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ABSTRACT

Tabulated differential cross sections are presented for the production spectra of proton, deuteron, triton, helium-3, and alpha particles from ^{120}Sn bombarded by 62- and 29-MeV protons. Continuum cross sections in $\sim$ 1-MeV bins are listed for 19 angles for 62-MeV incident protons, and for 5 angles for 29-MeV protons. The low-energy cutoffs range from 2 to 6 MeV for the different exit particle types. Angular distributions are given for excitation, by 62-MeV protons, of states at 0, 1.17, and 2.38 MeV in ^{120}Sn; and at 0, 0.73, 1.02, and 1.29 MeV in ^{119}Sn. Only the elastic scattering cross sections are given for incident 29-MeV protons, since there is an inadequate amount of data for angular distributions.

INTRODUCTION

This report gives tabulated differential cross sections for proton, deuteron, triton, helium-3, and alpha particles produced in a target of ^{120}Sn under bombardment by 62- and 29-MeV protons. The outgoing particles were counted over an energy range from as low as 1.8 MeV up to the maximum energy which is kinematically possible. The lower energy limit depended upon the type of particle and the experimental conditions. The details of the experimental and data analysis systems have been reported.[1] Previous documents in this series give data for other targets.[2]

METHOD

Protons were accelerated by the Oak Ridge Isochronous Cyclotron, momentum analyzed to $\sim 0.1\%$ in momentum in the facility's 153-deg magnet, and focused on the target in a spot approximately 8 mm in diameter. The charged reaction products were detected within a 1.2-m dia evacuated scattering chamber in a three-counter telescope composed of two silicon surface barrier ΔE dectors, about 100 and 500 microns in thickness, and a lithium-drifted germanium stopping detector.[3] This novel spectrometer contributed an energy resolution of approximately 180 keV (FWHM) for 62-MeV protons. Data were obtained from four analog-to-digital converters for each event, processed and written onto magnetic tape by an on-line PDP-8 computer, and later analyzed on the Laboratory's IBM-360 computers and on the PDP-8.

Secondary particles were identified unambiguously, by a combination of $\Delta E \times E$ and flight-time vs E methods, over the whole energy range from a few MeV to 62 MeV. Figure 1 illustrates the particle separations typically obtained in the two sets of ΔE by E discrimination arrangements, and a best example of operation of the flight-time mass discrimination system. In some runs the mass resolution was about twice as coarse as that illustrated. Figure 1a shows a vertical line at about 4.8 MeV which is caused by a weak α-emitting calibration source built into the system. The weak distribution in Figure 1b below the proton distribution is caused by protons over 9.2 MeV which fail to register in the stopping detector. Those below about 7.3 MeV are identified in the standard analysis program and placed in the spectrum distributed over the energy range corresponding to the observed ΔE. The similar distribution in Figure 1c

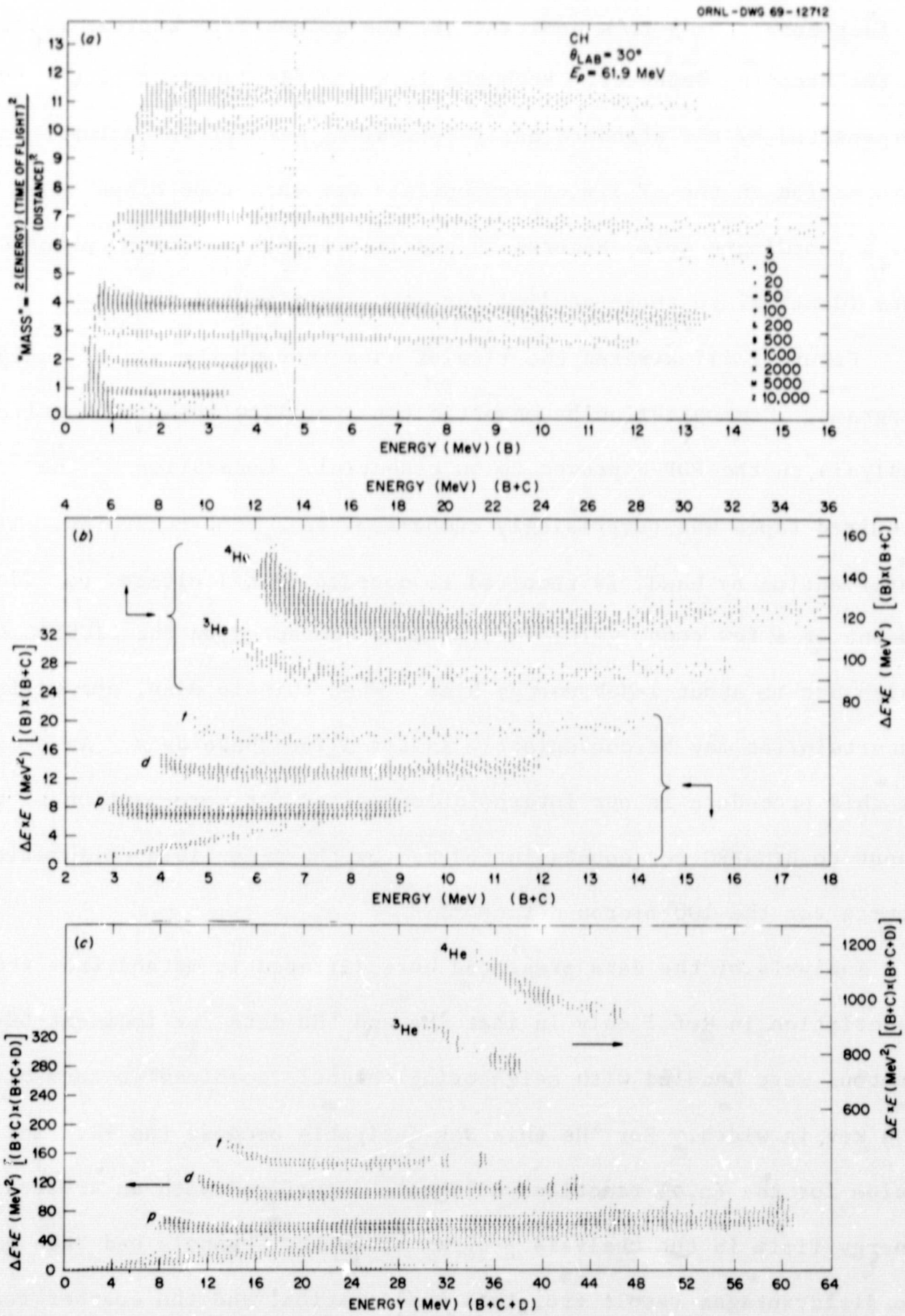

Fig. 1. Event Density Maps Illustrating Particle-Type Discrimination. In each 'map' the average density of each symbol represents the number of events observed in a two-dimensional region, as indicated in the legend of (a). The upper figure represents the apparent mass distribution in the 100-micron B detector as given by flight-time observations. The center map (b) shows the ($\Delta E \times E$) vs E distribution of particles stopped in the 500-micron C detector, while (c) illustrates the similar distribution for particles stopped in the germanium detector (D).

in fact corresponds to a constant ΔE, and arises from nuclear reactions in the stopping detector. Both the loss and displacement of events are compensated by the standard analysis system. Except for omission of information on the ΔE limits appropriate for each type of particle and for a coordinate grid, Figures 1b and 1c are photographs of printed outputs identical to those studied for each experimental run.

Figure 2 illustrates the flow of data through the set of analysis programs. Communication by magnetic tape to allow some interactive analysis on the PDP-8 proved to be essential. Generation of the required tapes was surprisingly cumbersome and time-consuming. If intervention by hand is required to correct difficulties peculiar to one or a few runs, values are usually corrected on the BINSPEC outputs which are in about 1-MeV energy bins. When this is done, nonstatistical uncertainties may be conveniently inserted for these data. An exception to this procedure is our interpolation method for compensation at the input to BINSPEC for counts introduced by the α-particle calibration source for the 100-micron detector.

Analysis of the data presented here differed in method from the description in Ref 1 only in that ^{3}He and ^{4}He data for incident 60-MeV protons were handled with neighboring channels combined to form bins 100 keV in width. For ^{4}He this was desirable because the +2.7 MeV Q value for the (p,α) reaction would have interfered with an arbitrary upper energy limit in the analysis program if 50-keV channels had been employed. No disadvantages result from this modification, and the coarser resolution allowed the dead-layer correction for the nickel foil over the stopping detector described in Ref 1 to function better.

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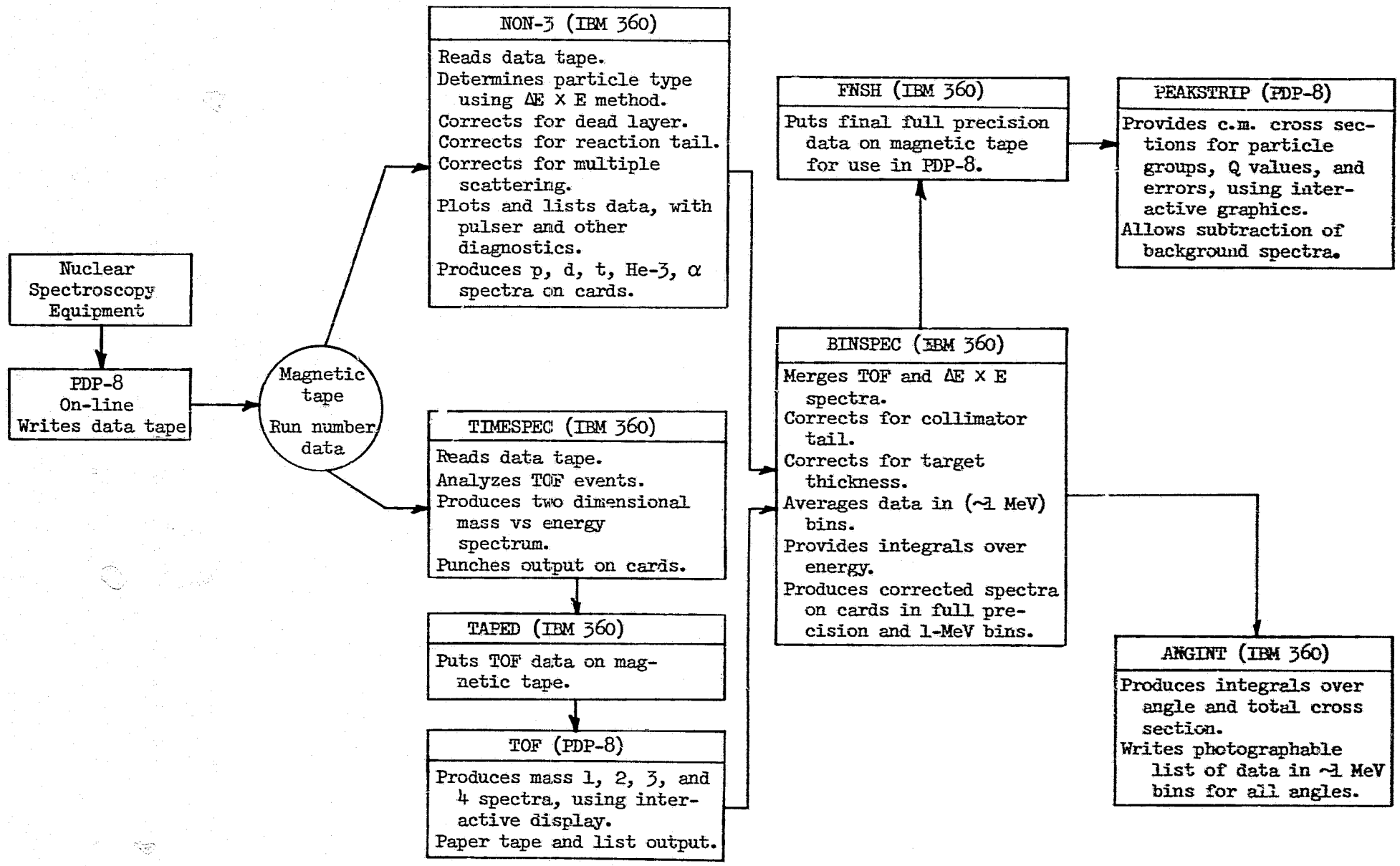

Fig. 2. Data Flow Through the Analysis Programs.

The ^{120}Sn target was fabricated by the Isotopes Division of the Oak Ridge National Laboratory. Target properties are listed in Table 1 along with other experimental parameters and the assigned systematic uncertainties. The systematic uncertainty is increased for areas of low cross section, such as most of the ^{3}He data, because the lines in ΔE by E space which distinguish events among the particle types are derived empirically on the basis of observed events, and scattered counts are not always detected in cells of the size illustrated in Figure 1. The difficulty was mitigated when chronologically neighboring runs on other targets gave many more particles of a given type, or when very long runs were made. This systematic bias is nearly always unidirectional, though for some runs a bit of the high-ΔE tail of the distribution of deuterons may have been misidentified as tritons.

Table 2 lists the low-energy cutoffs for the data presented in this report. The low-energy cutoffs for the alpha-particle and proton data were determined by a low energy background from a lighter-element contaminant in the target. Analysis by x-ray spectroscopy indicated a nickel component of 1. ± .4 mol %, fairly consistent with observations, and a small oxygen contamination. The cutoffs have been chosen so that the cross sections for only the lowest energy bins of the proton and alpha-particle data are affected by the nickel contaminant, by an amount thought comparable with the stated uncertainty.

Table 3 gives a list of the factors by which counts in the various runs must be multiplied to give laboratory-system cross sections in millibarns/steradian. These factors are based on the foil thickness and geometry, the detector solid angle, and the electric charge collected by a carefully constructed faraday cup. (See Ref 1, pages 46 and 81.)

TABLE 1

Experimental Parameters and Uncertainties

^{120}Sn Target					
Thickness				4.85 ± 0.05 mg/cm^2	
Uniformity				± 1%	
Isotopic Purity				98.4% ^{120}Sn, 0.5% ^{118}Sn, 0.4% ^{119}Sn, 0.3% ^{124}Sn, 0.4% other	
Beam Energies					
0100 runs				61.50 MeV	
2000 runs				61.89 MeV	
7000 runs				60.86 MeV	
0000 runs				28.81 MeV	
Collimators used:	Penetration Parameter[a]	Material	Thickness	Area(±1.5%)	Distance(±1%)
0100 runs	2.2	Ta	0.432cm	0.522cm^2	45.8cm
0000 runs	2.2	Ta	0.013cm	0.522cm^2	45.9cm
2000 runs	4.2	Ni	0.653cm	0.183cm^2	46.2cm
7000 runs	3.2	Ni	0.653cm	0.265cm^2	46.4cm

Detector Angle		± 0.5 deg
Zero Angle		± 0.5 deg
Angular Resolution (for 0000 and 0100 Runs)		± 1.2 deg
Target Angle		± 0.5 deg
Beam Spot Diameter		0.8 cm
Beam Spot "walk"		± 0.4 cm
Collimator misalignment at chamber center		± 0.5 cm
Uncertainty in various corrections to data		± 2%
Uncertainty in number of protons striking target		± 1%
Uncertainty in dead time measurement		± 2%
Combined systematic uncertainty		± 5%
Combined systematic undertainty for spectra with unusually small cross section		+ 10%
Combined systematic uncertainty for	20-deg data	± 10%
	25-deg data	± 20%

[a] See Ref. 1 for a description of the role of this parameter of the collimator penetration correction.

Table 2

^{120}Sn Low-Energy Cutoffs

Particle Type	Cutoff	Reason
	62-MeV Incident Proton Energy	
Proton	1.8 MeV	TOF Background from Target Contaminant
Deuteron	4.6 MeV	No Events Visible in TOF Data
Triton	5.7 MeV	Mass-3 Ambiguity in TOF Data
Helium-3	13.2 MeV	Lack of TOF Data
Alpha	11.0 MeV (15 MeV)	Target Contaminant (temporary difficulty in the tape-writing program)
	28.8 MeV Indicent Proton Energy	
Proton	1.9 MeV	TOF Background from Target Contaminant
Deuteron	4.6 MeV	No Events Visible in TOF Data
Triton	5.7 MeV	Mass-3 Ambiguity in TOF Data
Helium-3	13.2 MeV	Lack of TOF Data
Alpha	11.0 MeV	Target Contaminant

Table 3

List of Angles, Run Numbers, and Factors

^{120}Sn

Lab Angle (deg)	Run Number	Factor
	62 MeV	
12	0124	3.04(-2)[a]
15	0125	1.09(-2)
20	2012	4.14(-3)
25	2050	5.33(-3)
30	7124	1.36(-3)
35	2005	7.15(-4)
40	2036	3.27(-3)
45	7127	1.41(-3)
50	2037	1.36(-3)
55	2044	1.60(-3)
60	7123	8.49(-4)
65	2045	1.60(-3)
70	2027	1.20(-3)
75	2022	2.39(-4)
82	2026	8.12(-4)
90	7121	4.16(-4)
99	0133	2.83(-4)
110	7122	9.84(-4)
135	2057	2.41(-4)
160	2062	3.98(-4)
	28 MeV	
15	0011	1.57(-2)
30	0002	5.37(-3)
60	0005	3.81(-4)
90	0006	3.32(-4)
125	0020	2.97(-4)

[a] Read as 3.04×10^{-2}

The data tabulated in this report have been corrected to remove in first order the effects of energy loss of scattered particles in the target, penetration of the edges of the detector collimator, multiple scattering of secondary protons by the ΔE detectors, the nickel window "dead" layer covering the germanium detector, and nuclear reactions of hydrogen particles in the germanium detector. The correction techniques are described in Ref 1.

The magnitudes of the "tail" correction for nuclear reactions in the germanium detector and for collimator edge penetration are both dependent upon the number and spectral distribution of the recorded counts. These corrections are significant only for protons at scattering angles less than about 30 deg, where the spectra are dominated by strong elastic scattering, and the corrections generally fall rapidly with angle within that range. The uncertainty in the correction for collimator penetration is taken as 20% of the correction, which is approximately proportional to pulse height. This uncertainty is significant only for the 62-MeV data at 12 and 15 deg, as shown in the table below. The uncertainty in the reaction tail correction is taken as 25% of the correction, which rises from zero to its full value between 35 and 45 MeV for the 62-MeV data (between 17 and 21 MeV for the 29-MeV data) and then remains roughly constant up to the elastic peak. The cross section uncertainty in the standard correction is tabulated below for the runs in which it is significant. These uncertainties must be combined with the overall uncertainties of Table 2 and with statistical uncertainties.

Angle [deg]	Cross section uncertainty from reaction tail correction at 45 MeV [mb(ster-MeV)$^{-1}$]	Cross section uncertainty from collimator edge penetration at 45 MeV [mb(ster-MeV)$^{-1}$]
	62 MeV Incident Proton	
12	1.7	.7
15	.54	.2
20	.02	.02
30	.06	.04
	29 MeV Incident Proton	
15	.8	.5
30	.02	.03

The secondary proton data at 25 deg for 62 MeV incident protons has been discarded because a large amount of "tail", uncompensated by the standard correction, was found in the results for this run. The estimated systematic uncertainty for this run was increased for the other particle spectra. For similar reasons the overall uncertainty in the 20 deg data is listed as ±10%. This difficulty was discovered and its magnitude estimated by examination of the number of events with energy below ~ 40 MeV and outside all proper $\Delta E \times E$ regions, in comparison with the magnitude above ~ 40 MeV of the standard reaction-tail correction for protons.

The secondary proton data at 60 and 90 deg for incident 29 MeV protons has been discarded because of a temporary high threshold in one of the ΔE detectors. The diagnostic pulse-height spectrum for that detector indicated that the threshold was not high enough to affect the spectra observed for heavier particles. Since proton spectra remain for only three angles for the data at 29 MeV, no integrals over angle can be given for this case.

The secondary particle spectra in the tables and graphs below often show a local effect at the energy corresponding to stopping of

particles in the nickel foil which covered the germanium detector. The effect is exaggerated or hidden depending on the precision of the gain measurement in the second (500 micron) silicon detector, and also depends on the pulse height threshold in the stopping detector. The discontinuities appear at about 9, 12, and 15 MeV for protons, deuterons, and tritons, respectively; and at about 33 and 35 MeV for ^{3}He and ^{4}He. The total number of recorded counts is not affected.

