + 2 MEV	ELASTIC 4 MEV	ELASTIC 0 4 MEV
1.00	0.	0.	0.	0.
0.95	2.0958	1.7358	2.9970	2.7754
0.90	2.8818	2.3451	3.9876	3.6480
0.85	3.4150	2.7223	4.5295	4.0790
0.80	3.7921	2.9506	4.7590	4.1994
0.75	4.0450	3.0594	4.7135	4.0514
0.70	4.1842	3.0612	4.3956	3.6514
0.65	4.2089	2.9616	3.7882	3.0095
0.60	4.1108	2.7631	2.8579	2.1412
0.55	3.8746	2.4680	1.5554	1.0785
0.50	3.4777	2.0795	-0.1867	-0.1168
0.45	2.8887	1.6036	-2.4568	-1.3409
0.40	2.0652	1.0505	-5.3629	-2.4417
0.35	0.9496	0.4358	-9.0123	-3.2314
0.30	-0.5367	-0.2182	-13.4209	-3.5267
0.25	-2.5029	-0.8822	-18.1573	-3.2126
0.20	-5.1043	-1.5202	-21.0413	-2.2978
0.15	-8.5679	-2.0908	-14.3487	-0.9235
0.10	-13.2379	-2.5497	16.0966	0.6855
0.05	-19.6554	-2.8533	57.0512	2.2971
0.	-28.7043	-2.9627	71.8293	3.7298
-0.05	-41.8514	-2.8478	67.6603	4.8751
-0.10	-61.2980	-2.4902	59.2213	5.6908
-0.15	-87.5662	-1.8863	51.1999	6.1830
-0.20	-95.4672	-1.0470	44.3964	6.3896
-0.25	0.2809	0.0024	38.7534	6.3676
-0.30	86.4228	1.2246	34.1249	6.1863
-0.35	96.6325	2.5724	30.4395	5.9241
-0.40	88.5306	3.9920	27.7253	5.6667
-0.45	79.1478	5.4255	26.1053	5.5051
-0.50	71.0183	6.8137	25.7824	5.5327
-0.55	64.1357	8.0975	27.0043	5.8385
-0.60	58.1511	9.2191	29.9883	6.4963
-0.65	52.7409	10.1228	34.7806	7.5463
-0.70	47.6451	10.7533	41.0441	8.9701
-0.75	42.6471	11.0532	47.8334	10.6575
-0.80	37.5419	10.9565	53.5066	12.3676
-0.85	32.0897	10.3738	55.9266	13.6848
-0.90	25.9170	9.1517	52.8182	13.9458
-0.95	18.1575	6.9201	41.4091	11.9649
-1.00	0.0000	0.0000	0.0000	0.0000

K 39

Figure 64

K 39

COSINE
THETA
C.M.POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	0.	0.	0.	0.
0.95	3.4148	-0.5423	0.6040	3.9505
0.90	4.6956	-0.0082	1.8324	7.3785
0.85	5.5109	1.1260	4.6290	17.6110
0.80	5.9786	2.8280	9.6735	54.3550
0.75	6.1053	4.9821	13.9830	28.7170
0.70	5.8506	7.2244	8.1625	7.3258
0.65	5.1384	8.8041	-5.3928	-0.9503
0.60	3.8526	8.6984	-16.9230	-6.9039
0.55	1.8242	6.2005	-25.2690	-12.8880
0.50	-1.1923	1.5225	-31.8210	-19.5740
0.45	-5.5604	-4.4417	-37.4370	-27.0010
0.40	-11.8260	-10.9600	-42.3580	-34.5010
0.35	-20.8080	-18.0020	-46.2790	-40.1400
0.30	-33.5940	-26.3840	-48.0580	-40.1300
0.25	-50.5860	-37.9910	-44.9180	-29.9410
0.20	-64.1890	-56.1530	-31.7190	-9.4077
0.15	-32.6510	-81.3700	-5.8904	13.3780
0.10	57.0050	-75.3690	18.0330	28.9130
0.05	96.1030	-11.2540	22.8040	34.3170
0.	94.7440	23.7680	14.9810	31.7820
-0.05	84.6920	34.8550	5.2071	24.4120
-0.10	74.1630	39.0510	-2.5437	14.6030
-0.15	64.4600	41.3680	-7.5770	4.0290
-0.20	55.5370	43.0020	-10.0190	-6.0624
-0.25	47.1660	44.0880	-10.0850	-14.6180
-0.30	39.1600	44.3980	-7.9526	-20.6470
-0.35	31.4170	43.5290	-3.7822	-23.1430
-0.40	23.9230	40.9490	2.1782	-21.0300
-0.45	16.7660	35.9990	9.4144	-13.1350
-0.50	10.1790	27.9090	16.7970	1.6771
-0.55	4.6016	15.8390	21.9230	23.6570
-0.60	0.7942	-0.9393	20.0940	48.8850
-0.65	-0.0310	-22.5070	4.1097	61.9760
-0.70	3.8404	-46.8030	-28.9690	41.0530
-0.75	14.2160	-66.0630	-58.5100	0.9318
-0.80	31.3970	-61.8920	-48.0850	-17.5940
-0.85	51.2450	-13.2950	1.5709	-4.8137
-0.90	63.9860	61.0080	59.7050	31.4900
-0.95	58.2970	96.2630	95.4110	81.3490
-1.00	0.0000	0.0000	0.0000	0.0000

K 39

Figure 65

K 39

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	0.	0.	0.	0.
0.95	2.6669	-1.1649	2.1428	3.7423
0.90	3.9735	-0.8183	4.2566	6.9419
0.85	5.0664	0.4015	8.8825	19.7280
0.80	5.9976	2.4885	18.4410	77.0700
0.75	6.7323	5.0671	24.1680	16.5650
0.70	7.1857	6.8106	9.3861	5.2016
0.65	7.2195	5.5131	-5.8766	0.3846
0.60	6.6274	0.1532	-15.7540	-3.8770
0.55	5.1080	-7.5017	-23.2430	-8.7988
0.50	2.2235	-15.0170	-29.9320	-14.8110
0.45	-2.6684	-21.3480	-36.3220	-21.8960
0.40	-10.5290	-26.5690	-42.2830	-29.2200
0.35	-22.8220	-31.1560	-46.9830	-34.3450
0.30	-41.6880	-35.6700	-48.3750	-32.9460
0.25	-69.0330	-40.6670	-42.4340	-21.5350
0.20	-97.2080	-46.1090	-24.2350	-2.7263
0.15	-74.4260	-47.6700	3.8567	15.6630
0.10	25.9360	-31.1990	25.5680	27.9690
0.05	86.2610	-6.4438	29.9870	33.1850
0.	98.6040	4.3193	22.7680	32.5370
-0.05	94.9960	8.0286	12.0450	27.5350
-0.10	87.3200	10.4940	1.8843	19.4580
-0.15	78.7690	13.2550	-6.2989	9.4458
-0.20	70.0890	16.5490	-12.0850	-1.3232
-0.25	61.3520	20.2400	-15.3280	-11.5140
-0.30	52.4480	24.0270	-15.9170	-19.6170
-0.35	43.2270	27.4570	-13.7100	-23.9910
-0.40	33.5510	29.8800	-8.5652	-22.9520
-0.45	23.3220	30.3750	-0.4511	-14.8560
-0.50	12.5160	27.6660	10.2300	1.6729
-0.55	1.2595	20.0560	21.8050	26.8010
-0.60	-10.0240	5.5579	29.3910	56.1310
-0.65	-20.2880	-17.3210	22.5000	73.8070
-0.70	-27.2160	-46.8490	-7.6461	57.0650
-0.75	-26.1850	-71.6510	-39.4200	15.3150
-0.80	-9.8833	-65.6770	-35.6290	-12.0570
-0.85	26.1770	-10.4420	2.0147	-9.2282
-0.90	67.2120	62.7460	52.5850	19.9910
-0.95	77.9590	97.1820	93.0360	70.7810
-1.00	0.0000	0.0000	0.0000	0.0000

K 39

Figure 66

K 39

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	* 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	0.	0.	0.	0.
0.95	1.0086	-0.6806	3.3851	2.8855
0.90	1.9775	-0.0983	6.3460	4.9466
0.85	3.1551	1.6044	13.5410	16.9760
0.80	4.5322	4.5673	32.3840	48.5780
0.75	6.0525	7.6820	32.9530	8.2058
0.70	7.5899	7.0287	9.1212	3.4680
0.65	8.9137	-0.5134	-3.4367	0.6402
0.60	9.6580	-11.2100	-11.3370	-2.4492
0.55	9.3248	-20.5440	-18.1870	-6.3985
0.50	7.3514	-27.6660	-25.0840	-11.5100
0.45	3.2175	-33.1820	-32.2310	-17.7380
0.40	-3.5175	-37.6510	-39.1980	-24.1170
0.35	-13.3880	-41.2910	-44.6090	-27.8490
0.30	-27.4400	-43.8610	-45.5010	-24.6170
0.25	-47.6930	-44.1830	-37.1910	-12.7380
0.20	-75.9710	-38.8630	-16.6670	3.2636
0.15	-98.8220	-21.9590	9.7763	17.2250
0.10	-49.5990	1.7390	28.5280	26.4190
0.05	39.4080	10.7200	33.5440	30.8610
0.	72.7910	6.9458	28.5750	31.2750
-0.05	77.9210	1.6967	19.0160	28.2480
-0.10	75.7100	-1.4966	8.3244	22.1920
-0.15	71.7820	-2.3913	-1.7017	13.5600
-0.20	67.3520	-1.3200	-10.1090	3.1320
-0.25	62.5010	1.3733	-16.2870	-7.7556
-0.30	57.0020	5.3659	-19.7280	-17.1460
-0.35	50.5440	10.2810	-19.9140	-22.6590
-0.40	42.7890	15.5720	-16.2680	-21.9160
-0.45	33.3980	20.3610	-8.1736	-13.0280
-0.50	22.0530	23.1900	4.8187	4.9567
-0.55	8.5148	21.6860	22.1530	31.2300
-0.60	-7.2340	12.3120	39.5540	60.7690
-0.65	-24.6140	-8.8905	43.7190	79.5180
-0.70	-41.5160	-41.5910	18.2890	67.0950
-0.75	-52.1900	-69.5490	-17.7840	26.2570
-0.80	-44.0940	-59.6110	-25.2380	-7.7783
-0.85	-1.6732	-3.1897	-0.6666	-13.2130
-0.90	62.7970	63.0860	42.7690	9.4365
-0.95	91.4120	96.6900	88.6760	58.0230
-1.00	0.0000	0.0000	0.0000	0.0000

K 39

Figure 67

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⁴⁰Ca

Energy (MeV)

Energy Levels

6.00

None

7.00

8.00

9.00

10.00

11.00

12.00

13.00

14.00

15.00

16.00

CA 40

COSINE
THETA
C.M.POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	0.	0.	0.	0.
0.95	1.6559	-1.1441	3.3057	4.3229
0.90	2.5961	-0.8850	6.0404	8.4767
0.85	3.4632	0.1636	11.1070	23.9970
0.80	4.2689	1.9621	20.2220	66.4420
0.75	4.9706	4.0947	24.1320	14.4700
0.70	5.4859	5.2372	9.0609	4.2119
0.65	5.6845	3.2110	-6.2530	-0.1508
0.60	5.3687	-3.1113	-16.4470	-4.1069
0.55	4.2403	-12.0700	-24.4630	-8.8627
0.50	1.8444	-21.0780	-31.9220	-14.9130
0.45	-2.5335	-28.8930	-39.3350	-22.3010
0.40	-10.0660	-35.5290	-46.4940	-30.0900
0.35	-22.7730	-41.4530	-52.2660	-35.2930
0.30	-44.0730	-47.1300	-53.8040	-32.7830
0.25	-76.9050	-52.5430	-45.6640	-19.6070
0.20	-93.5100	-55.0180	-22.4840	-0.4461
0.15	4.7305	-41.1130	9.4042	16.6200
0.10	86.2040	-1.3583	30.5280	27.5230
0.05	98.8770	16.9010	33.3010	32.1980
0.	94.0230	15.2570	25.1950	31.8050
-0.05	86.3780	11.7880	13.7780	27.4160
-0.10	78.6800	10.1430	2.6957	19.8710
-0.15	71.2620	10.3440	-6.6653	9.9915
-0.20	63.9790	11.9690	-13.7750	-1.1881
-0.25	56.6060	14.6030	-18.3560	-12.2630
-0.30	48.9240	17.8250	-20.1620	-21.4360
-0.35	40.7330	21.1380	-18.9080	-26.6410
-0.40	31.8580	23.8850	-14.2830	-25.7660
-0.45	22.1580	25.1340	-6.0321	-16.9170
-0.50	11.5550	23.5540	5.7455	1.1848
-0.55	0.0978	17.2840	19.7340	28.1330
-0.60	-11.8770	3.9598	31.1840	58.6200
-0.65	-23.3970	-18.5340	28.5920	76.6810
-0.70	-32.0940	-48.8770	0.5041	60.7290
-0.75	-32.8190	-74.1210	-32.6410	18.1160
-0.80	-16.6550	-64.2770	-32.4080	-13.1700
-0.85	23.0840	-3.8955	1.5756	-13.9070
-0.90	69.8370	67.0900	50.2840	13.9360
-0.95	82.4520	96.4230	91.2750	66.2300
-1.00	0.0000	0.0000	0.0000	0.0000

CA 40

Figure 68

CA 40

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE		ELASTIC	
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	0.	0.	0.	0.
0.95	0.0614	-0.1078	4.4786	3.1994
0.90	0.6431	0.6263	8.2291	6.1970
0.85	1.5459	2.3038	16.2400	23.7440
0.80	2.7299	4.9755	33.8040	42.9760
0.75	4.1372	7.4332	31.2160	6.8914
0.70	5.6509	5.9028	8.6855	-2.3382
0.65	7.0527	-2.5707	-3.4124	-0.2901
0.60	7.9809	-14.4050	-11.2640	-3.1770
0.55	7.9096	-24.9660	-18.3580	-6.9472
0.50	6.1794	-33.2730	-25.8140	-11.9510
0.45	2.0741	-39.9510	-33.8480	-18.1760
0.40	-5.1483	-45.5920	-41.9260	-24.5370
0.35	-16.4480	-50.3480	-48.2490	-27.7460
0.30	-33.5610	-53.6370	-48.8890	-23.1480
0.25	-59.5670	-53.1440	-38.1420	-10.2630
0.20	-93.1520	-42.4140	-14.1490	5.0408
0.15	-74.3120	-12.9180	13.3890	17.3540
0.10	41.2640	17.9560	30.9060	25.2130
0.05	82.1760	22.0500	34.9840	29.0980
0.	82.6340	12.8680	29.9090	29.6450
-0.05	76.8740	3.9536	20.3870	27.1800
-0.10	71.2070	-1.8817	9.4001	21.7990
-0.15	66.3050	-4.8051	-1.3619	13.6400
-0.20	61.8690	-5.3214	-10.8570	3.2283
-0.25	57.4620	-3.8409	-18.3080	-8.1629
-0.30	52.6450	-0.6956	-23.0120	-18.3210
-0.35	46.9860	3.7683	-24.2390	-24.3410
-0.40	40.0580	9.0670	-21.1790	-23.3490
-0.45	31.4200	14.4030	-12.9460	-13.3820
-0.50	20.6350	18.3910	1.2329	5.9925
-0.55	7.3110	18.6410	21.1160	33.0750
-0.60	-8.7515	11.3110	42.4000	62.2540
-0.65	-27.1420	-8.3979	50.5640	80.4030
-0.70	-45.7360	-41.0990	26.8220	68.8880
-0.75	-58.0720	-68.9890	-11.4340	27.9180
-0.80	-49.4130	-55.8890	-23.7340	-9.5761
-0.85	-2.2755	2.2500	-3.2700	-18.2290
-0.90	65.9710	65.4640	38.6530	3.3575
-0.95	93.2170	95.5170	86.2390	52.9870
-1.00	0.0000	0.0000	0.0000	0.0000

CA 40

Figure 69

CA 40

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC		
	+ 8 MEV	0 11 MEV	X 14 MEV
1.00	0.	0.	0.
0.95	-1.0910	1.5816	4.8202
0.90	-0.8406	3.2081	9.1526
0.85	0.0358	6.1807	20.8340
0.80	1.4826	10.9310	52.6310
0.75	3.3746	14.2480	25.8850
0.70	5.3463	7.5350	6.5854
0.65	6.6442	-6.6761	-1.0740
0.60	6.1964	-18.9840	-6.7518
0.55	3.1460	-28.1620	-12.7160
0.50	-2.4718	-35.6380	-19.6850
0.45	-9.7908	-42.3130	-27.7390
0.40	-17.9550	-48.4060	-36.1030
0.35	-26.8280	-53.4230	-42.3270
0.30	-37.2490	-55.6500	-41.6240
0.25	-51.2460	-50.8700	-29.1600
0.20	-71.4120	-31.8550	-6.8272
0.15	-84.0090	1.7333	15.4650
0.10	-17.5780	27.0190	29.6130
0.05	34.7520	28.8340	34.4050
0.	41.2280	18.6160	32.0970
-0.05	39.8320	7.0389	25.1860
-0.10	38.4890	-2.5659	15.5720
-0.15	38.0450	-8.9842	4.7018
-0.20	38.2510	-12.9030	-6.1836
-0.25	38.6870	-14.2810	-15.8790
-0.30	38.8830	-13.2210	-23.1400
-0.35	38.3120	-9.7981	-26.6470
-0.40	36.3520	-4.1411	-25.0020
-0.45	32.2490	3.3968	-16.7350
-0.50	25.0930	11.8890	-0.5053
-0.55	13.8320	19.1210	23.8990
-0.60	-2.5797	20.3070	51.9760
-0.65	-24.5890	7.3111	67.2720
-0.70	-50.2340	-24.5430	47.3500
-0.75	-70.5900	-54.1530	5.4849
-0.80	-63.9260	-43.8010	-17.6010
-0.85	-9.0990	4.0838	-8.7621
-0.90	65.7240	59.6620	26.0690
-0.95	96.2990	93.9870	77.8480
-1.00	0.0000	0.0000	0.0000

CA 40

Figure 70

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$^{48}_{\text{Ti}}$

Energy (MeV)

Energy Levels*

3.00	G.S.	0^+
3.25	0.99	2^+
4.00	2.30	4^+
5.00	2.43	$(1)^{[+]}$
6.00	3.24	4^+
7.00	3.34	6^+
8.00	3.62	$(3)^-$
9.00	4.20	$[0^+]$
10.00		
11.00		
12.00		
13.00		
14.00		
15.00		
16.00		

*Energy levels obtained from NRC 61-2-3, except [] values which are assumed.

TI 48

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 3 MEV	ELASTIC 3 MEV
1.00	0.	0.
0.95	-2.3679	-2.2500
0.90	-3.6040	-3.4092
0.85	-4.7719	-4.4864
0.80	-5.9864	-5.5809
0.75	-7.3111	-6.7365
0.70	-8.8022	-7.9779
0.65	-10.5227	-9.3121
0.60	-12.5515	-10.7244
0.55	-14.9938	-12.1482
0.50	-17.9891	-13.4153
0.45	-21.6989	-14.1605
0.40	-26.1705	-13.7041
0.35	-30.4712	-11.0903
0.30	-27.6148	-5.7480
0.25	10.7884	1.2561
0.20	60.3509	7.3741
0.15	54.7933	10.8879
0.10	39.9392	11.9173
0.05	29.0270	11.3606
0.	21.3657	9.9889
-0.05	15.6984	8.2624
-0.10	11.2570	6.4197
-0.15	7.6066	4.5807
-0.20	4.5024	2.8109
-0.25	1.8132	1.1572
-0.30	-0.5149	-0.3320
-0.35	-2.4723	-1.5944
-0.40	-3.9850	-2.5437
-0.45	-4.9006	-3.0632
-0.50	-4.9644	-3.0024
-0.55	-3.7842	-2.1845
-0.60	-0.8013	-0.4348
-0.65	4.6907	2.3555
-0.70	13.3597	6.1235
-0.75	25.2771	10.5084
-0.80	38.8881	14.7768
-0.85	50.1770	17.8882
-0.90	53.5989	18.6665
-0.95	44.2927	15.7140
-1.00	0.0000	0.0000

TI 48

Figure 71

TI 48

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 3.25 MEV	ELASTIC 3.25 MEV
1.00	-0.	-0.
0.90	-3.5060	-3.3472
0.80	-5.8825	-5.5421
0.70	-8.7973	-8.0732
0.60	-12.8532	-11.1498
0.50	-19.0248	-14.4174
0.40	-28.5992	-14.9523
0.30	-22.9162	-4.5360
0.20	64.6960	11.2365
0.10	39.9268	15.2442
0.	23.1445	12.5365
-0.10	13.2946	8.3801
-0.20	6.1201	4.1222
-0.30	0.1390	0.0954
-0.40	-4.9573	-3.3397
-0.50	-8.4385	-5.3460
-0.60	-7.5935	-4.2588
-0.70	4.4505	2.0394
-0.80	35.8211	12.8438
-0.90	61.3207	19.6698
-1.00	0.0000	0.0000

TI 48

Figure 72

TI 48

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 4 MEV	ELASTIC + 4 MEV
1.00	0.	0.
0.95	-1.9938	-1.9450
0.90	-2.9887	-2.9064
0.85	-3.9285	-3.8037
0.80	-4.9352	-4.7492
0.75	-6.0922	-5.8114
0.70	-7.4859	-7.0499
0.65	-9.2245	-8.5215
0.60	-11.4549	-10.2705
0.55	-14.3831	-12.2882
0.50	-18.2841	-14.3967
0.45	-23.4047	-15.9502
0.40	-29.1237	-15.2752
0.35	-28.4656	-9.5861
0.30	8.9835	1.8809
0.25	61.8219	13.8616
0.20	62.6868	20.9895
0.15	51.1570	23.3726
0.10	41.6759	23.1259
0.05	34.6677	21.7042
0.	29.2623	19.7857
-0.05	24.8072	17.6366
-0.10	20.8831	15.3419
-0.15	17.2164	12.9128
-0.20	13.6178	10.3330
-0.25	9.9489	7.5797
-0.30	6.1031	4.6365
-0.35	1.9982	1.5030
-0.40	-2.4228	-1.7901
-0.45	-7.1780	-5.1596
-0.50	-12.2117	-8.4331
-0.55	-17.3134	-11.2947
-0.60	-21.9379	-13.2112
-0.65	-24.8116	-13.3705
-0.70	-23.1460	-10.7364
-0.75	-11.5666	-4.4465
-0.80	16.6407	5.2560
-0.85	57.7659	16.0186
-0.90	84.4038	23.6325
-0.95	73.8425	23.5256
-1.00	0.0000	0.0000

TI 48

Figure 73

TI 48

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE		ELASTIC	
	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	0.	0.	0.	0.
0.95	-2.0019	1.8200	7.2342	4.3143
0.90	-2.8267	2.2957	11.0940	9.2708
0.85	-3.4896	2.3690	14.6200	18.2310
0.80	-4.1184	1.9916	17.1480	22.2990
0.75	-4.7975	0.8773	15.7540	8.3142
0.70	-5.6143	-1.4849	6.4751	-4.1141
0.65	-6.6799	-6.2314	-8.3047	-8.9117
0.60	-8.1477	-15.1710	-22.3370	-12.5620
0.55	-10.2280	-30.8020	-35.0400	-16.9710
0.50	-13.1530	-54.2730	-49.0090	-23.4480
0.45	-16.8040	-77.6210	-66.4240	-32.9060
0.40	-17.9500	-73.0980	-86.5130	-42.6510
0.35	4.0404	-18.4490	-97.3240	-40.3270
0.30	60.9230	50.0910	-68.8890	-21.7380
0.25	69.4440	87.5030	-6.8362	-3.7438
0.20	58.5760	92.4800	35.1280	7.3109
0.15	49.9270	80.6680	48.6220	13.7380
0.10	44.1380	63.5580	47.6520	17.6330
0.05	40.0710	46.6420	40.5100	19.8880
0.	36.9300	31.9650	30.5070	20.6510
-0.05	34.2220	20.0380	18.9570	19.6040
-0.10	31.6200	10.7890	6.5196	16.0830
-0.15	28.8900	3.9659	-6.2662	9.2257
-0.20	25.8410	-0.7193	-18.7580	-1.6391
-0.25	22.2990	-3.5568	-30.0850	-16.0490
-0.30	18.0940	-4.8609	-39.0590	-30.9790
-0.35	13.0390	-5.0197	-44.1040	-40.3540
-0.40	6.9260	-4.5738	-43.2210	-37.8070
-0.45	-0.4867	-4.3341	-34.1110	-21.3440
-0.50	-9.4695	-5.5624	-14.8350	5.4408
-0.55	-20.2810	-10.2350	14.0210	36.0760
-0.60	-33.0080	-21.3070	44.4180	63.0200
-0.65	-47.0250	-42.1550	57.0150	76.7610
-0.70	-59.2610	-70.6880	36.1470	65.8170
-0.75	-59.5540	-78.4150	-1.1084	26.1160
-0.80	-25.7800	-21.6540	-20.0320	-21.7570
-0.85	46.8990	53.8560	-5.2853	-42.2290
-0.90	96.4880	89.6730	36.3140	-18.8860
-0.95	86.8910	84.2750	79.8430	45.4680
-1.00	0.0000	0.0000	0.0000	0.0000

TI 48

Figure 74

TI 48

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	+ 12 MEV	. 15 MEV
1.00	0.	0.	0.	0.
0.95	-1.7694	4.4229	6.8198	3.2075
0.90	-2.4677	6.0243	11.3480	8.2413
0.85	-2.9738	6.8854	16.4770	20.6500
0.80	-3.3835	6.8588	20.8000	19.9230
0.75	-3.7541	5.2336	17.9320	0.0482
0.70	-4.1444	0.4823	5.9639	-7.5420
0.65	-4.6280	-9.8880	-5.3687	-11.3700
0.60	-5.2946	-28.2260	-13.8600	-14.6930
0.55	-6.2087	-53.4110	-22.4930	-18.5520
0.50	-7.1565	-78.8970	-34.0750	-23.4580
0.45	-6.1868	-96.4310	-50.8310	-29.0080
0.40	8.8945	-98.1740	-71.9370	-31.2150
0.35	70.1400	-72.0100	-82.8870	-22.6580
0.30	92.5520	-6.8864	-57.3160	-8.1136
0.25	73.4120	67.7970	-12.5160	1.8486
0.20	60.0620	97.9460	17.6100	7.0093
0.15	52.4980	88.1260	31.4880	9.8561
0.10	47.9180	65.8530	35.9950	11.7360
0.05	44.8180	43.8620	35.1690	13.1160
0.	42.4190	25.2170	30.7410	14.0010
-0.05	40.2900	10.0540	23.3960	14.0660
-0.10	38.1620	-2.0493	13.4700	12.6590
-0.15	35.8410	-11.4670	1.3336	8.7628
-0.20	33.1600	-18.4140	-12.3300	1.1843
-0.25	29.9460	-22.9620	-26.2850	-10.4640
-0.30	25.9930	-25.0900	-38.5540	-23.5200
-0.35	21.0430	-24.7520	-46.3530	-31.0260
-0.40	14.7540	-21.9720	-46.2770	-26.4710
-0.45	6.6767	-17.0220	-34.9600	-10.1900
-0.50	-3.7803	-10.7390	-10.5740	12.6170
-0.55	-17.3580	-5.1182	24.2720	36.9690
-0.60	-34.8240	-4.2687	58.5250	58.8190
-0.65	-56.2860	-14.7450	72.5840	72.4590
-0.70	-78.3310	-38.6940	52.5670	67.3880
-0.75	-85.0510	-51.3330	11.0390	32.0830
-0.80	-40.8520	-18.5040	-20.7460	-21.3410
-0.85	47.8210	36.5250	-20.8320	-48.4700
-0.90	97.4860	76.1880	14.4440	-26.8650
-0.95	87.8500	83.3220	71.5560	36.0180
-1.00	0.0000	0.0000	0.0000	0.0000

TI 48

Figure 75

TI 48

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	0.	0.	0.	0.
0.95	-0.4941	6.4271	5.6553	2.4560
0.90	-0.8158	9.2475	10.4940	7.5286
0.85	-1.1530	11.2930	17.3130	26.3810
0.80	-1.5519	12.2180	22.5790	15.7250
0.75	-2.0878	10.5520	13.9900	-2.9783
0.70	-2.0942	3.4396	1.1449	-8.9038
0.65	-4.2019	-11.4300	-6.2050	-12.6810
0.60	-6.3907	-31.4520	-11.3670	-16.2910
0.55	-10.0210	-51.0740	-17.2960	-20.1890
0.50	-15.5330	-68.3730	-26.1190	-24.1510
0.45	-20.3680	-84.1840	-39.7030	-26.4040
0.40	-2.8897	-97.0710	-56.5550	-22.1430
0.35	62.0200	-96.0630	-61.5410	-9.2781
0.30	88.2530	-54.8850	-38.7210	2.3173
0.25	82.0780	22.3610	-9.1247	7.1932
0.20	72.1130	68.2480	10.1270	8.2882
0.15	63.0390	71.8040	20.5470	8.2073
0.10	54.9930	58.9530	25.7770	8.0008
0.05	47.7940	42.7240	27.6770	7.9818
0.	41.3780	26.8810	26.8670	8.1493
-0.05	35.7530	12.2800	23.3280	8.3027
-0.10	30.9200	-0.9155	16.7560	8.0090
-0.15	26.8340	-12.6030	6.8640	6.4985
-0.20	23.3830	-22.5710	-6.2104	2.6406
-0.25	20.3780	-30.4520	-21.3360	-4.4186
-0.30	17.5440	-35.7030	-35.7990	-13.0000
-0.35	14.4980	-37.5980	-45.1980	-17.1630
-0.40	10.7180	-35.2580	-44.5000	-11.9530
-0.45	5.4868	-27.7670	-30.2690	1.0271
-0.50	-2.1826	-14.5780	-2.9599	17.6760
-0.55	-13.6380	3.3335	31.9200	35.3970
-0.60	-30.5760	20.7580	63.6600	52.4950
-0.65	-54.2020	25.1560	77.5300	65.7230
-0.70	-81.3400	5.2062	61.2800	66.2810
-0.75	-88.8250	-21.1170	19.4230	37.5580
-0.80	-32.0300	-19.1730	-21.3810	-19.5390
-0.85	56.6770	14.2930	-32.9530	-51.0750
-0.90	96.7080	57.7960	-4.6994	-28.4690
-0.95	86.2920	82.8540	58.6620	31.6010
-1.00	0.0000	0.0000	0.0000	0.0000

TI 48

Figure 76

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51_v

Energy (MeV)	Energy Levels*	
1.00	G. S.	7/2 ⁻
2.00	0.320	5/2 ⁻
3.00	0.645	[7/2 ⁻]
5.00	0.930	(3/2 ⁻)
6.00	1.160	[7/2 ⁻]
7.00	1.609	(11/2 ⁻)
8.00	1.813	(9/2 ⁻)
9.00	2.250	[7/2 ⁻]
10.00	2.409	[5/2 ⁻]
11.00	2.545	[3/2 ⁻]
12.00	2.675	[7/2 ⁻]
13.00	2.699	[5/2 ⁻]
14.00	2.790	[3/2 ⁻]
15.00		
16.00		

* Energy levels obtained from NRC 61-3-14, except [] values which are assumed.