RESULTS

Figures 3 and 4 show the proton spectra at 30 deg from ^{120}Sn bombarded by protons of 62 MeV; Figure 5 shows the corresponding spectrum for incident protons of 29 MeV. The small peaks at about $\sim$ .8 and $\sim$ .4 MeV, excitation, respectively, in Figs. 4 and 5 are thought to arise from the oxygen contamination of the target. The differential cross sections for the elastic scattering of 62- and 29-MeV protons are listed in Table 4, and the differential cross sections for excitation by 62-MeV protons of states in ^{120}Sn at 1.16 and 2.39 MeV are listed in Table 5. (These levels were also seen for the 29-MeV incident protons.) The cross section for the 2.39 MeV level was extracted from a combination which included <u>at least</u> two other levels of excitation $\sim$ 2.21 and $\sim$ 2.63 MeV, though this is not apparent in the excitation plot of Figure 4. Due to the difficulties in extracting the cross section for the 2.39 MeV level, the relative uncertainty given for it at each angle is ± 25%. The Q-values listed are those extracted from the experiment by adjusting ground-state values to zero, and are estimated to be uncertain by ± .02 MeV. The levels of lowest excitation are in good agreement with a recent experiment using lower energy incident protons.[4] Inelastic cross sections were not extracted from the data

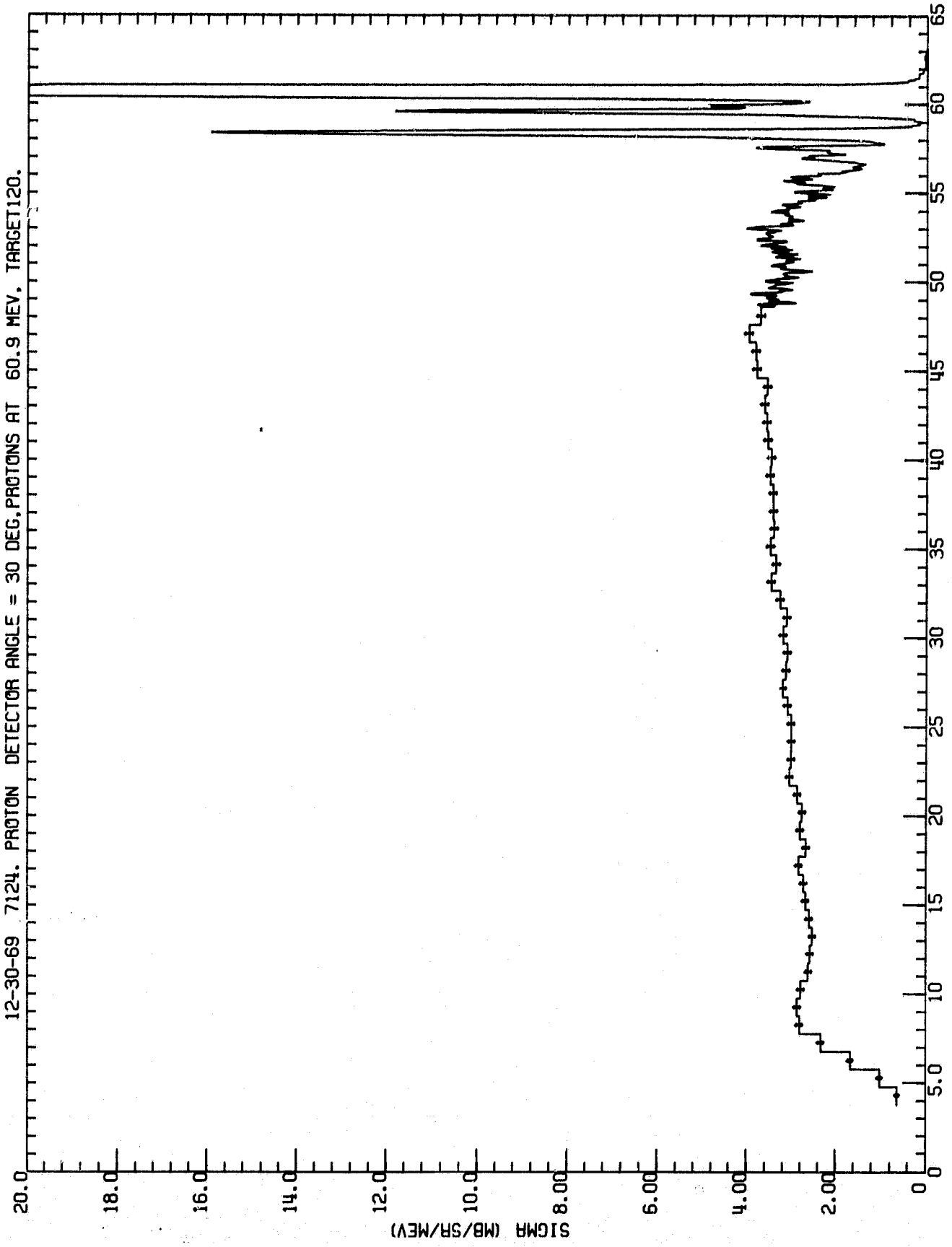

Fig. 3. Proton Spectrum Observed at 30 deg from 62-MeV Protons on ^{120}Sn.

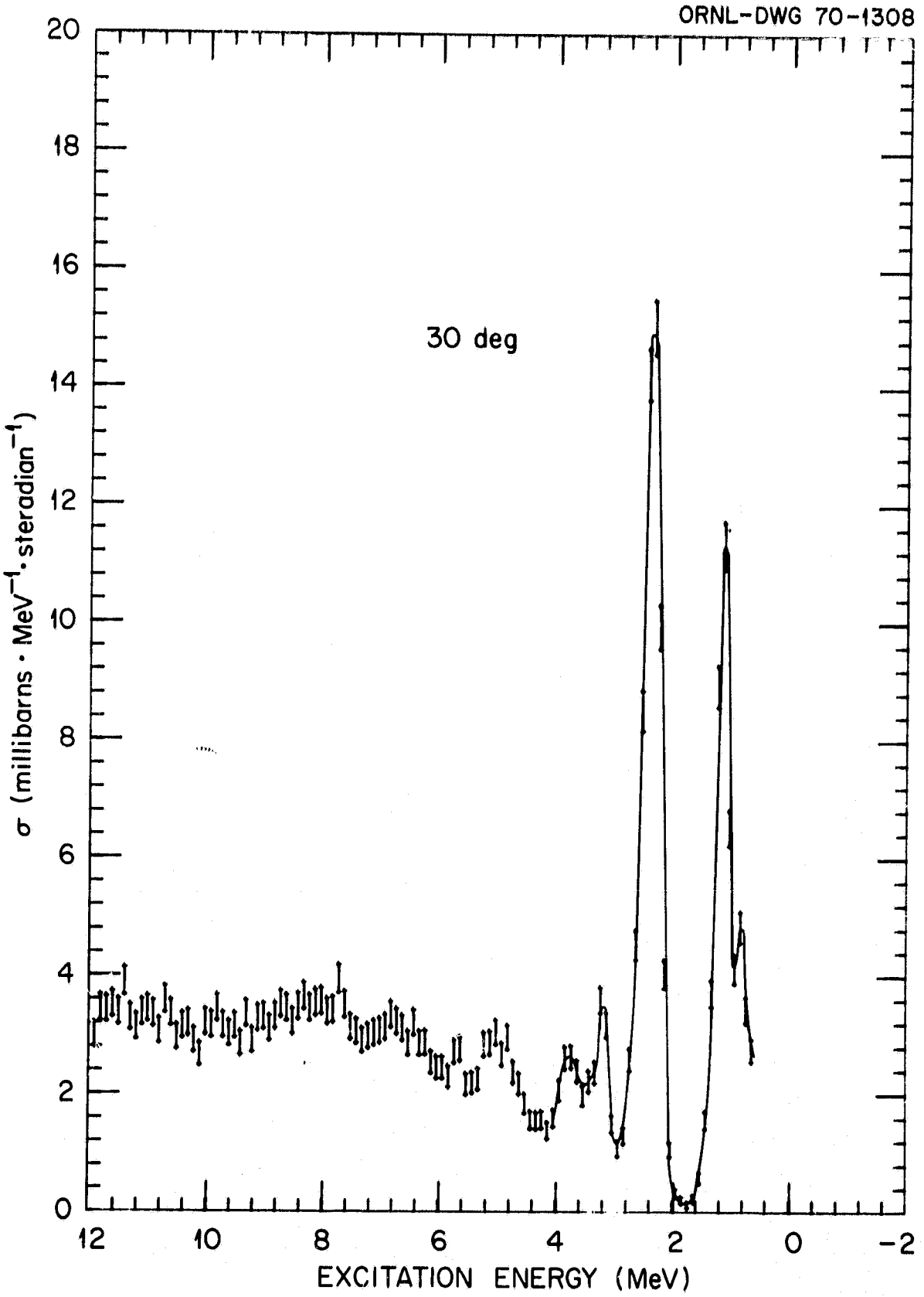

Fig. 4. Proton Spectrum vs Excitation Energy Observed at 30 deg from 62-MeV Protons on ^{120}Sn, less Elastic Scattering.

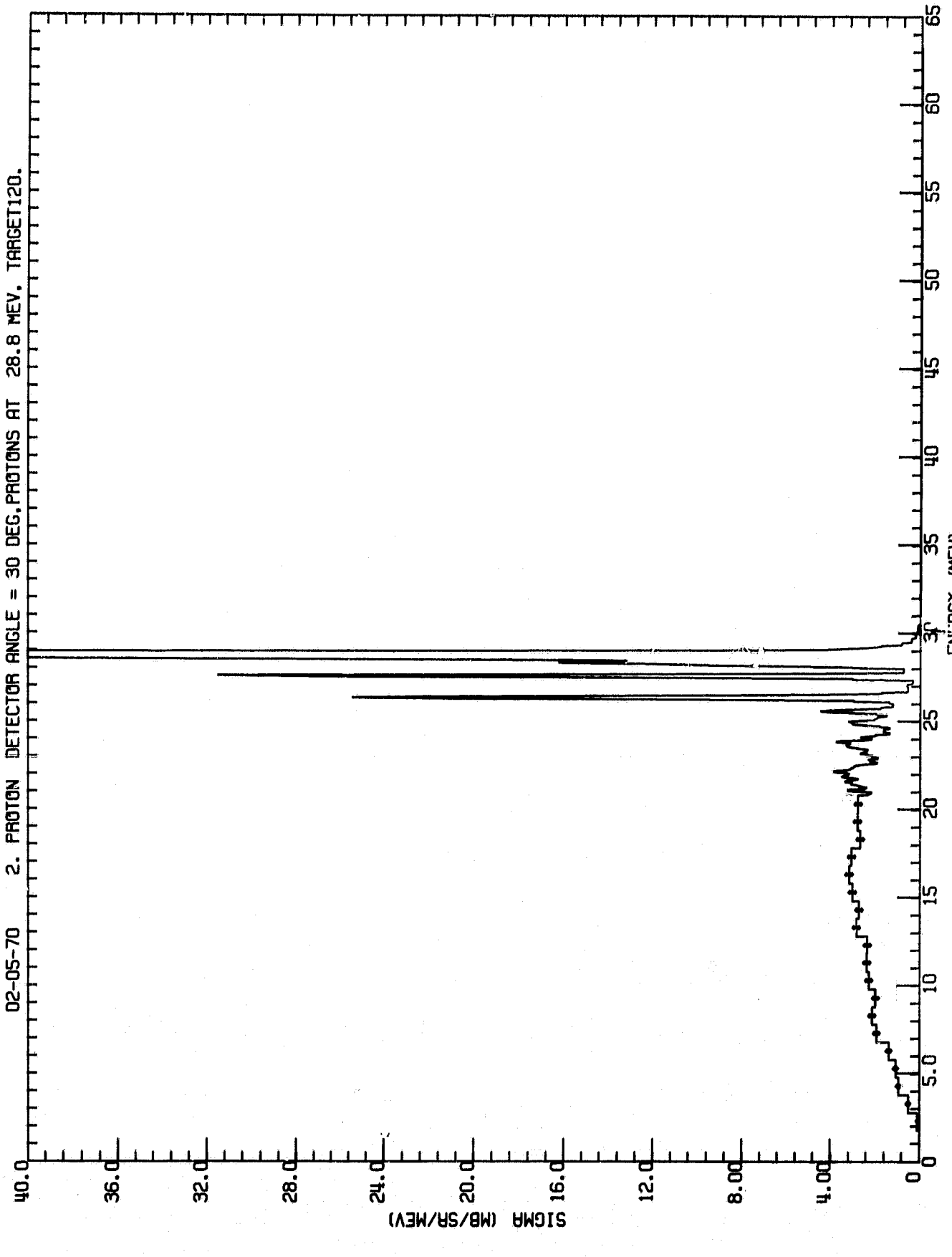

Fig. 5. Proton Spectrum Observed at 30 deg from 29-MeV Protons on ^{120}Sn.

Table 4

Tabulated Differential Cross Sections

$^{120}Sn(p,p)^{120}Sn$

Elastic Scattering

C.M.Angle (deg)	Cross Section (C.M.) (mb/sr)	Uncertainty (±%)
	62 MeV	
15.0	2150.	0.2
20.0	49.4	1.0
30.1	217.0	0.2
35.3	16.8	0.7
40.3	34.2	0.9
45.2	36.6	0.6
50.2	6.6	1.4
55.4	4.84	1.8
60.4	7.5	1.0
65.4	2.19	2.7
70.4	0.95	3.5
75.4	1.09	1.4
82.4	0.58	3.7
90.5	0.304	3.7
99.5	0.260	3.3
110.5	0.060	13.
135.4	0.019	11.
160.5	0.0037	30.
	28.8 MeV	
15.2	8465.	0.1
30.2	501.	0.3
125.5	0.88	1.8

Table 5

$^{120}Sn(p,p')^{120}Sn$

E_p = 62 MeV

C. M. Angle (deg)	C. M. Cross Section (mb/sr)	Uncertainty (±%)	C. M. Angle (deg)	C. M. Cross Section (mb/sr)	Error (±%)
	1.16 MeV Level			2.39 MeV Level	
15.1	14.7	3.	15.1	14.5	25.
20.	6.7	3.	20.2	13.2	25.
30.2	3.22	2.1	30.1	5.6	25.
35.3	2.77	1.8	40.2	2.5	25.
40.3	0.83	6.5	45.2	1.24	25.
45.2	0.68	5.1	50.3	0.53	25.
50.3	0.94	3.8	55.3	0.73	25.
55.3	0.52	5.6	60.4	0.48	25.
60.4	0.294	5.5	65.4	0.24	28.
65.4	0.224	9.0	70.4	0.19	30.
70.4	0.203	7.8	75.4	0.18	35.
75.4	0.078	5.7	82.4	0.090	30.
82.4	0.081	10.			
90.5	0.082	7.5			
99.5	0.025	11.			
110.5	0.032	19.			
135.5	0.008	17.			
160.5	0.0022	40.			

taken with 29 MeV incident protons since only a few angles were represented. Unless otherwise stated, the errors shown in the data tables are based on Poisson statistics and should be used in combination with the overall systematic uncertainty shown in Table 2. The cross sections in Table 5 (and Table 6 cited below) have been corrected for isotopic purity in those cases for which uncertainties are listed as less than 4%.

Fig. 6 shows the deuteron spectrum at 30 deg for incident 61-MeV protons, and Fig. 7 shows the same for 29-MeV incident protons. Fig. 8, an excitation plot of the data given in Fig. 7, is shown with neighboring channels combined in pairs. States in ^{118}Sn were observed at 0, 0.71, 1.01, and 1.30 MeV, the lower excitation levels being in good agreement with the reported level structure. Differential cross sections are listed in Table 6 for these states in ^{119}Sn. It was impossible to separate the ground state from the first two excited states of ^{119}Sn since the total separation of the three levels is only 90 keV compared to the 180 keV energy resolution. The cross sections listed for the ground state therefore contain whatever cross section the next two states contribute. The cross sections for the 0.71, 1.01, and 1.30 MeV levels were difficult to extract, so the listed uncertainties for these levels have been increased above the level given by Poisson statistics.

Figs. 9 and 10 show the differential energy spectra (integrated over angle) of each observed particle type for the two bombarding energies. The integrals over angle were obtained by using a trapezoidal quadrature formula which assumed that the cross sections at zero degrees may be extrapolated linearly against cos θ based on the cross sections at the two smallest data

Table 6

$^{120}Sn(p,d)^{119}Sn$

E_p = 62 MeV

C. M. Angle (deg)	C. M. Cross Section (mb/sr)	Error (±%)	C. M. Angle (deg)	Cross Section (mb/sr)	Error (±%)
	Ground State (Q = -6.89 MeV)			1.01 MeV Level	
			15.3	2.3	30.
15.2	5.05	4.8	20.2	2.4	30.
20.2	4.01	10.	25.3	1.5	30.
25.3	1.83	10.	30.3	0.70	30.
30.3	1.62	2.9	40.5	0.25	32.
40.4	0.48	8.4	50.5	0.067	35.
45.4	0.42	6.1	55.5	0.084	35.
50.5	0.31	6.9	60.6	0.035	50.
55.5	0.18	9.6	65.6	0.031	35.
60.6	0.143	7.9	70.6	0.039	22.
65.6	0.128	12.			
70.6	0.076	13.			
75.6	0.057	6.6			
82.6	0.042	14.		1.30 MeV Level	
90.8	0.031	12.			
99.8	0.018	13.	15.3	0.79	35.
			20.2	0.66	32.
	.71 MeV Level		25.3	0.66	32.
			30.3	0.31	50.
15.2	4.1	32.	40.5	0.088	35.
20.2	2.4	30.	50.5	0.046	35.
25.3	1.4	32.	55.5	0.038	35.
30.3	0.87	30.	60.6	0.027	35.
40.4	0.41	34.	70.7	0.011	38.
50.5	0.21	34.			
55.5	0.15	35.			
60.6	0.15	30.			
65.6	0.72	40.			
70.6	0.047	17.			

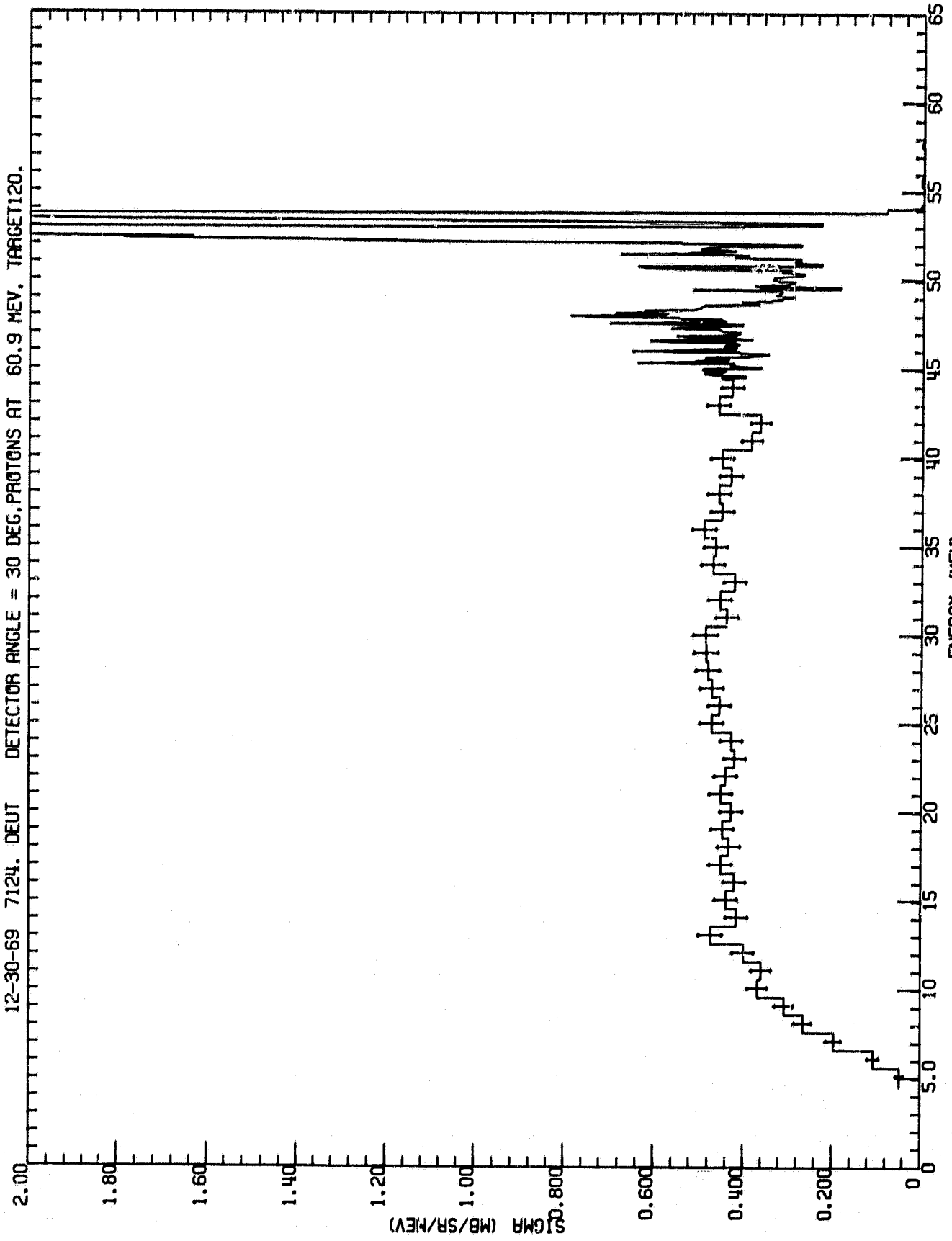

Fig. 6. Deuteron Spectrum Observed at 30 deg from 62-MeV Protons on ^{120}Sn.

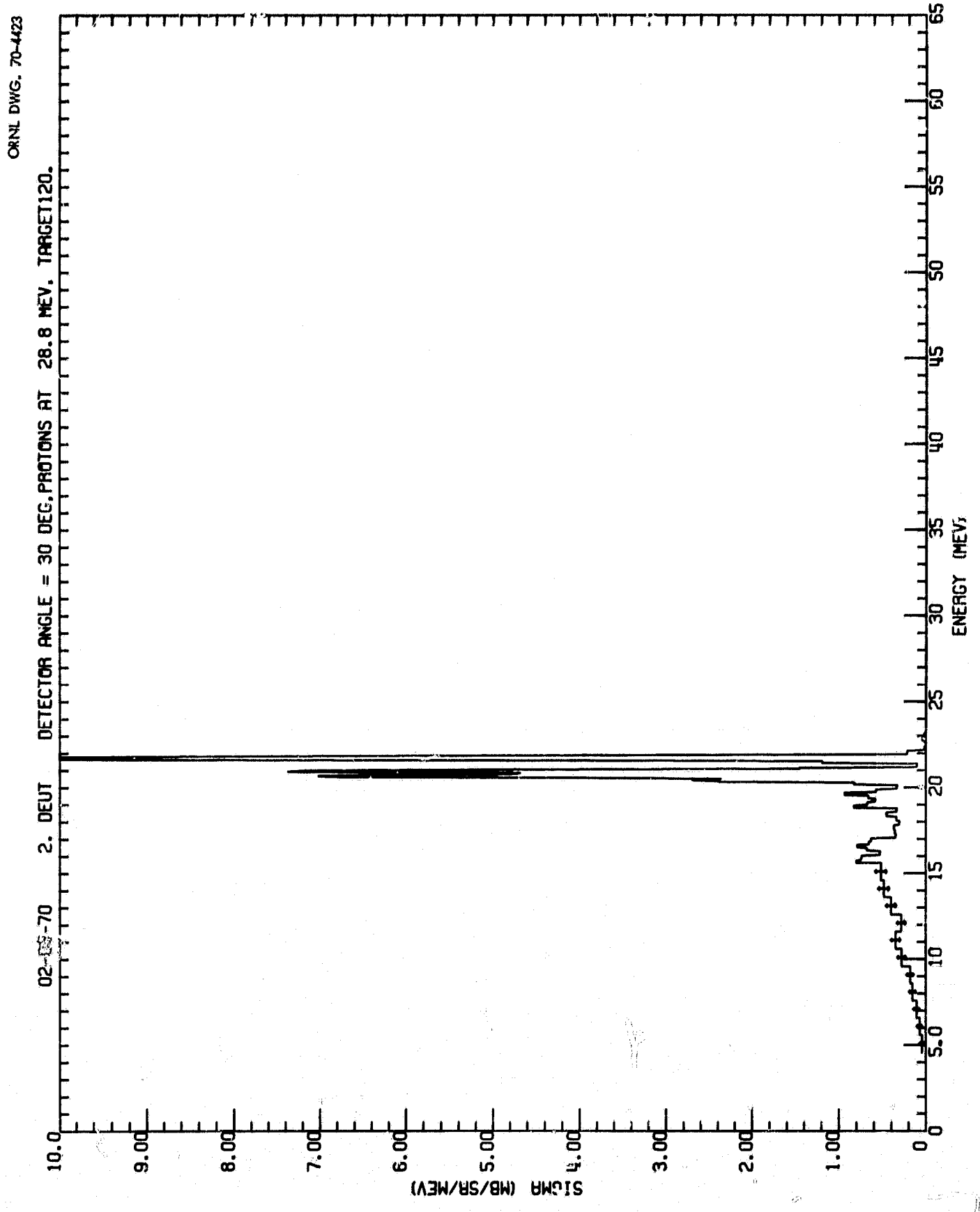

Fig. 7. Deuteron Spectrum Observed at 30 deg from 29-MeV Protons on ^{120}Sn.