V 51

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE	TOTAL	SHAPE	TOTAL
	ELASTIC 1 MEV	ELASTIC + 1 MEV	ELASTIC 3 MEV	ELASTIC 0 3 MEV
1.00	0.	0.	0.	0.
0.95	-1.0816	-0.8687	-3.4040	-3.3238
0.90	-1.4904	-1.1725	-5.1618	-5.0126
0.85	-1.7750	-1.3634	-6.8197	-6.5740
0.80	-1.9886	-1.4858	-8.5536	-8.1632
0.75	-2.1511	-1.5567	-10.4710	-9.8542
0.70	-2.2719	-1.5843	-12.6780	-11.6956
0.65	-2.3548	-1.5733	-15.3090	-13.7148
0.60	-2.3996	-1.5259	-18.5600	-15.9001
0.55	-2.4023	-1.4428	-22.7340	-18.1445
0.50	-2.3537	-1.3237	-28.3400	-20.1159
0.45	-2.2377	-1.1672	-36.2660	-21.0021
0.40	-2.0280	-0.9708	-47.9070	-19.2284
0.35	-1.6831	-0.7311	-62.3240	-12.9528
0.30	-1.1395	-0.4441	-31.5100	-2.6179
0.25	-0.3031	-0.1048	81.2670	7.4413
0.20	0.9590	0.2915	68.1900	13.4102
0.15	2.8208	0.7494	47.0810	15.2832
0.10	5.4794	1.2721	33.7330	14.6980
0.05	9.0965	1.8614	24.8570	12.9567
0.	13.6852	2.5164	18.4050	10.7515
-0.05	18.9796	3.2336	13.3350	8.3958
-0.10	24.4051	4.0061	9.0933	6.0183
-0.15	29.2549	4.8244	5.3610	3.6672
-0.20	32.9929	5.6759	1.9470	1.3597
-0.25	35.4370	6.5454	-1.2666	-0.8944
-0.30	36.7111	7.4156	-4.3478	-3.0787
-0.35	37.0787	8.2673	-7.3236	-5.1612
-0.40	36.8044	9.0795	-10.1770	-7.0835
-0.45	36.0910	9.8299	-12.8320	-8.7477
-0.50	35.0697	10.4944	-15.1200	-9.9980
-0.55	33.8129	11.0476	-16.7140	-10.5978
-0.60	32.3501	11.4619	-17.0180	-10.2047
-0.65	30.6806	11.7074	-14.9860	-8.3630
-0.70	28.7812	11.7499	-8.9229	-4.5584
-0.75	26.6070	11.5488	3.3975	1.5723
-0.80	24.0853	11.0507	23.1120	9.7727
-0.85	21.0952	10.1766	45.8700	18.5209
-0.90	17.4050	8.7852	59.3630	24.7207
-0.95	12.4246	6.5327	52.0690	24.0588
-1.00	0.0000	0.0000	0.0000	0.0000

V 51

+ 1 MEV

o 3 MEV

Figure 77

V 51

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 2 MEV	ELASTIC + 2 MEV
1.00	0.	0.
0.95	-4.0603	-3.8279
0.90	-5.9850	-5.5818
0.85	-7.6597	-7.0458
0.80	-9.2706	-8.3772
0.75	-10.9043	-9.6265
0.70	-12.6240	-10.8046
0.65	-14.4927	-11.8950
0.60	-16.5875	-12.8514
0.55	-19.0170	-13.5880
0.50	-21.9485	-13.9664
0.45	-25.6644	-13.7870
0.40	-30.6869	-12.8089
0.35	-38.0962	-10.8371
0.30	-50.4698	-7.8959
0.25	-74.6335	-4.3933
0.20	-86.0117	-1.0458
0.15	77.6735	1.4891
0.10	44.6847	2.9406
0.05	25.8420	3.4220
0.	15.8547	3.2235
-0.05	9.7935	2.6382
-0.10	5.7942	1.8929
-0.15	3.0581	1.1445
-0.20	1.2116	0.4998
-0.25	0.0790	0.0349
-0.30	-0.4092	-0.1905
-0.35	-0.2579	-0.1243
-0.40	0.5705	0.2816
-0.45	2.1397	1.0719
-0.50	4.5217	2.2829
-0.55	7.7690	3.9337
-0.60	11.8721	6.0118
-0.65	16.6980	8.4525
-0.70	21.9169	11.1142
-0.75	26.9402	13.7537
-0.80	30.9103	16.0055
-0.85	32.7641	17.3648
-0.90	31.2995	17.1399
-0.95	24.8346	14.1672
-1.00	0.0000	0.0000

U 51

Figure 78

V 51

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	0.	0.	0.	0.
0.95	-1.9360	3.8717	6.1314	2.9134
0.90	-2.9015	4.9038	9.5537	6.8351
0.85	-3.8029	5.0515	12.6760	13.5520
0.80	-4.7598	4.2752	14.8500	15.0750
0.75	-5.8616	2.2203	13.7330	0.8111
0.70	-7.2113	-1.8523	6.0848	-10.2050
0.65	-8.9469	-9.3290	-6.9852	-16.0640
0.60	-11.2560	-22.6480	-20.4570	-20.5560
0.55	-14.3490	-44.9120	-33.6140	-25.5320
0.50	-18.1640	-70.7220	-49.8930	-32.0790
0.45	-20.3150	-49.8400	-73.2100	-39.8950
0.40	-5.1723	35.2200	-97.8920	-41.0230
0.35	48.0300	84.5060	-78.2010	-23.3220
0.30	66.0270	95.5590	-9.5654	-5.2454
0.25	56.9330	91.0710	30.0090	2.7689
0.20	48.1020	80.2770	42.4650	6.0393
0.15	42.0540	66.8050	44.3620	7.8320
0.10	37.8820	52.5250	41.9680	9.2215
0.05	34.7970	38.5730	37.1450	10.4440
0.	32.2900	25.6380	30.3460	11.3670
-0.05	30.0270	14.1160	21.6020	11.5800
-0.10	27.7640	4.2164	10.8850	10.3420
-0.15	25.3090	-3.9492	-1.6802	6.4989
-0.20	22.4880	-10.3180	-15.6280	-1.4024
-0.25	19.1260	-14.8580	-29.9300	-14.1140
-0.30	15.0340	-17.5750	-42.7570	-28.9960
-0.35	9.9921	-18.5640	-51.2730	-37.9170
-0.40	3.7284	-18.0870	-51.6700	-32.8110
-0.45	-4.1014	-16.7260	-39.8680	-14.3510
-0.50	-13.9370	-15.6300	-13.6090	10.6530
-0.55	-26.3120	-16.8960	23.4670	36.1560
-0.60	-41.7370	-23.9640	57.7210	57.7870
-0.65	-60.0590	-40.6730	69.1520	70.1120
-0.70	-77.7700	-62.1960	48.4200	63.9510
-0.75	-78.9950	-53.6510	10.3090	29.5990
-0.80	-27.4850	6.2735	-17.4440	-23.2120
-0.85	62.3130	63.3420	-14.6970	-52.8720
-0.90	99.4520	87.2560	21.9710	-30.4580
-0.95	80.7760	79.1750	73.4700	38.7960
-1.00	0.0000	0.0000	0.0000	0.0000

Figure 79

V 51

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE		ELASTIC	
	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	0.	0.	0.	0.
0.95	-0.7531	5.8488	4.9237	2.6748
0.90	-1.3400	7.9133	8.5190	7.1464
0.85	-2.0252	8.8956	12.6220	16.7630
0.80	-2.8592	8.6281	15.8230	13.9940
0.75	-3.8996	6.3542	13.1580	-4.2820
0.70	-5.2227	0.4879	2.8319	-13.1310
0.65	-6.9181	-11.7860	-7.7138	-18.2740
0.60	-9.0332	-34.1410	-15.8110	-22.8200
0.55	-11.2710	-66.8960	-24.1760	-27.6760
0.50	-11.4290	-96.1030	-36.5940	-32.6870
0.45	2.1935	-90.5140	-57.6200	-35.0480
0.40	55.9850	-34.2100	-84.1640	-26.4160
0.35	87.5140	40.2960	-72.2190	-7.4914
0.30	74.3880	87.6590	-21.6390	3.4689
0.25	60.5410	99.3250	8.5203	5.7017
0.20	51.4720	90.4290	21.3040	5.1424
0.15	45.5070	74.0890	26.8050	4.2819
0.10	41.3070	56.4810	28.9250	3.8010
0.05	38.0980	39.7680	28.8410	3.8098
0.	35.4270	24.4930	26.7040	4.2100
-0.05	33.0140	10.6940	22.2290	4.7477
-0.10	30.6630	-1.6784	14.9530	4.9369
-0.15	28.2170	-12.5990	4.4572	3.8994
-0.20	25.5230	-21.9190	-9.2742	0.2426
-0.25	22.4070	-29.3460	-25.2860	-7.3711
-0.30	18.6500	-34.4310	-40.9320	-17.5070
-0.35	13.9640	-36.5850	-51.4770	-23.1080
-0.40	7.9524	-35.1220	-50.9920	-17.7940
-0.45	0.0757	-29.4180	-35.1350	-3.6127
-0.50	-10.4110	-19.3230	-4.6836	14.2960
-0.55	-24.4970	-6.1668	32.7730	32.8390
-0.60	-43.2970	5.3102	64.2350	50.1330
-0.65	-67.0490	5.6831	75.3830	62.8890
-0.70	-90.1790	-10.2550	57.7790	62.8380
-0.75	-85.7990	-22.3200	18.0500	34.7730
-0.80	-12.3030	-4.3781	-20.4420	-22.4720
-0.85	74.5460	34.8950	-31.3840	-57.7200
-0.90	99.9460	70.2740	-1.7026	-33.3050
-0.95	80.5900	79.9400	61.6820	34.8630
-1.00	0.0000	0.0000	0.0000	0.0000

Figure 80

V 51

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	0.	0.	0.	0.
0.95	1.3736	6.6221	3.7061	2.8254
0.90	1.4570	9.5463	7.3850	8.1513
0.85	1.0661	11.5870	12.5270	23.3690
0.80	0.1968	12.3880	15.7120	11.9570
0.75	-1.2688	10.6480	7.8905	-6.1676
0.70	-3.5563	3.8684	-4.2533	-13.3980
0.65	-7.0246	-10.6000	-12.0000	-18.5390
0.60	-12.1410	-31.8430	-17.4160	-23.5710
0.55	-18.9360	-54.5400	-23.3490	-28.6970
0.50	-22.7580	-74.6530	-32.2970	-32.6410
0.45	6.3627	-89.0460	-46.7460	-30.7220
0.40	82.0690	-83.5530	-61.1450	-16.1140
0.35	98.5160	-30.6630	-46.2120	2.7124
0.30	86.2580	41.1900	-14.9840	10.3010
0.25	73.6490	72.5230	2.4701	9.5613
0.20	63.2940	73.5640	10.6160	6.4564
0.15	54.4430	64.5320	14.9780	3.3706
0.10	46.4700	52.9780	17.6310	0.9774
0.05	39.0990	40.8620	19.1520	-0.5702
0.	32.2750	28.5490	19.4670	-1.2654
-0.05	26.0580	16.0530	18.1160	-1.1619
-0.10	20.5330	3.4042	14.3260	-0.3971
-0.15	15.7590	-9.2207	7.1048	0.6972
-0.20	11.7330	-21.4290	-4.4110	1.3836
-0.25	8.3666	-32.5450	-19.9840	0.4406
-0.30	5.4642	-41.5220	-36.5720	-2.5972
-0.35	2.6913	-46.8520	-47.3220	-4.7732
-0.40	-0.4688	-46.4870	-44.4900	-2.1185
-0.45	-4.7874	-37.9570	-25.6600	5.3587
-0.50	-11.3990	-19.1450	4.1895	15.8290
-0.55	-21.9390	9.1578	36.6500	28.1260
-0.60	-38.5570	38.0820	63.1370	41.4490
-0.65	-62.7450	48.6630	74.7280	53.9200
-0.70	-87.8860	29.2430	62.4220	59.1630
-0.75	-76.8750	-1.4517	24.1450	39.5550
-0.80	5.5867	-12.7140	-22.3950	-19.4380
-0.85	78.8690	7.1694	-43.9840	-57.5210
-0.90	97.2350	47.4600	-19.8130	-29.1860
-0.95	79.6420	79.3210	48.3590	35.2320
-1.00	0.0000	0.0000	0.0000	0.0000

V 51

Figure 81

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^{52}Cr

Energy (MeV)	Energy Levels*
2.00	G.S. 0^+
3.00	1.434 2^+
3.25	2.370 4^+
4.00	2.648 $(0)^{[+]}$
5.00	2.766 (4^+)
6.00	2.965 (2^+)
7.00	3.112 6^+
8.00	3.161 $[0^+]$
9.00	3.46 (3^-)
10.00	3.614 (5^+)
11.00	3.83 $[5^+]$
12.00	
13.00	
14.00	
15.00	
16.00	

*Energy levels obtained from NRC 61-3-26, except [] values which are assumed.

CR 52

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE ELASTIC	TOTAL ELASTIC	SHAPE ELASTIC	TOTAL ELASTIC
	2 MEV	+ 2 MEV	4 MEV	0 4 MEV
1.00	0.	0.	0.	0.
0.95	-4.4980	-3.8844	-2.5151	-2.4639
0.90	-6.6462	-5.6680	-3.8353	-3.7460
0.85	-8.5294	-7.1543	-5.1212	-4.9807
0.80	-10.3559	-8.4968	-6.5293	-6.3111
0.75	-12.2249	-9.7390	-8.1785	-7.8334
0.70	-14.2120	-10.8809	-10.2077	-9.6422
0.65	-16.3954	-11.8903	-12.8105	-11.8393
0.60	-18.8734	-12.7000	-16.2831	-14.5163
0.55	-21.7866	-13.2009	-21.0976	-17.6635
0.50	-25.3552	-13.2375	-27.9819	-20.8434
0.45	-29.9525	-12.6209	-37.5654	-22.2214
0.40	-36.2661	-11.1817	-44.9428	-17.0530
0.35	-45.6689	-8.8791	-5.7746	-1.2883
0.30	-60.9016	-5.9245	62.6401	16.5061
0.25	-81.2973	-2.7999	61.6621	25.7160
0.20	-5.3522	-0.0775	49.7188	27.7580
0.15	55.6290	1.8446	40.6405	26.7217
0.10	36.8175	2.8668	34.1268	24.6772
0.05	23.1315	3.1199	29.1828	22.3636
0.	14.5774	2.8259	25.1486	19.9915
-0.05	8.8512	2.2013	21.6127	17.5856
-0.10	4.7835	1.4182	18.3043	15.1070
-0.15	1.7952	0.6036	15.0300	12.5002
-0.20	-0.4086	-0.1504	11.6372	9.7001
-0.25	-1.9730	-0.7739	7.9931	6.6451
-0.30	-2.9543	-1.2096	3.9705	3.2761
-0.35	-3.3492	-1.4073	-0.5621	-0.4578
-0.40	-3.1094	-1.3215	-5.7484	-4.5902
-0.45	-2.1513	-0.9129	-11.7485	-9.1164
-0.50	-0.3673	-0.1538	-18.7338	-13.9508
-0.55	2.3546	0.9629	-26.8535	-18.8425
-0.60	6.0925	2.4107	-36.1068	-23.2173
-0.65	10.8260	4.1153	-45.9086	-25.9236
-0.70	16.3394	5.9427	-53.6407	-24.9837
-0.75	22.1114	7.6948	-50.2743	-17.9016
-0.80	27.2395	9.1153	-13.9393	-3.6896
-0.85	30.4662	9.9007	59.7994	13.7988
-0.90	30.2852	9.6879	98.4734	26.4022
-0.95	24.7101	7.8984	77.9223	27.3154
-1.00	0.0000	0.0000	0.0000	0.0000

CR 52

Figure 82

CR 52

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 3 MEV	ELASTIC + 3 MEV
1.00	0.	0.
0.95	-3.5373	-3.3356
0.90	-5.3786	-5.0385
0.85	-7.1279	-6.6172
0.80	-8.9718	-8.2253
0.75	-11.0288	-9.9341
0.70	-13.4215	-11.7860
0.65	-16.3107	-13.7959
0.60	-19.9368	-15.9255
0.55	-24.6919	-18.0161
0.50	-31.2683	-19.6437
0.45	-40.9710	-19.8795
0.40	-56.1699	-17.1739
0.35	-75.8848	-10.2422
0.30	-7.7361	-0.4069
0.25	89.2719	8.2787
0.20	63.8598	13.1606
0.15	44.1976	14.5958
0.10	32.0730	13.9663
0.05	23.8773	12.3246
0.	17.7970	10.2434
-0.05	12.9273	7.9929
-0.10	8.7787	5.6907
-0.15	5.0653	3.3845
-0.20	1.6090	1.0941
-0.25	-1.7048	-1.1673
-0.30	-4.9491	-3.3802
-0.35	-8.1632	-5.5088
-0.40	-11.3504	-7.4904
-0.45	-14.4649	-9.2219
-0.50	-17.3798	-10.5444
-0.55	-19.8231	-11.2265
-0.60	-21.2533	-10.9598
-0.65	-20.6296	-9.3892
-0.70	-16.0538	-6.2219
-0.75	-4.5407	-1.4514
-0.80	16.6282	4.3537
-0.85	43.9460	9.9095
-0.90	61.8219	13.4472
-0.95	54.9420	12.9987
-1.00	0.0000	0.0000

CR 52

Figure 83

CR 52

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 3.25 MEV	ELASTIC 3.25 MEV
1.00	-0.	-0.
0.90	-4.9453	-4.7222
0.80	-8.3421	-7.8338
0.70	-12.6916	-11.5148
0.60	-19.3036	-16.1840
0.50	-31.2510	-21.1567
0.40	-57.3556	-19.1563
0.30	36.9586	3.1825
0.20	58.3498	18.3944
0.10	32.3424	17.6768
0.	19.5678	13.0613
-0.10	11.0076	7.9811
-0.20	3.8092	2.8472
-0.30	-3.2109	-2.3937
-0.40	-10.6492	-7.6718
-0.50	-18.6338	-12.4125
-0.60	-25.9767	-14.8104
-0.70	-25.6842	-10.8934
-0.80	10.3082	2.7035
-0.90	74.2590	16.7577
-1.00	0.0000	0.0000

CR 52

Figure 84

CR 52

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE ELASTIC			
	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	0.	0.	0.	0.
0.95	-1.6938	4.3604	5.4635	2.6172
0.90	-2.6293	5.5434	8.6223	6.2654
0.85	-3.5658	5.7323	11.5670	12.3920
0.80	-4.6113	4.8841	13.6810	13.3050
0.75	-5.8566	2.6151	12.7920	-0.8969
0.70	-7.4129	-1.8715	5.7447	-12.4560
0.65	-9.4334	-10.0820	-6.9101	-18.9060
0.60	-12.1251	-24.6970	-20.5030	-23.9300
0.55	-15.6954	-48.8120	-34.0810	-29.3840
0.50	-19.8563	-70.1690	-51.3720	-36.1810
0.45	-20.5340	-16.1730	-76.9830	-42.9630
0.40	-3.9524	69.4480	-98.7860	-38.5380
0.35	-65.5186	95.7690	-53.6140	-15.6650
0.30	-62.9606	95.4660	11.4090	-0.5381
0.25	-53.6950	87.0850	35.7290	3.9830
0.20	-45.8256	75.6310	41.7410	5.1319
0.15	-40.3882	62.8040	41.8480	5.6683
0.10	36.5505	49.5400	39.4720	6.3065
0.05	33.6477	36.5050	35.3810	7.1316
0.	31.2436	24.1850	29.5660	7.9696
-0.05	29.0412	12.9170	21.7940	8.4274
-0.10	26.8196	2.9371	11.8270	7.8060
-0.15	24.3954	-5.5810	-0.4030	4.9603
-0.20	21.5987	-12.4900	-14.5800	-1.6943
-0.25	18.2557	-17.6560	-29.7060	-13.2940
-0.30	14.1725	-20.9720	-43.7310	-27.5290
-0.35	9.1185	-22.3970	-53.2530	-35.8870
-0.40	2.8050	-22.0440	-53.6440	-30.1230
-0.45	-5.1412	-20.3460	-40.2460	-11.9070
-0.50	-15.2082	-18.3300	-11.3690	11.6000
-0.55	-28.0103	-18.0570	27.3690	35.0800
-0.60	-44.1781	-23.0590	60.9200	55.1050
-0.65	-63.6661	-37.1610	71.0210	67.1360
-0.70	-82.5943	-54.5100	50.6020	62.5680
-0.75	-82.2718	-41.8610	12.7660	30.3470
-0.80	-22.3157	13.3020	-17.2060	-23.5630
-0.85	68.7842	63.9120	-18.0240	-56.0220
-0.90	98.9398	85.8280	16.9250	-33.1610
-0.95	78.0282	77.9860	71.0000	38.0390
-1.00	0.0000	0.0000	0.0000	0.0000

CR 52

Figure 85

CR 52

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	0.	0.	0.	0.
0.95	-0.2486	5.9686	4.1867	2.7000
0.90	-0.7304	8.0947	7.4180	7.0645
0.85	-1.4300	9.1106	11.1750	15.9570
0.80	-2.3813	8.8416	14.0920	12.6140
0.75	-3.6475	6.5300	11.5130	-5.6567
0.70	-5.3211	0.5840	1.4142	-15.0600
0.65	-7.5127	-11.9390	-9.3481	-20.7610
0.60	-10.2630	-35.3700	-17.7490	-25.8840
0.55	-13.0710	-71.0580	-26.3560	-31.2820
0.50	-12.3790	-99.3790	-39.3130	-36.4190
0.45	9.0502	-71.7020	-62.1340	-37.0740
0.40	67.0740	8.1302	-88.1890	-23.3520
0.35	83.2690	72.4780	-58.3320	-2.0907
0.30	69.7800	97.5880	-8.6925	6.4988
0.25	57.7200	96.9420	12.6500	6.4058
0.20	49.5350	85.0330	20.9010	4.3103
0.15	43.8680	69.5840	24.5420	2.4089
0.10	39.6810	53.7780	26.0950	1.1977
0.05	36.3560	38.6750	26.1460	0.7174
0.	33.5210	24.5180	24.5790	0.8672
-0.05	30.9400	11.3070	20.9410	1.4392
-0.10	28.4450	-0.9640	14.5880	2.0407
-0.15	25.8920	-12.2110	4.8582	1.9222
-0.20	23.1370	-22.2120	-8.5692	-0.2235
-0.25	20.0090	-30.5750	-24.9630	-5.9222
-0.30	16.2870	-36.7110	-41.5050	-14.3930
-0.35	11.6690	-39.8150	-52.6400	-19.2640
-0.40	5.7454	-38.8790	-51.4130	-14.4990
-0.45	-2.0575	-32.8360	-33.5820	-1.9846
-0.50	-12.5350	-21.0290	-1.6382	13.8480
-0.55	-26.7550	-4.5177	35.2720	30.5230
-0.60	-45.9290	11.3060	64.7820	46.5570
-0.65	-70.2290	15.1000	74.9020	59.1450
-0.70	-92.8050	0.3409	58.3230	60.6820
-0.75	-81.8980	-13.7180	19.5400	35.3710
-0.80	0.9522	-1.5837	-20.6770	-22.4450
-0.85	81.7140	32.9750	-34.8540	-60.1260
-0.90	99.4530	67.7970	-6.8067	-34.0670
-0.95	78.0860	79.2210	58.4440	35.8880
-1.00	0.0000	0.0000	0.0000	0.0000

CR 52

Figure 86

CR 52

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	0.	0.	0.	0.
0.95	1.9980	6.2860	3.1181	3.1367
0.90	2.2427	9.1161	6.4325	8.5995
0.85	1.8709	11.1220	11.0960	22.7940
0.80	0.8877	11.9590	13.7860	10.9980
0.75	-0.8471	10.4020	6.0157	-7.1500
0.70	-3.6035	4.0606	-6.3875	-14.8190
0.65	-7.8075	-9.9211	-14.6810	-20.4730
0.60	-13.9710	-31.5070	-20.5470	-26.1020
0.55	-21.7060	-55.6850	-26.8390	-31.7820
0.50	-22.2650	-76.7320	-36.1300	-35.6810
0.45	26.6600	-86.8520	-50.7160	-31.7080
0.40	94.3130	-62.0390	-61.0640	-13.1940
0.35	95.9650	10.1870	-35.9300	6.3657
0.30	82.3830	63.7210	-7.3828	12.2430
0.25	70.3550	75.6790	4.7415	10.0140
0.20	60.4850	70.5630	9.8691	5.8257
0.15	51.9130	61.0920	12.6930	1.8895
0.10	44.0720	50.6930	14.6160	-1.1924
0.05	36.7190	39.9690	15.9200	-3.2731
0.	29.8190	28.8470	16.4200	-4.3136
-0.05	23.4440	17.1770	15.6060	-4.2972
-0.10	17.7000	4.9103	12.6510	-3.2364
-0.15	12.6790	-7.8169	6.4201	-1.2628
-0.20	8.4152	-20.6100	-4.2521	1.1259
-0.25	4.8635	-32.7240	-19.5270	2.6752
-0.30	1.8666	-42.9380	-36.4010	1.8803
-0.35	-0.8792	-49.4050	-47.1510	-0.0121
-0.40	-3.8766	-49.5480	-43.2060	0.9042
-0.45	-7.9080	-40.2280	-23.1130	6.0031
-0.50	-14.1570	-18.8810	6.5416	14.3610
-0.55	-24.3610	13.0550	37.2610	25.0510
-0.60	-40.8060	44.4210	61.7820	37.3490
-0.65	-64.8770	54.8580	72.7830	49.6460
-0.70	-88.0060	34.8010	61.8930	56.3050
-0.75	-68.1850	3.0799	25.1420	40.0220
-0.80	18.4000	-11.6130	-22.8320	-18.6610
-0.85	83.2580	4.2654	-47.4480	-58.6500
-0.90	96.3600	43.5170	-24.0760	-28.1220
-0.95	77.6760	78.1370	45.8160	37.2930
-1.00	0.0000	0.0000	0.0000	0.0000

CR 52

Figure 87

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⁵⁵Mn

Energy (MeV)	Energy Levels*
1.00	G.S. 5/2 ⁻
2.00	0.126 7/2 ⁻
5.00	0.983 [5/2 ⁻]
6.00	1.289 [7/2 ⁻]
7.00	1.527 [5/2 ⁻]
8.00	1.884 [7/2 ⁻]
9.00	
10.00	
11.00	
12.00	
13.00	
14.00	
15.00	
16.00	

* Energy levels obtained from NRC 59-2-3, except [] values which are assumed.