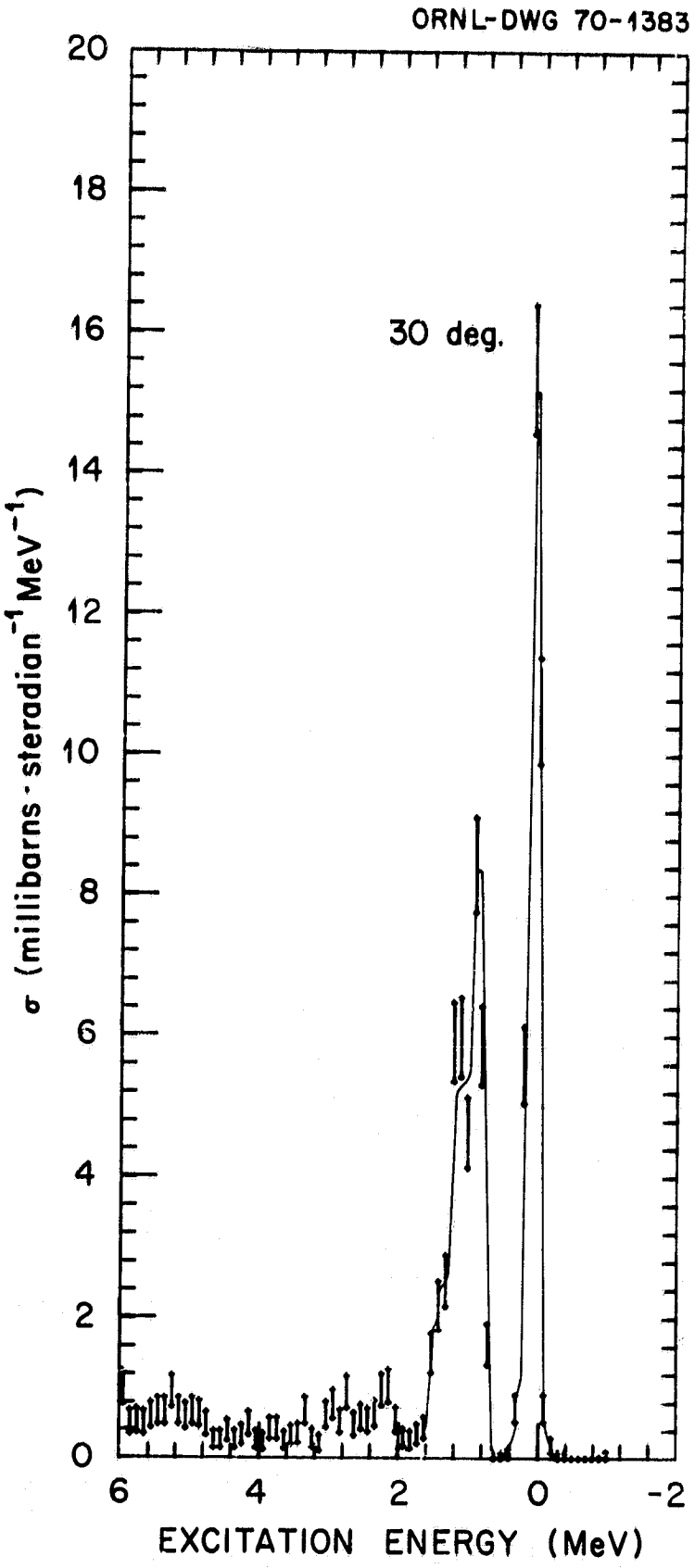

Fig. 8. Deuteron Spectrum vs Excitation Energy Observed at 30 deg from 29-MeV Protons on ^{120}Sn.

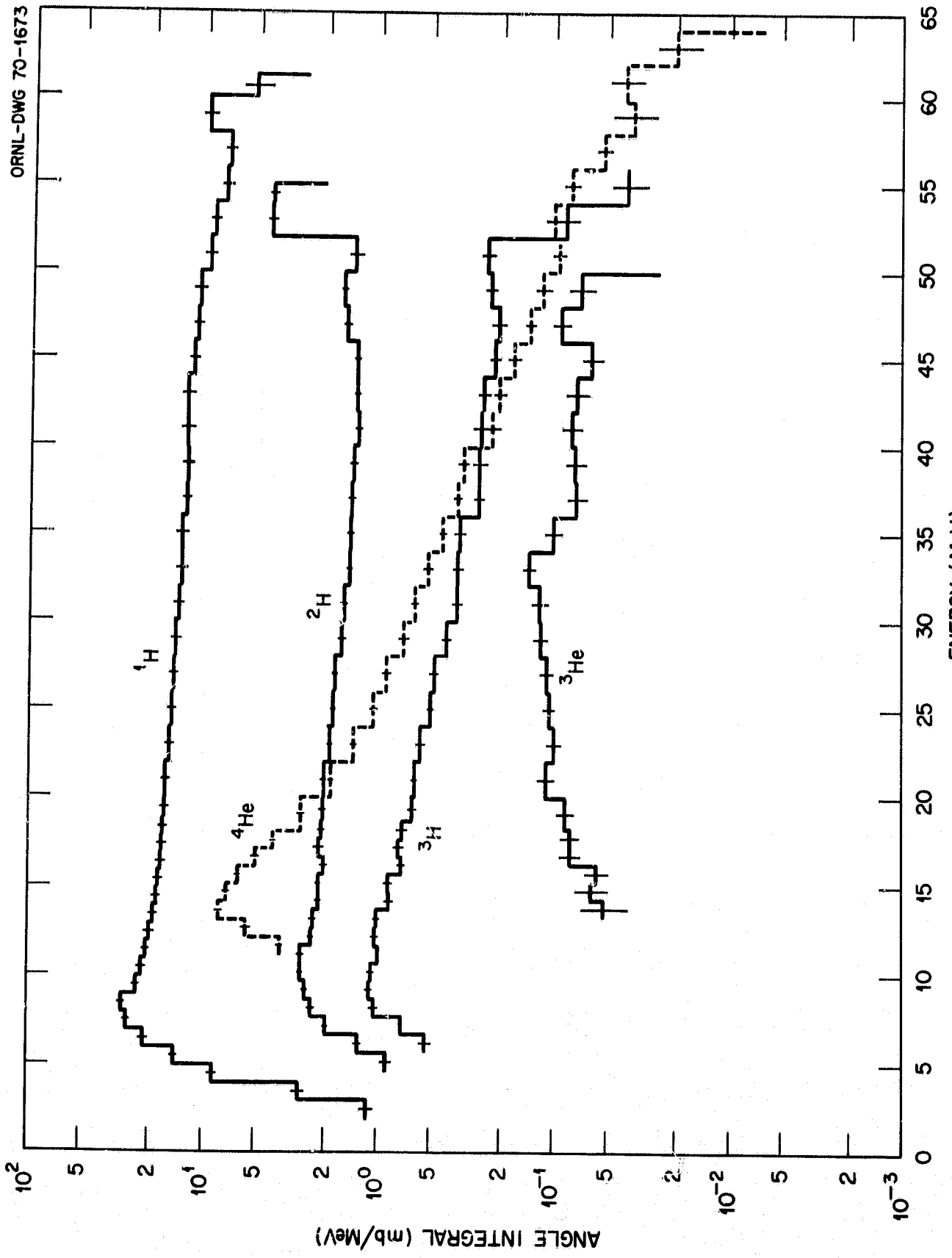

Fig. 9. Differential Energy Spectra for Hydrogen and Helium Particles from 62-MeV Protons on ^{120}Sn.

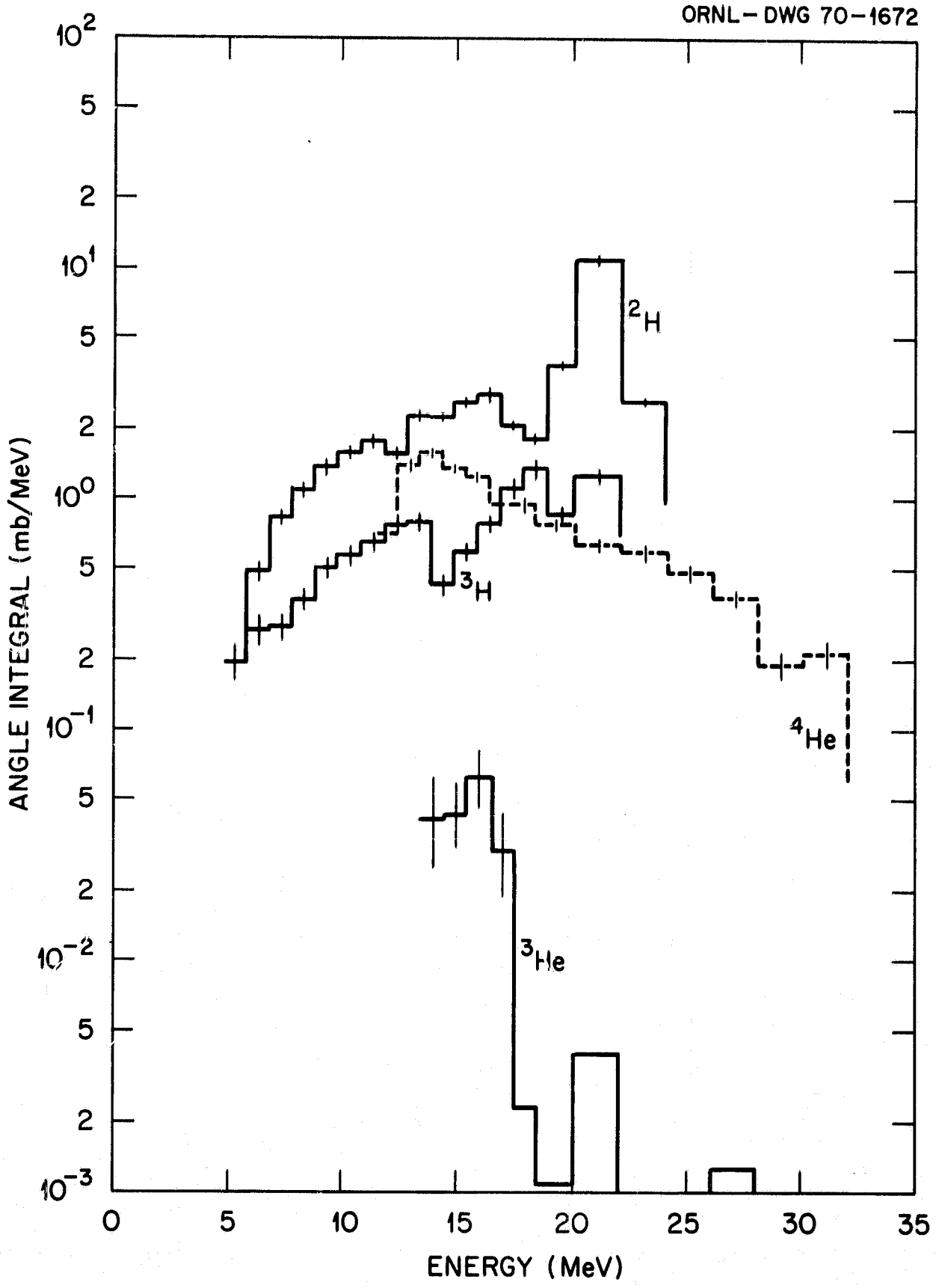

Fig. 10. Differential Energy Spectra for Hydrogen and Helium Particles from 29-MeV Protons on ^{120}Sn.

angles, and that the cross sections at 180 deg are equal to the cross section at the largest angle at which data were obtained. The assumption at the lower end of the angle range is questionable. The uncertainties in these graphs and in the corresponding tables cited below combine the statistical propagation with the estimated uncertainty in the extrapolation to zero angle. Tables 7 and 8 list the binned laboratory cross sections integrated over angle for each particle type for 62- and 29-MeV proton bombardment, respectively, in units of millibarns/MeV; the energy listed is for the lower edge of each bin.

As observed above, Tables 7 and 8 are based on a quadrature formula which extrapolates the cross section vs angle to $\cos\theta = 1$, while previous reports[1] assumed a cross section constant below the smallest angle observed. For most cases the difference in assumptions changed the result by an amount comparable to the statistical uncertainty, but for the proton spectrum in Table 7 the extrapolation changed the grand integral by 34 mb because the proton cross section observed at 12 deg is about twice the magnitude of that at 15 deg! In Tables 7 and 8 the listed uncertainties are the rms combination of statistical uncertainties and the difference between the two assumptions at $\cos\theta = 1$. In the case of the proton integral spectra, the systematic contribution is dominant.

Table 9 shows the energy integrated laboratory cross section in units of millibarns/steradian, and the average energies in MeV, at each angle, for the two incident energies used. This table also lists the low-energy cutoffs for the data from each angle. The total cross sections in millibarns, average energy in MeV, and average forward

Table 7. Angle Integrated Cross Sections ^{120}Sn

62-MeV Protons Incident[a]

Bin Energy (MeV)	Cross Section (mb/MeV)	Error (mb/MeV)	Bin Energy (MeV)	Cross Section (mb/MeV)	Error (mb/MeV)	Bin Energy (MeV)	Cross Section (mb/MeV)	Error (mb/MeV)
	Proton			Deuteron			Triton	
1.96	1.13	0.08	4.60	0.88	0.06	5.63	0.525	0.040
2.96	2.78	0.15	5.61	1.28	0.03	6.63	0.721	0.023
3.95	8.53	0.39	6.62	1.95	0.04	7.64	1.028	0.039
4.95	14.4	0.5	7.62	2.36	0.05	8.64	1.092	0.032
5.94	21.5	0.6	8.63	2.57	0.05	9.64	1.075	0.031
6.94	26.7	0.7	9.63	2.73	0.05	10.64	0.989	0.035
7.93	28.3	0.7	10.64	2.72	0.05	11.64	1.025	0.030
8.93	23.5	0.7	11.65	2.39	0.05	12.64	1.006	0.C32
9.92	22.2	0.7	12.65	2.29	0.05	13.64	0.853	0.029
10.92	20.9	0.7	13.66	2.15	0.05	14.65	0.862	0.031
11.91	20.0	0.8	14.66	2.14	0.05	15.65	0.727	0.029
12.91	19.1	0.7	15.67	2.03	0.05	16.65	0.752	0.035
13.90	18.3	0.6	16.68	2.14	0.05	17.65	0.722	0.034
14.89	17.9	0.6	17.68	2.09	0.05	18.65	0.628	0.026
15.89	17.4	0.6	18.69	2.04	0.05	20.00	0.616	0.019
16.88	17.2	0.7	20.00	2.01	0.04	22.00	0.573	0.020
17.88	16.9	0.7	22.00	1.872	0.035	24.00	0.499	0.018
18.87	16.6	0.6	24.00	1.795	0.034	26.00	0.473	0.019
20.00	16.4	0.8	26.00	1.754	0.038	28.00	0.403	0.016
22.00	15.7	0.7	28.00	1.603	0.032	30.00	0.352	0.017
24.00	15.1	0.7	30.00	1.559	0.032	32.00	0.351	0.016
26.00	14.9	0.8	32.00	1.476	0.033	34.00	0.341	0.019
28.00	14.5	0.8	34.00	1.449	0.033	36.00	0.269	0.015
30.00	14.0	0.8	36.00	1.429	0.033	38.00	0.270	0.016
32.00	13.5	0.7	38.00	1.40	0.04	40.00	0.260	0.015
34.00	13.4	0.8	40.00	1.31	0.04	42.00	0.255	0.016
36.00	12.6	0.7	42.00	1.34	0.04	44.00	0.222	0.015
38.00	12.6	0.8	44.00	1.35	0.05	46.00	0.211	0.020
40.00	12.7	0.9	46.00	1.54	0.05	48.00	0.234	0.016
42.00	12.7	1.0	48.00	1.61	0.04	50.00	0.244	0.019
44.00	11.7	0.7	50.00	1.39	0.11	52.00	0.087	0.013
46.00	11.2	0.6	52.00	4.23	0.22	54.00	0.039	0.009
48.00	10.9	0.7	54.00	4.16	0.14	56.00	0.0	
50.00	9.5	0.7	55.03	0.0				
52.00	9.1	0.5						
54.00	7.8	0.4						
56.00	7.5	0.5						
58.00	9.9	0.7						
60.00	5.3	1.0						
61.25	0.0							

[a]Elastic Proton Scattering has been excluded.

Table 7. (continued)

Bin Energy (MeV)	Cross Section (mb/MeV)	Error (mb/MeV)	Bin Energy (MeV)	Cross Section (mb/MeV)	Error (mb/MeV)	Bin Energy (MeV)	Cross Section (mb/MeV)	Error (mb/MeV)
	Helium-3			Alpha				
13.20	0.051	0.015	11.11	3.57	0.09			
14.20	0.060	0.011	12.10	5.57	0.15			
15.20	0.056	0.007	13.10	7.87	0.17			
16.19	0.080	0.010	14.09	7.25	0.16			
17.19	0.080	0.008	15.09	6.20	0.09			
18.19	0.085	0.009	16.09	4.99	0.07			
20.00	0.111	0.010	17.08	3.90	0.06			
22.00	0.098	0.008	18.08	2.718	0.039			
24.00	0.105	0.008	20.00	1.845	0.031			
26.00	0.109	0.008	22.00	1.368	0.027			
28.00	0.118	0.009	24.00	1.053	0.024			
30.00	0.120	0.011	26.00	0.893	0.025			
32.00	0.139	0.010	28.00	0.720	0.021			
34.00	0.101	0.010	30.00	0.614	0.020			
36.00	0.074	0.009	32.00	0.519	0.020			
38.00	0.075	0.009	34.00	0.425	0.017			
40.00	0.079	0.010	36.00	0.352	0.015			
42.00	0.074	0.010	38.00	0.329	0.016			
44.00	0.062	0.007	40.00	0.228	0.014			
46.00	0.092	0.009	42.00	0.208	0.015			
48.00	0.072	0.011	44.00	0.171	0.012			
50.00	0.018	0.021	46.00	0.138	0.011			
50.05	0.0		48.00	0.118	0.010			
			50.00	0.096	0.008			
			52.00	0.101	0.011			
			54.00	0.082	0.009			
			56.00	0.054	0.007			
			58.00	0.036	0.011			
			60.00	0.040	0.010			
			62.00	0.020	0.007			
			64.00	0.001	0.001			
			66.00	0.0				

Table 8

Angle Integrated Cross Sections

^{120}Sn

28.8 MeV Protons Incident[a]

Bin Energy (MeV)	Cross Section (mb/MeV)	Error (mb/MeV)	Bin Energy (MeV)	Cross Section (mb/MeV)	Error (mb/MeV)	Bin Energy (MeV)	Cross Section (mb/MeV)	Error (mb/MeV)
	Deuteron			Triton			Alpha	
4.65	0.197	0.033	5.70	0.274	0.038	11.18	0.72	0.06
5.65	0.498	0.041	6.71	0.281	0.033	12.19	1.43	0.06
6.66	0.85	0.05	7.71	0.370	0.037	13.19	1.63	0.07
7.66	1.11	0.06	8.72	0.51	0.04	14.20	1.37	0.06
8.67	1.41	0.07	9.72	0.58	0.05	15.20	1.26	0.07
9.67	1.64	0.08	10.73	0.67	0.05	16.21	0.96	0.06
10.68	1.85	0.08	11.73	0.80	0.06	17.21	0.97	0.06
11.68	1.58	0.08	12.74	0.83	0.07	18.22	0.785	0.044
12.69	2.36	0.10	13.74	0.43	0.05	20.00	0.643	0.037
13.69	2.29	0.10	14.75	0.60	0.06	22.00	0.601	0.040
14.70	2.71	0.11	15.75	0.81	0.06	24.00	0.485	0.037
15.70	2.94	0.12	16.76	1.16	0.08	26.00	0.378	0.033
16.71	2.10	0.10	17.76	1.41	0.09	28.00	0.195	0.025
17.71	1.83	0.09	18.77	0.88	0.07	30.00	0.219	0.028
18.72	3.88	0.14	20.00	1.31	0.06	32.00	0.0	
20.00	11.34	0.27	22.00	0.0				
22.00	2.69	0.12						
24.00	0.00							
				Helium-3				
			13.34	0.042	0.016			
			14.35	0.044	0.014			
			15.35	0.064	0.018			
			16.36	0.030	0.011			
			17.36	0.002	0.002			
			18.37	0.001	0.001			
			20.00	0.004	0.004			
			22.00	0.000	0.000			
			24.00	0.001	0.001			
			26.00	0.001	0.001			
			28.00	0.0				

[a]Proton scattering has been excluded because data was not available at a sufficient number of angles.