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COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 1 MEV	ELASTIC + 1 MEV
1.00	0.	0.
0.95	-3.6231	-2.9932
0.90	-5.1063	-4.1303
0.85	-6.2193	-4.9092
0.80	-7.1225	-5.4659
0.75	-7.8707	-5.8469
0.70	-8.4040	-6.0706
0.65	-8.9648	-6.1438
0.60	-9.3029	-6.0679
0.55	-9.4772	-5.8422
0.50	-9.4549	-5.4672
0.45	-9.1903	-4.9460
0.40	-8.6239	-4.2862
0.35	-7.6828	-3.5014
0.30	-6.2849	-2.6118
0.25	-4.3499	-1.6432
0.20	-1.8216	-0.6258
0.15	1.3001	0.4084
0.10	4.9233	1.4293
0.05	8.8449	2.4112
0.	12.7720	3.3353
-0.05	16.3902	4.1905
-0.10	19.4500	4.9735
-0.15	21.8303	5.6870
-0.20	23.5338	6.3381
-0.25	24.6548	6.9361
-0.30	25.3227	7.4902
-0.35	25.6627	8.0077
-0.40	25.7737	8.4930
-0.45	25.7219	8.9462
-0.50	25.5421	9.3623
-0.55	25.2419	9.7305
-0.60	24.8067	10.0334
-0.65	24.2030	10.2462
-0.70	23.3796	10.3349
-0.75	22.2656	10.2540
-0.80	20.7628	9.9404
-0.85	18.7245	9.3007
-0.90	15.8938	8.1754
-0.95	11.6589	6.1993
-1.00	0.0000	0.0000

HN 55

Figure 88

MN 55

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE ELASTIC 2 MEV	TOTAL ELASTIC + 2 MEV
1.00	0.	0.
0.95	-4.9157	-4.6277
0.90	-7.3067	-6.7979
0.85	-9.4354	-8.6454
0.80	-11.5299	-10.3549
0.75	-13.7017	-11.9812
0.70	-16.0371	-13.5246
0.65	-18.6243	-14.9405
0.60	-21.5684	-16.1225
0.55	-25.0028	-16.8996
0.50	-29.0910	-16.9716
0.45	-33.9734	-15.9581
0.40	-39.4479	-13.4924
0.35	-43.3644	-9.5100
0.30	-35.3822	-4.5725
0.25	2.1331	0.1989
0.20	33.5049	3.7494
0.15	33.7853	5.6597
0.10	25.6453	6.1190
0.05	17.9553	5.5628
0.	11.7921	4.4031
-0.05	6.8840	2.9371
-0.10	2.8875	1.3557
-0.15	-0.4439	-0.2232
-0.20	-3.2672	-1.7248
-0.25	-5.6723	-3.0956
-0.30	-7.6985	-4.2898
-0.35	-9.3424	-5.2605
-0.40	-10.5585	-5.9530
-0.45	-11.2560	-6.3017
-0.50	-11.2916	-6.2282
-0.55	-10.4621	-5.6434
-0.60	-8.5049	-4.4566
-0.65	-5.1251	-2.5949
-0.70	-0.0830	-0.0405
-0.75	6.6070	3.1113
-0.80	14.3462	6.5752
-0.85	21.6008	9.7941
-0.90	25.8314	11.8593
-0.95	23.6559	11.2828
-1.00	0.0000	0.0000

MM 55

Figure 89

MN 55

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	0.	0.	0.	0.
0.95	-0.5032	4.9438	3.2014	2.4037
0.90	-1.1600	6.3732	5.4428	5.5049
0.85	-2.0706	6.6889	7.7964	10.1850
0.80	-3.2982	5.8164	9.7424	9.3656
0.75	-4.9437	3.2968	9.4860	-5.8476
0.70	-7.1631	-1.8215	3.7763	-19.8100
0.65	-10.1920	-11.4030	-8.9017	-28.5720
0.60	-14.3440	-28.8200	-25.1660	-35.8630
0.55	-19.7810	-54.1050	-42.7640	-43.6610
0.50	-24.5900	-21.9200	-65.4370	-51.7420
0.45	-14.2430	82.6900	-89.8350	-51.4870
0.40	33.6820	99.0010	-18.5730	-20.7150
0.35	57.3600	91.2450	41.7370	7.3086
0.30	53.1720	81.4440	43.0720	9.6669
0.25	46.1460	71.7710	38.7690	5.6098
0.20	40.6580	62.0780	35.4280	1.7733
0.15	36.6020	52.1690	32.9970	-0.8692
0.10	33.4970	42.0060	30.8480	-2.3570
0.05	30.9650	31.6690	28.3510	-2.8654
0.	28.7380	21.3050	24.8710	-2.5937
-0.05	26.6140	11.0910	19.7290	-1.8097
-0.10	24.4260	1.2361	12.1920	-0.9686
-0.15	22.0180	-8.0171	1.5687	-0.9266
-0.20	19.2350	-16.3680	-12.5050	-3.2120
-0.25	15.9030	-23.4420	-29.4190	-9.7351
-0.30	11.8170	-28.7760	-46.5040	-19.8280
-0.35	6.7188	-31.8280	-58.0350	-25.8220
-0.40	0.2750	-32.0410	-56.1520	-20.2970
-0.45	-7.9655	-29.0210	-35.6650	-5.9935
-0.50	-18.6200	-22.9570	-0.0492	11.4360
-0.55	-32.5120	-15.4260	38.5410	29.0240
-0.60	-50.5600	-10.3910	65.8360	45.0760
-0.65	-72.7640	-12.8450	71.6190	56.6670
-0.70	-92.8240	-18.6760	52.9580	56.6790
-0.75	-79.8540	-7.9986	16.9080	31.5720
-0.80	7.6235	24.7960	-18.1850	-23.8460
-0.85	85.8410	60.2870	-28.3640	-63.8110
-0.90	94.8630	80.7900	2.0053	-37.3070
-0.95	69.8780	76.1510	63.2840	40.0500
-1.00	0.0000	0.0000	0.0000	0.0000

MN 55

Figure 90

MN 55

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	0.	0.	0.	0.
0.95	1.3600	5.2906	2.2090	3.3663
0.90	1.2923	7.3036	4.4274	7.6367
0.85	0.6602	8.3661	7.2451	14.7400
0.80	-0.5319	8.2867	9.4047	9.5577
0.75	-2.3851	6.3500	6.7350	-9.6062
0.70	-5.0800	1.0075	-3.9722	-20.8500
0.65	-8.8500	-11.0430	-17.2810	-28.4720
0.60	-13.7520	-36.7640	-28.6050	-35.8150
0.55	-18.1460	-83.1720	-40.0060	-43.4720
0.50	-10.5760	-71.2860	-56.9730	-48.8270
0.45	36.2780	55.6440	-85.8450	-40.6140
0.40	71.8250	96.7890	-64.0780	-9.5116
0.35	68.0600	97.8740	6.1669	12.0160
0.30	58.1660	89.7180	17.3190	12.9730
0.25	50.1120	79.2550	17.4060	7.5355
0.20	43.9830	68.3110	16.7780	1.8264
0.15	39.1420	57.4080	16.5650	-2.7935
0.10	35.1120	46.6080	16.6540	-6.1269
0.05	31.5430	35.7970	16.6940	-8.1879
0.	28.3980	24.8190	16.2030	-8.9993
-0.05	25.4040	13.5480	14.5210	-8.5693
-0.10	22.5190	1.9515	10.7320	-6.9303
-0.15	19.6560	-9.8676	3.6456	-4.2707
-0.20	16.7060	-21.6000	-7.9671	-1.2777
-0.25	13.5200	-32.6410	-24.3690	0.2998
-0.30	9.8768	-41.9580	-42.5330	-1.6590
-0.35	5.4525	-47.9250	-54.0000	-5.2735
-0.40	-0.2224	-48.1730	-48.7240	-5.0277
-0.45	-7.8261	-39.7220	-25.1560	0.5830
-0.50	-18.3270	-20.1740	7.8966	9.9436
-0.55	-33.0490	8.6799	39.7470	21.6410
-0.60	-53.4150	35.4710	62.5750	34.6270
-0.65	-78.7640	42.2480	70.2140	46.9790
-0.70	-95.4270	25.0190	57.0400	52.9260
-0.75	-55.8590	3.9405	21.8470	36.4860
-0.80	42.2140	1.9615	-22.3280	-20.7870
-0.85	95.4190	24.8700	-45.2720	-64.9090
-0.90	95.8690	59.1940	-20.5740	-32.4370
-0.95	71.4660	77.7960	50.6100	41.7620
-1.00	0.0000	0.0000	0.0000	0.0000

MN 55

Figure 91

MN 55

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	0.	0.	0.	0.
0.95	3.4273	4.4838	1.9328	4.4570
0.90	4.0942	6.7434	4.3801	10.4140
0.85	3.8359	8.5374	7.8352	21.9190
0.80	2.6594	9.5722	9.1905	8.6504
0.75	0.3448	8.8770	0.7281	-9.7634
0.70	-3.5372	4.3608	-13.8290	-18.6210
0.65	-9.6638	-7.5793	-24.9610	-25.9210
0.60	-18.6440	-30.8050	-33.3360	-33.7180
0.55	-27.1230	-63.6670	-42.0950	-41.4970
0.50	-3.2493	-82.5660	-53.9010	-44.6480
0.45	73.6980	-20.8370	-66.2940	-31.6750
0.40	90.3650	68.2400	-40.5950	-2.8244
0.35	79.8460	85.8140	2.0226	14.8810
0.30	68.7910	77.3610	9.0032	16.1740
0.25	59.6220	66.7340	7.6418	10.8870
0.20	51.7010	57.7500	6.0410	4.3061
0.15	44.4200	50.1550	5.2329	-1.8182
0.10	37.4270	43.1590	5.1594	-6.9086
0.05	30.5780	36.0310	5.5781	-10.6910
0.	23.8660	28.1620	6.1543	-12.9230
-0.05	17.3750	19.0580	6.3946	-13.2830
-0.10	11.2400	8.3540	5.5139	-11.3200
-0.15	5.6167	-4.1079	2.2608	-6.4604
-0.20	0.6456	-18.1350	-5.1147	1.5997
-0.25	-3.5797	-32.9220	-17.9720	11.2780
-0.30	-7.0566	-46.6550	-33.9180	16.9320
-0.35	-9.9326	-56.0640	-43.1420	14.1950
-0.40	-12.5900	-56.2620	-35.8300	8.4004
-0.45	-15.7740	-41.8950	-14.5900	5.9833
-0.50	-20.7610	-11.0260	11.3570	8.3276
-0.55	-29.5440	28.8950	35.7000	14.7560
-0.60	-44.5670	60.0390	54.8710	24.4680
-0.65	-65.5410	65.5630	64.7070	36.3760
-0.70	-74.8540	44.1460	58.0610	46.8410
-0.75	-28.9190	11.2790	26.6300	41.0140
-0.80	48.0230	-10.9950	-24.2130	-13.4130
-0.85	88.3500	-5.4084	-57.0350	-58.4660
-0.90	92.5610	30.6520	-33.8400	-22.0920
-0.95	73.3880	73.9590	42.2580	44.1560
-1.00	0.0000	0.0000	0.0000	0.0000

MN 55

Figure 92

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^{56}Fe

Energy (MeV)	Energy Levels*
1.95	G.S. 0^+
3.25	0.845 2^+
5.00	2.085 4^+
6.00	2.660 2^+
7.00	2.958 2^+
8.00	3.119 $[0^+]$
9.00	3.390** 2^+
10.00	3.445 3^+
11.00	3.60 $[0^+]$
12.00	3.84 (5^+)
13.00	4.10 4^+
14.00	4.31** (3^-) **
15.00	
16.00	

*Energy levels obtained from NRC 59-4-50, except [] values which are assumed.

**J and Π from Landolt-Bornstein.

FE 56

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 1.95 MEV	ELASTIC 1.95 MEV
1.00	-0.	-0.
0.90	-7.1730	-6.3704
0.80	-11.2881	-9.6927
0.70	-15.6081	-12.6142
0.60	-20.7232	-14.9267
0.50	-27.0869	-15.4685
0.40	-33.2974	-11.8339
0.30	-18.3795	-3.1242
0.20	29.0092	4.7489
0.10	23.2952	6.6873
0.	11.1827	4.6343
-0.10	2.6506	1.3335
-0.20	-3.5114	-1.9468
-0.30	-8.1228	-4.6786
-0.40	-11.3229	-6.4835
-0.50	-12.6122	-6.8891
-0.60	-10.6674	-5.3165
-0.70	-3.2886	-1.4306
-0.80	10.5704	3.9346
-0.90	23.0848	7.7216
-1.00	0.0000	0.0000

FE36

Figure 93

FE 56

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 3.25 MEV	ELASTIC 3.25 MEV
1.00	-0.	-0.
0.90	-4.1747	-4.0139
0.80	-7.5897	-7.1777
0.70	-12.4852	-11.3815
0.60	-20.8310	-17.3034
0.50	-38.7523	-23.9911
0.40	-41.3357	-16.8415
0.30	90.4014	14.6867
0.20	46.5014	23.1415
0.10	28.5446	19.4409
0.	18.6410	14.2365
-0.10	11.2193	8.9740
-0.20	4.3611	3.5354
-0.30	-2.9381	-2.3588
-0.40	-11.4715	-8.8957
-0.50	-22.0781	-15.8946
-0.60	-35.4862	-21.8820
-0.70	-48.8977	-21.4487
-0.80	-20.1347	-4.5701
-0.90	91.1785	18.2244
-1.00	0.0000	0.0000

FE 56

Figure 94

FE 56

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	0.	0.	0.	0.
0.95	-0.0204	4.8345	2.4966	2.5433
0.90	-0.5388	6.2688	4.4348	5.5442
0.85	-1.4013	6.6198	6.5807	9.8194
0.80	-2.6565	5.7970	8.4395	8.4109
0.75	-4.4126	3.3234	8.2950	-7.4676
0.70	-6.0497	-1.7928	2.7769	-22.4500
0.65	-10.2473	-11.5200	-10.4910	-32.1300
0.60	-14.9817	-29.3540	-28.8540	-40.3870
0.55	-21.1762	-51.8740	-49.4940	-49.2620
0.50	-25.8103	8.8861	-74.8460	-57.7540
0.45	-9.0828	91.5000	-78.5450	-52.6210
0.40	39.4971	93.8190	40.9870	-11.4400
0.35	54.8372	84.4660	56.0220	13.5250
0.30	50.1515	75.2100	44.8610	11.8380
0.25	44.0068	66.4960	37.2140	5.7087
0.20	39.1647	57.8720	32.6820	0.5924
0.15	35.4874	49.0390	29.8410	-2.9696
0.10	32.5901	39.8830	27.7000	-5.1478
0.05	30.1671	30.4120	25.5070	-6.1477
0.	27.9930	20.7080	22.5690	-6.1496
-0.05	25.0916	10.9040	18.1460	-5.3599
-0.10	23.7113	1.1767	11.4000	-4.1228
-0.15	21.3073	-8.2362	1.4531	-3.1285
-0.20	18.5272	-17.0130	-12.3290	-3.7437
-0.25	15.1979	-24.7190	-29.5640	-7.9910
-0.30	11.1101	-30.7690	-47.4020	-16.0130
-0.35	5.9983	-34.4150	-59.0930	-21.3050
-0.40	-0.4872	-34.7720	-55.5280	-16.8810
-0.45	-8.8224	-30.9950	-32.2040	-4.7741
-0.50	-19.6659	-22.7400	4.5939	10.4060
-0.55	-33.9061	-11.5690	41.4350	26.2330
-0.60	-52.5330	-2.0577	65.9660	41.2470
-0.65	-75.4348	-1.0038	70.5130	52.8170
-0.70	-94.8726	-6.1454	52.6230	54.2720
-0.75	-74.6440	0.0846	17.3890	31.7020
-0.80	20.3742	25.8030	-18.9980	-23.6280
-0.85	89.9049	57.8270	-31.9020	-65.8070
-0.90	93.0794	78.9180	-2.7072	-37.3750
-0.95	67.4501	76.0290	60.8970	41.9200
-1.00	0.0000	0.0000	0.0000	0.0000

FE 56

Figure 95

FE 56

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE		ELASTIC	
	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	0.	0.	0.	0.
0.95	1.8267	4.7813	1.7267	3.7456
0.90	1.8989	6.6679	3.6624	8.0422
0.85	1.3137	7.7216	6.1911	14.6350
0.80	0.0817	7.7487	8.0740	8.8009
0.75	-1.9176	6.0646	5.1922	-10.8330
0.70	-4.9055	1.1638	-6.1588	-22.6980
0.65	-9.1765	-10.3270	-20.9990	-31.0230
0.60	-14.7980	-36.3320	-34.0830	-39.2780
0.55	-19.4600	-85.7680	-47.3170	-47.9080
0.50	-7.5866	-27.1730	-66.7100	-53.0810
0.45	43.0900	87.3740	-94.3950	-40.1390
0.40	68.2720	98.6930	-26.4950	-3.9304
0.35	63.1570	91.6800	23.2830	15.5690
0.30	54.5770	82.2470	21.3880	14.4010
0.25	47.5340	72.6020	17.2880	7.7560
0.20	41.9870	63.1070	14.8430	1.1339
0.15	37.4470	53.7530	13.6990	-4.2859
0.10	33.5480	44.3910	13.3220	-8.3220
0.05	30.0570	34.8130	13.2280	-10.9570
0.	26.8290	24.8060	12.8990	-12.1550
-0.05	23.7700	14.2020	11.6710	-11.8340
-0.10	20.8120	2.9189	8.6135	-9.8753
-0.15	17.8840	-8.9786	2.4461	-6.2340
-0.20	14.8940	-21.1980	-8.3065	-1.3116
-0.25	11.7020	-33.0880	-24.2880	3.0878
-0.30	8.0915	-43.4500	-42.5050	3.4972
-0.35	3.7335	-50.2810	-53.4660	-0.2329
-0.40	-1.8614	-50.5470	-46.3830	-2.2489
-0.45	-9.4117	-40.4290	-21.5090	0.7418
-0.50	-19.9530	-17.2020	10.6160	8.0022
-0.55	-34.8980	15.7350	40.0650	18.2410
-0.60	-55.6910	43.7510	60.7620	30.4030
-0.65	-81.0130	48.7390	67.8110	42.7400
-0.70	-93.5230	29.9500	55.7980	50.0490
-0.75	-42.3880	7.1978	21.9840	36.7140
-0.80	54.1140	1.8359	-23.1030	-19.5640
-0.85	97.5990	21.6110	-48.6370	-65.5410
-0.90	94.4100	55.9330	-24.3940	-30.7450
-0.95	69.7380	77.3730	49.0390	44.2310
-1.00	0.0000	0.0000	0.0000	0.0000

FE 56

Figure 96

FE 56

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	0.	0.	0.	0.
0.95	3.6831	3.7507	1.7626	4.9538
0.90	4.4454	5.7617	4.0020	11.0720
0.85	4.2313	7.4518	7.1085	21.7630
0.80	3.0395	8.5480	8.0094	7.9770
0.75	0.6211	8.1626	-0.9697	-10.5020
0.70	-3.5096	4.2985	-16.6900	-19.6880
0.65	-10.1210	-6.9124	-29.1560	-27.5580
0.60	-19.7990	-31.1850	-38.7360	-36.2110
0.55	-27.2240	-69.8570	-48.7920	-44.8330
0.50	8.3849	-77.1390	-61.8520	-47.3310
0.45	76.9390	36.9900	-70.5140	-30.3370
0.40	83.8170	91.9690	-23.4950	0.6924
0.35	73.7450	85.8820	12.8790	16.7890
0.30	64.0450	72.5540	12.1940	16.9450
0.25	55.8900	61.6180	7.6621	11.0820
0.20	48.6890	53.2680	4.4392	3.9682
0.15	41.9380	46.5170	2.6466	-2.7667
0.10	35.3460	40.4300	1.9449	-8.5073
0.05	28.7910	34.2340	2.0038	-12.8930
0.	22.2690	27.2750	2.4801	-15.5690
-0.05	15.8590	18.9840	2.9171	-16.0750
-0.10	9.6958	8.8861	2.5933	-13.7650
-0.15	3.9429	-3.3204	0.3105	-7.8140
-0.20	-1.2323	-17.5800	-5.7410	2.2868
-0.25	-5.6911	-33.1260	-17.2410	14.6090
-0.30	-9.3673	-47.9230	-32.1680	21.9340
-0.35	-12.3320	-58.0120	-40.4460	18.4600
-0.40	-14.8920	-57.4310	-32.4620	10.3450
-0.45	-17.7330	-40.2540	-11.9990	5.5183
-0.50	-22.1200	-6.0565	11.9280	5.9937
-0.55	-30.0630	34.5970	34.1050	11.1420
-0.60	-43.8690	63.3740	51.8030	20.1080
-0.65	-62.0310	66.7710	61.4440	31.9170
-0.70	-64.1010	45.3310	56.1770	43.5160
-0.75	-14.2300	12.5570	26.7040	41.2410
-0.80	53.6790	-11.5770	-24.6170	-10.5240
-0.85	87.9650	-8.9056	-59.8880	-57.1170
-0.90	91.2360	26.1420	-35.9540	-19.5180
-0.95	72.5970	72.3160	42.5290	46.2760
-1.00	0.0000	0.0000	0.0000	0.0000

FE 56

Figure 97

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⁵⁸Ni

Energy (MeV)	Energy Levels*
1.00	G.S. 0 ⁺
2.00	1.452 2 ⁺
3.00	2.458 4 ⁺
4.00	2.772 [0 ⁺]
5.00	2.899 (1) ⁺
6.00	4.106 [0 ⁺]
7.00	4.500 3 ⁻
8.00	
9.00	
10.00	
11.00	
12.00	
13.00	
14.00	
15.00	
16.00	

* Energy levels obtained from NRC 60-5-12, except [] values which are assumed.