Table 9

Energy Integrated Differential Cross Sections and Average Energies for ^{120}S [a]

Lab Angle (deg)	Proton [b] σ ± Δσ (mb/sr)	Proton Ē (MeV)	Proton COE (MeV)	Deuteron σ ± Δσ (mb/sr)	Deuteron Ē (MeV)	Deuteron COE (MeV)	Triton σ ± Δσ (mb/sr)	Triton Ē (MeV)	Triton COE (MeV)	Helium-3 σ ± Δσ (mb/sr)	Helium-3 Ē (MeV)	Helium-3 COE (MeV)	Alpha σ ± Δσ (mb/sr)	Alpha Ē (MeV)	Alpha COE (MeV)
							62-MeV Incident Proton Energy								
12	605.0 ± 4.3	32.7	3.8	53.6 ± 1.3	41.2	4.6	9.5 ± 0.5	31.2	5.6	2.0 ± 0.2	34.6	13.3	11.8 ± 0.6	26.1	11.2
15	324.6 ± 1.9	36.3	3.8	46.6 ± 0.7	40.2	4.6	8.8 ± 0.3	31.5	5.6	1.58 ± 0.13	34.9	13.3	11.0 ± 0.3	26.1	11.2
20	212.2 ± 1.0	36.7	3.8	39.9 ± 0.4	39.3	4.6	7.4 ± 0.2	29.5	5.7	1.32 ± 0.07	35.9	13.3	10.3 ± 0.2	25.2	11.1
25				28.6 ± 0.4	36.3	4.6	6.1 ± 0.2	27.9	5.6	1.09 ± 0.08	33.2	13.2	9.8 ± 0.2	24.8	11.1
30	172.8 ± 0.5	34.3	3.8	23.5 ± 0.2	33.7	4.6	5.75 ± 0.09	26.3	5.6	0.90 ± 0.04	34.2	13.2	7.2 ± 0.1	26.9	15.4
35	128.0 ± 0.3	34.0	2.4	18.0 ± 0.1	32.9	4.6	4.22 ± 0.06	26.2	5.7	0.68 ± 0.02	32.8	13.4	6.7 ± 0.1	24.8	13.9
40	124.5 ± 0.6	31.5	2.0	14.8 ± 0.2	30.2	4.6	3.97 ± 0.11	24.8	5.6	0.63 ± 0.04	32.4	13.2	7.8 ± 0.2	22.3	11.1
45	104.3 ± 0.4	30.7	1.8	13.6 ± 0.1	29.2	4.6	3.71 ± 0.07	22.9	5.6	0.53 ± 0.03	32.1	13.2	5.3 ± 0.1	25.2	15.4
50	89.5 ± 0.4	29.0	2.0	11.2 ± 0.1	28.3	4.6	3.03 ± 0.06	23.0	5.6	0.442 ± 0.025	31.4	13.2	6.7 ± 0.1	21.0	11.1
55	74.7 ± 0.3	27.7	2.0	8.8 ± 0.1	26.8	4.6	2.46 ± 0.06	21.6	5.7	0.367 ± 0.024	29.7	13.2	5.9 ± 0.1	20.3	11.1
60	69.4 ± 0.2	26.9	1.8	8.8 ± 0.1	25.8	4.6	2.44 ± 0.05	21.2	5.7	0.295 ± 0.016	29.1	13.2	3.96 ± 0.06	23.5	15.4
65	56.5 ± 0.3	24.9	2.0	6.7 ± 0.1	25.0	4.6	1.87 ± 0.06	19.9	5.7	0.246 ± 0.020	29.1	13.3	5.30 ± 0.09	19.3	11.1
70	49.1 ± 0.2	23.9	1.8	6.0 ± 0.1	23.8	4.6	1.69 ± 0.05	19.6	5.7	0.224 ± 0.016	28.0	13.3	5.03 ± 0.08	18.9	11.1
75	41.3 ± 0.1	22.0	1.8	4.73 ± 0.03	22.5	4.6	1.34 ± 0.02	18.4	5.7	0.142 ± 0.006	27.0	13.4	4.27 ± 0.03	18.4	11.2
82	37.3 ± 0.2	20.9	1.7	4.33 ± 0.06	21.8	4.7	1.21 ± 0.03	18.0	5.7	0.142 ± 0.011	26.6	13.2	4.45 ± 0.06	18.0	11.2
90	31.7 ± 0.1	19.5	3.8	3.73 ± 0.04	20.2	4.7	1.16 ± 0.02	16.6	5.7	0.110 ± 0.007	26.1	13.4	2.27 ± 0.03	21.4	15.6
99	25.9 ± 0.1	18.3	3.8	2.97 ± 0.03	19.4	4.6	0.87 ± 0.02	16.4	5.7	0.084 ± 0.005	25.8	13.3	3.47 ± 0.03	17.2	11.2
110	25.4 ± 0.2	16.4	2.0	2.66 ± 0.05	17.7	4.6	0.83 ± 0.03	14.8	5.7	0.065 ± 0.008	24.3	13.3	3.89 ± 0.06	16.3	11.1
135	20.9 ± 0.1	14.2	2.0	1.91 ± 0.02	14.6	4.6	0.59 ± 0.01	12.9	5.6	0.036 ± 0.003	23.0	13.1	3.75 ± 0.03	15.3	11.0
160	18.5 ± 0.1	13.7	3.7	1.53 ± 0.03	13.9	4.6	0.49 ± 0.01	12.4	5.5	0.037 ± 0.004	21.1	13.0	3.36 ± 0.04	15.0	10.9
							28.8-MeV Incident Proton Energy								
15	265.6 ± 2.0	15.8	3.8	30.5 ± 0.7	19.5	4.6	5.5 ± 0.3	16.9	5.7	0.12 ± 0.04	15.0	13.2	1.76 ± 0.24	21.2	11.1
30	65.5 ± 0.6	17.9	1.8	12.6 ± 0.3	18.5	4.6	2.71 ± 0.12	16.1	5.7	0.027 ± 0.012	17.0	13.3	2.86 ± 0.12	20.4	11.1
60				4.54 ± 0.04	16.8	4.6	1.18 ± 0.02	15.8	5.7	0.014 ± 0.002	17.0	13.3	1.26 ± 0.02	18.2	11.2
90				1.62 ± 0.02	15.1	4.8	0.41 ± 0.01	14.4	5.8	0.009 ± 0.002	16.0	13.5	0.75 ± 0.02	16.5	11.4
125	10.2 ± 0.1	12.5	1.9	0.78 ± 0.02	13.8	4.7	0.189± 0.007	13.1	5.7	0.005 ± 0.001	15.0	13.4	0.59 ± 0.01	15.3	11.3

[a] These integrals cover the entire spectrum above the experimental cutoff energy (COE). The uncertainties shown were derived from counting uncertainties, and are generally unimportant compared with the systematic uncertainties given in Table 2.

[b] Elastic proton scattering has been excluded.

Table 10

Integral Cross Sections[a]

Particle	$\sigma \pm \Delta\sigma$ (mb)	$\bar{E}$ (MeV)	$\overline{pc \cos\theta}$[b] (MeV)	Lower Energy Limit (MeV)
		62 MeV		
Proton[c]	811. ± 7.	27.9	1.3×10^2	2.0
Deuteron	95.1 ± 0.6	29.9	2.0×10^2	4.6
Triton	23.6 ± 0.2	22.6	1.8×10^2	5.6
Helium-3	3.34± 0.08	31.3	2.6×10^2	13.2
Alpha	63.2 ± 0.4	19.4	0.89×10^2	11.1
		28.8 MeV		
Deuteron	56.5 ± 0.7	17.8	1.7×10^2	4.6
Triton	12.5 ± 0.3	15.8	1.8×10^2	5.7
Helium-3	0.20± 0.03	15.9	1.5×10^2	13.3
Alpha	14.8 ± 0.3	18.5	1.5×10^2	11.2

[a] All quantities have been summed above the indicated energy cutoffs. The statistical standard errors must be combined with the systematic uncertainties in Table 2.

[b] Average forward momentum

[c] Elastic proton scattering has been excluded.

momenta in MeV/c, are listed in Table 10 for each incident energy. The secondary proton cross sections listed do not include the elastic scattering cross sections, while the cross sections for the other secondary particles include all observed events. Since not all spectra have the same lower cutoff energy, results from individual angles were rebinned in a rather complex way. For the 62-MeV data, 7 angles were included in even the lowest energy bins; and for the 29-MeV data, 3 angles were included in the lowest bin.

Tables 11 through 15 list for each angle the laboratory cross section for proton, deuteron, triton, helium-3, and alpha particle production from 62-MeV incident protons on ^{120}Sn, averaged over 0.4-MeV wide bins at low energy and 1-MeV wide bins elsewhere, in units of millibarns(steradian-MeV)$^{-1}$. The bin energies listed are for the center of each bin. Tables 16-20 list analogous cross sections for 28.8-MeV incident protons. All cross sections are listed for energies above the cutoffs shown in Table 9.

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TABLE 11

PROTON FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

12 DEG - RUN 124			15 DEG - RUN 125			20 DEG - RUN 2012			30 DEG - RUN 7124			35 DEG - RUN 2005		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERRGR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
4.28	4.860	0.384	4.28	2.063	0.150	4.30	0.969	0.063	4.26	0.641	0.030	2.91	0.087	0.008
5.29	6.489	0.444	5.28	2.292	0.158	5.31	1.328	0.074	5.26	1.024	0.037	3.92	0.374	0.016
6.29	7.824	0.488	6.28	3.171	0.186	6.31	2.048	0.092	6.25	1.674	0.048	4.93	0.694	0.022
7.29	9.71	0.54	7.29	4.11	0.21	7.32	2.99	0.11	7.25	2.33	0.06	5.95	1.14	0.03
8.29	10.79	0.57	8.29	5.10	0.24	8.32	3.27	0.12	8.25	2.82	0.06	6.96	1.73	0.03
9.29	9.06	0.52	9.29	3.87	0.21	9.33	2.42	0.10	9.24	2.87	0.06	7.97	2.07	0.04
10.30	9.82	0.55	10.29	4.57	0.22	10.34	2.66	0.10	10.24	2.79	0.06	8.98	1.91	0.04
11.30	10.18	0.56	11.29	4.57	0.22	11.34	2.94	0.11	11.23	2.61	0.06	10.00	2.14	0.04
12.30	11.15	0.58	12.29	4.30	0.22	12.35	2.61	0.10	12.23	2.58	0.06	11.01	1.98	0.04
13.30	10.54	0.57	13.29	4.66	0.23	13.35	3.11	0.11	13.23	2.52	0.06	12.02	2.02	0.04
14.30	9.73	0.54	14.29	4.68	0.23	14.36	3.14	0.11	14.22	2.60	0.06	13.03	2.01	0.04
15.31	9.55	0.54	15.30	4.86	0.23	15.37	2.93	0.11	15.22	2.68	0.06	14.04	2.07	0.04
16.31	9.33	0.53	16.30	4.53	0.22	16.37	3.19	0.11	16.22	2.73	0.06	15.06	2.09	0.04
17.31	10.32	0.56	17.30	4.50	0.22	17.38	3.10	0.11	17.21	2.84	0.06	16.07	2.09	0.04
18.31	10.39	0.56	18.30	4.68	0.23	18.38	3.05	0.11	18.21	2.67	0.06	17.08	2.19	0.04
19.31	9.93	0.55	19.30	5.05	0.23	19.39	3.17	0.11	19.21	2.81	0.06	18.09	2.11	0.04
20.32	10.91	0.58	20.30	4.80	0.23	20.40	3.14	0.11	20.20	2.76	0.06	19.11	2.15	0.04
21.32	11.64	0.59	21.30	5.31	0.24	21.40	3.34	0.12	21.20	2.88	0.06	20.12	2.17	0.04
22.32	9.91	0.55	22.31	5.20	0.24	22.41	3.32	0.12	22.19	3.06	0.06	21.13	2.28	0.04
23.32	11.56	0.59	23.31	4.88	0.23	23.41	3.33	0.12	23.19	3.02	0.06	22.14	2.24	0.04
24.32	9.46	0.54	24.31	5.30	0.24	24.42	3.27	0.12	24.19	3.01	0.06	23.15	2.29	0.04
25.33	11.39	0.59	25.31	5.14	0.24	25.43	3.28	0.12	25.18	3.02	0.06	24.17	2.34	0.04
26.33	11.51	0.59	26.31	5.04	0.23	26.43	3.31	0.12	26.18	3.11	0.07	25.18	2.34	0.04
27.33	11.13	0.58	27.31	5.38	0.24	27.44	3.31	0.12	27.18	3.21	0.07	26.19	2.41	0.04
28.33	12.43	0.61	28.31	5.28	0.24	28.44	3.32	0.12	28.17	3.13	0.07	27.20	2.42	0.04
29.33	12.13	0.61	29.32	5.63	0.25	29.45	3.43	0.12	29.17	3.10	0.07	28.22	2.40	0.04
30.34	11.91	0.60	30.32	5.92	0.25	30.46	3.17	0.11	30.17	3.21	0.07	29.23	2.37	0.04
31.34	12.16	0.61	31.32	5.88	0.25	31.46	3.33	0.12	31.16	3.12	0.07	30.24	2.45	0.04
32.34	11.37	0.59	32.32	5.01	0.23	32.47	3.53	0.12	32.16	3.27	0.07	31.25	2.42	0.04
33.34	11.23	0.58	33.32	5.73	0.25	33.47	3.17	0.11	33.16	3.48	0.07	32.26	2.43	0.04
34.34	11.59	0.59	34.32	5.68	0.25	34.48	3.62	0.12	34.15	3.36	0.07	33.28	2.48	0.04
35.35	12.48	0.62	35.32	5.81	0.25	35.49	3.41	0.12	35.15	3.49	0.07	34.29	2.58	0.04
36.35	12.92	0.63	36.33	5.77	0.25	36.49	3.81	0.13	36.14	3.41	0.07	35.30	2.52	0.04
37.35	9.59	0.54	37.33	5.46	0.24	37.50	3.51	0.12	37.14	3.43	0.07	36.31	2.51	0.04
38.35	12.24	0.61	38.33	5.46	0.24	38.50	3.95	0.13	38.14	3.43	0.07	37.32	2.49	0.04
39.35	11.90	0.60	39.33	5.65	0.25	39.51	3.99	0.13	39.13	3.50	0.07	38.34	2.56	0.04
40.36	12.61	0.62	40.33	5.91	0.25	40.52	3.86	0.13	40.13	3.47	0.07	39.35	2.50	0.04
41.36	14.62	0.67	41.33	6.82	0.27	41.52	4.16	0.13	41.13	3.55	0.07	40.36	2.48	0.04
42.36	15.22	0.68	42.33	6.93	0.27	42.53	3.94	0.13	42.12	3.57	0.07	41.37	2.46	0.04
43.36	14.54	0.66	43.34	6.30	0.26	43.53	4.22	0.13	43.12	3.63	0.07	42.39	2.52	0.04
44.36	12.47	0.62	44.34	6.21	0.26	44.54	4.37	0.13	44.12	3.56	0.07	43.40	2.49	0.04
45.37	12.02	0.60	45.34	6.49	0.27	45.55	4.56	0.14	45.11	3.80	0.07	44.41	2.44	0.04
46.37	9.94	0.55	46.34	6.46	0.27	46.55	4.57	0.14	46.11	3.82	0.07	45.42	2.46	0.04
47.37	11.65	0.59	47.34	6.77	0.27	47.56	4.56	0.14	47.10	3.98	0.07	46.43	2.52	0.04
48.37	13.07	0.63	48.34	6.22	0.26	48.56	5.05	0.14	48.10	3.71	0.07	47.45	2.60	0.04
49.37	11.34	0.59	49.34	6.72	0.27	49.57	4.32	0.13	49.10	3.43	0.07	48.46	2.56	0.04
50.38	11.16	0.58	50.35	5.42	0.24	50.58	4.27	0.13	50.09	3.24	0.07	49.47	2.44	0.04
51.38	10.16	0.56	51.35	5.01	0.23	51.58	3.81	0.13	51.09	3.10	0.07	50.48	2.17	0.04
52.38	10.17	0.56	52.35	5.50	0.24	52.59	4.11	0.13	52.09	3.39	0.07	51.50	2.08	0.04
53.38	8.88	0.52	53.35	5.56	0.25	53.59	4.25	0.13	53.08	3.36	0.07	52.51	2.17	0.04
54.38	8.55	0.51	54.35	5.33	0.24	54.60	4.22	0.13	54.08	3.08	0.06	53.52	2.33	0.04
55.39	8.84	0.52	55.35	5.19	0.24	55.61	3.82	0.13	55.08	2.47	0.06	54.53	2.17	0.04
56.39	9.62	0.54	56.35	5.44	0.24	56.61	4.08	0.13	56.07	2.26	0.06	55.54	1.79	0.04
57.39	8.80	1.76	57.36	4.51	0.22	57.62	2.92	0.11	57.07	2.28	0.06	56.56	1.77	0.04
58.39	8.32	1.66	58.36	6.34	0.26	58.62	3.34	0.12	58.07	6.19	0.09	57.57	1.30	0.03
59.39	7.83	1.57	59.36	18.39	0.45	59.63	13.75	0.24	59.06	2.08	0.05	58.58	1.77	0.04
60.22	7.49	1.50	60.21	24.67	0.62	60.56	8.52	0.20	59.86	5.50	0.11	59.59	3.37	0.05
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.53	4.12	0.06

TABLE 11. (Continued)