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COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE ELASTIC	TOTAL ELASTIC	SHAPE ELASTIC	TOTAL ELASTIC
	1 MEV	+ 1 MEV	3 MEV	0 3 MEV
1.00	0.	0.	0.	0.
0.95	-3.8624	-2.4702	-2.2270	-2.0960
0.90	-5.4096	-3.4312	-3.6246	-3.3868
0.85	-6.5365	-4.0966	-5.1271	-4.7404
0.80	-7.4110	-4.5697	-6.8750	-6.2591
0.75	-8.0869	-4.8824	-8.9961	-8.0048
0.70	-8.5802	-5.0446	-11.6606	-10.0221
0.65	-8.8880	-5.0582	-15.1323	-12.3198
0.60	-8.9948	-4.9229	-19.8609	-14.8039
0.55	-8.8762	-4.6397	-26.6835	-17.1038
0.50	-8.5002	-4.2137	-37.3042	-18.2092
0.45	-7.8301	-3.6561	-55.2188	-16.0854
0.40	-6.8289	-2.9852	-77.9489	-8.6314
0.35	-5.4656	-2.2262	50.6312	2.6320
0.30	-3.7259	-1.4102	88.3409	12.2317
0.25	-1.6245	-0.5713	60.0119	17.1796
0.20	0.7823	0.2564	43.4301	18.4168
0.15	3.3898	1.0422	33.2963	17.6541
0.10	6.0500	1.7617	26.3352	15.9796
0.05	8.5932	2.3982	21.0637	13.9186
0.	10.8608	2.9437	16.7447	11.6950
-0.05	12.7385	3.3976	12.9711	9.3925
-0.10	14.1760	3.7656	9.4944	7.0333
-0.15	15.1871	4.0577	6.1483	4.6132
-0.20	15.8326	4.2867	2.8101	2.1183
-0.25	16.1978	4.4657	-0.6202	-0.4663
-0.30	16.3720	4.6072	-4.2327	-3.1516
-0.35	16.4338	4.7216	-8.1161	-5.9377
-0.40	16.4435	4.8162	-12.3644	-8.8047
-0.45	16.4412	4.8949	-17.0812	-11.6970
-0.50	16.4459	4.9573	-22.3793	-14.4958
-0.55	16.4573	4.9988	-28.3678	-16.9738
-0.60	16.4563	5.0108	-35.0926	-18.7299
-0.65	16.4059	4.9806	-42.3254	-19.1186
-0.70	16.2501	4.8919	-48.8020	-17.2610
-0.75	15.9108	4.7248	-49.4825	-12.3497
-0.80	15.2810	4.4547	-27.7049	-4.4707
-0.85	14.2063	4.0480	38.4621	4.4824
-0.90	12.4323	3.4500	86.9199	11.1774
-0.95	9.3968	2.5321	67.3384	12.5048
-1.00	0.0000	0.0000	0.0000	0.0000

NI 58

Figure 98

NI 58

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE ELASTIC	TOTAL ELASTIC	SHAPE ELASTIC	TOTAL ELASTIC
	2 MEV	+ 2 MEV	4 MEV	0 4 MEV
1.00	0.	0.	0.	0.
0.95	-4.0939	-3.5468	-0.5916	-0.5730
0.90	-6.1185	-5.2224	-1.3358	-1.2890
0.85	-7.9350	-6.6401	-2.3764	-2.2795
0.80	-9.7230	-7.9242	-3.8033	-3.6132
0.75	-11.5607	-9.0942	-5.7601	-5.3873
0.70	-13.4947	-10.1195	-8.4847	-7.7317
0.65	-15.5513	-10.9245	-12.3898	-10.7931
0.60	-17.7251	-11.3810	-18.2371	-14.6346
0.55	-19.9347	-11.3021	-27.5122	-18.8227
0.50	-21.8986	-10.4576	-42.8847	-21.1718
0.45	-22.8087	-8.6419	-61.5208	-16.2528
0.40	-20.5801	-5.8193	-7.9945	-1.2622
0.35	-11.0902	-2.2895	55.2463	14.1716
0.30	7.8607	1.3020	52.8206	22.3725
0.25	25.5683	4.2321	44.6692	25.0442
0.20	30.4924	6.0549	38.3445	25.1256
0.15	26.8225	6.7243	33.6141	24.1428
0.10	20.9114	6.4577	29.0819	22.7141
0.05	15.2231	5.5460	26.7314	21.0630
0.	10.2733	4.2414	23.8871	19.2529
-0.05	6.0201	2.7265	21.1557	17.2821
-0.10	2.3174	1.1224	18.3893	15.1206
-0.15	-0.9689	-0.4919	15.4619	12.7247
-0.20	-3.9399	-2.0630	12.2547	10.0432
-0.25	-6.6640	-3.5496	8.6435	7.0190
-0.30	-9.1803	-4.9139	4.4875	3.5915
-0.35	-11.5002	-6.1143	-0.3846	-0.3014
-0.40	-13.6046	-7.1012	-6.1932	-4.7137
-0.45	-15.4364	-7.8134	-13.2346	-9.6709
-0.50	-16.8861	-8.1764	-21.9198	-15.1190
-0.55	-17.7684	-8.1057	-32.8211	-20.8116
-0.60	-17.7882	-7.5154	-46.6800	-26.0720
-0.65	-16.5023	-6.3388	-64.0636	-29.3774
-0.70	-13.3026	-4.5616	-82.8901	-27.9757
-0.75	-7.5166	-2.2687	-85.1356	-18.7468
-0.80	1.1748	0.3110	-13.3250	-2.0803
-0.85	11.7824	2.7787	83.9357	14.9731
-0.90	20.9009	4.5703	92.3017	24.2650
-0.95	22.7973	4.8988	63.0802	22.8099
-1.00	0.0000	0.0000	0.0000	0.0000

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Figure 99

NI 58

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE		ELASTIC	
	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	0.	0.	0.	0.
0.95	0.9120	4.2111	1.2965	3.0880
0.90	0.6915	5.5380	2.6762	5.9874
0.85	-0.0341	5.9319	4.4002	9.5199
0.80	-1.2897	5.2681	6.0100	6.8683
0.75	-3.2059	3.0506	5.8939	-10.6580
0.70	-6.0243	-1.7585	0.3398	-27.8710
0.65	-10.1412	-11.2590	-15.1790	-39.5390
0.60	-16.0995	-28.6630	-40.5670	-50.0380
0.55	-23.8429	-36.2140	-71.2370	-61.4900
0.50	-26.4660	54.5090	-91.3790	-69.9650
0.45	4.7444	83.8540	38.1700	-48.2940
0.40	43.2456	77.4670	89.6660	8.7633
0.35	48.4195	69.6490	60.9470	22.8360
0.30	44.2397	62.8170	42.7700	14.8860
0.25	39.7220	56.4430	32.6650	5.6760
0.20	36.0409	50.0280	26.8640	-1.5731
0.15	33.0887	43.2720	23.3870	-6.8455
0.10	30.6329	36.0150	21.1020	-10.4200
0.05	28.4779	28.1850	19.2200	-12.4910
0.	26.4681	19.7720	17.0350	-13.1560
-0.05	24.4718	10.8170	13.7730	-12.4680
-0.10	22.3654	1.4219	8.4768	-10.5050
-0.15	20.0209	-8.2214	-0.0211	-7.5400
-0.20	17.2932	-17.7850	-12.8790	-4.4486
-0.25	14.0084	-26.7320	-30.2800	-3.3471
-0.30	9.9476	-34.2170	-49.0470	-6.5689
-0.35	4.8253	-38.9500	-60.0020	-11.1060
-0.40	-1.7430	-39.1620	-51.7380	-10.4830
-0.45	-10.2899	-32.7040	-23.1890	-3.5313
-0.50	-21.5635	-18.1970	13.5130	7.1963
-0.55	-36.5817	2.1705	45.1900	19.8740
-0.60	-56.4359	19.3390	64.2890	33.1750
-0.65	-80.4874	22.1340	66.8600	44.8500
-0.70	-96.6070	13.2110	50.6100	49.0650
-0.75	-57.1496	10.2310	17.1890	31.7000
-0.80	45.8986	24.8480	-21.3260	-22.5840
-0.85	95.3991	51.7150	-39.2320	-68.6940
-0.90	89.5359	74.8260	-11.5430	-35.6270
-0.95	63.3503	76.2370	57.0800	46.7520
-1.00	0.0000	0.0000	0.0000	0.0000

NI 58

Figure 100

NI 58

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	0.	0.	0.	0.
0.95	2.5081	3.5197	1.0827	4.6200
0.90	2.8113	5.0571	2.5469	9.0185
0.85	2.3295	6.0435	4.5185	14.6890
0.80	1.0720	6.2885	5.7718	7.5549
0.75	-1.1266	5.1937	2.1755	-13.0930
0.70	-4.5788	1.4002	-11.1430	-26.1360
0.65	-9.7201	-8.4094	-30.2270	-35.9260
0.60	-16.5960	-33.3520	-48.1590	-46.2930
0.55	-20.7360	-71.3800	-66.2980	-57.2100
0.50	2.3628	76.7660	-89.8870	-60.9580
0.45	48.8360	93.3390	-75.2650	-35.3450
0.40	59.0290	83.1740	54.3350	6.9599
0.35	53.7990	74.4730	41.5790	20.7440
0.30	47.4890	67.0520	24.9030	16.4290
0.25	42.1440	60.2070	15.6280	8.1443
0.20	37.6670	53.5690	10.5280	0.0814
0.15	33.7730	46.8980	7.7966	-6.7990
0.10	30.2470	39.9590	6.4808	-12.2490
0.05	26.9510	32.4980	5.9702	-16.1140
0.	23.8030	24.2420	5.7378	-18.1850
-0.05	20.7540	14.9300	5.1662	-18.1350
-0.10	17.7700	4.3526	3.3747	-15.4950
-0.15	14.8140	-7.5635	-0.9675	-9.6932
-0.20	11.8230	-20.6260	-9.6707	-0.5735
-0.25	8.6825	-34.1360	-24.0880	9.6798
-0.30	5.1892	-46.4910	-41.4340	14.3680
-0.35	1.0087	-54.6460	-50.3930	9.5282
-0.40	-4.3875	-53.7430	-39.8020	2.5354
-0.45	-11.8060	-38.1810	-14.1870	0.2891
-0.50	-22.4290	-6.3649	14.4320	3.5415
-0.55	-37.8320	31.9610	38.8690	11.1000
-0.60	-59.2850	57.2350	55.8580	21.8100
-0.65	-83.0600	56.6730	62.1000	34.1850
-0.70	-82.4340	35.5050	52.3710	44.0700
-0.75	-11.0880	10.6230	21.4860	37.0840
-0.80	72.1210	-0.0155	-24.8550	-15.9000
-0.85	99.3020	14.3660	-55.1290	-65.2050
-0.90	91.7120	48.7970	-30.6500	-26.1550
-0.95	67.2190	76.3070	47.8990	49.1370
-1.00	0.0000	0.0000	0.0000	0.0000

NI 58

Figure 101

NI 58

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE		ELASTIC	
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	0.	0.	0.	0.
0.95	3.8100	2.2804	1.7666	5.9067
0.90	4.6691	3.7670	3.6996	12.2900
0.85	4.5341	5.2106	6.1450	21.4330
0.80	3.3739	6.3790	6.0458	6.7068
0.75	0.8831	6.5440	-4.3547	-11.7590
0.70	-3.5320	3.9046	-22.9780	-21.4590
0.65	-10.8080	-5.8754	-38.6160	-30.4740
0.60	-21.2580	-33.3160	-51.0710	-41.0610
0.55	-23.2820	-91.3090	-64.2800	-51.5650
0.50	30.4440	13.4820	-79.3170	-51.5910
0.45	71.2140	99.8010	-66.3790	-25.4030
0.40	69.5980	88.6390	18.3520	7.0064
0.35	61.8300	72.8450	28.1320	19.3110
0.30	54.7230	60.5540	16.1410	17.8620
0.25	48.4970	51.5220	7.0018	11.4000
0.20	42.7320	44.7840	1.1415	3.5829
0.15	37.0980	39.4420	-2.4354	-4.1869
0.10	31.3970	34.7290	-4.3937	-11.1870
0.05	25.5400	29.9650	-5.1514	-16.8260
0.	19.5200	24.4980	-5.0299	-20.4490
-0.05	13.3970	17.6680	-4.3840	-21.2210
-0.10	7.2923	8.8026	-3.7590	-18.0480
-0.15	1.3725	-2.7077	-4.1341	-9.6373
-0.20	-4.1568	-17.1670	-7.2190	4.6273
-0.25	-9.0716	-33.9960	-15.1100	21.5610
-0.30	-13.1640	-50.6540	-26.8020	31.0730
-0.35	-16.3060	-61.3500	-32.9040	25.0020
-0.40	-18.5630	-57.4820	-25.0660	13.5900
-0.45	-20.3800	-33.1680	-7.8900	4.2990
-0.50	-22.8310	6.2665	11.4390	1.2072
-0.55	-27.7540	44.7750	29.6110	3.9091
-0.60	-36.7760	67.0750	44.8890	11.4880
-0.65	-45.8140	66.6530	54.3910	23.1390
-0.70	-34.9520	45.6570	51.7800	36.8610
-0.75	9.9880	13.4250	26.3570	41.7270
-0.80	58.6150	-13.8400	-25.2250	-2.6555
-0.85	85.0750	-16.4310	-64.8780	-52.4330
-0.90	88.7280	16.9580	-38.2510	-14.2670
-0.95	71.9250	68.9160	45.0830	49.6170
-1.00	0.0000	0.0000	0.0000	0.0000

NI 58

Figure 102

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^{59}Co

Energy (MeV)

1.95

4.00

Energy Levels*

(Obtained from S. C. Mathur,
WASH-1064, 186 [1965])

G.S. $7/2^-$

1.097 $1/2^-$

1.189 $3/2^-$

1.289 $3/2^-$

1.432 $1/2^-$

1.458 $5/2^-$

1.479 $3/2^-$

(Obtained from NRC 60-6-20)

1.743 $[7/2^-]$

2.086 $[1/2^-]$

2.152 $[3/2^-]$

2.477 $[3/2^-]$

2.540 $[1/2^-]$

2.585 $[5/2^-]$

3.654 $[3/2^-]$

*[] values are assumed.

CO 59

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 1.95 MEV	ELASTIC 1.95 MEV
1.00	-0.	-0.
0.90	-5.5158	-4.6828
0.80	-8.7061	-6.8637
0.70	-11.9000	-8.2805
0.60	-15.1160	-8.4772
0.50	-17.2110	-6.6756
0.40	-12.1950	-2.7187
0.30	12.3700	1.7272
0.20	27.3310	4.3359
0.10	19.4360	4.5068
0.	9.8377	3.0456
-0.10	2.2639	0.8364
-0.20	-3.8484	-1.5637
-0.30	-9.0570	-3.8121
-0.40	-13.5520	-5.6185
-0.50	-17.0610	-6.6290
-0.60	-18.4770	-6.3688
-0.70	-14.9800	-4.3262
-0.80	-1.7875	-0.4213
-0.90	18.0360	3.8169
-1.00	0.0000	0.0000

CO 59

Figure 103

CO 59

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 4 MEV	ELASTIC + 4 MEV
1.00	-0.	-0.
0.95	-0.0974	-0.0932
0.90	-0.6599	-0.6233
0.85	-1.5847	-1.4694
0.80	-2.9451	-2.6566
0.75	-4.8891	-4.2283
0.70	-7.6767	-6.2117
0.65	-11.7756	-8.5423
0.60	-18.0781	-10.8865
0.55	-28.3910	-12.3330
0.50	-45.9955	-11.2815
0.45	-63.8882	-6.5536
0.40	8.7027	0.6118
0.35	53.7716	7.3478
0.30	49.5468	12.0287
0.25	42.4724	14.6939
0.20	36.9966	15.9361
0.15	32.8189	16.2694
0.10	29.4498	16.0181
0.05	26.5450	15.3624
0.	23.8704	14.3941
-0.05	21.2570	13.1539
-0.10	18.5710	11.6529
-0.15	15.6949	9.8861
-0.20	12.5141	7.8397
-0.25	8.9059	5.4973
-0.30	4.7285	2.8466
-0.35	-0.1941	-0.1126
-0.40	-6.0912	-3.3541
-0.45	-13.2760	-6.8028
-0.50	-22.1893	-10.2965
-0.55	-33.4574	-13.5266
-0.60	-47.9115	-15.9574
-0.65	-66.2203	-16.7560
-0.70	-85.9980	-14.8444
-0.75	-85.8274	-9.3074
-0.80	-3.8330	-0.3188
-0.85	87.4631	9.9456
-0.90	89.6803	17.6606
-0.95	60.5514	18.7656
-1.00	0.0000	0.0000

CO 59

Figure 104

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$^{62}_{Ni}$

Energy (MeV)

4.00

Energy Levels*

G.S. 0^+

1.172 2^+

2.048 $(0)^+$

2.303 $(0)^+$

2.336 (4^+)

2.890 $[0^+]$

3.060 $[0^+]$

3.160 $[0^+]$

3.180 $[0^+]$

3.250 $[0^+]$

3.270 $[0^+]$

3.370 $[0^+]$

3.470 $[0^+]$

3.520 $[0^+]$

*Energy levels obtained from NRC 60-5-51 replacement, except [] values which are assumed.

NI 62

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 4 MEV	ELASTIC + 4 MEV
1.00	-0.	-0.
0.95	1.2814	1.2449
0.90	1.2858	1.2456
0.85	0.7765	0.7484
0.80	-0.2767	-0.2643
0.75	-2.0387	-1.9181
0.70	-4.8470	-4.4369
0.65	-9.3737	-8.1470
0.60	-17.0584	-13.3411
0.55	-31.2442	-19.3494
0.50	-57.6481	-21.1465
0.45	-48.2670	-9.1307
0.40	34.6464	9.7746
0.35	44.0647	20.8651
0.30	40.1698	24.8873
0.25	36.1309	25.7560
0.20	32.8922	25.3833
0.15	30.2492	24.4891
0.10	27.9592	23.3247
0.05	25.8373	21.9643
0.	23.7434	20.4120
-0.05	21.5640	18.6418
-0.10	19.1974	16.6126
-0.15	16.5444	14.2739
-0.20	13.4986	11.5670
-0.25	9.9382	8.4246
-0.30	5.7141	4.7702
-0.35	0.6342	0.5185
-0.40	-5.5612	-4.4195
-0.45	-13.2381	-10.1166
-0.50	-22.9296	-16.5726
-0.55	-35.4180	-23.5604
-0.60	-51.7631	-30.2464
-0.65	-72.6737	-34.4010
-0.70	-93.2389	-31.5261
-0.75	-75.9700	-16.8195
-0.80	33.1517	6.4395
-0.85	93.7912	25.1506
-0.90	82.6420	31.3672
-0.95	54.6038	26.0838
-1.00	0.0000	0.0000

NI 62

+ 4 MEV

* 4.0 MEV G.V. GORLOV, SOVIET PHYSICS-DOKLADY 9, 806 (1965)

Figure 105

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^{69}Ga

Energy (MeV)	Energy Levels*
5.00	G.S. $3/2^-$
6.00	0.322 $[3/2^-]$
7.00	0.580 $[3/2^-]$
8.00	0.880 $[3/2^-]$
9.00	
10.00	
11.00	
12.00	
13.00	
14.00	
15.00	
16.00	

*Energy levels obtained from NRC 59-3-30, except [] values which are assumed.

GA 69

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	0.	0.	0.	0.
0.95	0.5414	-1.5868	1.3569	6.3619
0.90	0.3930	-2.2643	1.2620	9.4673
0.85	-0.1455	-2.8734	0.3083	10.6140
0.80	-1.2006	-3.5673	-2.1557	3.2506
0.75	-3.0816	-4.3918	-7.9133	-23.2710
0.70	-6.4650	-4.5739	-19.9120	-52.6160
0.65	-12.7780	3.3035	-2.7179	-72.8650
0.60	-21.6550	33.0360	82.9370	-89.9770
0.55	-3.2645	35.1090	82.2860	-51.4630
0.50	17.4250	28.7520	72.8060	36.9780
0.45	18.7580	25.2870	61.7720	48.1190
0.40	17.4430	23.5780	48.5580	38.9560
0.35	16.1660	22.6460	34.1870	28.5110
0.30	15.1560	21.9550	20.2410	18.3190
0.25	14.3660	21.1750	7.8356	7.9330
0.20	13.7410	20.0680	-2.5594	-3.0234
0.15	13.2440	18.4330	-10.8890	-14.5440
0.10	12.8540	16.0710	-17.2760	-26.0880
0.05	12.5600	12.7550	-21.8840	-36.3900
0.	12.3560	8.2040	-24.8640	-43.2810
-0.05	12.2300	2.0556	-26.3380	-43.6970
-0.10	12.1530	-6.1334	-26.4160	-34.2830
-0.15	12.0640	-16.7770	-25.2100	-13.4120
-0.20	11.8370	-29.7240	-22.8450	14.9300
-0.25	11.2490	-42.3640	-19.3550	38.6540
-0.30	9.9125	-45.0840	-14.3680	44.6650
-0.35	7.2149	-21.1200	-7.5169	32.0180
-0.40	2.2470	25.5950	0.5526	11.4630
-0.45	-6.1878	61.3300	9.1134	-6.3666
-0.50	-19.2620	73.2090	17.6830	-16.4960
-0.55	-36.7210	69.0610	25.5610	-18.0540
-0.60	-52.3710	56.1370	31.4620	-11.7780
-0.65	-46.7190	37.9600	33.0450	1.2167
-0.70	-1.2686	16.7820	26.1420	19.0280
-0.75	56.4120	-3.6289	4.1536	33.8030
-0.80	88.3370	-14.7690	-37.5120	10.2820
-0.85	93.4630	-2.4712	-73.3680	-46.3330
-0.90	82.2710	39.2360	-27.4480	-6.2936
-0.95	59.5890	78.3960	72.6050	64.2610
-1.00	0.0000	0.0000	0.0000	0.0000

GA 69

Figure 106

GA 69

COSINE
THETA
C.M.POLARIZATION (PERCENT)
SHAPE ELASTIC

	6 MEV	9 MEV	12 MEV	15 MEV
1.00	0.	0.	0.	0.
0.95	-0.2438	-1.5766	3.5889	6.4912
0.90	-0.7030	-2.3072	4.3707	10.6650
0.85	-1.5139	-2.9285	3.5961	12.9390
0.80	-2.8867	-3.4797	-0.6045	2.5017
0.75	-5.1998	-3.6496	-14.6210	-20.5190
0.70	-9.0748	-0.8756	-54.8990	-36.9440
0.65	-14.3610	23.1960	-85.5980	-54.8730
0.60	-8.1520	65.6440	10.4910	-85.9690
0.55	18.8080	48.0280	78.8760	-84.0750
0.50	23.9500	35.8250	95.9600	-1.3527
0.45	21.9320	30.2670	83.5520	22.1700
0.40	19.7030	27.3130	60.5770	23.4690
0.35	17.8660	25.2830	37.8440	20.2810
0.30	16.2930	23.4380	18.6240	15.4080
0.25	14.8360	21.4320	2.9997	9.0258
0.20	13.3840	19.1060	-9.6468	0.8517
0.15	11.8630	16.3830	-19.8320	-9.2789
0.10	10.2260	13.1880	-27.8120	-20.9460
0.05	8.4470	9.3907	-33.5880	-32.5140
0.	6.5284	4.7361	-36.9070	-40.5650
-0.05	4.5065	-1.2185	-37.2190	-40.3340
-0.10	2.4702	-9.1730	-33.5760	-28.2060
-0.15	0.5901	-20.0700	-24.6090	-5.3638
-0.20	-0.8365	-34.5360	-9.4770	21.0750
-0.25	-1.3287	-49.9790	7.7166	41.2390
-0.30	-0.1898	-52.7280	14.4120	47.4920
-0.35	3.3529	-23.0450	7.2481	38.2160
-0.40	9.4795	21.9280	-1.0954	18.5290
-0.45	16.3650	51.0400	-3.5089	-2.9102
-0.50	19.7380	62.3600	-0.2321	-18.7100
-0.55	16.7790	62.6420	6.8525	-25.1950
-0.60	10.6280	55.4770	15.7490	-21.6800
-0.65	8.1535	41.6710	23.8340	-8.5683
-0.70	15.0390	20.9280	26.2910	13.8720
-0.75	32.7510	-6.0846	13.1690	42.6360
-0.80	56.6010	-33.0820	-29.6490	40.9800
-0.85	76.7730	-39.5640	-74.3830	-24.3680
-0.90	83.5340	3.8389	-21.7650	-6.1171
-0.95	70.2770	73.6260	73.9040	52.6250
-1.00	0.0000	0.0000	0.0000	0.0000

GA 69

Figure 107

GA 69

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	0.	0.	0.	0.
0.95	-0.9825	-0.5611	5.4112	6.1869
0.90	-1.5636	-1.1492	7.3331	11.3530
0.85	-2.3062	-1.9502	7.2899	13.9580
0.80	-3.4418	-3.0702	1.5027	-1.5630
0.75	-5.2901	-4.3792	-21.7050	-18.9260
0.70	-8.1082	-2.5702	-69.3410	-29.7160
0.65	-9.2500	38.4880	-94.5090	-44.7600
0.60	9.4110	95.3400	-61.9570	-72.2610
0.55	26.9850	66.0300	28.8330	-71.0920
0.50	26.0640	50.3390	90.0900	-9.6548
0.45	23.5050	41.8140	80.6760	10.6940
0.40	21.6660	35.3290	56.5300	14.0720
0.35	20.3310	29.1150	35.7570	13.3640
0.30	19.1920	22.7450	18.8940	11.0110
0.25	18.0180	16.3560	4.5550	7.2179
0.20	16.6340	10.2520	-8.1705	1.6021
0.15	14.8910	4.6876	-19.6120	-6.3213
0.10	12.6500	-0.2211	-29.6220	-16.5860
0.05	9.7760	-4.5184	-37.6260	-27.6760
0.	6.1318	-8.4129	-42.5840	-35.2610
-0.05	1.5931	-12.3040	-42.8880	-33.2730
-0.10	-3.9151	-16.8490	-36.2900	-19.2730
-0.15	-10.3100	-23.0240	-20.4050	2.1628
-0.20	-17.0660	-31.8100	4.3556	23.5540
-0.25	-22.5260	-41.6390	28.2520	39.1310
-0.30	-22.5540	-41.2660	34.4320	45.2520
-0.35	-9.8087	-18.4440	21.3540	39.8260
-0.40	19.4060	10.4390	3.9326	23.4140
-0.45	50.5870	29.9740	-7.5498	1.0211
-0.50	63.9020	40.9240	-11.0490	-19.0230
-0.55	58.8970	46.0170	-7.6649	-29.6600
-0.60	44.6280	45.9110	0.9405	-28.0940
-0.65	28.0870	39.4810	12.7510	-14.3820
-0.70	14.2850	24.2430	23.9000	11.5740
-0.75	8.6365	-2.6466	23.5170	49.6600
-0.80	17.1570	-39.3510	-14.5560	65.5250
-0.85	41.4610	-62.6850	-65.3470	-7.5535
-0.90	69.9470	-20.3570	-12.2600	-10.2330
-0.95	78.0210	71.1150	71.4770	38.1070
-1.00	0.0000	0.0000	0.0000	0.0000

GA 69

Figure 108

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^{80}Se

Energy (MeV)

4.00

Energy Levels*

G.S. 0^+

0.645 2^+

*Energy levels obtained from NRC 59-1-52.

SE 80

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE ELASTIC	TOTAL ELASTIC
	4 MEV	+ 4 MEV
1.00	-0.	-0.
0.95	-4.3890	-4.1191
0.90	-6.7524	-6.2374
0.85	-9.1582	-8.2207
0.80	-12.0261	-10.2113
0.75	-15.9457	-12.0196
0.70	-22.1998	-12.5192
0.65	-32.7567	-8.3625
0.60	18.6793	1.3588
0.55	29.2255	6.7721
0.50	13.8865	6.2367
0.45	6.8697	4.0746
0.40	2.8834	1.9564
0.35	0.2570	0.1874
0.30	-1.6260	-1.2345
0.25	-3.0285	-2.3504
0.20	-4.0679	-3.1873
0.15	-4.7893	-3.7522
0.10	-5.1946	-4.0344
0.05	-5.2555	-4.0109
0.	-4.9199	-3.6533
-0.05	-4.1173	-2.9398
-0.10	-2.7693	-1.8737
-0.15	-0.8123	-0.5113
-0.20	1.7517	1.0031
-0.25	4.7520	2.4103
-0.30	7.6631	3.3434
-0.35	9.3385	3.4079
-0.40	7.8333	2.3447
-0.45	0.9040	0.2216
-0.50	-11.8928	-2.4470
-0.55	-25.9499	-4.7267
-0.60	-31.3300	-5.4377
-0.65	-19.3677	-3.4711
-0.70	8.6814	1.7281
-0.75	41.1664	9.5916
-0.80	65.1662	18.1888
-0.85	74.5727	24.7977
-0.90	69.7488	26.9735
-0.95	52.2632	22.7953
-1.00	0.0000	0.0000

SE 80

Figure 109

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^{89}Y

Energy (MeV)

Energy Levels

3.00

None

6.00

7.00

8.00

9.00

10.00

11.00

12.00

13.00

14.00

15.00

16.00

Y 89

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 3 MEV	ELASTIC + 3 MEV
1.00	0.	0.
0.90	-6.9434	-6.2278
0.80	-8.7450	-7.2691
0.70	-6.2822	-4.4897
0.60	2.2601	1.3347
0.50	5.5935	3.2064
0.40	-0.1015	-0.0636
0.30	-6.3142	-4.2261
0.20	-10.9553	-7.4826
0.10	-14.1841	-9.4850
0.	-16.1749	-10.1251
-0.10	-16.9489	-9.3360
-0.20	-16.6430	-7.3114
-0.30	-16.4589	-4.8942
-0.40	-22.0694	-3.4300
-0.50	-45.4982	-2.9754
-0.60	-10.5786	-0.6605
-0.70	45.7277	6.3301
-0.80	60.1228	15.6700
-0.90	50.3791	19.8710
-1.00	0.0000	0.0000

Y 89

Figure 110

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	0.	0.	0.	0.
0.95	-1.0774	2.1396	0.3760	2.3835
0.90	-3.0457	1.5011	0.3945	2.6861
0.85	-6.6079	-1.4657	-0.0884	0.1811
0.80	-13.6440	-8.8590	-0.9000	-16.3570
0.75	-31.4390	-17.4950	18.7630	-68.8200
0.70	-79.4700	17.5730	44.6700	58.2910
0.65	37.5980	30.2620	34.4750	81.6700
0.60	27.9320	29.1140	30.6870	69.7960
0.55	20.8240	26.8420	28.7220	45.0210
0.50	16.3010	24.4040	26.6470	22.3930
0.45	12.8780	21.6250	23.7580	5.5790
0.40	9.9000	18.2490	19.8620	-6.6037
0.35	7.0279	14.0280	14.9400	-15.6850
0.30	4.0475	8.7146	8.8753	-22.6390
0.25	0.7889	2.0715	1.2272	-27.9140
0.20	-2.9112	-6.0872	-8.9623	-31.4100
0.15	-7.2339	-15.7380	-23.1400	-32.0620
0.10	-12.3940	-26.1810	-41.5880	-26.8430
0.05	-18.6440	-34.7860	-55.1230	-12.4920
0.	-26.2200	-34.6450	-39.2980	2.2323
-0.05	-35.0720	-15.1450	-1.0051	5.9936
-0.10	-43.7090	22.0210	26.9620	4.5413
-0.15	-44.9450	52.5210	40.4670	3.4195
-0.20	-17.8250	62.7740	45.2920	3.7880
-0.25	44.7050	59.3900	44.6190	5.3686
-0.30	83.1090	50.7620	39.2540	7.4309
-0.35	83.0810	41.3420	28.9080	8.6781
-0.40	70.2790	33.0200	13.2330	6.5295
-0.45	55.7990	26.4390	-6.8944	-3.9061
-0.50	41.8280	21.5130	-27.7920	-26.8760
-0.55	28.2500	17.5260	-42.4220	-47.3330
-0.60	14.4910	13.0330	-43.0290	-36.3010
-0.65	-0.0611	5.6031	-26.1110	-3.7294
-0.70	-15.8860	-8.6154	4.6282	30.6050
-0.75	-32.8210	-34.9340	36.1640	58.5710
-0.80	-47.8010	-72.7660	38.1300	64.0750
-0.85	-45.3110	-65.9940	4.0419	5.5897
-0.90	18.0190	50.5310	16.5450	-52.9970
-0.95	92.3050	99.5470	66.2120	0.3729
-1.00	0.0000	0.0000	0.0000	0.0000

Figure 111

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	0.	0.	0.	0.
0.95	0.4586	1.8327	0.2984	4.0281
0.90	-1.0905	1.5855	0.2828	4.9924
0.85	-4.7175	-0.5303	-0.1357	0.5717
0.80	-12.5980	-6.3794	-0.3101	-34.4790
0.75	-30.3360	-10.2320	40.7890	-98.7970
0.70	-13.4750	23.4090	64.1060	-16.3280
0.65	27.9350	30.1680	43.6620	91.3780
0.60	25.9950	29.1310	36.8410	82.7480
0.55	22.1350	27.7400	31.8060	44.4370
0.50	18.9130	26.1610	25.9310	19.1150
0.45	16.0710	24.0480	19.1340	2.6041
0.40	13.3260	21.0410	12.0620	-9.4519
0.35	10.4830	16.7670	5.2209	-19.0340
0.30	7.3865	10.8130	-1.3247	-26.8120
0.25	3.8943	2.6977	-7.9719	-32.6100
0.20	-0.1446	-8.0781	-15.5810	-35.3050
0.15	-4.9034	-21.7480	-25.4320	-32.2750
0.10	-10.5750	-37.1590	-37.9340	-19.5290
0.05	-17.3120	-48.5710	-45.3210	1.6055
0.	-24.9800	-41.7290	-28.9190	15.2260
-0.05	-32.2370	-6.3222	-1.2534	13.3850
-0.10	-33.7690	36.0880	16.2640	5.9205
-0.15	-16.4150	59.5800	25.2100	-0.1540
-0.20	26.4110	64.0230	29.7640	-3.3137
-0.25	64.1290	57.7260	31.4390	-3.8357
-0.30	76.1190	46.4120	30.0310	-2.3612
-0.35	73.1030	33.2430	24.2410	0.2348
-0.40	65.0040	20.2420	12.0580	2.2811
-0.45	55.3740	8.9930	-8.0050	-0.2053
-0.50	44.9530	0.7575	-33.3240	-13.6790
-0.55	33.5110	-3.7612	-52.6210	-28.9870
-0.60	20.4410	-4.8581	-50.5990	-20.0320
-0.65	4.8798	-4.4520	-23.5820	3.4666
-0.70	-14.2690	-7.1057	17.3180	28.5980
-0.75	-38.0560	-21.3360	54.1290	51.9580
-0.80	-65.0340	-50.9990	56.3260	62.3990
-0.85	-75.5580	-32.8270	4.2560	9.3095
-0.90	6.9314	57.5280	-11.8440	-63.6660
-0.95	99.8440	96.2920	41.6350	-7.2162
-1.00	0.0000	0.0000	0.0000	0.0001

Figure 112

Y 89

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC		
	+ 8 MEV	0 11 MEV	X 14 MEV
1.00	0.	0.	0.
0.95	1.6345	1.0493	1.0134
0.90	0.5321	1.0215	1.0356
0.85	-2.9268	-0.1356	-0.0730
0.80	-10.8760	-3.4777	-4.3706
0.75	-23.9380	0.8838	29.1430
0.70	8.5777	31.2640	79.5430
0.65	29.2050	30.7460	59.8940
0.60	27.7240	28.9290	49.8030
0.55	24.6880	27.8890	38.0040
0.50	21.7680	26.8200	24.6280
0.45	18.8500	25.1470	12.0640
0.40	15.7240	22.4570	1.5730
0.35	12.2160	18.3820	-6.7987
0.30	8.1782	12.4940	-13.5160
0.25	3.4792	4.1887	-19.1590
0.20	-1.9917	-7.3993	-24.2900
0.15	-8.2919	-23.1680	-29.2570
0.10	-15.3100	-42.3400	-33.0080
0.05	-22.4280	-56.3300	-29.5440
0.	-27.5980	-43.7000	-13.8460
-0.05	-25.4860	-1.8977	0.6121
-0.10	-7.4460	35.4280	7.9312
-0.15	25.7100	53.5940	12.0220
-0.20	53.0920	57.8590	15.0950
-0.25	63.0520	53.8450	17.5220
-0.30	62.0040	44.3880	18.6980
-0.35	56.9910	30.9470	17.0950
-0.40	51.0660	14.8590	9.9150
-0.45	44.9930	-1.8949	-6.6921
-0.50	38.5430	-16.4390	-33.1780
-0.55	30.9920	-25.4360	-54.8290
-0.60	21.2460	-26.2270	-47.8260
-0.65	7.7786	-18.2350	-14.0600
-0.70	-11.5090	-4.3841	27.0290
-0.75	-39.0690	6.1846	60.1980
-0.80	-73.6770	-2.6941	62.6250
-0.85	-81.9690	-5.0772	3.9265
-0.90	26.3870	43.2040	-35.7080
-0.95	99.6050	85.5240	17.7120
-1.00	0.0000	0.0000	0.0000

Y 89

Figure 113

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⁹³Nb

Energy (MeV)	Energy Levels *
1.00	G.S. 9/2 ⁺
2.00	0.029 (1/2 ⁻)
4.00	0.741 (7/2) ^[+]
5.00	0.809 (5/2) ^[-]
6.00	0.958 (9/2) ^[+]
7.00	1.08 (5/2) ^[-]
8.00	1.17 [9/2 ⁺]
9.00	1.28 [1/2 ⁻]
10.00	1.34 [7/2 ⁺]
11.00	1.48 [5/2 ⁻]
12.00	1.67 [9/2 ⁺]
13.00	1.92 [5/2 ⁻]
14.00	
15.00	
16.00	

* Energy levels obtained from NRC 60-5-92, except [] values which are assumed.

NB 93

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE ELASTIC 1 MEV	TOTAL ELASTIC + 1 MEV
1.00	-0.	-0.
0.95	-0.4869	-0.4273
0.90	-0.6678	-0.5798
0.85	-0.7986	-0.6850
0.80	-0.9079	-0.7683
0.75	-1.0098	-0.8417
0.70	-1.1137	-0.9129
0.65	-1.2279	-0.9879
0.60	-1.3599	-1.0716
0.55	-1.5178	-1.1687
0.50	-1.7101	-1.2832
0.45	-1.9461	-1.4190
0.40	-2.2363	-1.5794
0.35	-2.5928	-1.7670
0.30	-3.0292	-1.9841
0.25	-3.5616	-2.2314
0.20	-4.2085	-2.5090
0.15	-4.9920	-2.8150
0.10	-5.9383	-3.1458
0.05	-7.0792	-3.4956
0.	-8.4537	-3.8559
-0.05	-10.1105	-4.2156
-0.10	-12.1116	-4.5604
-0.15	-14.5374	-4.8729
-0.20	-17.4943	-5.1330
-0.25	-21.1263	-5.3179
-0.30	-25.6312	-5.4035
-0.35	-31.2826	-5.3653
-0.40	-38.4525	-5.1809
-0.45	-47.5981	-4.8319
-0.50	-59.0581	-4.3074
-0.55	-72.0288	-3.6072
-0.60	-80.8529	-2.7451
-0.65	-69.0218	-1.7517
-0.70	-27.1378	-0.6763
-0.75	12.5510	0.4116
-0.80	29.1251	1.4220
-0.85	30.9290	2.2397
-0.90	26.4017	2.7094
-0.95	18.5417	2.5630
-1.00	0.0000	0.0000

NB 93

Figure 114

NB 93

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE ELASTIC 2 MEV	TOTAL ELASTIC + 2 MEV	SHAPE ELASTIC 4 MEV	TOTAL ELASTIC 0 4 MEV
1.00	-0.	-0.	-0.	-0.
0.95	-2.9900	-2.8204	-2.0216	-1.9588
0.90	-3.8738	-3.6139	-3.0711	-2.9259
0.85	-4.2386	-3.9008	-3.7548	-3.4703
0.80	-4.2243	-3.8232	-3.5280	-3.0784
0.75	-3.8798	-3.4411	-0.7130	-0.5567
0.70	-3.2370	-2.8026	8.3988	5.4359
0.65	-2.3362	-1.9666	22.7902	12.4717
0.60	-1.2418	-1.0125	25.3136	14.3089
0.55	-0.0492	-0.0388	17.4823	11.2427
0.50	1.1168	0.8470	9.6904	6.9045
0.45	2.1181	1.5464	3.6991	2.8097
0.40	2.8276	1.9881	-1.0555	-0.8324
0.35	3.1556	2.1398	-5.1306	-4.1295
0.30	3.0653	2.0082	-8.8837	-7.2110
0.25	2.5699	1.6292	-12.5441	-10.1723
0.20	1.7168	1.0538	-16.2737	-13.0690
0.15	0.5646	0.3354	-20.2031	-15.9168
0.10	-0.8363	-0.4797	-24.4525	-18.6824
0.05	-2.4574	-1.3559	-29.1440	-21.2618
0.	-4.3005	-2.2691	-34.4028	-23.4388
-0.05	-6.4019	-3.2037	-40.3294	-24.8186
-0.10	-8.8372	-4.1489	-46.8725	-24.7520
-0.15	-11.7284	-5.0923	-53.3179	-22.3324
-0.20	-15.2554	-6.0120	-56.2449	-16.7012
-0.25	-19.6741	-6.8668	-42.2826	-7.9324
-0.30	-25.3401	-7.5836	15.7914	1.9885
-0.35	-32.7190	-8.0442	74.9552	9.8110
-0.40	-42.2876	-8.0747	71.2077	13.4109
-0.45	-53.8566	-7.4481	48.4631	12.9454
-0.50	-63.2550	-5.9128	28.6617	9.8193
-0.55	-51.3320	-3.2644	13.5805	5.4735
-0.60	9.6617	0.5410	2.2513	1.0026
-0.65	69.4334	5.2720	-5.7937	-2.7245
-0.70	83.6238	10.3836	-10.0649	-4.8306
-0.75	77.1014	15.1122	-8.9194	-4.2638
-0.80	66.0327	18.6655	0.1978	0.0932
-0.85	54.4305	20.3764	18.2122	8.5864
-0.90	42.5222	19.6842	38.0245	18.8365
-0.95	28.9692	15.7343	43.0230	23.8113
-1.00	0.0000	0.0000	0.0000	0.0000

NB 93

Figure 115

NB 93

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.95	-0.3960	1.5473	-0.4609	1.2199
0.90	-1.4689	0.6882	-1.0414	0.5781
0.85	-3.2483	-2.5110	-2.2523	-1.9189
0.80	-5.9434	-11.0490	-3.5595	-4.7658
0.75	-8.7260	-24.7620	14.2580	88.7430
0.70	15.7740	12.9330	27.0970	71.4600
0.65	66.1290	22.4920	23.2160	54.5590
0.60	33.1500	21.5250	21.3910	44.6360
0.55	20.4490	19.8100	20.5980	33.3610
0.50	13.9290	17.9890	19.9280	20.1100
0.45	9.5033	15.9600	18.8410	6.6929
0.40	5.8761	13.5640	16.9360	-5.3754
0.35	2.5047	10.6440	13.8410	-15.5550
0.30	-0.9011	7.0367	9.1017	-23.8790
0.25	-4.5382	2.5744	2.0456	-30.4630
0.20	-8.5755	-2.8984	-8.3527	-35.0230
0.15	-13.1880	-9.4317	-23.1290	-35.9060
0.10	-18.5790	-16.6570	-39.7350	-28.0550
0.05	-25.0030	-22.8620	-39.4460	-7.0965
0.	-32.7520	-22.9890	-2.7044	9.4957
-0.05	-42.0480	-8.4372	33.7260	10.6960
-0.10	-52.4070	20.3070	49.4020	7.6331
-0.15	-59.6700	44.6760	53.0600	5.7217
-0.20	-45.1620	54.7040	51.1300	5.5167
-0.25	22.7010	55.2870	45.8020	6.4499
-0.30	82.8590	52.0800	37.4780	7.6057
-0.35	83.9910	47.8220	25.9920	7.5298
-0.40	66.6230	43.4580	11.3380	3.5940
-0.45	49.0350	39.0670	-5.5663	-8.6729
-0.50	33.7340	34.2380	-22.0070	-32.4220
-0.55	20.2070	28.1590	-33.1400	-52.7720
-0.60	7.7109	19.5820	-33.4420	-39.9590
-0.65	-4.2732	6.6757	-20.2480	-3.2411
-0.70	-15.8550	-13.1690	2.5221	33.2110
-0.75	-26.1970	-42.9810	21.4500	58.4640
-0.80	-31.6530	-79.7320	15.5910	57.1470
-0.85	-20.4940	-73.6800	3.6830	1.9672
-0.90	27.1340	47.9090	37.3480	-46.8490
-0.95	71.7810	98.2440	80.2000	10.9540
-1.00	0.0000	0.0000	0.0000	0.0000

NB 93

Figure 116

NB 93

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.95	0.7971	1.1204	-0.6932	2.9331
0.90	-0.2411	0.4207	-1.3611	2.7371
0.85	-3.0000	-2.2904	-2.2954	-1.3479
0.80	-9.6124	-9.4079	-0.7896	-19.4240
0.75	-31.3100	-13.1290	35.9640	59.2570
0.70	-53.3670	17.1810	37.9430	84.5540
0.65	33.4590	22.0620	28.3220	75.5120
0.60	24.2640	21.3730	24.5100	60.7140
0.55	19.3390	20.2530	22.3150	39.9460
0.50	16.0410	18.9420	20.0950	19.3920
0.45	13.3300	17.2530	17.1680	2.2016
0.40	10.7580	14.9540	13.2860	-11.6140
0.35	8.0741	11.7900	8.4006	-22.8000
0.30	5.0970	7.4626	2.4448	-31.7910
0.25	1.6603	1.6326	-4.8863	-38.3450
0.20	-2.4175	-6.0267	-14.3200	-41.0790
0.15	-7.3552	-15.5280	-26.7640	-36.4700
0.10	-13.4230	-25.4510	-39.8590	-19.1260
0.05	-20.9320	-29.8210	-35.2590	6.8116
0.	-30.0960	-15.7830	-1.0214	18.6220
-0.05	-40.3900	18.8540	24.9190	13.1220
-0.10	-47.9920	48.4190	34.7380	4.2047
-0.15	-38.6550	59.2740	37.5570	-2.0289
-0.20	8.4476	58.0120	37.4380	-4.9440
-0.25	62.8490	51.6170	35.2350	-5.1776
-0.30	80.7470	43.5200	30.4900	-3.5562
-0.35	75.9220	35.2940	22.0770	-1.1510
-0.40	64.7270	27.7920	8.5953	0.0784
-0.45	52.4810	21.5340	-10.6250	-4.1482
-0.50	40.2050	16.7180	-33.0270	-19.9680
-0.55	27.7340	13.0080	-49.5990	-36.6070
-0.60	14.5750	9.2014	-47.2360	-25.0750
-0.65	0.1097	2.7471	-21.1430	2.8309
-0.70	-16.3560	-10.8740	17.7130	30.3870
-0.75	-35.3190	-37.8390	48.2000	52.6430
-0.80	-55.3020	-72.9040	42.9470	57.5940
-0.85	-62.0860	-41.5350	2.8114	5.7959
-0.90	6.3668	66.5540	5.1763	-61.5100
-0.95	98.3190	98.6330	58.1430	-1.4865
-1.00	0.0000	0.0000	0.0000	0.0000

NB 93

Figure 117

NB 93

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.95	1.4276	0.3032	-0.1165	4.5023
0.90	0.4538	-0.2820	-0.8607	5.1395
0.85	-2.7680	-2.2124	-2.2169	-0.6535
0.80	-11.3420	-6.7610	-0.1880	-44.8560
0.75	-36.3080	-1.2631	64.0220	-45.8430
0.70	1.8916	20.8210	53.5670	75.9970
0.65	23.3150	21.7510	38.5330	95.3060
0.60	21.5570	20.9110	31.9080	68.7640
0.55	19.1810	20.2840	26.4890	38.8070
0.50	17.0280	19.5960	20.1810	17.1120
0.45	14.9190	18.5040	12.7630	1.1077
0.40	12.6730	16.6740	4.7876	-12.0090
0.35	10.1390	13.7300	-3.1209	-23.5620
0.30	7.1784	9.2014	-10.6430	-33.6320
0.25	3.6409	2.4657	-17.8260	-40.9880
0.20	-0.6469	-7.2403	-24.9570	-42.5790
0.15	-5.8836	-20.3560	-31.9700	-33.3270
0.10	-12.2500	-34.4630	-35.5090	-10.3160
0.05	-19.7140	-36.7440	-23.2040	15.5820
0.	-27.3370	-7.7057	2.0061	25.3050
-0.05	-31.2470	33.6170	14.9690	18.4530
-0.10	-21.6720	55.9340	18.6410	6.3962
-0.15	9.2670	61.1440	19.8710	-3.9282
-0.20	44.3670	57.8450	20.5990	-10.4960
-0.25	62.6990	50.3680	20.8160	-13.2370
-0.30	66.4880	40.4620	19.6990	-12.5870
-0.35	63.4800	29.0160	15.7030	-9.0806
-0.40	57.6840	16.8820	6.3777	-3.5253
-0.45	50.4530	5.2473	-11.1810	1.7573
-0.50	41.9800	-4.3105	-36.5570	-0.0612
-0.55	31.9470	-10.1570	-56.6590	-10.9650
-0.60	19.7330	-11.3900	-48.8880	-9.6942
-0.65	4.4079	-9.0255	-12.9260	4.7034
-0.70	-15.3310	-7.4747	29.3210	23.3650
-0.75	-40.9830	-15.6020	58.4120	42.8420
-0.80	-71.5000	-34.5730	53.3820	54.4910
-0.85	-82.5550	-8.5526	0.9492	11.5570
-0.90	17.0710	61.6850	-24.5040	-69.0180
-0.95	98.7720	93.9080	32.7010	-3.5074
-1.00	0.0000	0.0000	0.0000	0.0000

NB 93

Figure 118

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^{114}Ca

Energy (MeV)

4.00

Energy Levels*

G.S. 0^+

0.556 2^+

1.150 $(0)^+$

1.210 2^+

1.278 4^+

1.305 0^+

1.360 2^+

1.854 $(0)^+$

2.220 $[0^+]$

2.530 $(0)^+$

2.610 $(0)^+$

2.680 $[0^+]$

2.900 $(0)^+$

2.990 $[0^+]$

3.120 $[0^+]$

3.230 $(0)^+$

3.550 $[0^+]$

3.640 $(0)^+$

3.720 $[0^+]$

3.990 $[0^+]$

*Energy levels obtained from NRC 60-3-89, except [] values which are assumed.

CD 114

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 4 MEV	ELASTIC + 4 MEV
1.00	-0.	-0.
0.95	4.2085	4.1412
0.90	6.4661	6.3444
0.85	8.7011	8.4894
0.80	11.1286	10.7512
0.75	13.6815	13.0167
0.70	15.7966	14.7483
0.65	16.5388	15.2069
0.60	15.6541	14.3166
0.55	13.9110	12.7586
0.50	12.0243	11.0886
0.45	10.1739	9.4230
0.40	8.2414	7.6458
0.35	6.0191	5.5746
0.30	3.2697	3.0111
0.25	-0.2848	-0.2595
0.20	-5.0088	-4.4827
0.15	-11.4321	-9.9437
0.10	-20.3943	-16.9393
0.05	-33.3053	-25.5963
0.	-52.4838	-35.1437
-0.05	-79.9935	-41.5996
-0.10	-98.2568	-34.0191
-0.15	-11.7888	-3.2802
-0.20	79.6767	31.3733
-0.25	85.9226	48.3603
-0.30	73.7997	50.9018
-0.35	61.0080	46.9379
-0.40	49.5733	40.5217
-0.45	39.2252	33.1833
-0.50	29.4825	25.4176
-0.55	19.9321	17.3327
-0.60	10.2339	8.9020
-0.65	0.1057	0.0912
-0.70	-10.6352	-8.9856
-0.75	-21.7970	-17.6530
-0.80	-31.5314	-23.4143
-0.85	-30.4815	-18.9143
-0.90	13.5998	6.3219
-0.95	74.3530	32.0452
-1.00	0.0000	0.0000

CD 114

* 4.0 MEV G.V. GORLOV, SOVIET PHYSICS-DOKLADY 9, 806 (1965)

Figure 119

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^{115}In

Energy (MeV)

4.00

Energy Levels*

G.S. $9/2^+$

0.335 $1/2^-$

0.595 $(5/2^-)$

0.825 $(1/2^-)$

0.858 $(1/2^-)$

0.935 $(7/2^+)$

1.080 $[9/2^+]$

1.140 $[9/2^+]$

1.300 $[9/2^+]$

1.420 $[9/2^+]$

1.600 $[9/2^+]$

1.980 $[9/2^+]$

*Energy levels obtained from NRC 60-3-104, except [] values which are assumed.

IN 115

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 4 MEV	ELASTIC + 4 MEV
1.00	-0.	-0.
0.95	3.7502	3.6474
0.90	5.8225	5.5848
0.85	7.9156	7.4223
0.80	10.2238	9.2476
0.75	12.6869	10.8904
0.70	14.7927	11.9300
0.65	15.6772	11.9996
0.60	15.0585	11.2409
0.55	13.5875	10.1227
0.50	11.9210	8.9391
0.45	10.2469	7.7177
0.40	8.4652	6.3582
0.35	6.3763	4.7298
0.30	3.7388	2.7061
0.25	0.2581	0.1795
0.20	-4.4626	-2.9181
0.15	-11.0134	-6.5656
0.10	-20.3470	-10.5468
0.05	-34.0897	-14.2575
0.	-54.9038	-16.4644
-0.05	-84.3736	-15.3170
-0.10	-93.9889	-9.2939
-0.15	10.8067	0.9406
-0.20	81.4951	12.1249
-0.25	82.7193	20.8679
-0.30	71.3362	25.7847
-0.35	59.6226	27.1834
-0.40	48.9593	25.9274
-0.45	39.0951	22.7964
-0.50	29.6185	18.3362
-0.55	20.1639	12.8984
-0.60	10.4137	6.7258
-0.65	0.0842	0.0536
-0.70	-11.0385	-6.7338
-0.75	-22.8356	-12.7803
-0.80	-33.5622	-16.0562
-0.85	-33.5520	-12.2854
-0.90	13.0028	3.4610
-0.95	77.4503	22.6993
-1.00	0.0000	0.0000

IN 115

Figure 120

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^{118}Sn

Energy (MeV)

3.10

4.00

Energy Levels*

G.S. 0^+ 1.22 2^+ 1.75 $(0)^+$ 2.03 $(0)^+$ 2.25 $4^{(+)}$ 2.48 $(0)^+$ 2.51 $5^{(+)}$ 2.55 $[0^+]$

*Energy levels obtained from NRC 60-3-140, except [] values which are assumed.

SN 118

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 3.1 MEV +	ELASTIC 3.1 MEV
1.00	-0.	-0.
0.90	6.3194	6.0723
0.80	8.7116	8.2438
0.70	9.6959	8.9229
0.60	8.7507	7.7286
0.50	5.4650	4.5970
0.40	0.0000	0.1833
0.30	-6.5870	-4.9001
0.20	-15.7050	-10.3927
0.10	-29.2523	-15.3933
0.	-50.0429	-16.1064
-0.10	-37.8102	-4.9808
-0.20	85.4231	14.3709
-0.30	62.2940	23.3717
-0.40	38.1655	20.7200
-0.50	21.4837	13.5041
-0.60	8.6502	5.6240
-0.70	-0.3996	-0.2457
-0.80	1.1571	0.5982
-0.90	28.9801	11.6468
-1.00	0.0000	0.0000

SN 118

Figure 121

SN 118

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 4 MEV	ELASTIC + 4 MEV
1.00	-0.	-0.
0.95	2.1477	2.0865
0.90	3.5760	3.4521
0.85	5.2044	4.9679
0.80	7.1737	6.7225
0.75	9.4512	8.6193
0.70	11.6302	10.2663
0.65	12.9501	11.1192
0.60	13.0031	11.0129
0.55	12.1671	10.2916
0.50	10.9948	9.3321
0.45	9.7231	8.2689
0.40	8.3143	7.0502
0.35	6.5945	5.5363
0.30	4.3082	3.5474
0.25	1.1035	0.8797
0.20	-3.5371	-2.6782
0.15	-10.4436	-7.2881
0.10	-21.0579	-12.8826
0.05	-38.0039	-18.6939
0.	-65.3417	-22.3455
-0.05	-97.1296	-19.3844
-0.10	-47.0036	-6.6389
-0.15	55.3844	11.5227
-0.20	76.7705	26.6085
-0.25	72.1991	34.9886
-0.30	63.7275	37.7066
-0.35	55.0866	36.7212
-0.40	46.6631	33.4291
-0.45	38.2742	28.6202
-0.50	29.6594	22.7000
-0.55	20.5552	15.8619
-0.60	10.6868	8.1999
-0.65	-0.2519	-0.1891
-0.70	-12.5846	-9.0200
-0.75	-26.4372	-17.3415
-0.80	-40.3938	-22.3118
-0.85	-43.5715	-17.3336
-0.90	12.5354	3.1945
-0.95	85.5706	22.4268
-1.00	0.0000	0.0000

SN 118

Figure 122

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^{127}I

Energy (MeV)

4.00

Energy Levels *

G.S. $5/2^{(+)}$

0.059 $(7/2^+)$

0.203 $(3/2^+)$

0.375 $(1/2^+)$

0.418 $[5/2^+]$

0.610 $[7/2^+]$

0.650 $[3/2^+]$

0.724 $[1/2^+]$

0.750 $[5/2^+]$

0.980 $[7/2^+]$

1.030 $[3/2^+]$

1.090 $[1/2^+]$

1.220 $[5/2^+]$

1.400 $[7/2^+]$

*Energy levels obtained from NRC 61-1-72, except [] values which are assumed.