PROTON FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

40 DEG - RUN 2036			45 DEG - RUN 7127			50 DEG - RUN 2037			55 DEG - RUN 2044			60 DEG - RUN 7123		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
2.46	0.074	0.015	2.32	0.050	0.008	2.51	0.069	0.010	2.52	0.064	0.010	2.32	0.052	0.007
3.46	0.302	0.032	3.32	0.150	0.015	3.51	0.235	0.018	3.51	0.254	0.020	3.32	0.138	0.011
4.45	0.754	0.050	4.32	0.435	0.025	4.50	0.542	0.027	4.51	0.513	0.029	4.32	0.415	0.019
5.45	1.22	0.06	5.31	0.75	0.03	5.50	0.95	0.04	5.50	0.99	0.04	5.31	0.81	0.03
6.44	1.90	0.08	6.31	1.46	0.05	6.49	1.66	0.05	6.50	1.57	0.05	6.31	1.34	0.03
7.43	2.50	0.09	7.31	1.93	0.05	7.49	2.20	0.05	7.50	1.99	0.06	7.31	1.83	0.04
8.43	2.83	0.10	8.31	2.21	0.06	8.48	2.47	0.06	8.49	2.34	0.06	8.31	2.08	0.04
9.42	2.34	0.09	9.30	2.46	0.06	9.48	1.96	0.05	9.49	1.95	0.06	9.31	2.29	0.04
10.42	2.30	0.09	10.30	2.10	0.05	10.47	2.10	0.05	10.49	1.88	0.05	10.30	1.90	0.04
11.41	2.27	0.09	11.30	2.02	0.05	11.47	2.00	0.05	11.48	1.76	0.05	11.30	1.83	0.04
12.41	2.44	0.09	12.30	2.01	0.05	12.46	2.03	0.05	12.48	1.69	0.05	12.30	1.71	0.04
13.40	2.15	0.08	13.30	1.96	0.05	13.45	2.02	0.05	13.47	1.84	0.05	13.30	1.69	0.04
14.40	2.42	0.09	14.29	1.97	0.05	14.45	1.95	0.05	14.47	1.65	0.05	14.30	1.68	0.04
15.39	2.30	0.09	15.29	1.97	0.05	15.44	1.93	0.05	15.47	1.73	0.05	15.29	1.69	0.04
16.39	2.38	0.09	16.29	2.07	0.05	16.44	1.92	0.05	16.46	1.76	0.05	16.29	1.63	0.04
17.38	2.28	0.09	17.29	2.01	0.05	17.43	1.88	0.05	17.46	1.74	0.05	17.29	1.62	0.04
18.38	2.28	0.09	18.28	2.11	0.05	18.43	1.97	0.05	18.45	1.80	0.05	18.29	1.68	0.04
19.37	2.35	0.09	19.28	2.07	0.05	19.42	1.97	0.05	19.45	1.93	0.06	19.29	1.68	0.04
20.36	2.50	0.09	20.28	2.09	0.05	20.42	1.92	0.05	20.45	1.68	0.05	20.28	1.62	0.04
21.36	2.40	0.09	21.28	2.12	0.05	21.41	1.95	0.05	21.44	1.69	0.05	21.28	1.59	0.04
22.35	2.36	0.09	22.28	1.99	0.05	22.41	1.85	0.05	22.44	1.68	0.05	22.28	1.60	0.04
23.35	2.40	0.09	23.27	2.07	0.05	23.40	1.91	0.05	23.44	1.61	0.05	23.28	1.57	0.04
24.34	2.23	0.09	24.27	2.11	0.05	24.40	1.95	0.05	24.43	1.59	0.05	24.28	1.58	0.04
25.34	2.39	0.09	25.27	2.14	0.06	25.39	1.93	0.05	25.43	1.59	0.05	25.27	1.54	0.04
26.33	2.51	0.09	26.27	2.19	0.06	26.39	1.81	0.05	26.42	1.56	0.05	26.27	1.50	0.04
27.33	2.40	0.09	27.26	2.13	0.05	27.38	1.85	0.05	27.42	1.59	0.05	27.27	1.56	0.04
28.32	2.42	0.09	28.26	2.14	0.05	28.38	1.86	0.05	28.42	1.55	0.05	28.27	1.51	0.04
29.32	2.35	0.09	29.26	2.27	0.06	29.37	1.70	0.05	29.41	1.62	0.05	29.27	1.52	0.04
30.31	2.35	0.09	30.26	2.21	0.06	30.37	1.80	0.05	30.41	1.51	0.05	30.26	1.39	0.03
31.31	2.24	0.09	31.26	2.15	0.06	31.36	1.81	0.05	31.41	1.51	0.05	31.26	1.42	0.03
32.30	2.38	0.09	32.25	2.17	0.06	32.36	1.74	0.05	32.40	1.49	0.05	32.26	1.43	0.03
33.29	2.41	0.09	33.25	2.09	0.05	33.35	1.76	0.05	33.40	1.49	0.05	33.26	1.37	0.03
34.29	2.40	0.09	34.25	2.19	0.06	34.35	1.73	0.05	34.39	1.42	0.05	34.26	1.27	0.03
35.28	2.70	0.09	35.25	2.14	0.06	35.34	1.69	0.05	35.39	1.36	0.05	35.25	1.26	0.03
36.28	2.52	0.09	36.25	2.11	0.05	36.34	1.76	0.05	36.39	1.26	0.04	36.25	1.21	0.03
37.27	2.50	0.09	37.24	2.11	0.05	37.33	1.69	0.05	37.38	1.27	0.05	37.25	1.23	0.03
38.27	2.45	0.09	38.24	1.99	0.05	38.32	1.72	0.05	38.38	1.29	0.05	38.25	1.19	0.03
39.26	2.38	0.09	39.24	1.98	0.05	39.32	1.56	0.05	39.37	1.28	0.05	39.25	1.15	0.03
40.26	2.37	0.09	40.24	2.06	0.05	40.31	1.62	0.05	40.37	1.21	0.04	40.24	1.12	0.03
41.25	2.38	0.09	41.23	1.98	0.05	41.31	1.56	0.05	41.37	1.24	0.04	41.24	1.08	0.03
42.25	2.38	0.09	42.23	1.99	0.05	42.30	1.49	0.05	42.36	1.16	0.04	42.24	1.00	0.03
43.24	2.40	0.09	43.23	1.98	0.05	43.30	1.54	0.05	43.36	1.12	0.04	43.24	1.05	0.03
44.23	2.37	0.09	44.23	1.90	0.05	44.29	1.48	0.05	44.36	1.13	0.04	44.24	1.00	0.03
45.23	2.26	0.09	45.23	1.95	0.05	45.29	1.40	0.04	45.35	1.01	0.04	45.23	0.94	0.03
46.22	2.24	0.09	46.22	1.85	0.05	46.28	1.32	0.04	46.35	0.99	0.04	46.23	0.90	0.03
47.22	2.28	0.09	47.22	1.86	0.05	47.28	1.38	0.04	47.34	1.02	0.04	47.23	0.85	0.03
48.21	2.29	0.09	48.22	1.70	0.05	48.27	1.32	0.04	48.34	0.95	0.04	48.23	0.80	0.03
49.21	1.97	0.08	49.22	1.47	0.05	49.27	1.31	0.04	49.34	0.89	0.04	49.23	0.74	0.03
50.20	2.053	0.082	50.21	1.418	0.045	50.26	1.074	0.038	50.33	0.780	0.035	50.22	0.629	0.023
51.20	1.830	0.078	51.21	1.443	0.045	51.26	1.049	0.038	51.33	0.768	0.035	51.22	0.671	0.024
52.19	1.818	0.077	52.21	1.572	0.047	52.25	1.051	0.038	52.33	0.706	0.034	52.22	0.706	0.025
53.19	1.821	0.077	53.21	1.434	0.045	53.25	1.005	0.037	53.32	0.732	0.034	53.22	0.643	0.023
54.18	1.680	0.074	54.21	1.195	0.041	54.24	0.878	0.035	54.32	0.616	0.031	54.22	0.523	0.021
55.18	1.530	0.071	55.20	1.120	0.040	55.24	0.789	0.033	55.31	0.566	0.030	55.21	0.476	0.020
56.17	1.411	0.068	56.20	0.772	0.033	56.23	0.662	0.030	56.31	0.486	0.028	56.21	0.294	0.016
57.16	1.237	0.064	57.20	1.030	0.038	57.23	0.461	0.025	57.31	0.345	0.023	57.21	0.437	0.019
58.16	1.15	0.06	58.20	2.65	0.06	58.22	0.72	0.03	58.30	0.39	0.02	58.21	0.82	0.03
59.15	3.177	0.102	59.19	0.831	0.034	59.22	1.094	0.039	59.30	0.891	0.038	59.16	0.358	0.018
60.15	0.978	0.057	59.82	0.608	0.059	60.21	0.993	0.037	60.29	0.553	0.030	0.0	0.0	0.0
60.94	0.323	0.042	0.0	0.0	0.0	60.81	0.044	0.017	60.87	0.105	0.033	0.0	0.0	0.0

TABLE 11. (Continued)

PROTON FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

65 DEG - RUN 2045			70 DEG - RUN 2027			75 DEG - RUN 2022			82 DEG - RUN 2026			90 DEG - RUN 7121		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
2.51	0.066	0.010	2.32	0.087	0.010	2.33	0.097	0.005	2.17	0.090	0.009	4.32	0.419	0.013
3.51	0.251	0.020	3.31	0.177	0.015	3.33	0.247	0.008	3.16	0.160	0.011	5.32	0.863	0.019
4.51	0.569	0.030	4.31	0.449	0.023	4.34	0.502	0.011	4.16	0.414	0.018	6.31	1.411	0.024
5.50	0.91	0.04	5.30	0.87	0.03	5.34	0.89	0.01	5.15	0.75	0.02	7.31	1.85	0.03
6.50	1.54	0.05	6.30	1.37	0.04	6.34	1.42	0.02	6.15	1.29	0.03	8.31	1.92	0.03
7.49	1.96	0.06	7.30	1.88	0.05	7.34	1.87	0.02	7.15	1.82	0.04	9.31	1.80	0.03
8.49	2.26	0.06	8.29	2.08	0.05	8.34	2.09	0.02	8.14	1.94	0.04	10.31	1.51	0.03
9.49	1.774	0.053	9.29	1.792	0.046	9.35	1.502	0.019	9.14	1.796	0.038	11.31	1.285	0.023
10.48	1.801	0.054	10.28	1.671	0.045	10.35	1.507	0.019	10.13	1.497	0.035	12.31	1.170	0.022
11.48	1.766	0.053	11.28	1.448	0.042	11.35	1.450	0.019	11.13	1.412	0.034	13.30	1.098	0.021
12.47	1.578	0.050	12.28	1.470	0.042	12.35	1.385	0.018	12.13	1.305	0.033	14.30	1.047	0.021
13.47	1.526	0.049	13.27	1.378	0.041	13.36	1.351	0.018	13.12	1.280	0.032	15.30	0.997	0.020
14.47	1.541	0.050	14.27	1.436	0.042	14.36	1.270	0.017	14.12	1.176	0.031	16.30	0.980	0.020
15.46	1.603	0.051	15.26	1.448	0.042	15.36	1.240	0.017	15.11	1.146	0.031	17.30	0.904	0.019
16.46	1.446	0.048	16.26	1.254	0.039	16.36	1.204	0.017	16.11	1.093	0.030	18.30	0.876	0.019
17.45	1.392	0.047	17.26	1.314	0.040	17.37	1.148	0.017	17.11	1.068	0.029	19.29	0.814	0.018
18.45	1.407	0.048	18.25	1.230	0.038	18.37	1.117	0.016	18.10	1.046	0.029	20.29	0.794	0.018
19.45	1.310	0.046	19.25	1.234	0.039	19.37	1.078	0.016	19.10	1.040	0.029	21.29	0.760	0.018
20.44	1.389	0.047	20.24	1.207	0.038	20.37	1.050	0.016	20.09	0.955	0.028	22.29	0.750	0.018
21.44	1.384	0.047	21.24	1.170	0.038	21.38	1.011	0.016	21.09	0.917	0.027	23.29	0.711	0.017
22.43	1.226	0.044	22.24	1.145	0.037	22.38	0.974	0.015	22.09	0.912	0.027	24.29	0.685	0.017
23.43	1.351	0.047	23.23	1.139	0.037	23.38	0.960	0.015	23.08	0.858	0.026	25.28	0.663	0.017
24.43	1.273	0.045	24.23	1.161	0.037	24.38	0.908	0.015	24.08	0.846	0.026	26.28	0.645	0.016
25.42	1.272	0.045	25.22	1.046	0.035	25.39	0.871	0.014	25.07	0.826	0.026	27.28	0.579	0.016
26.42	1.186	0.044	26.22	1.098	0.036	26.39	0.822	0.014	26.07	0.779	0.025	28.28	0.531	0.015
27.41	1.239	0.045	27.22	1.080	0.036	27.39	0.786	0.014	27.07	0.759	0.025	29.28	0.506	0.015
28.41	1.063	0.041	28.21	0.958	0.034	28.39	0.776	0.014	28.06	0.674	0.023	30.28	0.459	0.014
29.41	1.074	0.042	29.21	0.929	0.033	29.40	0.766	0.013	29.06	0.656	0.023	31.27	0.451	0.014
30.40	1.087	0.042	30.20	0.900	0.033	30.40	0.727	0.013	30.05	0.648	0.023	32.27	0.441	0.014
31.40	1.099	0.042	31.20	0.932	0.034	31.40	0.684	0.013	31.05	0.605	0.022	33.27	0.405	0.013
32.39	1.119	0.042	32.20	0.824	0.031	32.40	0.668	0.013	32.05	0.583	0.022	34.27	0.392	0.013
33.39	1.044	0.041	33.19	0.853	0.032	33.40	0.647	0.012	33.04	0.533	0.021	35.27	0.357	0.012
34.39	0.990	0.040	34.19	0.869	0.032	34.41	0.616	0.012	34.04	0.523	0.021	36.27	0.343	0.012
35.38	0.994	0.040	35.18	0.822	0.031	35.41	0.574	0.012	35.03	0.499	0.020	37.27	0.288	0.011
36.38	0.929	0.039	36.18	0.796	0.031	36.41	0.531	0.011	36.03	0.504	0.020	38.26	0.291	0.011
37.37	0.873	0.037	37.18	0.703	0.029	37.41	0.507	0.011	37.03	0.430	0.019	39.26	0.284	0.011
38.37	0.832	0.037	38.17	0.686	0.029	38.42	0.508	0.011	38.02	0.408	0.018	40.26	0.250	0.010
39.37	0.808	0.036	39.17	0.680	0.029	39.42	0.469	0.011	39.02	0.394	0.018	41.26	0.249	0.010
40.36	0.787	0.036	40.16	0.611	0.027	40.42	0.412	0.010	40.01	0.358	0.017	42.26	0.219	0.010
41.36	0.750	0.035	41.16	0.566	0.026	41.42	0.397	0.010	41.01	0.327	0.016	43.26	0.191	0.009
42.35	0.726	0.034	42.16	0.576	0.026	42.43	0.394	0.010	42.01	0.306	0.016	44.25	0.173	0.008
43.35	0.671	0.033	43.15	0.501	0.025	43.43	0.376	0.009	43.00	0.280	0.015	45.25	0.162	0.008
44.35	0.627	0.032	44.15	0.561	0.026	44.43	0.350	0.009	44.00	0.274	0.015	46.25	0.146	0.008
45.34	0.616	0.031	45.14	0.484	0.024	45.43	0.327	0.009	44.99	0.259	0.015	47.25	0.147	0.008
46.34	0.604	0.031	46.14	0.486	0.024	46.44	0.300	0.008	45.99	0.231	0.014	48.25	0.138	0.008
47.33	0.573	0.030	47.14	0.455	0.023	47.44	0.282	0.008	46.99	0.203	0.013	49.25	0.097	0.006
48.33	0.510	0.029	48.13	0.454	0.023	48.44	0.269	0.008	47.98	0.192	0.013	50.24	0.099	0.006
49.33	0.482	0.028	49.13	0.396	0.022	49.44	0.241	0.008	48.98	0.206	0.013	51.24	0.094	0.006
50.32	0.471	0.027	50.12	0.323	0.020	50.45	0.220	0.007	49.97	0.154	0.011	52.24	0.093	0.006
51.32	0.399	0.025	51.12	0.338	0.020	51.45	0.199	0.007	50.97	0.138	0.011	53.24	0.072	0.005
52.31	0.368	0.024	52.12	0.292	0.019	52.45	0.202	0.007	51.97	0.131	0.010	54.24	0.057	0.005
53.31	0.409	0.026	53.11	0.307	0.019	53.45	0.179	0.007	52.96	0.147	0.011	55.24	0.049	0.005
54.31	0.342	0.023	54.11	0.215	0.016	54.46	0.149	0.006	53.96	0.105	0.009	56.23	0.048	0.004
55.30	0.250	0.020	55.10	0.214	0.016	55.46	0.121	0.005	54.95	0.076	0.008	57.23	0.106	0.007
56.30	0.246	0.020	56.10	0.159	0.014	56.46	0.097	0.005	55.95	0.075	0.008	58.23	0.053	0.005
57.29	0.183	0.017	57.10	0.125	0.012	57.46	0.099	0.005	56.95	0.058	0.007	59.03	0.091	0.008
58.29	0.193	0.018	58.09	0.148	0.013	58.46	0.212	0.007	57.94	0.060	0.007	0.0	0.0	0.0
59.29	0.313	0.022	59.09	0.298	0.019	59.47	0.049	0.003	58.94	0.115	0.010	0.0	0.0	0.0
60.26	0.277	0.022	60.08	0.216	0.016	60.19	0.121	0.008	59.93	0.088	0.008	0.0	0.0	0.0
0.0	0.0	0.0	60.71	0.026	0.011	0.0	0.0	0.0	60.53	0.003	0.003	0.0	0.0	0.0

TABLE 11. (Continued)

PROTON FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

99 DEG - RUN 133			110 DEG - RUN 7122			135 DEG - RUN 2057			160 DEG - RUN 2062					
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
4.33	0.386	0.010	2.52	0.062	0.008	2.45	0.078	0.004	4.21	0.600	0.016			
5.33	0.749	0.015	3.52	0.205	0.014	3.44	0.240	0.008	5.20	1.062	0.021			
6.34	1.28	0.02	4.52	0.55	0.02	4.43	0.64	0.01	6.18	1.56	0.03			
7.34	1.61	0.02	5.52	0.99	0.03	5.42	1.19	0.02	7.17	1.79	0.03			
8.34	1.77	0.02	6.51	1.56	0.04	6.41	1.69	0.02	8.15	1.73	0.03			
9.34	1.258	0.019	7.51	1.837	0.043	7.40	1.980	0.022	9.14	1.343	0.023			
10.34	1.389	0.020	8.51	2.022	0.045	8.40	1.976	0.022	10.12	0.993	0.020			
11.34	1.202	0.018	9.51	1.720	0.041	9.39	1.182	0.017	11.11	0.866	0.019			
12.34	1.101	0.018	10.51	1.352	0.036	10.38	1.200	0.017	12.10	0.838	0.018			
13.35	0.970	0.017	11.51	1.229	0.035	11.37	1.075	0.016	13.08	0.742	0.017			
14.35	0.934	0.016	12.50	1.066	0.032	12.36	0.936	0.015	14.07	0.660	0.016			
15.35	0.896	0.016	13.50	0.994	0.031	13.35	0.802	0.014	15.05	0.626	0.016			
16.35	0.817	0.015	14.50	0.879	0.029	14.34	0.723	0.013	16.04	0.581	0.015			
17.35	0.785	0.015	15.50	0.817	0.028	15.33	0.674	0.013	17.02	0.530	0.015			
18.35	0.732	0.014	16.50	0.763	0.027	16.32	0.608	0.012	18.01	0.496	0.014			
19.36	0.687	0.014	17.50	0.725	0.027	17.31	0.538	0.011	18.99	0.445	0.013			
20.36	0.666	0.014	18.50	0.646	0.025	18.30	0.513	0.011	19.98	0.406	0.013			
21.36	0.614	0.013	19.49	0.619	0.025	19.29	0.478	0.011	20.96	0.362	0.012			
22.36	0.568	0.013	20.49	0.635	0.025	20.28	0.445	0.010	21.95	0.319	0.011			
23.36	0.567	0.013	21.49	0.559	0.023	21.27	0.399	0.010	22.94	0.301	0.011			
24.36	0.522	0.012	22.49	0.486	0.022	22.26	0.373	0.010	23.92	0.277	0.011			
25.37	0.490	0.012	23.49	0.483	0.022	23.25	0.356	0.009	24.91	0.252	0.010			
26.37	0.481	0.012	24.49	0.443	0.021	24.24	0.310	0.009	25.89	0.225	0.010			
27.37	0.447	0.011	25.48	0.422	0.020	25.24	0.281	0.008	26.88	0.212	0.009			
28.37	0.430	0.011	26.48	0.386	0.020	26.23	0.261	0.008	27.86	0.193	0.009			
29.37	0.375	0.010	27.48	0.341	0.018	27.22	0.251	0.008	28.85	0.175	0.008			
30.37	0.350	0.010	28.48	0.321	0.018	28.21	0.216	0.007	29.83	0.140	0.008			
31.38	0.331	0.010	29.48	0.309	0.017	29.20	0.204	0.007	30.82	0.127	0.007			
32.38	0.325	0.010	30.48	0.316	0.018	30.19	0.161	0.006	31.80	0.118	0.007			
33.38	0.292	0.009	31.47	0.269	0.016	31.18	0.159	0.006	32.79	0.099	0.006			
34.38	0.273	0.009	32.47	0.234	0.015	32.17	0.140	0.006	33.77	0.101	0.006			
35.38	0.247	0.008	33.47	0.215	0.015	33.16	0.134	0.006	34.76	0.078	0.006			
36.38	0.222	0.008	34.47	0.214	0.015	34.15	0.114	0.005	35.75	0.069	0.005			
37.38	0.223	0.008	35.47	0.179	0.013	35.14	0.107	0.005	36.73	0.064	0.005			
38.39	0.189	0.007	36.47	0.167	0.013	36.13	0.092	0.005	37.72	0.049	0.004			
39.39	0.180	0.007	37.46	0.159	0.013	37.12	0.079	0.004	38.70	0.042	0.004			
40.39	0.168	0.007	38.46	0.133	0.011	38.11	0.073	0.004	39.69	0.043	0.004			
41.39	0.151	0.007	39.46	0.121	0.011	39.10	0.060	0.004	40.67	0.028	0.003			
42.39	0.127	0.006	40.46	0.097	0.010	40.09	0.052	0.004	41.66	0.034	0.004			
43.39	0.115	0.006	41.46	0.077	0.009	41.08	0.052	0.004	42.64	0.030	0.003			
44.40	0.104	0.005	42.46	0.102	0.010	42.08	0.045	0.003	43.63	0.026	0.003			
45.40	0.091	0.005	43.46	0.095	0.010	43.07	0.038	0.003	44.61	0.022	0.003			
46.40	0.098	0.005	44.45	0.082	0.009	44.06	0.035	0.003	45.60	0.018	0.003			
47.40	0.075	0.005	45.45	0.068	0.008	45.05	0.029	0.003	46.58	0.017	0.003			
48.40	0.070	0.004	46.45	0.067	0.008	46.04	0.024	0.002	47.57	0.010	0.002			
49.40	0.063	0.004	47.45	0.050	0.007	47.03	0.024	0.002	48.56	0.006	0.002			
50.41	0.054	0.004	48.45	0.046	0.007	48.02	0.022	0.002	49.54	0.007	0.002			
51.41	0.051	0.004	49.45	0.040	0.006	49.01	0.016	0.002	50.53	0.005	0.001			
52.41	0.050	0.004	50.44	0.047	0.007	50.00	0.012	0.002	51.51	0.006	0.002			
53.41	0.047	0.004	51.44	0.041	0.006	50.99	0.010	0.002	52.50	0.007	0.002			
54.41	0.038	0.003	52.44	0.030	0.005	51.98	0.010	0.002	53.48	0.003	0.001			
55.41	0.024	0.003	53.44	0.020	0.004	52.97	0.007	0.001	54.47	0.003	0.001			
56.42	0.022	0.002	54.44	0.019	0.004	53.96	0.006	0.001	55.45	0.006	0.002			
57.42	0.019	0.002	55.44	0.018	0.004	54.95	0.004	0.001	56.44	0.003	0.001			
58.42	0.055	0.004	56.43	0.014	0.004	55.94	0.002	0.001	57.42	0.003	0.001			
59.42	0.027	0.003	57.43	0.035	0.006	56.93	0.004	0.001	58.41	0.002	0.001			
59.97	0.006	0.004	58.43	0.034	0.006	57.93	0.005	0.001	59.32	0.000	0.000			
0.0	0.0	0.0	59.11	0.008	0.005	58.92	0.008	0.001	0.0	0.0	0.0			

TABLE 12

DEUTERON FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

12 DEG - RUN 124			15 DEG - RUN 125			20 DEG - RUN 2012			25 DEG - RUN 2050			30 DEG - RUN 7124		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
5.09	0.060	0.043	5.08	0.036	0.020	5.11	0.087	0.019	5.10	0.099	0.023	5.11	0.047	0.008
6.09	0.121	0.061	6.08	0.100	0.033	6.11	0.140	0.024	6.10	0.161	0.029	6.10	0.107	0.012
7.09	0.162	0.070	7.08	0.231	0.050	7.12	0.237	0.031	7.09	0.200	0.033	7.10	0.196	0.016
8.09	0.208	0.080	8.09	0.314	0.058	8.12	0.328	0.037	8.09	0.358	0.044	8.10	0.265	0.019
9.09	0.310	0.097	9.09	0.270	0.054	9.13	0.403	0.041	9.08	0.364	0.044	9.09	0.307	0.021
10.10	0.409	0.112	10.09	0.452	0.070	10.14	0.522	0.046	10.08	0.447	0.049	10.09	0.368	0.022
11.10	0.449	0.117	11.09	0.543	0.077	11.14	0.464	0.044	11.07	0.422	0.048	11.08	0.359	0.022
12.10	0.486	0.122	12.09	0.351	0.062	12.15	0.383	0.040	12.07	0.431	0.048	12.08	0.401	0.023
13.10	0.48	0.12	13.09	0.50	0.07	13.15	0.37	0.04	13.06	0.41	0.05	13.08	0.47	0.03
14.10	0.327	0.100	14.09	0.412	0.067	14.16	0.338	0.037	14.06	0.305	0.040	14.07	0.415	0.024
15.11	0.549	0.129	15.10	0.433	0.069	15.17	0.446	0.043	15.06	0.315	0.041	15.07	0.440	0.025
16.11	0.314	0.098	16.10	0.472	0.072	16.17	0.389	0.040	16.05	0.421	0.047	16.07	0.420	0.024
17.11	0.627	0.138	17.10	0.569	0.079	17.18	0.434	0.042	17.05	0.448	0.049	17.06	0.452	0.025
18.11	0.533	0.127	18.10	0.468	0.071	18.18	0.509	0.046	18.04	0.412	0.047	18.06	0.433	0.024
19.11	0.616	0.137	19.10	0.465	0.071	19.19	0.449	0.043	19.04	0.407	0.047	19.06	0.448	0.025
20.12	0.712	0.147	20.10	0.561	0.078	20.20	0.512	0.046	20.03	0.522	0.053	20.05	0.428	0.024
21.12	0.863	0.162	21.10	0.435	0.069	21.20	0.501	0.045	21.03	0.426	0.048	21.05	0.451	0.025
22.12	0.456	0.118	22.11	0.650	0.084	22.21	0.471	0.044	22.02	0.441	0.049	22.05	0.441	0.025
23.12	0.493	0.122	23.11	0.601	0.081	23.21	0.545	0.047	23.02	0.409	0.047	23.04	0.420	0.024
24.12	0.551	0.129	24.11	0.552	0.078	24.22	0.530	0.047	24.01	0.574	0.055	24.04	0.428	0.024
25.13	0.47	0.12	25.11	0.64	0.08	25.23	0.53	0.05	25.01	0.45	0.05	25.03	0.47	0.03
26.13	0.545	0.129	26.11	0.686	0.086	26.23	0.535	0.047	26.00	0.360	0.044	26.03	0.454	0.025
27.13	0.93	0.17	27.11	0.53	0.08	27.24	0.49	0.04	27.00	0.61	0.06	27.03	0.47	0.03
28.13	0.64	0.14	26.11	0.70	0.09	28.24	0.50	0.05	28.00	0.46	0.05	28.02	0.48	0.03
29.13	0.51	0.12	29.12	0.51	0.07	29.25	0.55	0.05	28.99	0.50	0.05	29.02	0.48	0.03
30.14	0.49	0.12	30.12	0.74	0.09	30.26	0.53	0.05	29.99	0.48	0.05	30.02	0.49	0.03
31.14	0.651	0.141	31.12	0.654	0.084	31.26	0.585	0.049	30.98	0.411	0.047	31.01	0.439	0.025
32.14	0.893	0.165	32.12	0.640	0.083	32.27	0.469	0.044	31.98	0.543	0.054	32.01	0.455	0.025
33.14	0.662	0.142	33.12	0.671	0.086	33.27	0.565	0.048	32.97	0.489	0.051	33.01	0.421	0.024
34.14	0.64	0.14	34.12	0.70	0.09	34.28	0.58	0.05	33.97	0.48	0.05	34.00	0.47	0.03
35.15	0.80	0.16	35.12	0.89	0.10	35.29	0.72	0.05	34.96	0.46	0.05	35.00	0.46	0.03
36.15	0.86	0.16	36.13	0.72	0.09	36.29	0.66	0.05	35.96	0.47	0.05	35.99	0.49	0.03
37.15	0.758	0.152	37.13	0.765	0.091	37.30	0.671	0.053	36.95	0.542	0.054	36.99	0.450	0.025
38.15	0.64	0.14	38.13	0.70	0.09	38.30	0.75	0.06	37.95	0.54	0.05	37.99	0.46	0.03
39.15	1.120	0.185	39.13	0.691	0.087	39.31	0.681	0.053	38.95	0.566	0.055	38.98	0.431	0.024
40.16	0.972	0.172	40.13	0.738	0.090	40.32	0.657	0.052	39.94	0.546	0.054	39.98	0.451	0.025
41.16	0.898	0.165	41.13	0.784	0.092	41.32	0.675	0.053	40.94	0.594	0.056	40.98	0.384	0.023
42.16	0.996	0.174	42.13	0.899	0.099	42.33	0.803	0.058	41.93	0.491	0.051	41.97	0.365	0.022
43.16	1.19	0.19	43.14	0.95	0.10	43.33	0.79	0.06	42.93	0.51	0.05	42.97	0.46	0.03
44.16	1.101	0.183	44.14	1.036	0.106	44.34	0.933	0.062	43.92	0.558	0.055	43.97	0.429	0.024
45.17	1.08	0.18	45.14	0.85	0.10	45.35	0.92	0.06	44.92	0.47	0.05	44.96	0.46	0.03
46.17	1.445	0.210	46.14	0.814	0.094	46.35	1.009	0.064	45.91	0.527	0.053	45.96	0.444	0.025
47.17	1.49	0.21	47.14	1.29	0.12	47.36	1.18	0.07	46.91	0.69	0.06	46.96	0.47	0.03
48.17	1.60	0.22	48.14	1.65	0.13	48.36	1.45	0.08	47.90	0.73	0.06	47.95	0.56	0.03
49.17	1.984	0.246	49.14	1.947	0.146	49.37	1.587	0.081	48.90	0.914	0.070	48.95	0.368	0.022
50.18	1.107	0.183	50.15	0.961	0.102	50.38	0.788	0.057	49.89	0.626	0.058	49.94	0.316	0.021
51.18	1.892	0.240	51.15	0.925	0.100	51.38	0.814	0.058	50.89	0.424	0.048	50.94	0.365	0.022
52.18	3.13	0.31	52.15	1.13	0.11	52.39	0.95	0.06	51.89	0.45	0.05	51.94	0.72	0.03
53.18	7.94	0.49	53.15	5.16	0.24	53.39	4.07	0.13	52.88	0.87	0.07	52.93	1.96	0.05
54.18	7.22	0.47	54.15	8.71	0.31	54.40	6.07	0.16	53.88	3.33	0.13	53.83	1.98	0.06
54.86	0.217	0.137	54.83	0.111	0.059	54.95	0.555	0.151	54.70	3.170	0.162	0.0	0.0	0.0

TABLE 12. (Continued)

DEUTERON FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

35 DEG - RUN 2005			40 DEG - RUN 2036			45 DEG - RUN 7127			50 DEG - RUN 2037			55 DEG - RUN 2044		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
5.14	0.050	0.006	5.10	0.054	0.013	5.11	0.040	0.008	5.10	0.080	0.010	5.11	0.055	0.009
6.15	0.103	0.009	6.09	0.118	0.020	6.11	0.086	0.011	6.09	0.115	0.013	6.10	0.082	0.011
7.16	0.199	0.012	7.09	0.199	0.026	7.11	0.145	0.014	7.09	0.155	0.015	7.10	0.163	0.016
8.17	0.209	0.012	8.08	0.236	0.028	8.11	0.275	0.020	8.08	0.239	0.018	8.09	0.259	0.020
9.19	0.282	0.014	9.08	0.319	0.032	9.10	0.279	0.020	9.08	0.286	0.020	9.09	0.232	0.019
10.20	0.293	0.014	10.07	0.380	0.035	10.10	0.290	0.020	10.07	0.327	0.021	10.09	0.260	0.020
11.21	0.344	0.016	11.06	0.418	0.037	11.10	0.316	0.021	11.07	0.339	0.022	11.08	0.262	0.021
12.22	0.264	0.014	12.06	0.299	0.031	12.10	0.321	0.021	12.06	0.291	0.020	12.08	0.278	0.021
13.23	0.311	0.015	13.05	0.283	0.031	13.10	0.362	0.023	13.06	0.229	0.018	13.08	0.236	0.019
14.25	0.321	0.015	14.05	0.335	0.033	14.09	0.365	0.023	14.05	0.249	0.018	14.07	0.243	0.020
15.26	0.372	0.016	15.04	0.256	0.029	15.09	0.346	0.022	15.05	0.253	0.019	15.07	0.216	0.019
16.27	0.325	0.015	16.04	0.303	0.032	16.09	0.348	0.022	16.04	0.295	0.020	16.06	0.229	0.019
17.28	0.385	0.016	17.03	0.343	0.034	17.09	0.339	0.022	17.04	0.274	0.019	17.06	0.199	0.018
18.30	0.353	0.016	18.03	0.307	0.032	18.09	0.333	0.022	18.03	0.289	0.020	18.06	0.265	0.021
19.31	0.378	0.016	19.02	0.318	0.032	19.08	0.309	0.021	19.03	0.276	0.019	19.05	0.251	0.020
20.32	0.368	0.016	20.02	0.342	0.034	20.08	0.342	0.022	20.02	0.255	0.019	20.05	0.222	0.019
21.33	0.375	0.016	21.01	0.344	0.034	21.08	0.337	0.022	21.02	0.260	0.019	21.04	0.244	0.020
22.34	0.363	0.016	22.01	0.345	0.034	22.08	0.313	0.021	22.01	0.279	0.020	22.04	0.230	0.019
23.36	0.416	0.017	23.00	0.344	0.034	23.07	0.293	0.020	23.00	0.256	0.019	23.04	0.226	0.019
24.37	0.365	0.016	23.99	0.333	0.033	24.07	0.334	0.022	24.00	0.282	0.020	24.03	0.222	0.019
25.38	0.394	0.017	24.99	0.320	0.032	25.07	0.341	0.022	24.99	0.275	0.019	25.03	0.224	0.019
26.39	0.346	0.015	25.98	0.338	0.033	26.07	0.330	0.022	25.99	0.271	0.019	26.03	0.163	0.016
27.41	0.362	0.015	26.98	0.347	0.034	27.07	0.296	0.020	26.98	0.286	0.020	27.02	0.179	0.017
28.42	0.377	0.016	27.97	0.356	0.034	28.06	0.316	0.021	27.98	0.208	0.017	28.02	0.205	0.018
29.43	0.360	0.016	28.97	0.290	0.031	29.06	0.255	0.019	28.97	0.263	0.019	29.01	0.193	0.018
30.44	0.337	0.015	29.96	0.331	0.033	30.06	0.301	0.021	29.97	0.250	0.018	30.01	0.169	0.016
31.45	0.359	0.015	30.96	0.373	0.035	31.06	0.304	0.021	30.96	0.188	0.016	31.01	0.185	0.017
32.47	0.348	0.016	31.95	0.288	0.031	32.05	0.305	0.021	31.96	0.180	0.016	32.00	0.176	0.017
33.48	0.325	0.015	32.95	0.299	0.031	33.05	0.276	0.020	32.95	0.224	0.017	33.00	0.171	0.017
34.49	0.351	0.016	33.94	0.305	0.032	34.05	0.257	0.019	33.95	0.230	0.018	34.00	0.164	0.016
35.50	0.338	0.015	34.94	0.277	0.030	35.05	0.282	0.020	34.94	0.213	0.017	34.99	0.165	0.016
36.52	0.353	0.016	35.93	0.270	0.030	36.05	0.290	0.020	35.94	0.197	0.016	35.99	0.166	0.016
37.53	0.352	0.016	36.92	0.368	0.035	37.04	0.242	0.018	36.93	0.214	0.017	36.98	0.150	0.016
38.54	0.329	0.015	37.92	0.240	0.028	38.04	0.261	0.019	37.93	0.181	0.016	37.98	0.155	0.016
39.55	0.351	0.015	38.91	0.253	0.029	39.04	0.216	0.018	38.92	0.214	0.017	38.98	0.144	0.015
40.56	0.313	0.015	39.91	0.271	0.030	40.04	0.245	0.019	39.92	0.188	0.016	39.97	0.138	0.015
41.58	0.294	0.014	40.90	0.219	0.027	41.03	0.205	0.017	40.91	0.192	0.016	40.97	0.114	0.013
42.59	0.323	0.015	41.90	0.276	0.030	42.03	0.210	0.017	41.91	0.160	0.015	41.96	0.123	0.014
43.60	0.329	0.015	42.89	0.241	0.028	43.03	0.191	0.016	42.90	0.177	0.016	42.96	0.105	0.013
44.61	0.293	0.014	43.89	0.251	0.029	44.03	0.217	0.018	43.90	0.175	0.015	43.96	0.129	0.014
45.62	0.319	0.015	44.88	0.220	0.027	45.03	0.199	0.017	44.89	0.170	0.015	44.95	0.110	0.013
46.64	0.335	0.015	45.88	0.236	0.028	46.02	0.183	0.016	45.89	0.124	0.013	45.95	0.137	0.015
47.65	0.393	0.017	46.87	0.230	0.027	47.02	0.200	0.017	46.88	0.168	0.015	46.95	0.121	0.014
48.66	0.469	0.018	47.87	0.246	0.028	48.02	0.228	0.018	47.87	0.132	0.013	47.94	0.092	0.012
49.67	0.328	0.015	48.86	0.248	0.029	49.02	0.135	0.014	48.87	0.179	0.016	48.94	0.089	0.012
50.69	0.250	0.013	49.85	0.181	0.024	50.01	0.140	0.014	49.86	0.113	0.012	49.93	0.054	0.009
51.70	0.250	0.013	50.85	0.143	0.022	51.01	0.169	0.015	50.86	0.100	0.012	50.93	0.076	0.011
52.71	0.414	0.017	51.84	0.173	0.024	52.01	0.378	0.023	51.85	0.092	0.011	51.93	0.065	0.010
53.72	1.207	0.029	52.84	0.241	0.028	53.01	0.801	0.034	52.85	0.175	0.015	52.92	0.183	0.017
54.53	1.073	0.031	53.83	0.714	0.048	53.76	0.157	0.021	53.84	0.469	0.025	53.92	0.306	0.022
0.0	0.0	0.0	54.68	0.710	0.058	0.0	0.0	0.0	54.69	0.248	0.022	54.72	0.007	0.004

TABLE 12. (Continued)

DEUTERON FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

60 DEG - RUN 7123			65 DEG - RUN 2045			70 DEG - RUN 2027			75 DEG - RUN 2022			82 DEG - RUN 2026		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
5.11	0.043	0.006	5.10	0.042	0.008	5.10	0.042	0.007	5.14	0.057	0.004	5.15	0.050	0.006
6.11	0.101	0.009	6.10	0.112	0.013	6.10	0.077	0.010	6.14	0.100	0.005	6.15	0.099	0.009
7.11	0.156	0.012	7.10	0.161	0.016	7.10	0.158	0.014	7.14	0.155	0.006	7.15	0.145	0.011
8.11	0.238	0.014	8.09	0.195	0.018	8.09	0.194	0.015	8.14	0.192	0.007	8.14	0.183	0.012
9.11	0.245	0.014	9.09	0.212	0.018	9.09	0.218	0.016	9.15	0.217	0.007	9.14	0.188	0.012
10.10	0.252	0.015	10.08	0.275	0.021	10.08	0.250	0.017	10.15	0.214	0.007	10.13	0.209	0.013
11.10	0.252	0.015	11.08	0.238	0.020	11.08	0.234	0.017	11.15	0.211	0.007	11.13	0.206	0.013
12.10	0.269	0.015	12.08	0.223	0.019	12.08	0.216	0.016	12.15	0.173	0.006	12.13	0.187	0.012
13.10	0.304	0.016	13.07	0.191	0.017	13.07	0.219	0.016	13.16	0.147	0.006	13.12	0.147	0.011
14.10	0.253	0.015	14.07	0.200	0.018	14.07	0.176	0.015	14.16	0.145	0.006	14.12	0.156	0.011
15.09	0.261	0.015	15.06	0.190	0.017	15.06	0.183	0.015	15.16	0.145	0.006	15.11	0.152	0.011
16.09	0.247	0.014	16.06	0.183	0.017	16.06	0.201	0.016	16.16	0.141	0.006	16.11	0.138	0.011
17.09	0.238	0.014	17.06	0.208	0.018	17.06	0.195	0.015	17.17	0.152	0.006	17.11	0.124	0.010
18.09	0.267	0.015	18.05	0.197	0.018	18.05	0.170	0.014	18.17	0.146	0.006	18.10	0.137	0.011
19.09	0.255	0.015	19.05	0.188	0.017	19.05	0.166	0.014	19.17	0.141	0.006	19.10	0.131	0.010
20.08	0.244	0.014	20.04	0.184	0.017	20.04	0.180	0.015	20.17	0.130	0.006	20.09	0.131	0.010
21.08	0.239	0.014	21.04	0.174	0.017	21.04	0.171	0.014	21.18	0.123	0.005	21.09	0.111	0.010
22.08	0.219	0.014	22.04	0.181	0.017	22.04	0.164	0.014	22.18	0.129	0.006	22.09	0.116	0.010
23.08	0.247	0.014	23.03	0.175	0.017	23.03	0.177	0.015	23.18	0.119	0.005	23.08	0.114	0.010
24.08	0.240	0.014	24.03	0.166	0.016	24.03	0.152	0.014	24.18	0.113	0.005	24.08	0.105	0.009
25.07	0.235	0.014	25.02	0.144	0.015	25.02	0.166	0.014	25.19	0.104	0.005	25.07	0.104	0.009
26.07	0.236	0.014	26.02	0.164	0.016	26.02	0.128	0.012	26.19	0.104	0.005	26.07	0.089	0.009
27.07	0.199	0.013	27.02	0.150	0.016	27.02	0.154	0.014	27.19	0.099	0.005	27.07	0.077	0.008
28.07	0.202	0.013	28.01	0.145	0.015	28.01	0.136	0.013	28.19	0.095	0.005	28.06	0.071	0.008
29.07	0.185	0.013	29.01	0.160	0.016	29.01	0.164	0.014	29.19	0.084	0.004	29.06	0.088	0.008
30.06	0.194	0.013	30.00	0.125	0.014	30.00	0.090	0.010	30.20	0.099	0.005	30.05	0.067	0.007
31.06	0.199	0.013	31.00	0.131	0.014	31.00	0.105	0.011	31.20	0.082	0.004	31.05	0.092	0.009
32.06	0.158	0.012	32.00	0.137	0.015	32.00	0.101	0.011	32.20	0.073	0.004	32.05	0.090	0.009
33.06	0.152	0.011	32.99	0.137	0.015	32.99	0.100	0.011	33.20	0.065	0.004	33.04	0.051	0.006
34.06	0.164	0.012	33.99	0.120	0.014	33.99	0.075	0.010	34.21	0.066	0.004	34.04	0.050	0.006
35.05	0.158	0.012	34.98	0.115	0.014	34.98	0.078	0.010	35.21	0.068	0.004	35.03	0.063	0.007
36.05	0.147	0.011	35.98	0.117	0.014	35.98	0.099	0.011	36.21	0.063	0.004	36.03	0.063	0.007
37.05	0.140	0.011	36.98	0.076	0.011	36.98	0.105	0.011	37.21	0.054	0.004	37.03	0.050	0.006
38.05	0.147	0.011	37.97	0.089	0.012	37.97	0.082	0.010	38.22	0.062	0.004	38.02	0.045	0.006
39.05	0.116	0.010	38.97	0.104	0.013	38.97	0.074	0.009	39.22	0.055	0.004	39.02	0.042	0.006
40.04	0.135	0.011	39.96	0.096	0.012	39.96	0.065	0.009	40.22	0.043	0.003	40.01	0.043	0.006
41.04	0.124	0.010	40.96	0.081	0.011	40.96	0.072	0.009	41.22	0.048	0.003	41.01	0.041	0.006
42.04	0.105	0.009	41.96	0.068	0.010	41.96	0.054	0.008	42.23	0.039	0.003	42.01	0.040	0.006
43.04	0.099	0.009	42.95	0.055	0.009	42.95	0.062	0.009	43.23	0.042	0.003	43.00	0.029	0.005
44.04	0.107	0.010	43.95	0.075	0.011	43.95	0.055	0.008	44.23	0.038	0.003	44.00	0.032	0.005
45.03	0.095	0.009	44.94	0.069	0.011	44.94	0.047	0.008	45.23	0.040	0.003	44.99	0.029	0.005
46.03	0.099	0.009	45.94	0.070	0.011	45.94	0.058	0.008	46.24	0.032	0.003	45.99	0.028	0.005
47.03	0.111	0.010	46.94	0.068	0.010	46.94	0.051	0.008	47.24	0.031	0.003	46.99	0.027	0.005
48.03	0.097	0.009	47.93	0.079	0.011	47.93	0.055	0.008	48.24	0.039	0.003	47.98	0.029	0.005
49.03	0.062	0.007	48.93	0.073	0.011	48.93	0.049	0.008	49.24	0.027	0.003	48.98	0.032	0.005
50.02	0.068	0.008	49.92	0.041	0.008	49.92	0.038	0.007	50.25	0.026	0.002	49.97	0.022	0.004
51.02	0.066	0.008	50.92	0.041	0.008	50.92	0.030	0.006	51.25	0.023	0.002	50.97	0.022	0.004
52.02	0.233	0.014	51.92	0.039	0.008	51.92	0.026	0.006	52.25	0.030	0.003	51.97	0.017	0.004
53.02	0.182	0.012	52.91	0.150	0.016	52.91	0.107	0.011	53.25	0.066	0.004	52.96	0.042	0.006
53.57	0.0	0.0	53.86	0.162	0.017	53.76	0.122	0.014	53.98	0.072	0.006	53.63	0.111	0.016

TABLE 12. (Continued)