I 127

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE ELASTIC	TOTAL ELASTIC
	4 MEV	+ 4 MEV
1.00	-0.	-0.
0.95	-2.2285	-2.1994
0.90	-2.4715	-2.4236
0.85	-1.9159	-1.8594
0.80	-0.5853	-0.5589
0.75	1.4026	1.3073
0.70	3.5303	3.1887
0.65	4.8535	4.2384
0.60	4.6624	3.9536
0.55	3.1368	2.5999
0.50	0.9828	0.7986
0.45	-1.2553	-0.9973
0.40	-3.3937	-2.6125
0.35	-5.5160	-4.0500
0.30	-7.9041	-5.3920
0.25	-11.0954	-6.7311
0.20	-16.1633	-8.0782
0.15	-25.5887	-9.1699
0.10	-45.9331	-9.1653
0.05	-84.6923	-6.7047
0.	-18.7930	-1.2185
-0.05	36.8205	5.8377
-0.10	41.7618	12.4209
-0.15	41.1349	17.6029
-0.20	40.2007	21.3526
-0.25	39.2806	23.8551
-0.30	38.1131	25.2249
-0.35	36.3806	25.4690
-0.40	33.7771	24.5169
-0.45	30.0069	22.2529
-0.50	24.7679	18.5391
-0.55	17.7204	13.2308
-0.60	8.4346	6.1968
-0.65	-3.6963	-2.6226
-0.70	-19.5717	-13.0169
-0.75	-40.3222	-23.8243
-0.80	-65.0370	-30.8116
-0.85	-68.8020	-22.4347
-0.90	44.8583	12.2380
-0.95	90.8250	40.2847
-1.00	0.0000	0.0000

Figure 123

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$^{184}_{\text{W}}$

Energy (MeV)	Energy Levels*	
2.00	G.S.	0^+
3.00	0.111	2^+
5.00	0.364	4^+
6.00	0.690	(0^+)
7.00	0.904	2^+
8.00	1.001	$(2)^+$
9.00	1.006	(3^+)
10.00	1.150	(2^+)
11.00	1.240	$[0^+]$
12.00	1.310	$[0^+]$
13.00	1.400	$(0)^{[+]}$
14.00	1.410	$(2)^{[+]}$
15.00	1.610	$[0^+]$
16.00	2.120	$[0^+]$
	2.480	$[0^+]$

*Energy levels obtained from NRC 60-1-142, BNL 818, except [] values which are assumed.

W 184

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE ELASTIC	TOTAL ELASTIC
	2 MEV	+ 2 MEV
1.00	-0.	-0.
0.95	1.9949	1.9709
0.90	2.5300	2.4953
0.85	2.6743	2.6304
0.80	2.4936	2.4416
0.75	1.9618	1.9063
0.70	0.9913	0.9503
0.65	-0.5797	-0.5416
0.60	-2.9902	-2.6458
0.55	-6.2064	-4.8144
0.50	-5.0247	-2.7368
0.45	40.9920	13.5458
0.40	55.7189	27.4077
0.35	40.1793	27.9601
0.30	31.4298	25.3574
0.25	26.4281	22.8550
0.20	23.1699	20.7927
0.15	20.7857	19.0604
0.10	18.8597	17.5261
0.05	17.1675	16.0874
0.	15.5729	14.6678
-0.05	13.9828	13.2067
-0.10	12.3255	11.6524
-0.15	10.5380	9.9563
-0.20	8.5585	8.0688
-0.25	6.3190	5.9353
-0.30	3.7381	3.4918
-0.35	0.7113	0.6593
-0.40	-2.9046	-2.6628
-0.45	-7.3174	-6.6045
-0.50	-12.8463	-11.3312
-0.55	-20.0086	-17.0305
-0.60	-29.6848	-23.8129
-0.65	-43.3705	-31.2642
-0.70	-62.8081	-36.7682
-0.75	-79.4936	-31.5548
-0.80	-20.2459	-5.8379
-0.85	52.4465	21.0315
-0.90	48.3650	28.0648
-0.95	30.7978	21.7608
-1.00	0.0000	0.0000

W 184

Figure 124

W 184

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 3 MEV	ELASTIC + 3 MEV
1.00	-0.	-0.
0.95	1.9436	1.9311
0.90	2.4036	2.3854
0.85	2.3726	2.3496
0.80	1.8259	1.8012
0.75	0.5651	0.5533
0.70	-1.8870	-1.8184
0.65	-6.7534	-6.2523
0.60	-18.0792	-14.6687
0.55	-55.5923	-23.2113
0.50	52.1404	13.2294
0.45	42.6635	28.3115
0.40	32.0771	26.4525
0.35	26.8224	23.8041
0.30	23.6194	21.6648
0.25	21.3390	19.9163
0.20	19.5114	18.3919
0.15	17.9081	16.9771
0.10	16.4041	15.5974
0.05	14.9241	14.2030
0.	13.4180	12.7586
-0.05	11.8475	11.2361
-0.10	10.1772	9.6087
-0.15	8.3656	7.8455
-0.20	6.3549	5.9034
-0.25	4.0544	3.7168
-0.30	1.3140	1.1826
-0.35	-2.1216	-1.8603
-0.40	-6.6976	-5.6543
-0.45	-13.2117	-10.5294
-0.50	-23.1454	-16.8144
-0.55	-39.3393	-24.3570
-0.60	-66.6443	-30.7447
-0.65	-98.9579	-27.3198
-0.70	-12.4411	-2.4563
-0.75	95.4443	31.6849
-0.80	94.0227	50.4502
-0.85	76.7619	52.7733
-0.90	58.8631	45.8607
-0.95	39.4493	32.8662
-1.00	0.0000	0.0000

W 184

Figure 125

W 184

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.95	-1.9600	3.9001	2.2262	-3.7799
0.90	-2.0925	7.9034	11.7580	-25.2380
0.85	-1.5920	12.0010	11.3610	8.0038
0.80	-0.6496	3.5853	4.6651	4.8573
0.75	0.3370	-7.2895	2.5032	2.6327
0.70	0.1317	-15.0410	-0.2145	0.3014
0.65	-5.3913	-23.2030	-4.7243	-2.3285
0.60	-30.9030	-34.4740	-12.1510	-2.7784
0.55	-65.4150	-52.0530	-19.3670	13.1840
0.50	-3.8018	-71.9710	-4.3191	35.1510
0.45	21.1820	-0.0601	19.6030	33.5860
0.40	27.0570	47.9220	26.0500	27.9210
0.35	27.4230	34.9250	25.3970	22.9420
0.30	25.9810	21.7670	22.5800	18.2750
0.25	24.0580	11.4780	18.5540	13.1770
0.20	22.1600	2.9183	13.2730	6.8627
0.15	20.4270	-4.6991	6.4205	-1.5418
0.10	18.8090	-11.7850	-2.2878	-12.1940
0.05	17.1450	-18.4730	-12.5380	-18.9240
0.	15.1920	-24.5710	-21.6670	-1.1016
-0.05	12.6230	-29.2350	-21.1660	30.1190
-0.10	9.0034	-29.9300	0.2497	42.9680
-0.15	3.7352	-19.9570	33.0630	43.2880
-0.20	-4.0294	11.3050	53.0090	38.4270
-0.25	-15.5240	49.0660	56.1940	30.2410
-0.30	-32.4180	50.9680	49.6080	18.5280
-0.35	-55.5970	31.0250	38.1050	2.9651
-0.40	-75.3860	11.9130	23.7110	-14.8280
-0.45	-43.3180	-1.4101	7.0460	-28.8420
-0.50	39.5390	-8.6766	-11.7130	-29.9380
-0.55	72.8460	-9.4710	-31.6700	-14.2250
-0.60	69.1250	-2.7881	-47.7140	11.5040
-0.65	54.4130	11.6190	-39.8720	33.8700
-0.70	36.4120	29.4740	25.9340	42.5680
-0.75	16.9920	36.7500	89.9330	40.9590
-0.80	-2.4128	11.4180	67.9010	32.5290
-0.85	-16.2820	-54.1890	4.9158	5.1431
-0.90	-4.3060	-51.0710	-44.7750	-63.8400
-0.95	49.1610	91.6710	21.8840	3.8448
-1.00	0.0000	0.0000	0.0000	0.0000

W 184

Figure 126

W 184

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE ELASTIC			
	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.95	-1.6856	5.2280	-0.3867	-4.0026
0.90	-1.5836	12.3380	-7.9113	-15.0890
0.85	-0.9317	20.1140	7.0485	10.9750
0.80	-1.0754	5.6175	3.9431	7.0934
0.75	-5.4364	-1.2735	2.2989	4.0152
0.70	-17.2270	-6.6136	0.1179	0.6948
0.65	-34.0060	-13.5650	-3.4554	-2.7371
0.60	-52.0700	-24.1430	-8.8520	-1.1993
0.55	-71.7730	-39.8030	-10.0430	26.2220
0.50	-80.5360	-45.2090	9.9678	47.9330
0.45	26.0810	6.7531	24.2090	39.8530
0.40	56.3690	33.7330	25.7960	29.8850
0.35	33.4160	31.6100	24.0150	21.6580
0.30	18.0550	24.6130	21.1510	14.3440
0.25	8.7159	17.1190	17.3350	7.1481
0.20	2.8421	9.5160	12.1980	-0.5933
0.15	-0.8681	1.6289	5.2142	-9.4446
0.10	-3.0781	-6.7330	-3.9436	-18.6500
0.05	-4.1614	-15.6190	-14.0070	-18.8500
0.	-4.3781	-24.6590	-18.0850	8.6851
-0.05	-3.9929	-32.1660	-3.3138	33.1880
-0.10	-3.3983	-32.4460	25.1650	37.0650
-0.15	-3.2923	-11.5360	44.5020	33.7460
-0.20	-5.0287	35.9330	50.0350	28.2140
-0.25	-10.9730	65.5680	47.1390	20.5540
-0.30	-24.0880	58.7910	39.5820	9.2144
-0.35	-40.8050	39.5880	29.0240	-7.7596
-0.40	-37.8390	20.2880	16.1080	-29.1300
-0.45	-7.5192	3.4904	1.0123	-41.6200
-0.50	22.4310	-10.2990	-16.1730	-26.3080
-0.55	40.2200	-20.0810	-34.1220	7.0576
-0.60	47.1460	-23.0580	-44.6670	33.7530
-0.65	45.3210	-13.2180	-20.7040	40.6820
-0.70	35.7350	17.1950	48.6750	26.8790
-0.75	18.4270	56.2520	85.2480	10.8640
-0.80	-7.4332	42.1250	63.9830	6.5849
-0.85	-42.3310	-28.8320	9.0686	-1.5090
-0.90	-65.6470	-29.3230	-54.8150	-54.4680
-0.95	55.2040	80.1540	-3.7827	25.0010
-1.00	0.0000	0.0000	0.0000	0.0000

Figure 127

W 184

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE		ELASTIC	
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.95	1.0128	4.4579	-2.5357	-3.3538
0.90	2.5688	14.5320	-33.0340	-8.6165
0.85	4.1290	19.6650	6.4418	14.4890
0.80	0.6376	5.5618	3.8782	10.3370
0.75	-10.9500	1.0369	2.1674	6.3847
0.70	-23.0350	-1.8950	0.1495	1.4070
0.65	-33.6510	-7.5719	-2.7190	-4.5263
0.60	-45.7740	-16.7880	-5.7544	-3.2758
0.55	-63.9220	-28.8930	0.5943	35.5560
0.50	-93.5000	-22.2310	22.6020	58.8610
0.45	12.9530	13.9630	28.5770	46.7460
0.40	73.9000	28.0750	26.5240	32.1600
0.35	36.6180	28.0420	23.4610	19.3540
0.30	17.1220	24.2560	20.0650	7.9594
0.25	5.3902	19.1040	15.9350	-2.4172
0.20	-2.7278	12.9220	10.4310	-11.9670
0.15	-8.8360	5.5820	2.7945	-20.4170
0.10	-13.5960	-3.1035	-7.3094	-25.1010
0.05	-17.2350	-13.1040	-16.6310	-14.5580
0.	-19.6920	-23.4720	-11.0260	16.9280
-0.05	-20.6210	-30.2820	17.0650	30.4010
-0.10	-19.2530	-22.6770	39.9950	26.8420
-0.15	-14.1750	11.2050	47.1710	20.9350
-0.20	-3.4908	50.6490	45.2900	15.4050
-0.25	11.5880	64.0780	38.6610	9.3080
-0.30	18.1920	56.8110	28.7820	0.4385
-0.35	8.4155	41.7980	16.3150	-14.4840
-0.40	-2.3022	24.6680	2.1738	-35.7940
-0.45	-5.1249	7.0680	-12.0220	-42.6400
-0.50	-0.5489	-10.4480	-23.9440	-12.8700
-0.55	9.1906	-26.8710	-29.9960	21.2400
-0.60	21.2080	-38.6580	-21.9920	39.8300
-0.65	31.4130	-34.5630	11.8240	39.5680
-0.70	34.5570	10.0010	53.9660	15.4630
-0.75	25.0720	79.5480	67.9220	-15.1300
-0.80	-2.4371	64.6030	52.6700	-17.7170
-0.85	-52.4890	-4.9936	9.2737	-4.5789
-0.90	-82.7280	-33.8160	-61.8790	-22.9790
-0.95	86.1590	54.6740	-10.0500	34.0760
-1.00	0.0000	0.0000	0.0000	0.0000

Figure 128

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^{208}Pb

Energy (MeV)	Energy Levels*
3.1	G.S. 0^+
4.00	2.615 3^-
5.00	3.198 5^-
6.00	3.475 4^-
7.00	3.709 5^-
8.00	3.75 $[0^+]$
9.00	3.961 $(6)^-$
10.00	4.30 (4^+)
11.00	5.10 $[0^+]$
12.00	5.40 $[0^+]$
13.00	
14.00	
15.00	
16.00	

*Energy levels obtained from NRC 61-3-126, except [] values which are assumed.

PB 208

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE ELASTIC	TOTAL ELASTIC
	3.1 MEV	+ 3.1 MEV
1.00	-0.	-0.
0.90	-5.2403	-4.6534
0.80	-9.2445	-7.0221
0.70	-20.1670	-6.8612
0.60	66.2247	1.7693
0.50	11.2625	4.1943
0.40	5.2206	2.9691
0.30	2.5471	1.6317
0.20	0.4446	0.2902
0.10	-1.9610	-1.2237
0.	-5.2569	-2.9083
-0.10	-10.0816	-4.3670
-0.20	-17.1792	-4.6165
-0.30	-24.5286	-2.6242
-0.40	29.2500	0.8255
-0.50	55.7045	2.9647
-0.60	21.3930	2.5094
-0.70	8.0581	1.2677
-0.80	17.5264	2.8003
-0.90	46.8470	7.7628
-1.00	0.0000	0.0000

Figure 129

PB 208

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE	TOTAL
	ELASTIC 4 MEV	ELASTIC + 4 MEV
1.00	-0.	-0.
0.95	-2.8902	-2.7958
0.90	-4.5077	-4.3002
0.85	-6.3102	-5.8540
0.80	-8.8044	-7.6730
0.75	-13.0238	-9.6220
0.70	-22.0398	-9.4224
0.65	-3.5407	-0.1949
0.60	47.6062	9.4360
0.55	22.5928	10.5918
0.50	15.0214	9.3685
0.45	11.3941	8.0235
0.40	9.1476	6.8324
0.35	7.4542	5.7324
0.30	5.9494	4.6311
0.25	4.4331	3.4520
0.20	2.7710	2.1374
0.15	0.8533	0.6456
0.10	-1.4318	-1.0506
0.05	-4.2220	-2.9597
0.	-7.7122	-5.0590
-0.05	-12.2039	-7.2642
-0.10	-18.1942	-9.3714
-0.15	-26.5402	-10.9660
-0.20	-38.7170	-11.3387
-0.25	-56.4046	-9.5806
-0.30	-68.0815	-5.1464
-0.35	29.0314	1.2617
-0.40	94.1297	7.6536
-0.45	73.6587	12.1011
-0.50	53.6452	13.8421
-0.55	38.5954	13.0894
-0.60	26.1600	10.3920
-0.65	14.6894	6.3002
-0.70	3.1815	1.3753
-0.75	-8.8195	-3.5693
-0.80	-20.4592	-7.0287
-0.85	-25.2805	-6.4435
-0.90	2.3619	0.4105
-0.95	57.9324	9.6802
-1.00	0.0000	0.0000

Figure 130

PB 208

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.95	0.0156	4.5108	-0.2147	-1.7646
0.90	-0.8716	7.2601	10.8050	12.5750
0.85	-2.7706	8.1056	2.2884	7.8420
0.80	-6.6151	2.5622	-4.8374	3.6321
0.75	-15.2300	-4.2113	-8.7237	-1.2520
0.70	-40.5130	-9.0634	-12.9800	-8.0323
0.65	4.3538	-16.7140	-18.1050	-13.3870
0.60	57.1850	-37.8840	-17.4270	6.4898
0.55	38.9360	-92.5070	10.7140	34.8890
0.50	30.1920	38.2330	18.9910	34.0710
0.45	24.1650	34.4630	14.1060	26.0550
0.40	18.8570	28.5620	9.6240	17.3580
0.35	13.6000	24.1900	6.2064	8.5270
0.30	8.2038	20.1310	3.4226	-0.4059
0.25	2.6782	15.5650	0.9506	-8.8649
0.20	-2.8971	9.8546	-1.3625	-14.6320
0.15	-8.4413	2.3702	-3.3320	-11.1890
0.10	-13.9100	-7.5775	-3.6553	12.4180
0.05	-19.3140	-20.6440	1.8443	44.4660
0.	-24.7390	-36.6600	15.5530	50.8430
-0.05	-30.3700	-50.9310	25.1020	39.5950
-0.10	-36.5030	-43.8780	26.3080	26.3720
-0.15	-43.4210	6.9000	24.9460	15.2130
-0.20	-49.9600	55.9090	23.5880	5.9618
-0.25	-42.3420	66.6780	22.6350	-2.3592
-0.30	23.7740	57.0160	21.7520	-10.7400
-0.35	58.1200	40.9070	20.0460	-19.2850
-0.40	46.5870	22.9650	15.7270	-22.7440
-0.45	35.6650	4.4863	5.7693	-2.5240
-0.50	28.6370	-13.9520	-12.7300	31.3760
-0.55	23.5370	-31.2820	-34.6140	40.4070
-0.60	18.6820	-44.2530	-34.5160	33.4500
-0.65	12.7170	-42.9890	7.3189	20.6650
-0.70	4.3227	-3.8510	59.3510	6.3108
-0.75	-8.1443	71.1870	81.9920	-1.9182
-0.80	-27.2680	69.9670	63.9210	4.5588
-0.85	-56.3860	7.6238	6.9373	3.0628
-0.90	-59.5550	-11.8660	-72.0100	-48.8550
-0.95	92.4950	62.1380	-29.3800	42.9030
-1.00	0.0000	0.0000	0.0000	0.0000

Figure 131

PB 208

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.95	3.5433	2.4322	-0.8671	-2.1608
0.90	3.8418	6.1135	25.3700	1.8286
0.85	2.0750	6.7380	3.1043	9.2488
0.80	-3.7682	-1.2006	-2.8738	6.0943
0.75	-19.7550	-5.5546	-7.1822	1.5821
0.70	-59.5840	-9.1153	-12.1250	-5.6165
0.65	-52.8140	-15.5590	-16.9000	-11.5620
0.60	41.1710	-32.2720	-9.2692	13.2560
0.55	59.3350	-43.1100	20.9530	38.5470
0.50	54.8340	8.7112	24.3760	36.7700
0.45	44.4670	14.8820	17.7550	29.0560
0.40	32.7710	14.7440	11.7490	19.7690
0.35	21.5180	14.0410	6.8179	9.0654
0.30	11.2580	13.0760	2.5290	-3.0095
0.25	1.9511	11.5410	-1.3880	-15.1150
0.20	-6.6539	8.9126	-4.8289	-22.1670
0.15	-14.8540	4.4193	-6.6069	-12.2300
0.10	-22.9310	-3.0057	-2.1208	21.2780
0.05	-31.1270	-14.3590	16.8090	49.3530
0.	-39.5990	-28.0930	37.0290	49.7960
-0.05	-48.1830	-32.8030	38.2490	35.7370
-0.10	-55.2900	-11.2850	31.5670	19.7450
-0.15	-52.7440	22.5550	24.6900	6.1378
-0.20	-11.2850	44.0710	18.7990	-4.4378
-0.25	58.3190	51.3390	13.6600	-12.5070
-0.30	57.4380	49.1920	8.9448	-18.6850
-0.35	33.5950	40.5930	4.4484	-22.0110
-0.40	16.0130	26.7830	0.1576	-14.2270
-0.45	5.4877	8.2569	-3.5223	16.1610
-0.50	0.3278	-14.5160	-5.1155	36.4500
-0.55	-0.6637	-39.8900	-1.9730	35.7690
-0.60	1.3644	-61.0680	7.4227	28.1050
-0.65	4.5893	-53.8100	23.2100	15.5890
-0.70	5.8873	22.3100	43.3280	-4.1139
-0.75	0.4168	95.1120	59.0310	-25.3470
-0.80	-19.1210	70.2680	53.4130	-15.4500
-0.85	-62.1730	7.3912	5.5650	19.4750
-0.90	-20.9260	-39.4250	-80.8260	1.2888
-0.95	93.7830	17.7570	-5.9402	37.8130
-1.00	0.0000	0.0000	0.0000	0.0000

Figure 132

PB 208

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.95	5.3742	0.7698	-1.3675	-2.5939
0.90	7.0360	6.5162	83.6150	2.6612
0.85	6.2958	3.8729	5.4712	9.8785
0.80	0.1309	-4.5744	0.3175	7.5105
0.75	-13.6950	-8.2787	-4.4311	3.6364
0.70	-26.7330	-11.9850	-10.2860	-3.2886
0.65	-30.3670	-17.5700	-15.0820	-9.0008
0.60	-14.0940	-24.7390	-0.9479	20.7610
0.55	62.4080	-5.2812	29.0170	41.0910
0.50	90.4230	13.3040	29.6480	37.7530
0.45	62.2440	12.0300	21.9850	30.2660
0.40	42.0480	9.6637	14.5390	20.9220
0.35	28.9320	7.8956	7.8334	9.1495
0.30	19.0580	6.5059	1.6173	-5.5439
0.25	10.4430	5.1698	-4.1278	-21.4730
0.20	2.0342	3.5183	-8.6829	-29.3230
0.15	-6.8313	1.0561	-9.0198	-10.7330
0.10	-16.6630	-2.8261	3.5518	27.2130
0.05	-27.8970	-8.0278	32.8950	48.1970
0.	-40.7490	-10.2260	47.8230	45.8990
-0.05	-54.1660	-1.2766	41.6260	31.5330
-0.10	-60.6100	13.6090	31.1920	13.5810
-0.15	-30.2800	24.7980	21.8630	-3.0843
-0.20	48.2500	31.5960	13.7490	-15.7820
-0.25	74.8690	35.2620	6.1088	-23.2560
-0.30	57.5920	36.0030	-1.7282	-24.5760
-0.35	35.4130	33.0270	-9.8529	-16.8270
-0.40	16.4550	24.8240	-15.8840	6.1360
-0.45	1.0864	9.5216	-10.2530	31.1180
-0.50	-10.8750	-14.1730	13.7570	31.6460
-0.55	-18.8870	-43.7310	30.1650	24.1160
-0.60	-21.2880	-62.5670	29.4270	17.1820
-0.65	-15.1880	-29.2240	23.9630	7.7769
-0.70	1.7488	54.8190	22.4810	-11.3150
-0.75	22.9970	94.1150	28.3020	-39.4090
-0.80	20.5690	67.5250	32.1570	-14.1610
-0.85	-20.9540	6.7559	1.9461	39.3230
-0.90	16.9500	-58.6380	-79.1350	31.1790
-0.95	85.7100	-22.0750	25.3360	14.8910
-1.00	0.0000	0.0000	0.0000	0.0000

Figure 133

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^{209}Bi

Energy (MeV)

4.00

Energy Levels*

G.S. $9/2^-$

0.894 $3/2^+$

1.60 $13/2^+$

2.50 $3/2^+$

2.67 $3/2^+$

3.10 $1/2^+$

3.45 $[9/2^-]$

*Energy levels obtained from J. Alster, Phys. Rev. 141, 1138 (1966), except [] values which are assumed.