DEUTERON FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

90 DEG - RUN 7121			99 DEG - RUN 133			110 DEG - RUN 7122			135 DEG - RUN 2057			160 DEG - RUN 2062		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
5.17	0.039	0.004	5.13	0.027	0.003	5.12	0.037	0.006	5.08	0.063	0.004	5.05	0.049	0.004
6.17	0.103	0.007	6.13	0.075	0.005	6.12	0.099	0.010	6.07	0.114	0.005	6.04	0.094	0.006
7.16	0.145	0.008	7.14	0.143	0.006	7.11	0.147	0.012	7.06	0.154	0.006	7.02	0.128	0.007
8.16	0.172	0.008	8.14	0.147	0.006	8.11	0.144	0.012	8.05	0.157	0.006	8.01	0.149	0.008
9.16	0.209	0.009	9.14	0.152	0.007	9.11	0.162	0.013	9.04	0.153	0.006	8.99	0.134	0.007
10.16	0.182	0.009	10.14	0.152	0.007	10.11	0.160	0.013	10.03	0.150	0.006	9.98	0.123	0.007
11.16	0.172	0.008	11.14	0.157	0.007	11.11	0.180	0.013	11.02	0.141	0.006	10.96	0.113	0.007
12.16	0.172	0.008	12.14	0.112	0.006	12.11	0.149	0.012	12.01	0.096	0.005	11.95	0.083	0.006
13.15	0.167	0.008	13.15	0.149	0.006	13.10	0.140	0.012	13.00	0.074	0.004	12.93	0.057	0.005
14.15	0.156	0.008	14.15	0.127	0.006	14.10	0.129	0.011	13.99	0.074	0.004	13.92	0.054	0.005
15.15	0.138	0.008	15.15	0.114	0.006	15.10	0.104	0.010	14.98	0.074	0.004	14.90	0.058	0.005
16.15	0.129	0.007	16.15	0.121	0.006	16.10	0.079	0.009	15.97	0.063	0.004	15.89	0.054	0.005
17.15	0.124	0.007	17.15	0.114	0.006	17.10	0.092	0.010	16.96	0.063	0.004	16.87	0.042	0.004
18.15	0.122	0.007	18.15	0.104	0.005	18.10	0.079	0.009	17.95	0.053	0.004	17.86	0.052	0.005
19.14	0.116	0.007	19.16	0.092	0.005	19.09	0.074	0.009	18.95	0.056	0.004	18.85	0.044	0.004
20.14	0.115	0.007	20.16	0.084	0.005	20.09	0.069	0.008	19.94	0.043	0.003	19.83	0.038	0.004
21.14	0.097	0.006	21.16	0.088	0.005	21.09	0.073	0.008	20.93	0.039	0.003	20.82	0.034	0.004
22.14	0.092	0.006	22.16	0.083	0.005	22.09	0.063	0.008	21.92	0.041	0.003	21.80	0.029	0.003
23.14	0.090	0.006	23.16	0.078	0.005	23.09	0.066	0.008	22.91	0.040	0.003	22.79	0.024	0.003
24.14	0.084	0.006	24.16	0.065	0.004	24.09	0.055	0.007	23.90	0.036	0.003	23.77	0.025	0.003
25.13	0.084	0.006	25.17	0.071	0.004	25.08	0.057	0.008	24.89	0.028	0.003	24.76	0.019	0.003
26.13	0.075	0.006	26.17	0.061	0.004	26.08	0.047	0.007	25.88	0.024	0.002	25.74	0.020	0.003
27.13	0.077	0.006	27.17	0.056	0.004	27.08	0.039	0.006	26.87	0.023	0.002	26.73	0.018	0.003
28.13	0.072	0.005	28.17	0.053	0.004	28.08	0.036	0.006	27.86	0.024	0.002	27.71	0.013	0.002
29.13	0.055	0.005	29.17	0.047	0.004	29.08	0.031	0.006	28.85	0.017	0.002	28.70	0.013	0.002
30.13	0.064	0.005	30.17	0.040	0.003	30.08	0.043	0.007	29.84	0.014	0.002	29.69	0.007	0.002
31.13	0.062	0.005	31.17	0.034	0.003	31.08	0.029	0.005	30.83	0.014	0.002	30.67	0.009	0.002
32.12	0.059	0.005	32.18	0.042	0.003	32.07	0.029	0.005	31.82	0.014	0.002	31.66	0.011	0.002
33.12	0.043	0.004	33.18	0.030	0.003	33.07	0.028	0.005	32.81	0.009	0.001	32.64	0.010	0.002
34.12	0.045	0.004	34.18	0.031	0.003	34.07	0.016	0.004	33.80	0.009	0.002	33.63	0.008	0.002
35.12	0.047	0.004	35.18	0.030	0.003	35.07	0.015	0.004	34.79	0.007	0.001	34.61	0.006	0.002
36.12	0.040	0.004	36.18	0.026	0.003	36.07	0.014	0.004	35.79	0.006	0.001	35.60	0.008	0.002
37.12	0.037	0.004	37.18	0.028	0.003	37.07	0.019	0.004	36.78	0.008	0.001	36.58	0.004	0.001
38.11	0.027	0.003	38.19	0.026	0.003	38.06	0.019	0.004	37.77	0.005	0.001	37.57	0.002	0.001
39.11	0.033	0.004	39.19	0.019	0.002	39.06	0.014	0.004	38.76	0.004	0.001	38.55	0.003	0.001
40.11	0.029	0.003	40.19	0.019	0.002	40.06	0.008	0.003	39.75	0.002	0.001	39.54	0.002	0.001
41.11	0.026	0.003	41.19	0.018	0.002	41.06	0.016	0.004	40.74	0.005	0.001	40.52	0.002	0.001
42.11	0.026	0.003	42.19	0.013	0.002	42.06	0.011	0.003	41.73	0.004	0.001	41.51	0.001	0.001
43.11	0.023	0.003	43.19	0.013	0.002	43.06	0.011	0.003	42.72	0.004	0.001	42.50	0.001	0.001
44.10	0.022	0.003	44.20	0.013	0.002	44.05	0.010	0.003	43.71	0.004	0.001	43.48	0.002	0.001
45.10	0.019	0.003	45.20	0.011	0.002	45.05	0.012	0.003	44.70	0.002	0.001	44.47	0.003	0.001
46.10	0.023	0.003	46.20	0.012	0.002	46.05	0.012	0.003	45.69	0.002	0.001	45.45	0.000	0.000
47.10	0.018	0.003	47.20	0.012	0.002	47.05	0.011	0.003	46.68	0.002	0.001	46.44	0.001	0.001
48.10	0.013	0.002	48.20	0.011	0.002	48.05	0.007	0.003	47.67	0.002	0.001	47.42	0.001	0.001
49.10	0.010	0.002	49.20	0.010	0.002	49.05	0.006	0.002	48.66	0.001	0.000	48.41	0.0	0.0
50.09	0.010	0.002	50.21	0.009	0.002	50.04	0.007	0.003	49.65	0.001	0.001	49.39	0.000	0.000
51.09	0.022	0.003	51.21	0.008	0.001	51.04	0.006	0.002	50.64	0.001	0.001	50.38	0.000	0.000
52.09	0.045	0.004	52.21	0.013	0.002	51.89	0.015	0.005	51.64	0.001	0.001	51.36	0.001	0.001
52.82	0.006	0.002	52.96	0.037	0.005	0.0	0.0	0.0	52.58	0.002	0.001	52.35	0.0	0.0

TABLE 13

TRITON FROM A = 12C BOMBARDED BY 62 MEV. PROTONS.

12 DEG - RUN 124			15 DEG - RUN 125			20 DEG - RUN 2012			25 DEG - RUN 2050			30 DEG - RUN 7124		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
6.14	0.182	0.074	6.13	0.063	0.026	6.16	0.061	0.016	6.10	0.057	0.017	6.10	0.030	0.006
7.14	0.006	0.013	7.13	0.029	0.018	7.17	0.066	0.017	7.09	0.079	0.021	7.10	0.075	0.010
8.14	0.298	0.095	8.14	0.134	0.038	8.17	0.125	0.023	8.09	0.120	0.025	8.10	0.135	0.014
9.14	0.146	0.067	9.14	0.086	0.031	9.18	0.194	0.028	9.08	0.163	0.030	9.09	0.147	0.014
10.15	0.158	0.069	10.14	0.133	0.038	10.19	0.198	0.029	10.08	0.181	0.031	10.09	0.159	0.015
11.15	0.061	0.043	11.14	0.223	0.049	11.19	0.191	0.028	11.07	0.205	0.033	11.08	0.176	0.016
12.15	0.121	0.061	12.14	0.138	0.039	12.20	0.205	0.029	12.07	0.131	0.026	12.08	0.204	0.017
13.15	0.226	0.083	13.14	0.176	0.044	13.20	0.212	0.030	13.06	0.179	0.031	13.08	0.182	0.016
14.15	0.168	0.072	14.14	0.167	0.043	14.21	0.124	0.023	14.06	0.198	0.033	14.07	0.151	0.014
15.16	0.214	0.081	15.15	0.249	0.052	15.22	0.171	0.027	15.06	0.161	0.029	15.07	0.203	0.017
16.16	0.211	0.080	16.15	0.159	0.042	16.22	0.160	0.026	16.05	0.147	0.028	16.07	0.195	0.016
17.16	0.295	0.095	17.15	0.154	0.041	17.23	0.153	0.025	17.05	0.114	0.025	17.06	0.181	0.016
18.16	0.312	0.097	18.15	0.179	0.044	18.23	0.226	0.030	18.04	0.134	0.027	18.06	0.141	0.014
19.16	0.148	0.067	19.15	0.273	0.055	19.24	0.153	0.025	19.04	0.148	0.028	19.06	0.170	0.015
20.17	0.150	0.068	20.15	0.211	0.048	20.25	0.212	0.030	20.03	0.120	0.025	20.05	0.193	0.016
21.17	0.190	0.075	21.15	0.166	0.043	21.25	0.212	0.030	21.03	0.155	0.029	21.05	0.125	0.013
22.17	0.281	0.092	22.16	0.175	0.044	22.26	0.170	0.026	22.02	0.145	0.028	22.05	0.153	0.014
23.17	0.202	0.078	23.16	0.189	0.045	23.26	0.153	0.025	23.02	0.158	0.029	23.04	0.141	0.014
24.17	0.182	0.074	24.16	0.205	0.047	24.27	0.146	0.025	24.01	0.142	0.028	24.04	0.153	0.014
25.18	0.152	0.068	25.16	0.188	0.045	25.28	0.133	0.023	25.01	0.149	0.028	25.03	0.168	0.015
26.18	0.318	0.098	26.16	0.183	0.045	26.28	0.144	0.024	26.00	0.128	0.026	26.03	0.147	0.014
27.18	0.200	0.078	27.16	0.254	0.053	27.29	0.163	0.026	27.00	0.140	0.027	27.03	0.103	0.012
28.18	0.257	0.088	28.16	0.126	0.037	28.29	0.139	0.024	28.00	0.109	0.024	28.02	0.101	0.012
29.18	0.105	0.057	29.17	0.106	0.034	29.30	0.134	0.024	28.99	0.158	0.029	29.02	0.133	0.014
30.19	0.091	0.053	30.17	0.170	0.043	30.31	0.118	0.022	29.99	0.161	0.029	30.02	0.099	0.012
31.19	0.147	0.067	31.17	0.214	0.048	31.31	0.181	0.027	30.98	0.107	0.024	31.01	0.095	0.011
32.19	0.122	0.061	32.17	0.202	0.047	32.32	0.159	0.026	31.98	0.134	0.027	32.01	0.130	0.013
33.19	0.210	0.080	33.17	0.193	0.046	33.32	0.156	0.025	32.97	0.146	0.028	33.01	0.115	0.013
34.19	0.214	0.081	34.17	0.142	0.039	34.33	0.147	0.025	33.97	0.137	0.027	34.00	0.121	0.013
35.20	0.280	0.092	35.17	0.146	0.040	35.34	0.132	0.023	34.96	0.119	0.025	35.00	0.115	0.013
36.20	0.127	0.062	36.18	0.239	0.051	36.34	0.126	0.023	35.96	0.135	0.027	35.99	0.101	0.012
37.20	0.128	0.062	37.18	0.134	0.038	37.35	0.115	0.022	36.95	0.107	0.024	36.99	0.098	0.012
38.20	0.182	0.074	38.18	0.154	0.041	38.35	0.177	0.027	37.95	0.132	0.027	37.99	0.113	0.012
39.20	0.201	0.078	39.18	0.290	0.056	39.36	0.129	0.023	38.95	0.105	0.024	38.98	0.080	0.010
40.21	0.193	0.077	40.18	0.216	0.048	40.37	0.112	0.022	39.94	0.121	0.025	39.98	0.069	0.010
41.21	0.128	0.062	41.18	0.159	0.042	41.37	0.141	0.024	40.94	0.118	0.025	40.98	0.097	0.012
42.21	0.255	0.088	42.18	0.238	0.051	42.38	0.161	0.026	41.93	0.104	0.024	41.97	0.102	0.012
43.21	0.190	0.076	43.19	0.200	0.047	43.38	0.105	0.021	42.93	0.068	0.019	42.97	0.111	0.012
44.21	0.180	0.074	44.19	0.231	0.050	44.39	0.169	0.026	43.92	0.107	0.024	43.97	0.097	0.012
45.22	0.091	0.053	45.19	0.151	0.041	45.40	0.147	0.025	44.92	0.117	0.025	44.96	0.099	0.012
45.22	0.216	0.081	46.19	0.232	0.050	46.40	0.168	0.026	45.91	0.106	0.024	45.96	0.058	0.009
47.22	0.310	0.097	47.19	0.144	0.040	47.41	0.092	0.019	46.91	0.121	0.025	46.96	0.062	0.009
48.22	0.196	0.077	48.19	0.113	0.035	48.41	0.152	0.025	47.90	0.073	0.020	47.95	0.073	0.010
49.22	0.194	0.077	49.19	0.275	0.055	49.42	0.175	0.027	48.90	0.059	0.018	48.95	0.151	0.014
50.23	0.510	0.125	50.20	0.316	0.059	50.43	0.222	0.030	49.89	0.135	0.027	49.94	0.090	0.011
51.23	0.233	0.084	51.20	0.281	0.055	51.43	0.220	0.030	50.89	0.167	0.030	50.94	0.068	0.010
52.23	0.114	0.059	52.20	0.095	0.032	52.44	0.070	0.017	51.89	0.112	0.024	51.94	0.010	0.004
53.23	0.152	0.068	53.20	0.079	0.029	53.44	0.025	0.010	52.88	0.027	0.012	52.93	0.044	0.008
54.23	0.213	0.080	54.20	0.166	0.042	54.45	0.119	0.022	53.88	0.010	0.007	53.93	0.003	0.002
55.24	0.0	0.0	55.20	0.011	0.011	55.46	0.0	0.0	54.87	0.011	0.008	54.93	0.0	0.0

TABLE 13. (Continued)

TRITON FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

35 DEG - RUN 2005			40 DEG - RUN 2036			45 DEG - RUN 7127			50 DEG - RUN 2037			55 DEG - RUN 2044		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
6.20	0.028	0.304	6.09	0.040	0.011	6.11	0.035	0.007	6.14	0.025	0.006	6.15	0.045	0.009
7.21	0.060	0.007	7.09	0.042	0.012	7.11	0.071	0.010	7.14	0.056	0.009	7.15	0.070	0.011
8.22	0.085	0.008	8.08	0.111	0.019	8.11	0.109	0.012	8.13	0.104	0.012	8.14	0.090	0.012
9.24	0.113	0.009	9.08	0.119	0.020	9.10	0.122	0.013	9.13	0.135	0.014	9.14	0.098	0.013
10.25	0.108	0.009	10.07	0.161	0.023	10.10	0.139	0.014	10.12	0.104	0.012	10.14	0.128	0.014
11.26	0.125	0.009	11.06	0.134	0.021	11.10	0.142	0.014	11.12	0.133	0.013	11.13	0.115	0.014
12.27	0.131	0.010	12.06	0.167	0.023	12.10	0.162	0.015	12.11	0.153	0.014	12.13	0.110	0.013
13.29	0.148	0.010	13.05	0.134	0.021	13.10	0.162	0.015	13.11	0.131	0.013	13.12	0.113	0.013
14.30	0.111	0.009	14.05	0.138	0.021	14.09	0.161	0.015	14.10	0.115	0.013	14.12	0.093	0.012
15.31	0.162	0.011	15.04	0.120	0.020	15.09	0.131	0.014	15.10	0.112	0.012	15.12	0.069	0.010
16.32	0.133	0.010	16.04	0.086	0.017	16.09	0.114	0.013	16.09	0.092	0.011	16.11	0.072	0.011
17.33	0.131	0.010	17.03	0.107	0.019	17.09	0.139	0.014	17.09	0.102	0.012	17.11	0.087	0.012
18.35	0.123	0.009	18.03	0.116	0.020	18.09	0.124	0.013	18.08	0.101	0.012	18.11	0.077	0.011
19.36	0.113	0.009	19.02	0.115	0.019	19.08	0.121	0.013	19.08	0.086	0.011	19.10	0.069	0.010
20.37	0.110	0.009	20.02	0.134	0.021	20.08	0.118	0.013	20.07	0.096	0.011	20.10	0.086	0.012
21.38	0.116	0.009	21.01	0.111	0.019	21.08	0.124	0.013	21.06	0.086	0.011	21.09	0.090	0.012
22.39	0.116	0.009	22.01	0.126	0.020	22.08	0.101	0.012	22.06	0.080	0.010	22.09	0.073	0.011
23.41	0.120	0.009	23.00	0.113	0.019	23.07	0.115	0.013	23.05	0.074	0.010	23.09	0.061	0.010
24.42	0.108	0.009	23.99	0.125	0.020	24.07	0.098	0.012	24.05	0.083	0.011	24.08	0.063	0.010
25.43	0.110	0.009	24.99	0.086	0.017	25.07	0.087	0.011	25.04	0.060	0.009	25.08	0.066	0.010
26.44	0.106	0.009	25.98	0.087	0.017	26.07	0.096	0.012	26.04	0.073	0.010	26.08	0.041	0.008
27.46	0.108	0.009	26.98	0.118	0.020	27.07	0.098	0.012	27.03	0.072	0.010	27.07	0.049	0.009
28.47	0.103	0.009	27.97	0.096	0.018	28.06	0.099	0.012	28.03	0.064	0.009	28.07	0.068	0.010
29.48	0.091	0.008	28.97	0.091	0.017	29.06	0.069	0.010	29.02	0.059	0.009	29.06	0.054	0.009
30.49	0.103	0.009	29.96	0.066	0.015	30.06	0.075	0.010	30.02	0.049	0.008	30.06	0.055	0.009
31.50	0.098	0.008	30.96	0.075	0.016	31.06	0.058	0.009	31.01	0.050	0.008	31.06	0.029	0.007
32.52	0.080	0.008	31.95	0.079	0.016	32.05	0.054	0.009	32.01	0.058	0.009	32.05	0.051	0.009
33.53	0.074	0.007	32.95	0.078	0.016	33.05	0.062	0.009	33.00	0.059	0.009	33.05	0.042	0.008
34.54	0.072	0.007	33.94	0.065	0.015	34.05	0.075	0.010	34.00	0.063	0.009	34.05	0.026	0.006
35.55	0.074	0.007	34.94	0.099	0.018	35.05	0.046	0.008	34.99	0.049	0.008	35.04	0.038	0.008
36.57	0.084	0.008	35.93	0.065	0.015	36.05	0.047	0.008	35.99	0.037	0.007	36.04	0.032	0.007
37.58	0.064	0.007	36.92	0.042	0.012	37.04	0.038	0.007	36.98	0.043	0.008	37.03	0.037	0.008
38.59	0.069	0.007	37.92	0.046	0.012	38.04	0.059	0.009	37.98	0.032	0.007	38.03	0.024	0.006
39.60	0.069	0.007	38.91	0.059	0.014	39.04	0.042	0.008	38.97	0.036	0.007	39.03	0.018	0.005
40.61	0.063	0.007	39.91	0.084	0.017	40.04	0.049	0.008	39.97	0.034	0.007	40.02	0.024	0.006
41.63	0.058	0.006	40.90	0.068	0.015	41.03	0.066	0.010	40.96	0.042	0.008	41.02	0.030	0.007
42.64	0.059	0.006	41.90	0.045	0.012	42.03	0.032	0.007	41.96	0.037	0.007	42.01	0.026	0.006
43.65	0.075	0.007	42.89	0.045	0.013	43.03	0.036	0.007	42.95	0.025	0.006	43.01	0.028	0.007
44.66	0.068	0.007	43.89	0.050	0.013	44.03	0.041	0.008	43.95	0.025	0.006	44.01	0.019	0.005
45.68	0.071	0.007	44.88	0.041	0.012	45.03	0.034	0.007	44.94	0.030	0.006	45.00	0.018	0.005
46.69	0.045	0.006	45.88	0.039	0.011	46.02	0.024	0.006	45.93	0.031	0.007	46.00	0.008	0.004
47.70	0.026	0.004	46.87	0.042	0.012	47.02	0.023	0.006	46.93	0.013	0.004	47.00	0.005	0.003
48.71	0.054	0.006	47.87	0.038	0.011	48.02	0.022	0.006	47.92	0.021	0.005	47.99	0.010	0.004
49.72	0.079	0.007	48.86	0.018	0.008	49.02	0.042	0.008	48.92	0.017	0.005	48.99	0.014	0.005
50.74	0.054	0.006	49.85	0.055	0.013	50.01	0.025	0.006	49.91	0.039	0.007	49.98	0.010	0.004
51.75	0.032	0.005	50.85	0.061	0.014	51.01	0.007	0.003	50.91	0.024	0.006	50.98	0.018	0.005
52.76	0.005	0.002	51.84	0.033	0.010	52.01	0.009	0.004	51.90	0.013	0.004	51.98	0.009	0.004
53.77	0.036	0.005	52.84	0.009	0.005	53.01	0.013	0.004	52.90	0.001	0.001	52.97	0.002	0.002
54.79	0.002	0.001	53.83	0.003	0.003	54.01	0.0	0.0	53.89	0.014	0.004	53.97	0.002	0.002

TABLE 13. (Continued)