BI 209

COSINE THETA C.M.	POLARIZATION (PERCENT)	
	SHAPE ELASTIC 4 MEV	TOTAL ELASTIC + 4 MEV
1.00	-0.	-0.
0.95	-2.8017	-2.7162
0.90	-4.4476	-4.2164
0.85	-6.3461	-5.7465
0.80	-9.0404	-7.3772
0.75	-13.6949	-8.5409
0.70	-23.9344	-6.7457
0.65	6.1211	0.1620
0.60	46.2807	5.8299
0.55	22.7606	7.3126
0.50	15.2581	7.0187
0.45	11.5351	6.2659
0.40	9.1581	5.4084
0.35	7.3234	4.5043
0.30	5.6728	3.5392
0.25	4.0082	2.4883
0.20	2.1961	1.3343
0.15	0.1258	0.0736
0.10	-2.3165	-1.2801
0.05	-5.2730	-2.6894
0.	-8.9473	-4.0836
-0.05	-13.6576	-5.3448
-0.10	-19.9325	-6.2915
-0.15	-28.6904	-6.6754
-0.20	-41.5008	-6.2148
-0.25	-59.8371	-4.6995
-0.30	-66.2894	-2.1555
-0.35	48.6613	1.0351
-0.40	93.4844	4.2062
-0.45	70.8039	6.6690
-0.50	51.3875	7.9547
-0.55	36.8580	7.8852
-0.60	24.7755	6.5032
-0.65	13.5408	3.9918
-0.70	2.1610	0.6637
-0.75	-9.8795	-2.9291
-0.80	-21.9232	-5.7172
-0.85	-27.8985	-5.6883
-0.90	-0.7908	-0.1196
-0.95	59.1325	10.0009
-1.00	0.0000	0.0000

Figure 134

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^{234}U

Energy (MeV)

Energy Levels

5.00

None

6.00

7.00

8.00

9.00

10.00

11.00

12.00

13.00

14.00

15.00

16.00

U 234

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.95	2.6182	-1.2044	5.6313	1.7034
0.90	2.3938	-0.7021	14.0080	14.6300
0.85	0.1671	-0.8426	1.3655	2.0884
0.80	-6.3605	-10.5860	-7.4621	-0.5491
0.75	-28.8300	-36.8270	-15.6960	-4.6797
0.70	26.9520	-56.1790	-30.2470	-11.6810
0.65	42.0200	-33.7880	-50.7210	-7.1118
0.60	31.7560	44.7010	5.9994	17.3320
0.55	26.4720	33.9930	26.7450	20.7910
0.50	22.7160	17.6290	20.1480	18.5290
0.45	19.3370	8.1000	12.3850	15.0250
0.40	15.8370	2.4487	4.7944	10.2590
0.35	11.9390	-1.0536	-2.9940	3.5283
0.30	7.4415	-3.2679	-11.1800	-5.5354
0.25	2.1521	-4.7047	-19.2850	-13.2600
0.20	-4.1657	-5.8125	-24.6390	-3.5651
0.15	-11.8580	-7.2364	-18.2610	25.2700
0.10	-21.4820	-10.1660	12.4010	41.4990
0.05	-33.9750	-16.0660	43.3700	42.9410
0.	-50.7980	-20.5520	44.7190	37.5040
-0.05	-72.5110	-11.3220	32.1920	28.3140
-0.10	-79.3390	3.0784	18.3570	16.2040
-0.15	25.2530	13.9810	6.1938	1.8108
-0.20	91.5480	21.7590	-3.8869	-13.0670
-0.25	75.5440	27.0960	-11.6230	-24.0120
-0.30	55.8790	29.7110	-16.0570	-22.7220
-0.35	41.2790	28.6250	-14.5390	-0.0411
-0.40	30.6120	22.3730	-1.1635	37.1480
-0.45	22.6200	9.1803	28.7260	58.6250
-0.50	16.4360	-12.6270	47.5320	52.9370
-0.55	11.3300	-42.8600	28.5620	33.7600
-0.60	6.4492	-71.4470	6.8721	11.1700
-0.65	0.5275	-56.3240	0.6020	-12.2590
-0.70	-8.5071	34.1280	11.2800	-33.9680
-0.75	-24.3540	87.4860	35.5390	-35.8790
-0.80	-54.2190	66.4300	54.8410	29.3720
-0.85	-97.8190	15.9790	22.3840	72.7730
-0.90	52.4770	-32.3210	-79.9310	-6.4209
-0.95	81.8070	-0.2265	10.7180	7.5391
-1.00	0.0000	0.0000	0.0000	0.0000

U 234

Figure 135

U 234

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.95	1.5875	0.7173	6.0309	-1.7533
0.90	1.9361	2.2258	20.6570	8.2398
0.85	1.1947	-1.3536	2.4118	2.2273
0.80	-2.6419	-18.6020	-2.9918	-0.2963
0.75	-23.1820	-33.8920	-9.5608	-3.8958
0.70	57.8020	-50.9830	-21.9110	-8.2824
0.65	34.6820	-86.7990	-32.8470	3.8922
0.60	29.3340	94.0150	8.5019	22.4520
0.55	27.3030	42.8490	22.7550	21.7110
0.50	25.8650	16.6090	20.0470	18.2950
0.45	24.1990	4.3380	14.7700	14.4610
0.40	21.9630	-3.2506	8.4019	9.6599
0.35	18.9660	-8.7022	0.7783	3.0154
0.30	15.0260	-12.8880	-8.2262	-5.6640
0.25	9.8797	-16.0280	-17.5660	-9.7871
0.20	3.1028	-17.8150	-21.7840	10.8550
0.15	-5.9952	-16.9450	-7.0471	36.3180
0.10	-18.5480	-9.8048	26.9390	42.4370
0.05	-36.3440	7.1650	46.4710	39.3500
0.	-61.0670	18.0470	44.6750	32.5590
-0.05	-82.8360	12.9040	34.0380	22.8600
-0.10	-31.3740	6.5443	21.1060	9.8002
-0.15	64.9150	3.7221	7.9722	-6.4246
-0.20	79.5470	4.0407	-4.5961	-22.0460
-0.25	66.5500	6.7010	-15.8100	-26.5920
-0.30	50.7540	10.8530	-23.6960	-9.5526
-0.35	35.9320	15.1420	-22.5170	21.6040
-0.40	22.2880	16.9980	1.0831	45.3940
-0.45	9.6752	11.7950	48.5190	49.5090
-0.50	-1.8553	-6.8164	64.4560	37.4360
-0.55	-11.9050	-39.3560	41.3230	19.0830
-0.60	-19.6070	-57.1510	14.7370	0.3848
-0.65	-23.5780	-15.8110	-3.1928	-18.5390
-0.70	-22.4480	49.2190	-8.1333	-37.4740
-0.75	-17.4760	78.0050	6.3937	-32.0900
-0.80	-15.5540	62.8610	40.5670	45.9320
-0.85	12.5370	14.7030	34.4030	70.2250
-0.90	75.6350	-53.2760	-68.9320	3.5624
-0.95	80.0060	-42.4580	33.0380	-18.5540
-1.00	0.0000	0.0000	0.0000	0.0000

U 234

Figure 136

U 234

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE		ELASTIC	
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.95	-0.7366	3.5432	4.5862	-4.6523
0.90	-0.3353	7.5028	22.6760	7.3853
0.85	0.3744	-0.5173	2.3722	3.1708
0.80	-0.2302	-14.3490	-1.1028	0.2667
0.75	-17.1050	-24.6230	-6.2449	-3.3749
0.70	-17.0420	-40.6200	-15.9600	-5.4585
0.65	18.7870	-72.7710	10.0600	14.9550
0.60	24.9280	17.1780	12.7690	28.5900
0.55	25.3150	34.5920	21.0620	23.8680
0.50	23.0880	18.7060	19.2300	18.5470
0.45	20.1300	7.9467	15.3040	13.4540
0.40	17.3510	-0.2843	9.9785	7.7065
0.35	14.9120	-7.3895	2.8458	0.4898
0.30	12.5740	-13.9040	-6.3538	-7.5586
0.25	9.8516	-19.7460	-15.6450	-5.4091
0.20	5.9891	-23.7260	-14.9160	24.6120
0.15	-0.2248	-21.4510	9.3714	41.4920
0.10	-10.8250	-2.1417	36.7020	39.8440
0.05	-28.8240	30.9470	45.4300	33.5980
0.	-53.5460	38.0620	41.6210	25.7080
-0.05	-53.9770	25.5820	32.2710	15.6120
-0.10	-0.4093	12.7350	20.2370	1.8372
-0.15	39.4340	3.4252	6.7376	-16.0990
-0.20	51.8610	-2.4796	-7.2004	-31.2230
-0.25	51.8130	-5.2364	-19.8010	-23.7920
-0.30	45.9390	-4.6943	-26.8560	7.1282
-0.35	36.3110	-0.3997	-18.2990	33.9190
-0.40	23.4960	7.6919	18.4410	44.1390
-0.45	7.6065	16.3690	60.1200	38.2030
-0.50	-11.2550	13.7310	63.2870	20.4110
-0.55	-32.4370	-6.7090	41.5230	-0.0525
-0.60	-52.9560	-16.2100	15.7710	-14.9690
-0.65	-61.0060	1.1907	-7.3069	-23.9540
-0.70	-22.2290	33.1460	-23.4200	-28.6640
-0.75	63.7830	60.3370	-20.2810	-7.5867
-0.80	71.1440	60.9040	25.8610	51.2190
-0.85	25.5290	17.2400	58.0210	56.7540
-0.90	9.5397	-68.1570	-31.5510	6.4969
-0.95	53.3190	-29.9700	28.6040	-40.4850
-1.00	0.0000	0.0000	0.0000	0.0000

U 234

Figure 137

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^{235}U

Energy (MeV)	Energy Levels*	
5.00	G.S.	$7/2^-$
6.00	75ev	$1/2^+$
7.00	0.013	$3/2^+$
8.00	0.046	$9/2^-$
9.00	0.052	$5/2^+$
10.00	0.084	$7/2^+$
11.00	0.130	$11/2^-$
12.00	0.150	$9/2^+$
13.00	0.173	$7/2^-$
14.00	0.235	$11/2^{[-]}$
15.00		
16.00		

*Energy levels obtained from Landolt-Bornstein Handbook, except [] values which are assumed.

U 235

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE		ELASTIC	
	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.95	2.5627	-1.2074	5.8029	1.7046
0.90	2.3653	-0.7714	13.9800	14.1080
0.85	0.1974	-1.1011	1.3341	1.8012
0.80	-6.2951	-11.5600	-7.4171	-0.8411
0.75	-29.3650	-39.8090	-15.7060	-4.9549
0.70	30.2830	-58.5470	-30.7330	-11.8130
0.65	39.6110	-27.5240	-51.9810	-6.1944
0.60	30.4540	44.1440	7.5187	17.4060
0.55	25.6380	33.0400	26.4290	20.2480
0.50	22.1610	17.0720	19.9580	17.9400
0.45	18.9870	7.4370	12.3650	14.5150
0.40	15.6560	1.5752	4.8258	9.8757
0.35	11.9030	-2.1385	-3.0331	3.3072
0.30	7.5249	-4.5316	-11.4120	-5.5381
0.25	2.3225	-6.0868	-19.7960	-12.7400
0.20	-3.9560	-7.2049	-25.2960	-1.8517
0.15	-11.6820	-8.4365	-18.2420	26.4950
0.10	-21.4580	-10.7790	13.6910	41.2090
0.05	-34.3010	-15.3440	43.9970	42.0930
0.	-51.7760	-17.7950	44.7500	36.6970
-0.05	-74.1120	-8.7296	32.2150	27.7440
-0.10	-75.0150	3.4792	18.3210	15.8550
-0.15	38.5840	12.8660	5.9393	1.5352
-0.20	90.9810	19.9750	-4.4713	-13.4070
-0.25	73.6410	25.1930	-12.5800	-24.1940
-0.30	54.7550	28.0530	-17.3140	-21.8830
-0.35	40.7030	27.4520	-15.7460	2.1847
-0.40	30.3220	21.7870	-1.3107	38.7510
-0.45	22.4580	9.1008	30.9540	58.5740
-0.50	16.3140	-12.5150	50.2460	52.4720
-0.55	11.2060	-43.0240	29.9500	33.2960
-0.60	6.3044	-71.7440	7.0865	10.4840
-0.65	0.3452	-54.5310	-0.4074	-13.3530
-0.70	-8.7900	36.1630	9.2406	-35.3550
-0.75	-24.9360	86.6500	33.4290	-36.3700
-0.80	-55.5610	65.6730	54.4210	31.7650
-0.85	-98.3580	15.9050	23.6480	74.0760
-0.90	57.6920	-32.9860	-79.7390	-6.5856
-0.95	81.4070	-2.2548	12.6910	4.8923
-1.00	0.0000	0.0000	0.0000	0.0000

U 235

Figure 138

U 235

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE		ELASTIC	
	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.95	1.3354	0.8935	6.1080	-1.7727
0.90	1.6569	2.3504	20.1460	8.1514
0.85	1.0030	-1.5121	2.2417	1.9859
0.80	-2.5690	-19.3470	-3.0540	-0.5944
0.75	-22.7660	-35.1540	-9.5939	-4.2195
0.70	50.5130	-52.8700	-22.1480	-8.3718
0.65	31.5930	-88.4160	-32.8690	4.9449
0.60	27.3230	98.0290	9.0834	22.4320
0.55	25.8110	42.3810	22.2650	21.2200
0.50	24.7500	16.5200	19.6360	17.7260
0.45	23.4090	4.1333	14.5530	13.9070
0.40	21.4690	-3.6645	8.3268	9.1804
0.35	18.7410	-9.3620	0.7535	2.6971
0.30	15.0380	-13.8150	-8.3205	-5.6090
0.25	10.0860	-17.2210	-17.8030	-8.6358
0.20	3.4375	-19.2040	-21.8450	13.2000
0.15	-5.6415	-18.2180	-6.0945	37.0450
0.10	-18.3740	-9.9692	27.8320	41.8890
0.05	-36.7060	9.3204	46.2500	38.4410
0.	-62.3300	20.2760	44.2740	31.6740
-0.05	-82.6210	13.7770	33.8500	22.1530
-0.10	-21.5690	6.4397	21.0280	9.2951
-0.15	67.5490	2.9219	7.7985	-6.8172
-0.20	78.1020	2.7373	-5.0348	-22.3150
-0.25	65.3610	5.0863	-16.5820	-26.0150
-0.30	50.2050	9.1685	-24.6470	-7.4432
-0.35	35.8010	13.7090	-22.9620	23.6680
-0.40	22.3360	16.1920	2.4869	45.7910
-0.45	9.7004	11.8880	50.9490	48.8420
-0.50	-2.0259	-5.9689	65.4030	36.6600
-0.55	-12.4180	-38.1590	41.5210	18.3140
-0.60	-20.5570	-55.0810	14.3780	-0.5164
-0.65	-24.9220	-14.1980	-4.2883	-19.5320
-0.70	-23.7750	48.2680	-10.0140	-38.0970
-0.75	-17.6050	76.5060	4.2265	-30.6760
-0.80	-12.3620	62.3450	40.1450	48.2040
-0.85	17.1160	14.9680	37.0450	70.3130
-0.90	74.6900	-53.4370	-66.9270	2.6335
-0.95	79.4690	-43.0180	33.0350	-21.0790
-1.00	0.0000	0.0000	0.0000	0.0000

U 235

Figure 139

U 235

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.95	-0.9463	3.7744	4.6073	-4.7068
0.90	-0.6145	7.6645	21.7080	7.4065
0.85	0.0807	-0.5482	2.1024	3.0030
0.80	-0.4969	-14.4980	-1.3134	0.0100
0.75	-19.3790	-24.9590	-6.4124	-3.7050
0.70	-15.4450	-41.6500	-16.1220	-5.4799
0.65	17.4030	-75.9480	-18.2530	16.0150
0.60	23.3160	22.3710	13.0110	28.4820
0.55	23.9000	34.4720	20.5120	23.4380
0.50	21.8990	18.6930	18.6860	18.0190
0.45	19.0750	7.9726	14.9040	12.8760
0.40	16.3560	-0.3466	9.7350	7.1382
0.35	13.9570	-7.6344	2.7318	0.0632
0.30	11.6770	-14.4100	-6.3952	-7.4196
0.25	9.0601	-20.5670	-15.5720	-3.4886
0.20	5.3598	-24.7980	-14.1400	27.0420
0.15	-0.6531	-22.2620	10.7900	41.7760
0.10	-11.0930	-1.3302	36.9040	39.1640
0.05	-29.1320	32.7690	44.7640	32.6470
0.	-53.5540	38.8750	40.9570	24.7440
-0.05	-50.1780	25.8590	31.8770	14.7680
-0.10	3.1226	12.6610	20.0440	1.1905
-0.15	38.9290	2.9717	6.5525	-16.5370
-0.20	50.0670	-3.3332	-7.5671	-31.1730
-0.25	50.1480	-6.4621	-20.3690	-22.1630
-0.30	44.7890	-6.1796	-27.1940	9.4938
-0.35	35.6910	-1.8565	-17.3340	34.9420
-0.40	23.2750	6.8899	20.7910	43.7510
-0.45	7.5711	17.1920	61.2240	37.2840
-0.50	-11.3840	16.3840	63.3000	19.4840
-0.55	-32.9780	-3.7165	41.3270	-1.0803
-0.60	-54.1120	-14.4130	15.2360	-16.0100
-0.65	-62.1370	0.7827	-8.4082	-24.4680
-0.70	-20.6500	31.1500	-25.1270	-27.8010
-0.75	65.7830	58.5060	-22.0050	-4.9072
-0.80	70.7130	60.5370	26.5160	51.8990
-0.85	25.1980	17.8620	61.1070	56.0920
-0.90	8.1530	-68.2920	-29.9930	5.3339
-0.95	51.6770	-27.9870	26.8090	-42.1160
-1.00	0.0000	0.0000	0.0000	0.0000

U 235

Figure 140

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^{236}U

Energy (MeV)

Energy Levels

5.00

None

6.00

7.00

8.00

9.00

10.00

11.00

12.00

13.00

14.00

15.00

16.00

U 236

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.95	2.4924	-1.1911	5.9559	1.6989
0.90	2.3202	-0.8196	13.9330	13.6060
0.85	0.2156	-1.3489	1.2946	1.5154
0.80	-6.2283	-12.5610	-7.3729	-1.1391
0.75	-29.9020	-42.8790	-15.7050	-5.2422
0.70	32.1350	-60.2990	-31.2070	-11.9470
0.65	37.2990	-20.8270	-53.1940	-5.2392
0.60	29.1610	43.6200	8.9452	17.4650
0.55	24.7940	32.1980	26.0750	19.7170
0.50	21.5930	16.5550	19.7490	17.3590
0.45	18.6260	6.8060	12.3370	14.0010
0.40	15.4680	0.7283	4.8621	9.4808
0.35	11.8640	-3.2062	-3.0547	3.0738
0.30	7.6103	-5.7932	-11.6170	-5.5373
0.25	2.4997	-7.4876	-20.2790	-12.1620
0.20	-3.7352	-8.6409	-25.9160	-0.0839
0.15	-11.4930	-9.6982	-18.1480	27.6140
0.10	-21.4240	-11.4250	14.9700	40.8580
0.05	-34.6290	-14.5030	44.5160	41.2300
0.	-52.7790	-14.8560	44.7400	35.8780
-0.05	-75.6300	-6.2604	32.2390	27.1570
-0.10	-70.7210	3.7993	18.3100	15.4920
-0.15	50.4300	11.7670	5.7223	1.2602
-0.20	89.8950	18.2280	-5.0170	-13.7220
-0.25	71.7890	23.3070	-13.5050	-24.3050
-0.30	53.6780	26.3820	-18.5500	-20.9120
-0.35	40.1450	26.2410	-16.9280	4.4289
-0.40	30.0350	21.1600	-1.3766	40.1770
-0.45	22.2910	8.9957	33.2550	58.4070
-0.50	16.1820	-12.4000	52.8040	51.9640
-0.55	11.0680	-43.1560	31.2190	32.8270
-0.60	6.1441	-71.9400	7.2608	9.8098
-0.65	0.1467	-52.5540	-1.4139	-14.4290
-0.70	-9.0899	38.0490	7.2128	-36.7090
-0.75	-25.5410	85.7310	31.2990	-36.7400
-0.80	-56.9410	64.8920	53.9860	34.2000
-0.85	-98.6040	15.8210	25.0000	75.1870
-0.90	62.5380	-33.6140	-79.4530	-6.8407
-0.95	81.0570	-4.1999	14.5840	2.2110
-1.00	0.0000	0.0000	0.0000	0.0000

U 236

Figure 141

U 236

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE ELASTIC			
	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.95	1.0836	1.0789	6.1637	-1.7897
0.90	1.3753	2.4853	19.6260	8.0629
0.85	0.8052	-1.6602	2.0624	1.7494
0.80	-2.4989	-20.0840	-3.1276	-0.8937
0.75	-22.2270	-36.3860	-9.6349	-4.5516
0.70	44.1870	-54.6420	-22.3850	-8.4592
0.65	28.7870	-88.7410	-32.8120	5.9976
0.60	25.4430	99.5830	9.6242	22.4000
0.55	24.3900	41.8860	21.7710	20.7420
0.50	23.6710	16.4310	19.2170	17.1650
0.45	22.6290	3.9458	14.3230	13.3500
0.40	20.9650	-4.0522	8.2427	8.6901
0.35	18.4900	-9.9937	0.7294	2.3662
0.30	15.0140	-14.7190	-8.4019	-5.5436
0.25	10.2520	-18.4040	-18.0140	-7.4021
0.20	3.7344	-20.6000	-21.8510	15.5040
0.15	-5.3200	-19.5020	-5.0959	37.6500
0.10	-18.2300	-10.0670	28.6320	41.3000
0.05	-37.1100	11.5800	45.9650	37.5200
0.	-63.6320	22.3890	43.8480	30.7760
-0.05	-81.8080	14.5740	33.6540	21.4250
-0.10	-11.5190	6.3356	20.9590	8.7701
-0.15	69.4230	2.1580	7.6489	-7.2119
-0.20	76.5740	1.4774	-5.4447	-22.5420
-0.25	64.1570	3.5039	-17.3300	-25.3170
-0.30	49.6260	7.4942	-25.5710	-5.2583
-0.35	35.6350	12.2630	-23.3440	25.5970
-0.40	22.3540	15.3680	3.9731	46.0400
-0.45	9.7014	11.9960	53.2320	48.1070
-0.50	-2.2158	-5.0395	66.2160	35.8490
-0.55	-12.9500	-36.8060	41.6930	17.5330
-0.60	-21.5330	-52.8740	14.0300	-1.4099
-0.65	-26.3000	-12.7170	-5.3676	-20.4890
-0.70	-25.1150	47.1920	-11.8890	-38.6210
-0.75	-17.6090	74.9670	2.0460	-29.1140
-0.80	-8.8765	61.8170	39.7270	50.3280
-0.85	21.1890	15.2300	39.7970	70.2960
-0.90	73.6430	-53.5940	-64.8410	1.6895
-0.95	78.9000	-43.4080	32.8680	-23.5490
-1.00	0.0000	0.0000	0.0000	0.0000

U 236

Figure 142

U 236

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE		ELASTIC	
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.95	-1.1451	3.9976	4.6074	-4.7493
0.90	-0.8841	7.8188	20.7790	7.4331
0.85	-0.2140	-0.5759	1.8244	2.8485
0.80	-0.7919	-14.6290	-1.5393	-0.2390
0.75	-22.1260	-25.2580	-6.5967	-4.0383
0.70	-13.2550	-42.6440	-16.2870	-5.5006
0.65	16.2730	-79.1470	-17.5680	17.0430
0.60	21.9080	27.1860	13.2200	28.3820
0.55	22.6160	34.2990	19.9560	23.0310
0.50	20.7760	18.6670	18.1320	17.5040
0.45	18.0430	8.0031	14.4870	12.2980
0.40	15.3540	-0.3916	9.4746	6.5546
0.35	12.9670	-7.8540	2.6084	-0.3847
0.30	10.7250	-14.8900	-6.4276	-7.2714
0.25	8.1950	-21.3680	-15.4530	-1.4948
0.20	4.6458	-25.8620	-13.2710	29.3350
0.15	-1.1654	-23.0460	12.1820	41.9650
0.10	-11.4270	-0.4420	37.0120	38.4560
0.05	-29.4520	34.5060	44.0590	31.6820
0.	-53.3430	39.5970	40.2700	23.7620
-0.05	-45.9300	26.1150	31.4640	13.9020
-0.10	6.2507	12.6050	19.8450	0.5257
-0.15	38.2100	2.5530	6.3785	-16.9620
-0.20	48.2080	-4.1481	-7.9075	-31.0320
-0.25	48.4290	-7.6563	-20.8940	-20.3910
-0.30	43.5720	-7.6493	-27.4470	11.7990
-0.35	35.0030	-3.3156	-16.2400	35.8010
-0.40	22.9990	6.0909	23.0870	43.2670
-0.45	7.4988	18.0840	62.1500	36.3260
-0.50	-11.5320	19.1350	63.2440	18.5410
-0.55	-33.5240	-0.7658	41.1270	-2.1106
-0.60	-55.2590	-12.7390	14.7210	-17.0370
-0.65	-63.1420	0.3159	-9.4893	-24.9160
-0.70	-18.7300	29.1490	-26.8150	-26.8090
-0.75	67.6310	56.6570	-23.6820	-2.2489
-0.80	70.1380	60.1600	27.2660	52.4220
-0.85	24.7860	18.5030	64.0210	55.3640
-0.90	6.7267	-68.4240	-28.5780	4.1649
-0.95	50.0250	-25.8810	24.8990	-43.6240
-1.00	0.0000	0.0000	0.0000	0.0000

U 236

Figure 143

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^{237}U

Energy (MeV)

Energy Levels

None

5.00

6.00

7.00

8.00

9.00

10.00

11.00

12.00

13.00

14.00

15.00

16.00

U 237

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE		ELASTIC	
	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.95	2.4061	-1.1574	6.0904	1.6889
0.90	2.2563	-0.8516	13.8630	13.1210
0.85	0.2181	-1.5945	1.2427	1.2299
0.80	-6.1664	-13.6100	-7.3298	-1.4438
0.75	-30.4520	-46.1040	-15.6910	-5.5428
0.70	32.7770	-61.3360	-31.6680	-12.0860
0.65	35.0580	-13.8750	-54.3360	-4.2538
0.60	27.8670	43.1370	10.2770	17.5040
0.55	23.9340	31.4310	25.6900	19.1970
0.50	21.0060	16.0620	19.5250	16.7850
0.45	18.2480	6.1905	12.3040	13.4870
0.40	15.2680	-0.1080	4.9059	9.0783
0.35	11.8170	-4.2719	-3.0562	2.8323
0.30	7.6929	-7.0657	-11.7940	-5.5281
0.25	2.6791	-8.9163	-20.7280	-11.5220
0.20	-3.5082	-10.1230	-26.4890	1.7325
0.15	-11.2960	-11.0120	-17.9610	28.6310
0.10	-21.3860	-12.0720	16.2400	40.4570
0.05	-34.9680	-13.4720	44.9400	40.3560
0.	-53.8150	-11.7170	44.6970	35.0500
-0.05	-76.9990	-3.9446	32.2690	26.5520
-0.10	-63.7000	4.0034	18.3260	15.1120
-0.15	60.5020	10.6420	5.5439	0.9816
-0.20	88.3710	16.4860	-5.5226	-14.0140
-0.25	69.9520	21.4190	-14.3980	-24.3380
-0.30	52.6210	24.6900	-19.7630	-19.7970
-0.35	39.5930	24.9980	-18.0820	6.6909
-0.40	29.7470	20.5020	-1.3680	41.4280
-0.45	22.1200	8.8819	35.5990	58.1220
-0.50	16.0460	-12.2620	55.1940	51.4100
-0.55	10.9260	-43.2370	32.3800	32.3580
-0.60	5.9823	-72.0170	7.4097	9.1642
-0.65	-0.0510	-50.4170	-2.4023	-15.4660
-0.70	-9.3882	39.7400	5.2030	-38.0060
-0.75	-26.1520	84.7140	29.1460	-36.9850
-0.80	-58.3480	64.0830	53.5350	36.6090
-0.85	-98.5070	15.7250	26.4360	76.1420
-0.90	67.0560	-34.2260	-79.0810	-7.1214
-0.95	80.7600	-6.0755	16.3850	-0.5077
-1.00	0.0000	0.0000	0.0000	0.0000

U 237

Figure 144

U 237

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE		ELASTIC	
	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.95	0.8281	1.2720	6.1974	-1.8005
0.90	1.0847	2.6273	19.0970	7.9706
0.85	0.5916	-1.8030	1.8670	1.5182
0.80	-2.4469	-20.8070	-3.2183	-1.1932
0.75	-21.5590	-37.5660	-9.6886	-4.8911
0.70	38.7270	-56.2480	-22.6260	-8.5410
0.65	26.2250	-87.4230	-32.6480	7.0514
0.60	23.6720	99.4930	10.1100	22.3610
0.55	23.0280	41.3900	21.2560	20.2820
0.50	22.6170	16.3530	18.7810	16.6180
0.45	21.8500	3.7864	14.0780	12.8010
0.40	20.4420	-4.4036	8.1495	8.1989
0.35	18.2070	-10.5880	0.7087	2.0331
0.30	14.9490	-15.5910	-8.4636	-5.4567
0.25	10.3740	-19.5700	-18.1840	-6.0787
0.20	3.9899	-21.9990	-21.7720	17.7590
0.15	-5.0334	-20.7960	-4.0243	38.1510
0.10	-18.1180	-10.0990	29.3430	40.6850
0.05	-37.5600	13.9360	45.6080	36.6010
0.	-64.9600	24.3990	43.3910	29.8770
-0.05	-80.2170	15.3200	33.4480	20.6850
-0.10	-1.4673	6.2477	20.9000	8.2286
-0.15	70.6230	1.4403	7.5261	-7.6105
-0.20	74.9630	0.2680	-5.8194	-22.7300
-0.25	62.9230	1.9581	-18.0400	-24.4900
-0.30	49.0070	5.8314	-26.4490	-2.9904
-0.35	35.4310	10.8030	-23.6280	27.4040
-0.40	22.3400	14.5220	5.5599	46.1570
-0.45	9.6821	12.1180	55.3540	47.3060
-0.50	-2.4174	-4.0240	66.8980	35.0020
-0.55	-13.4890	-35.2960	41.8490	16.7400
-0.60	-22.5170	-50.5440	13.7070	-2.2901
-0.65	-27.6830	-11.3620	-6.4172	-21.4020
-0.70	-26.4190	46.0120	-13.7470	-39.0470
-0.75	-17.4140	73.3980	-0.1417	-27.4400
-0.80	-5.1134	61.2900	39.3060	52.2850
-0.85	24.6980	15.5090	42.6520	70.2190
-0.90	72.4700	-53.7220	-62.6640	0.7517
-0.95	78.3030	-43.6260	32.5510	-26.0070
-1.00	0.0000	0.0000	0.0000	0.0000

U 237

Figure 145

U 237

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.95	-1.3242	4.2151	4.5968	-4.7813
0.90	-1.1352	7.9647	19.8880	7.4556
0.85	-0.5063	-0.6006	1.5411	2.7027
0.80	-1.1291	-14.7420	-1.7766	-0.4824
0.75	-25.4210	-25.5220	-6.7962	-4.3734
0.70	-10.6660	-43.6070	-16.4600	-5.5102
0.65	15.4150	-82.3430	-16.8160	18.0320
0.60	20.7180	31.5130	13.4020	28.2750
0.55	21.4680	34.0680	19.4080	22.6430
0.50	19.7280	18.6370	17.5820	17.0060
0.45	17.0440	8.0483	14.0650	11.7290
0.40	14.3550	-0.4091	9.2048	5.9730
0.35	11.9580	-8.0392	2.4791	-0.8289
0.30	9.7309	-15.3350	-6.4517	-7.0794
0.25	7.2696	-22.1410	-15.2920	0.5913
0.20	3.8575	-26.9030	-12.3170	31.4760
0.15	-1.7553	-23.7760	13.5390	42.0600
0.10	-11.8210	0.5476	37.0420	37.7270
0.05	-29.7780	36.1530	43.3290	30.7160
0.	-52.8770	40.2500	39.5710	22.7790
-0.05	-41.3050	26.3750	31.0390	13.0280
-0.10	9.0115	12.5860	19.6420	-0.1464
-0.15	37.3630	2.1830	6.2159	-17.3710
-0.20	46.3390	-4.9153	-8.2226	-30.8040
-0.25	46.6940	-8.8134	-21.3780	-18.4910
-0.30	42.3150	-9.0996	-27.6150	14.0410
-0.35	34.2650	-4.7709	-15.0290	36.5340
-0.40	22.6790	5.3098	25.3010	42.7230
-0.45	7.4018	19.0780	62.8960	35.3510
-0.50	-11.6820	22.0170	63.1250	17.5890
-0.55	-34.0580	2.1672	40.9320	-3.1411
-0.60	-56.3760	-11.1670	14.2360	-18.0390
-0.65	-64.0180	-0.2087	-10.5410	-25.2670
-0.70	-16.5390	27.1280	-28.4840	-25.6400
-0.75	69.3090	54.7840	-25.3160	0.4104
-0.80	69.4660	59.7850	28.0910	52.8000
-0.85	24.3330	19.1870	66.7500	54.6050
-0.90	5.3173	-68.5380	-27.2920	3.0306
-0.95	48.3800	-23.6590	22.8680	-45.0350
-1.00	0.0000	0.0000	0.0000	0.0000

U 237

Figure 146

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^{238}U

Energy (MeV)	Energy Levels*	
5.00	G.S.	0^+
6.00	0.045	2^+
7.00	0.148	4^+
8.00	0.308	6^+
9.00	0.654	1^-
10.00	0.710	3^-
11.00	0.728	5^-
12.00	0.935	0^+
13.00	0.986	2^+
14.00	1.030	2^+
15.00	1.110	3^+
16.00	1.130	4^+
	1.170	4^+

* Energy levels obtained from Moore, et al, BNL 818, 19 (1963).

U 238

COSINE THETA C.M.	POLARIZATION (PERCENT) SHAPE ELASTIC			
	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.95	2.3080	-1.1056	6.2058	1.6770
0.90	2.1782	-0.8642	13.7700	12.6590
0.85	0.2095	-1.8317	1.1851	0.9473
0.80	-6.1032	-14.6910	-7.2844	-1.7535
0.75	-31.0020	-49.3880	-15.6640	-5.8566
0.70	32.6240	-61.4640	-32.1160	-12.2280
0.65	32.9440	-7.0784	-55.4090	-3.2391
0.60	26.6050	42.7070	11.5230	17.5290
0.55	23.0790	30.7490	25.2930	18.6890
0.50	20.4150	15.6020	19.2930	16.2170
0.45	17.8650	5.6024	12.2650	12.9680
0.40	15.0610	-0.9198	4.9533	8.6645
0.35	11.7660	-5.3198	-3.0432	2.5794
0.30	7.7741	-8.3330	-11.9470	-5.5111
0.25	2.8606	-10.3590	-21.1510	-10.8140
0.20	-3.2754	-11.6420	-27.0250	3.5857
0.15	-11.0910	-12.3800	-17.6980	29.5420
0.10	-21.3420	-12.7350	17.4900	40.0040
0.05	-35.3140	-12.2760	45.2770	39.4690
0.	-54.8800	-8.4540	44.6190	34.2090
-0.05	-78.1890	-1.7869	32.2920	25.9300
-0.10	-54.8990	4.1359	18.3560	14.7170
-0.15	68.5330	9.5322	5.3930	0.7056
-0.20	86.6130	14.7780	-5.9965	-14.2750
-0.25	68.2000	19.5480	-15.2640	-24.2830
-0.30	51.6210	22.9880	-20.9580	-18.5430
-0.35	39.0680	23.7210	-19.2110	8.9434
-0.40	29.4690	19.8070	-1.2830	42.5130
-0.45	21.9490	8.7488	37.9630	57.7390
-0.50	15.9020	-12.1140	57.3890	50.8140
-0.55	10.7710	-43.2790	33.4210	31.8780
-0.60	5.8000	-71.9810	7.5219	8.5290
-0.65	-0.2751	-48.1250	-3.3853	-16.4830
-0.70	-9.7185	41.2520	3.2016	-39.2550
-0.75	-26.8050	83.6210	26.9620	-37.0850
-0.80	-59.8100	63.2560	53.0470	39.0180
-0.85	-98.0350	15.6280	27.9470	76.9270
-0.90	71.1890	-34.7960	-78.6020	-7.4730
-0.95	80.5000	-7.8689	18.0690	-3.2291
-1.00	0.0000	0.0000	0.0000	0.0000

U 238

Figure 147

U 238

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE		ELASTIC	
	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.95	0.5698	1.4705	6.2114	-1.8012
0.90	0.7871	2.7751	18.5580	7.8835
0.85	0.3662	-1.9377	1.6604	1.2969
0.80	-2.4039	-21.5320	-3.3221	-1.4894
0.75	-20.6750	-38.7230	-9.7521	-5.2374
0.70	33.9770	-57.7030	-22.8660	-8.6230
0.65	23.8630	-84.1470	-32.3720	8.0914
0.60	21.9910	98.3390	10.5480	22.3130
0.55	21.7100	40.8710	20.7320	19.8370
0.50	21.5790	16.2710	18.3330	16.0800
0.45	21.0640	3.6385	13.8170	12.2480
0.40	19.8950	-4.7344	8.0447	7.6955
0.35	17.8860	-11.1580	0.6868	1.6852
0.30	14.8390	-16.4440	-8.5110	-5.3593
0.25	10.4470	-20.7260	-18.3190	-4.6753
0.20	4.1993	-23.4020	-21.6170	19.9420
0.15	-4.7879	-22.0870	-2.9071	38.5400
0.10	-18.0450	-10.0270	29.9600	40.0350
0.05	-38.0660	16.3770	45.1930	35.6710
0.	-66.2980	26.2690	42.9080	28.9690
-0.05	-77.6270	15.9950	33.2300	19.9300
-0.10	8.2991	6.1573	20.8460	7.6729
-0.15	71.1980	0.7524	7.4244	-8.0054
-0.20	73.2550	-0.9034	-6.1640	-22.8640
-0.25	61.6460	0.4426	-18.7200	-23.5250
-0.30	48.3400	4.1804	-27.2870	-0.6612
-0.35	35.1770	9.3345	-23.8260	29.0820
-0.40	22.2840	13.6660	7.2266	46.1630
-0.45	9.6288	12.2670	57.3200	46.4590
-0.50	-2.6469	-2.9069	67.4610	34.1240
-0.55	-14.0540	-33.6100	41.9810	15.9290
-0.60	-23.5250	-48.1080	13.3970	-3.1650
-0.65	-29.0750	-10.1560	-7.4474	-22.2670
-0.70	-27.6560	44.7280	-15.5920	-39.3360
-0.75	-16.9370	71.7990	-2.3251	-25.5970
-0.80	-1.0770	60.7530	38.9060	54.0850
-0.85	27.6250	15.7940	45.5780	70.0480
-0.90	71.1630	-53.8350	-60.4480	-0.1712
-0.95	77.6870	-43.6640	32.0720	-28.3700
-1.00	0.0000	0.0000	0.0000	0.0000

U 238

Figure 148

U 238

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE ELASTIC			
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.95	-1.4913	4.4233	4.5703	-4.7985
0.90	-1.3764	8.1009	19.0280	7.4754
0.85	-0.8015	-0.6226	1.2537	2.5663
0.80	-1.5015	-14.8360	-2.0258	-0.7200
0.75	-29.3640	-25.7490	-7.0121	-4.7119
0.70	-7.8236	-44.5320	-16.6390	-5.5111
0.65	14.7710	-85.4980	-15.9890	18.9810
0.60	19.6920	35.3310	13.5620	28.1650
0.55	20.4260	33.7840	18.8660	22.2700
0.50	18.7360	18.5900	17.0310	16.5180
0.45	16.0650	8.0959	13.6320	11.1600
0.40	13.3480	-0.4096	8.9194	5.3809
0.35	10.9170	-8.1971	2.3382	-1.2828
0.30	8.6837	-15.7500	-6.4708	-6.8536
0.25	6.2723	-22.8870	-15.0860	2.7558
0.20	2.9843	-27.9200	-11.2740	33.4680
0.15	-2.4304	-24.4500	14.8520	42.0720
0.10	-12.2780	1.6324	36.9930	36.9760
0.05	-30.0850	37.7020	42.5670	29.7400
0.	-52.0600	40.8230	38.8480	21.7850
-0.05	-36.3540	26.6230	30.5890	12.1400
-0.10	11.3600	12.5900	19.4230	-0.8279
-0.15	36.3490	1.8530	6.0550	-17.7580
-0.20	44.4190	-5.6379	-8.5185	-30.4670
-0.25	44.9110	-9.9323	-21.8220	-16.4520
-0.30	40.9970	-10.5270	-27.6930	16.2040
-0.35	33.4630	-6.2187	-13.7000	37.1220
-0.40	22.3050	4.5466	27.4250	42.0990
-0.45	7.2710	20.1610	63.4790	34.3390
-0.50	-11.8450	24.9800	62.9450	16.6160
-0.55	-34.5920	5.0297	40.7290	-4.1737
-0.60	-57.4740	-9.7043	13.7630	-19.0070
-0.65	-64.7440	-0.7718	-11.5810	-25.5110
-0.70	-14.0260	25.1090	-30.1400	-24.3210
-0.75	70.7990	52.8940	-26.8970	2.9855
-0.80	68.6780	59.4040	29.0120	53.0110
-0.85	23.8210	19.8970	69.2770	53.7990
-0.90	3.8857	-68.6510	-26.1450	1.9014
-0.95	46.7440	-21.3160	20.7450	-46.3490
-1.00	0.0000	0.0000	0.0000	0.0000

U 238

Figure 149

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^{239}Pu

Energy (MeV)

Energy Levels

None

5.00

6.00

7.00

8.00

9.00

10.00

11.00

12.00

13.00

14.00

15.00

16.00

PU 239

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.95	2.1949	-1.0380	6.3024	1.6578
0.90	2.0814	-0.8613	13.6590	12.2180
0.85	0.1838	-2.0638	1.1143	0.6657
0.80	-6.0469	-15.8130	-7.2470	-2.0702
0.75	-31.5620	-52.7840	-15.6350	-6.1845
0.70	31.8760	-60.5920	-32.5620	-12.3730
0.65	30.9270	-0.5308	-56.3750	-2.1995
0.60	25.3620	42.3130	12.6400	17.5380
0.55	22.2230	30.1280	24.8560	18.1920
0.50	19.8170	15.1660	19.0410	15.6540
0.45	17.4720	5.0339	12.2160	12.4460
0.40	14.8460	-1.7155	5.0016	8.2389
0.35	11.7100	-6.3594	-3.0166	2.3135
0.30	7.8541	-9.6045	-12.0770	-5.4900
0.25	3.0452	-11.8230	-21.5440	-10.0460
0.20	-3.0356	-13.2040	-27.5110	5.4601
0.15	-10.8770	-13.7990	-17.3410	30.3530
0.10	-21.2920	-13.3880	18.7040	39.5110
0.05	-35.6690	-10.8550	45.5160	38.5740
0.	-55.9730	-5.0653	44.5100	33.3590
-0.05	-79.0910	0.2131	32.3190	25.2890
-0.10	-44.1860	4.1935	18.4110	14.3030
-0.15	74.6380	8.4255	5.2792	0.4219
-0.20	84.6540	13.0930	-6.4325	-14.5160
-0.25	66.4930	17.6900	-16.0990	-24.1540
-0.30	50.6480	21.2760	-22.1310	-17.1640
-0.35	38.5510	22.4200	-20.3020	11.1670
-0.40	29.1890	19.0860	-1.0932	43.4350
-0.45	21.7720	8.6068	40.3610	57.2620
-0.50	15.7490	-11.9450	59.4130	50.1780
-0.55	10.6040	-43.2670	34.3750	31.3910
-0.60	5.6046	-71.8050	7.6175	7.9100
-0.65	-0.5125	-45.6890	-4.3546	-17.4720
-0.70	-10.0620	-42.5640	1.2168	-40.4520
-0.75	-27.4750	-82.4510	24.7640	-37.0480
-0.80	-61.2970	62.4130	52.5460	41.3940
-0.85	-97.1370	15.5250	29.5460	77.5720
-0.90	74.9900	-35.3410	-78.0110	-7.8488
-0.95	80.2710	-9.5669	19.6510	-5.9738
-1.00	0.0000	0.0000	0.0000	0.0000

PU 239

Figure 150

PU 239

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.95	0.3149	1.6750	6.2060	-1.7966
0.90	0.4900	2.9294	18.0160	7.7976
0.85	0.1349	-2.0637	1.4422	1.0815
0.80	-2.3693	-22.2450	-3.4412	-1.7851
0.75	-19.5340	-39.8260	-9.8296	-5.5907
0.70	30.0090	-58.9370	-23.1150	-8.6984
0.65	21.7430	-78.5900	-31.9910	9.1197
0.60	20.4360	96.5270	10.9430	22.2590
0.55	20.4680	40.3470	20.2040	19.4090
0.50	20.5830	16.1940	17.8780	15.5560
0.45	20.2930	3.5130	13.5440	11.7030
0.40	19.3400	-5.0334	7.9290	7.1910
0.35	17.5400	-11.6950	0.6619	1.3355
0.30	14.6900	-17.2670	-8.5491	-5.2370
0.25	10.4770	-21.8650	-18.4270	-3.1859
0.20	4.3642	-24.8070	-21.3940	22.0510
0.15	-4.5815	-23.3800	-1.7506	38.8400
0.10	-18.0080	-9.8627	30.4900	39.3650
0.05	-38.6200	18.8700	44.7280	34.7410
0.	-67.6220	28.0070	42.4030	28.0540
-0.05	-73.9780	16.6190	33.0010	19.1600
-0.10	17.3850	6.0819	20.7960	7.1002
-0.15	71.2790	0.1085	7.3403	-8.3989
-0.20	71.5090	-2.0250	-6.4839	-22.9420
-0.25	60.3520	-1.0338	-19.3740	-22.4150
-0.30	47.6380	2.5464	-28.0860	1.7189
-0.35	34.8850	7.8587	-23.9330	30.6180
-0.40	22.1970	12.7950	8.9583	46.0410
-0.45	9.5522	12.4360	59.1110	45.5470
-0.50	-2.8937	-1.6948	67.9140	33.2120
-0.55	-14.6360	-31.7620	42.0950	15.1150
-0.60	-24.5580	-45.5880	13.0990	-4.0149
-0.65	-30.4950	-9.0837	-8.4621	-23.0720
-0.70	-28.8770	43.3580	-17.4320	-39.5040
-0.75	-16.2570	70.1750	-4.5227	-23.6580
-0.80	3.0880	60.2130	38.5030	55.7190
-0.85	30.0800	16.0810	48.5600	69.8320
-0.90	69.7860	-53.9440	-58.1930	-1.0930
-0.95	77.0310	-43.4870	31.4380	-30.7070
-1.00	0.0000	0.0000	0.0000	0.0000

PU 239

Figure 151

PU 239

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE		ELASTIC	
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.95	-1.6382	4.6213	4.5323	-4.8014
0.90	-1.5975	8.2265	18.2100	7.4936
0.85	-1.0905	-0.6418	0.9625	2.4397
0.80	-1.9095	-14.9070	-2.2864	-0.9501
0.75	-33.9940	-25.9300	-7.2441	-5.0503
0.70	-4.9468	-45.4030	-16.8260	-5.4995
0.65	14.3380	-88.5420	-15.0990	19.8850
0.60	18.8410	38.6110	13.6910	28.0500
0.55	19.5030	33.4740	18.3270	21.9150
0.50	17.8150	18.5430	16.4780	16.0460
0.45	15.1230	8.1548	13.1910	10.5990
0.40	12.3530	-0.3875	8.6213	4.7889
0.35	9.8643	-8.3250	2.1873	-1.7351
0.30	7.6032	-16.1320	-6.4855	-6.5838
0.25	5.2203	-23.6080	-14.8390	4.9856
0.20	2.0386	-28.9230	-10.1560	35.3000
0.15	-3.1861	-25.0830	16.1060	42.0110
0.10	-12.7990	2.7851	36.8710	36.2130
0.05	-30.3840	39.1490	41.7830	28.7670
0.	-50.8900	41.3350	38.1120	20.7910
-0.05	-31.2170	26.8680	30.1240	11.2480
-0.10	13.3480	12.6200	19.1960	-1.5136
-0.15	35.2460	1.5631	5.9000	-18.1200
-0.20	42.5020	-6.3185	-8.7925	-30.0190
-0.25	43.1200	-11.0170	-22.2220	-14.2900
-0.30	39.6450	-11.9370	-27.6760	18.2830
-0.35	32.6140	-7.6679	-12.2580	37.5950
-0.40	21.8890	3.7907	29.4530	41.4300
-0.45	7.1146	21.3190	63.9120	33.3140
-0.50	-12.0130	27.9890	62.7120	15.6360
-0.55	-35.1150	7.7895	40.5270	-5.2081
-0.60	-58.5460	-8.3550	13.3160	-19.9510
-0.65	-65.3280	-1.3714	-12.5910	-25.6560
-0.70	-11.2800	23.0900	-31.7640	-22.8340
-0.75	72.0880	50.9810	-28.4010	5.5465
-0.80	67.8250	59.0060	30.0210	53.0920
-0.85	23.3000	20.6310	71.5860	52.9530
-0.90	2.4913	-68.7520	-25.1200	0.7977
-0.95	45.1230	-18.8990	18.5290	-47.5220
-1.00	0.0000	0.0000	0.0000	0.0000

PU 239

Figure 152

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^{240}Pu

Energy (MeV)

Energy Levels

5.00

None

6.00

7.00

8.00

9.00

10.00

11.00

12.00

13.00

14.00

15.00

16.00

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COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 5 MEV	0 8 MEV	X 11 MEV	. 14 MEV
1.00	-0.	-0.	-0.	-0.
0.95	2.0663	-0.9549	6.3787	1.6401
0.90	1.9651	-0.8423	13.5240	11.7980
0.85	0.1401	-2.2902	1.0323	0.3888
0.80	-5.9982	-16.9700	-7.2127	-2.3900
0.75	-32.1220	-56.1910	-15.5970	-6.5250
0.70	30.6800	-58.6190	-33.0020	-12.5240
0.65	28.9770	5.5397	-57.2230	-1.1439
0.60	24.1270	41.9650	13.6430	17.5380
0.55	21.3560	29.5710	24.3970	17.7090
0.50	19.2020	14.7590	18.7730	15.1010
0.45	17.0620	4.4925	12.1570	11.9230
0.40	14.6170	-2.4849	5.0515	7.8047
0.35	11.6410	-7.3779	-2.9756	2.0367
0.30	7.9261	-10.8670	-12.1810	-5.4622
0.25	3.2261	-13.2970	-21.9040	-9.2114
0.20	-2.7953	-14.7990	-27.9460	7.3469
0.15	-10.6600	-15.2670	-16.8950	31.0620
0.10	-21.2440	-14.0370	19.8700	38.9770
0.05	-36.0430	-9.2227	45.6600	37.6710
0.	-57.0930	-1.6298	44.3610	32.4990
-0.05	-79.5530	2.0487	32.3390	24.6290
-0.10	-31.6220	4.1990	18.4820	13.8690
-0.15	78.9640	7.3429	5.1953	0.1328
-0.20	82.5340	11.4480	-6.8331	-14.7300
-0.25	64.8140	15.8560	-16.9030	-23.9300
-0.30	49.6910	19.5630	-23.2790	-15.6530
-0.35	38.0340	21.0930	-21.3580	13.3390
-0.40	28.9020	18.3330	-0.8246	44.1840
-0.45	21.5830	8.4509	42.7310	56.6920
-0.50	15.5830	-11.7570	61.2400	49.4970
-0.55	10.4230	-43.2010	35.2340	30.8870
-0.60	5.3955	-71.4940	7.6923	7.2967
-0.65	-0.7620	-43.1420	-5.3096	-18.4410
-0.70	-10.4160	43.6790	-0.7564	-41.5970
-0.75	-28.1620	81.2090	22.5390	-36.8810
-0.80	-62.8070	61.5530	52.0190	43.7210
-0.85	-95.7560	15.4260	31.2280	78.0750
-0.90	78.4630	-35.8450	-77.3090	-8.2775
-0.95	80.0820	-11.1720	21.0890	-8.7267
-1.00	0.0000	0.0000	0.0000	0.0000

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Figure 153

PU 240

COSINE
THETA
C.M.

POLARIZATION (PERCENT)
SHAPE ELASTIC

	+ 6 MEV	0 9 MEV	X 12 MEV	. 15 MEV
1.00	-0.	-0.	-0.	-0.
0.95	0.0584	1.8803	6.1824	-1.7830
0.90	0.1857	3.0847	17.4700	7.7147
0.85	-0.1120	-2.1849	1.2131	0.8736
0.80	-2.3552	-22.9400	-3.5753	-2.0793
0.75	-18.0500	-40.8590	-9.9206	-5.9513
0.70	26.6090	-59.8960	-23.3700	-8.7685
0.65	19.8110	-70.6270	-31.4870	10.1340
0.60	18.9750	94.3430	11.2900	22.2000
0.55	19.2740	39.8250	19.6700	18.9950
0.50	19.6050	16.1220	17.4140	15.0410
0.45	19.5180	3.4065	13.2580	11.1570
0.40	18.7610	-5.3034	7.8030	6.6779
0.35	17.1540	-12.1980	0.6370	0.9762
0.30	14.4910	-18.0590	-8.5711	-5.0960
0.25	10.4500	-22.9850	-18.4950	-1.6195
0.20	4.4739	-26.2110	-21.0900	24.0660
0.15	-4.4253	-24.6710	-0.5605	39.0470
0.10	-18.0180	-9.5972	30.9310	38.6720
0.05	-39.2310	21.4070	44.2130	33.8060
0.	-68.8800	29.6260	41.8740	27.1330
-0.05	-69.0050	17.2030	32.7580	18.3760
-0.10	25.6370	6.0268	20.7460	6.5118
-0.15	70.8990	-0.4875	7.2727	-8.7932
-0.20	69.6900	-3.0931	-6.7776	-22.9700
-0.25	59.0100	-2.4676	-19.9990	-21.1800
-0.30	46.8790	0.9320	-28.8410	4.1084
-0.35	34.5360	6.3758	-23.9410	32.0090
-0.40	22.0600	11.9070	10.7540	45.8260
-0.45	9.4376	12.6270	60.7420	44.6040
-0.50	-3.1681	-0.3808	68.2710	32.2810
-0.55	-15.2390	-29.7470	42.1920	14.2860
-0.60	-25.6040	-43.0000	12.8140	-4.8632
-0.65	-31.9060	-8.1353	-9.4578	-23.8410
-0.70	-29.9880	41.9210	-19.2560	-39.5590
-0.75	-15.2330	68.5310	-6.7087	-21.6020
-0.80	7.3405	59.6650	38.1240	57.2140
-0.85	31.9710	16.3740	51.5580	69.5390
-0.90	68.2850	-54.0360	-55.9360	-2.0168
-0.95	76.3560	-43.1650	30.6510	-32.9640
-1.00	0.0000	0.0000	0.0000	0.0000

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Figure 154

PU 240

COSINE THETA C.M.	POLARIZATION (PERCENT)			
	SHAPE		ELASTIC	
	+ 7 MEV	0 10 MEV	X 13 MEV	. 16 MEV
1.00	-0.	-0.	-0.	-0.
0.95	-1.7703	4.8087	4.4794	-4.7906
0.90	-1.8059	8.3394	17.4280	7.5109
0.85	-1.3812	-0.6633	0.6663	2.3216
0.80	-2.3580	-14.9680	-2.5623	-1.1758
0.75	-39.4510	-26.0800	-7.4988	-5.3940
0.70	-2.0388	-46.2410	-17.0260	-5.4799
0.65	14.0830	-91.4260	-14.1390	20.7450
0.60	18.1260	41.3290	13.8000	27.9360
0.55	18.6670	33.1140	17.7950	21.5760
0.50	16.9400	18.4810	15.9250	15.5850
0.45	14.1950	8.2176	12.7380	10.0380
0.40	11.3470	-0.3475	8.3064	4.1872
0.35	8.7799	-8.4251	2.0229	-2.1962
0.30	6.4702	-16.4830	-6.4962	-6.2788
0.25	4.0965	-24.2990	-14.5440	7.2608
0.20	1.0061	-29.8940	-8.9559	36.9750
0.15	-4.0320	-25.6390	17.3000	41.8820
0.10	-13.3860	4.0332	36.6800	35.4330
0.05	-30.6370	40.4860	40.9730	27.7830
0.	-49.2350	41.7830	37.3560	19.7820
-0.05	-25.9570	27.1120	29.6390	10.3340
-0.10	14.9500	12.6780	18.9580	-2.2173
-0.15	34.0140	1.3154	5.7525	-18.4700
-0.20	40.5450	-6.9544	-9.0391	-29.4710
-0.25	41.2880	-12.0650	-22.5720	-12.0280
-0.30	38.2380	-13.3230	-27.5600	20.2490
-0.35	31.7030	-9.1061	-10.7240	37.9290
-0.40	21.4180	3.0651	31.3500	40.6880
-0.45	6.9197	22.5840	64.1910	32.2560
-0.50	-12.2000	31.0550	62.4280	14.6370
-0.55	-35.6410	10.4580	40.3260	-6.2417
-0.60	-59.5950	-7.1037	12.8920	-20.8600
-0.65	-65.7280	-2.0013	-13.5810	-25.6950
-0.70	-8.2549	21.0750	-33.3750	-21.2210
-0.75	73.1650	49.0560	-29.8500	7.9851
-0.80	66.8630	58.6120	31.1300	53.0280
-0.85	22.7020	21.4090	73.6850	52.0660
-0.90	1.0596	-68.8360	-24.2120	-0.3078
-0.95	43.5070	-16.3980	16.2250	-48.6130
-1.00	0.0000	0.0000	0.0000	0.0000

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Figure 155