TRITON FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

60 DEG - RUN 7123			65 DEG - RUN 2045			70 DEG - RUN 2027			75 DEG - RUN 2022			82 DEG - RUN 2026		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
6.16	0.033	0.005	6.15	0.017	0.005	6.15	0.032	0.006	6.19	0.036	0.003	6.15	0.031	0.005
7.16	0.077	0.008	7.15	0.066	0.010	7.15	0.046	0.007	7.19	0.062	0.004	7.15	0.053	0.007
8.16	0.079	0.008	8.14	0.090	0.012	8.14	0.085	0.010	8.19	0.081	0.004	8.14	0.065	0.007
9.16	0.091	0.009	9.14	0.095	0.012	9.14	0.071	0.009	9.20	0.083	0.004	9.14	0.088	0.008
10.15	0.099	0.009	10.13	0.122	0.014	10.13	0.084	0.010	10.20	0.075	0.004	10.13	0.088	0.008
11.15	0.118	0.010	11.13	0.075	0.011	11.13	0.090	0.010	11.20	0.081	0.004	11.13	0.073	0.008
12.15	0.123	0.010	12.13	0.088	0.012	12.13	0.078	0.010	12.20	0.077	0.004	12.13	0.067	0.007
13.15	0.106	0.009	13.12	0.115	0.014	13.12	0.096	0.011	13.21	0.068	0.004	13.12	0.077	0.008
14.15	0.095	0.009	14.12	0.081	0.011	14.12	0.089	0.010	14.21	0.061	0.004	14.12	0.063	0.007
15.14	0.112	0.010	15.11	0.089	0.012	15.11	0.075	0.009	15.21	0.060	0.004	15.11	0.045	0.006
16.14	0.092	0.009	16.11	0.066	0.010	16.11	0.053	0.008	16.21	0.047	0.003	16.11	0.048	0.006
17.14	0.091	0.009	17.11	0.062	0.010	17.11	0.059	0.008	17.22	0.047	0.003	17.11	0.040	0.006
18.14	0.082	0.008	18.10	0.045	0.009	18.10	0.085	0.010	18.22	0.040	0.003	18.10	0.038	0.006
19.14	0.081	0.008	19.10	0.061	0.010	19.10	0.081	0.010	19.22	0.042	0.003	19.10	0.028	0.005
20.13	0.085	0.009	20.09	0.063	0.010	20.09	0.058	0.008	20.22	0.034	0.003	20.09	0.031	0.005
21.13	0.069	0.008	21.09	0.036	0.008	21.09	0.051	0.008	21.23	0.035	0.003	21.09	0.032	0.005
22.13	0.075	0.008	22.09	0.071	0.011	22.09	0.048	0.008	22.23	0.038	0.003	22.09	0.028	0.005
23.13	0.058	0.007	23.08	0.043	0.008	23.08	0.033	0.006	23.23	0.032	0.003	23.08	0.028	0.005
24.13	0.077	0.008	24.08	0.033	0.007	24.08	0.048	0.008	24.23	0.030	0.003	24.08	0.022	0.004
25.12	0.059	0.007	25.07	0.058	0.010	25.07	0.026	0.006	25.24	0.026	0.003	25.07	0.020	0.004
26.12	0.062	0.007	26.07	0.031	0.007	26.07	0.034	0.006	26.24	0.030	0.003	26.07	0.028	0.005
27.12	0.051	0.007	27.07	0.040	0.008	27.07	0.034	0.006	27.24	0.022	0.002	27.07	0.020	0.004
28.12	0.057	0.007	28.06	0.041	0.008	28.06	0.031	0.006	28.24	0.019	0.002	28.06	0.018	0.004
29.12	0.052	0.007	29.06	0.032	0.007	29.06	0.028	0.006	29.25	0.018	0.002	29.06	0.014	0.003
30.11	0.049	0.006	30.05	0.039	0.008	30.05	0.035	0.006	30.25	0.023	0.002	30.05	0.022	0.004
31.11	0.036	0.006	31.05	0.031	0.007	31.05	0.020	0.005	31.25	0.018	0.002	31.05	0.012	0.003
32.11	0.043	0.006	32.05	0.028	0.007	32.05	0.027	0.006	32.25	0.018	0.002	32.05	0.008	0.003
33.11	0.029	0.005	33.04	0.020	0.006	33.04	0.019	0.005	33.25	0.016	0.002	33.04	0.012	0.003
34.11	0.042	0.006	34.04	0.026	0.006	34.04	0.017	0.004	34.26	0.012	0.002	34.04	0.008	0.002
35.10	0.030	0.005	35.03	0.011	0.004	35.03	0.019	0.005	35.26	0.013	0.002	35.03	0.015	0.003
36.10	0.028	0.005	36.03	0.029	0.007	36.03	0.020	0.005	36.26	0.013	0.002	36.03	0.006	0.002
37.10	0.032	0.005	37.03	0.013	0.005	37.03	0.020	0.005	37.26	0.008	0.001	37.03	0.009	0.003
38.10	0.024	0.005	38.02	0.015	0.005	38.02	0.008	0.003	38.27	0.008	0.001	38.02	0.006	0.002
39.10	0.028	0.005	39.02	0.019	0.006	39.02	0.016	0.004	39.27	0.007	0.001	39.02	0.010	0.003
40.09	0.018	0.004	40.01	0.009	0.004	40.01	0.007	0.003	40.27	0.007	0.001	40.01	0.010	0.003
41.09	0.022	0.004	41.01	0.016	0.005	41.01	0.011	0.004	41.27	0.005	0.001	41.01	0.003	0.001
42.09	0.024	0.005	42.01	0.019	0.005	42.01	0.005	0.002	42.28	0.007	0.001	42.01	0.012	0.003
43.09	0.020	0.004	43.00	0.008	0.004	43.00	0.012	0.004	43.28	0.008	0.001	43.00	0.005	0.002
44.09	0.014	0.003	44.00	0.019	0.006	44.00	0.010	0.003	44.28	0.006	0.001	44.00	0.011	0.003
45.08	0.009	0.003	44.99	0.020	0.006	44.99	0.007	0.003	45.28	0.007	0.001	44.99	0.004	0.002
46.08	0.008	0.003	45.99	0.01[illegible]	0.004	45.99	0.003	0.002	46.29	0.003	0.001	45.99	0.001	0.001
47.08	0.015	0.004	46.99	0.003	0.002	46.99	0.007	0.003	47.29	0.003	0.001	46.99	0.006	0.002
48.08	0.019	0.004	47.98	0.005	0.003	47.98	0.003	0.002	48.29	0.002	0.001	47.98	0.002	0.001
49.08	0.013	0.003	48.98	0.002	0.002	48.98	0.008	0.003	49.29	0.005	0.001	48.98	0.004	0.002
50.07	0.009	0.003	49.97	0.008	0.004	49.97	0.008	0.003	50.30	0.002	0.001	49.97	0.004	0.002
51.07	0.001	0.001	50.97	0.0	0.0	50.97	0.001	0.001	51.30	0.001	0.[illegible]	50.97	0.001	0.001
52.07	0.002	0.001	51.97	0.0	0.0	51.97	0.004	0.002	52.30	0.000	0.[illegible]	51.97	0.0	0.0
53.07	0.001	0.001	52.96	0.0	0.0	52.96	0.0	0.0	53.30	0.000	0.000	52.96	0.0	0.0

TABLE 13. (Continued)

TRITON FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

90 DEG - RUN 7121			95 DEG - RUN 133			110 DEG - RUN 7122			135 DEG - RUN 2057			160 DEG - RUN 2061		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
6.22	0.035	0.004	6.18	0.025	0.003	6.17	0.041	0.006	6.12	0.044	0.003	6.04	0.045	0.004
7.21	0.058	0.005	7.19	0.046	0.004	7.16	0.058	0.008	7.11	0.063	0.004	7.02	0.051	0.005
8.21	0.080	0.006	8.19	0.060	0.004	8.16	0.067	0.008	8.10	0.064	0.004	8.01	0.053	0.005
9.21	0.082	0.006	9.19	0.065	0.004	9.16	0.077	0.009	9.09	0.066	0.004	8.99	0.052	0.005
10.21	0.071	0.005	10.19	0.064	0.004	10.16	0.060	0.008	10.08	0.054	0.004	9.98	0.044	0.004
11.21	0.074	0.006	11.19	0.056	0.004	11.16	0.048	0.007	11.07	0.045	0.003	10.96	0.042	0.004
12.21	0.084	0.006	12.19	0.056	0.004	12.16	0.057	0.008	12.06	0.039	0.003	11.95	0.031	0.004
13.20	0.057	0.005	13.20	0.051	0.004	13.15	0.053	0.007	13.05	0.031	0.003	12.93	0.026	0.003
14.20	0.055	0.005	14.20	0.037	0.003	14.15	0.043	0.006	14.04	0.025	0.002	13.92	0.022	0.003
15.20	0.068	0.005	15.20	0.044	0.004	15.15	0.049	0.007	15.03	0.021	0.002	14.90	0.016	0.003
16.20	0.051	0.005	16.20	0.038	0.003	16.15	0.030	0.005	16.02	0.016	0.002	15.89	0.010	0.002
17.20	0.040	0.004	17.20	0.037	0.003	17.15	0.033	0.006	17.01	0.015	0.002	16.87	0.014	0.002
18.20	0.040	0.004	18.20	0.030	0.003	18.15	0.025	0.005	18.00	0.013	0.002	17.86	0.014	0.002
19.19	0.036	0.004	19.21	0.027	0.003	19.14	0.015	0.004	18.99	0.014	0.002	18.85	0.011	0.002
20.19	0.035	0.004	20.21	0.020	0.002	20.14	0.017	0.004	19.99	0.009	0.001	19.83	0.005	0.001
21.19	0.031	0.004	21.21	0.023	0.003	21.14	0.021	0.005	20.98	0.009	0.001	20.82	0.010	0.002
22.19	0.028	0.003	22.21	0.021	0.002	22.14	0.022	0.005	21.97	0.007	0.001	21.80	0.007	0.002
23.19	0.026	0.003	23.21	0.018	0.002	23.14	0.016	0.004	22.96	0.009	0.001	22.79	0.008	0.002
24.19	0.022	0.003	24.21	0.014	0.002	24.14	0.015	0.004	23.95	0.008	0.001	23.77	0.004	0.001
25.18	0.020	0.003	25.22	0.018	0.002	25.13	0.012	0.003	24.94	0.008	0.001	24.76	0.003	0.001
26.18	0.020	0.003	26.22	0.013	0.002	26.13	0.006	0.002	25.93	0.003	0.001	25.74	0.004	0.001
27.18	0.016	0.003	27.22	0.013	0.002	27.13	0.008	0.003	26.92	0.004	0.001	26.73	0.003	0.001
28.18	0.011	0.002	28.22	0.011	0.002	28.13	0.004	0.002	27.91	0.004	0.001	27.71	0.006	0.002
29.18	0.011	0.002	29.22	0.011	0.002	29.13	0.007	0.003	28.90	0.003	0.001	28.70	0.002	0.001
30.18	0.010	0.002	30.22	0.008	0.002	30.13	0.005	0.002	29.89	0.003	0.001	29.69	0.002	0.001
31.18	0.013	0.002	31.22	0.007	0.001	31.13	0.006	0.002	30.88	0.002	0.001	30.67	0.002	0.001
32.17	0.011	0.002	32.23	0.006	0.001	32.12	0.004	0.002	31.87	0.002	0.001	31.66	0.002	0.001
33.17	0.007	0.002	33.23	0.009	0.002	33.12	0.003	0.002	32.86	0.002	0.001	32.64	0.000	0.000
34.17	0.006	0.002	34.23	0.006	0.001	34.12	0.006	0.002	33.85	0.002	0.001	33.63	0.000	0.000
35.17	0.005	0.001	35.23	0.006	0.001	35.12	0.004	0.002	34.84	0.001	0.001	34.61	0.002	0.001
36.17	0.006	0.002	36.23	0.004	0.001	36.12	0.002	0.002	35.83	0.003	0.001	35.60	0.001	0.001
37.17	0.008	0.002	37.23	0.004	0.001	37.12	0.001	0.001	36.83	0.002	0.001	36.58	0.0	0.0
38.16	0.008	0.002	38.24	0.002	0.001	38.11	0.0	0.0	37.82	0.001	0.000	37.57	0.001	0.001
39.16	0.004	0.001	39.24	0.003	0.001	39.11	0.002	0.001	38.81	0.000	0.000	38.55	0.0	0.0
40.16	0.001	0.001	40.24	0.002	0.001	40.11	0.002	0.001	39.80	0.000	0.000	39.54	0.000	0.000
41.16	0.004	0.001	41.24	0.003	0.001	41.11	0.003	0.002	40.79	0.001	0.000	40.52	0.000	0.000
42.16	0.003	0.001	42.24	0.003	0.001	42.11	0.001	0.001	41.78	0.000	0.000	41.51	0.0	0.0
43.16	0.005	0.001	43.24	0.001	0.001	43.11	0.002	0.001	42.77	0.001	0.000	42.50	0.000	0.000
44.15	0.005	0.001	44.25	0.002	0.001	44.10	0.001	0.001	43.76	0.001	0.000	43.48	0.0	0.0
45.15	0.002	0.001	45.25	0.001	0.001	45.10	0.001	0.001	44.75	0.000	0.000	44.47	0.0	0.0
46.15	0.001	0.001	46.25	0.001	0.000	46.10	0.0	0.0	45.74	0.000	0.000	45.45	0.0	0.0
47.15	0.002	0.001	47.25	0.001	0.001	47.10	0.001	0.001	46.73	0.000	0.000	46.44	0.0	0.0
48.15	0.003	0.001	48.25	0.002	0.001	48.10	0.001	0.001	47.72	0.000	0.000	47.42	0.0	0.0
49.15	0.002	0.001	49.25	0.000	0.000	49.10	0.0	0.0	48.71	0.0	0.0	48.41	0.0	0.0

TABLE 14

HELIUM-3 FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

12 DEG - RUN 124			15 DEG - RUN 125			20 DEG - RUN 2012			25 DEG - RUN 2050			30 DEG - RUN 7124		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
13.80	0.028	0.028	13.76	0.011	0.011	13.83	0.011	0.007	13.69	0.009	0.007	13.70	0.003	0.002
14.81	0.063	0.044	14.76	0.044	0.022	14.84	0.005	0.004	14.68	0.007	0.006	14.70	0.007	0.003
15.81	0.0	0.0	15.77	0.008	0.009	15.84	0.014	0.008	15.68	0.010	0.007	15.69	0.007	0.003
16.82	0.030	0.030	16.77	0.014	0.012	16.85	0.015	0.008	16.67	0.020	0.010	16.69	0.010	0.004
17.82	0.0	0.0	17.77	0.0	0.0	17.86	0.028	0.011	17.67	0.010	0.007	17.69	0.008	0.003
18.82	0.0	0.0	18.77	0.004	0.006	18.86	0.016	0.008	18.67	0.016	0.009	18.68	0.009	0.003
19.83	0.121	0.061	19.77	0.018	0.014	19.87	0.001	0.002	19.66	0.036	0.014	19.68	0.014	0.004
20.83	0.061	0.043	20.77	0.019	0.014	20.87	0.027	0.011	20.66	0.044	0.015	20.68	0.028	0.006
21.84	0.061	0.043	21.77	0.029	0.029	21.88	0.045	0.014	21.65	0.021	0.011	21.67	0.026	0.006
22.84	0.0	0.0	22.77	0.024	0.016	22.89	0.022	0.010	22.65	0.012	0.008	22.67	0.022	0.005
23.84	0.0	0.0	23.77	0.043	0.022	23.89	0.012	0.007	23.64	0.031	0.013	23.67	0.017	0.005
24.85	0.061	0.043	24.77	0.049	0.023	24.90	0.044	0.013	24.64	0.043	0.015	24.66	0.018	0.005
25.85	0.030	0.030	25.78	0.043	0.022	25.90	0.035	0.012	25.63	0.054	0.017	25.66	0.036	0.007
26.86	0.030	0.030	26.78	0.038	0.020	26.91	0.021	0.009	26.63	0.015	0.009	26.66	0.021	0.005
27.86	0.061	0.043	27.78	0.045	0.022	27.92	0.029	0.011	27.63	0.035	0.014	27.65	0.027	0.006
28.86	0.0	0.0	28.78	0.043	0.022	28.92	0.060	0.016	28.62	0.036	0.014	28.65	0.024	0.006
29.87	0.121	0.061	29.78	0.021	0.015	29.93	0.049	0.014	29.62	0.038	0.014	29.65	0.034	0.007
30.87	0.030	0.030	30.78	0.054	0.024	30.93	0.032	0.011	30.61	0.041	0.015	30.64	0.027	0.006
31.88	0.121	0.061	31.78	0.032	0.019	31.94	0.064	0.016	31.61	0.039	0.014	31.64	0.031	0.007
32.88	0.061	0.043	32.78	0.026	0.017	32.95	0.053	0.015	32.60	0.059	0.018	32.64	0.032	0.007
33.88	0.040	0.035	33.78	0.075	0.029	33.95	0.033	0.012	33.60	0.060	0.018	33.63	0.045	0.008
34.89	0.110	0.059	34.78	0.077	0.029	34.96	0.015	0.008	34.59	0.039	0.014	34.63	0.038	0.007
35.89	0.063	0.044	35.78	0.052	0.024	35.96	0.017	0.008	35.59	0.007	0.006	35.62	0.023	0.006
36.90	0.030	0.030	36.78	0.109	0.035	36.97	0.041	0.013	36.58	0.033	0.013	36.62	0.030	0.006
37.90	0.045	0.037	37.79	0.031	0.018	37.98	0.021	0.009	37.58	0.034	0.014	37.62	0.016	0.005
38.90	0.076	0.048	38.79	0.038	0.020	38.98	0.034	0.012	38.58	0.015	0.009	38.61	0.035	0.007
39.91	0.061	0.043	39.79	0.059	0.025	39.99	0.021	0.009	39.57	0.028	0.012	39.61	0.026	0.006
40.91	0.091	0.053	40.79	0.037	0.020	40.99	0.038	0.012	40.57	0.026	0.012	40.61	0.034	0.007
41.92	0.091	0.053	41.79	0.069	0.027	42.00	0.045	0.014	41.56	0.006	0.006	41.60	0.034	0.007
42.92	0.079	0.046	42.79	0.059	0.025	43.01	0.038	0.013	42.56	0.025	0.011	42.60	0.020	0.005
43.92	0.072	0.047	43.79	0.023	0.016	44.01	0.043	0.013	43.55	0.023	0.011	43.60	0.022	0.005
44.93	0.0	0.0	44.79	0.065	0.027	45.02	0.066	0.016	44.55	0.011	0.008	44.59	0.037	0.007
45.93	0.061	0.043	45.80	0.013	0.012	46.02	0.034	0.012	45.54	0.017	0.009	45.59	0.030	0.006
46.94	0.042	0.036	46.80	0.075	0.029	47.03	0.090	0.019	46.54	0.038	0.014	46.59	0.064	0.009
47.94	0.116	0.059	47.80	0.119	0.036	48.04	0.082	0.018	47.54	0.043	0.015	47.58	0.047	0.008
48.94	0.146	0.066	48.80	0.065	0.027	49.04	0.099	0.020	48.53	0.069	0.019	48.58	0.0	0.0
49.75	0.0	0.0	49.70	0.0	0.0	49.80	0.024	0.014	49.53	0.043	0.015	49.58	0.0	0.0

TABLE 14. (Continued)

HELIUM-3 FRO A = 120 BOMBARDED BY 62 MEV. PROTONS.

35 DEG - RUN 2005			40 DEG - RUN 2036			45 DEG - RUN 7127			50 DEG - RUN 2037			55 DEG - RUN 2044		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
13.91	0.003	0.002	13.68	0.0	0.0	13.72	0.002	0.002	13.68	0.004	0.002	13.70	0.005	0.003
14.93	0.010	0.003	14.67	0.009	0.005	14.72	0.002	0.002	14.67	0.006	0.003	14.69	0.007	0.003
15.94	0.013	0.003	15.66	0.008	0.005	15.72	0.005	0.003	15.67	0.006	0.003	15.69	0.008	0.004
16.95	0.011	0.003	16.64	0.012	0.006	16.71	0.005	0.003	16.66	0.007	0.003	16.69	0.013	0.004
17.96	0.011	0.003	17.65	0.004	0.004	17.71	0.011	0.004	17.66	0.007	0.003	17.68	0.009	0.004
18.97	0.018	0.003	18.63	0.010	0.006	18.71	0.005	0.003	18.65	0.013	0.004	18.68	0.008	0.004
19.98	0.015	0.003	19.64	0.012	0.006	19.71	0.014	0.005	19.65	0.008	0.003	19.67	0.009	0.004
21.00	0.022	0.004	20.64	0.015	0.007	20.70	0.015	0.005	20.64	0.011	0.004	20.67	0.013	0.005
22.01	0.015	0.003	21.63	0.024	0.009	21.70	0.018	0.005	21.63	0.015	0.005	21.67	0.010	0.004
23.02	0.018	0.003	22.63	0.026	0.009	22.70	0.024	0.006	22.63	0.010	0.004	22.65	0.018	0.005
24.03	0.016	0.003	23.62	0.006	0.004	23.70	0.021	0.005	23.62	0.020	0.005	23.66	0.018	0.005
25.05	0.032	0.005	24.62	0.021	0.008	24.70	0.020	0.005	24.62	0.007	0.003	24.66	0.006	0.003
26.06	0.020	0.004	25.61	0.017	0.007	25.69	0.013	0.004	25.61	0.016	0.005	25.65	0.013	0.005
27.07	0.023	0.004	26.61	0.022	0.009	26.69	0.021	0.006	26.61	0.012	0.004	26.65	0.014	0.005
28.08	0.025	0.004	27.60	0.033	0.010	27.69	0.021	0.005	27.60	0.017	0.005	27.64	0.015	0.005
29.09	0.021	0.004	28.59	0.021	0.008	28.69	0.018	0.005	28.60	0.020	0.005	28.64	0.007	0.003
30.11	0.020	0.004	29.59	0.029	0.010	29.68	0.018	0.005	29.59	0.015	0.005	29.64	0.011	0.004
31.12	0.020	0.004	30.58	0.019	0.008	30.68	0.016	0.005	30.59	0.013	0.004	30.63	0.022	0.006
32.13	0.017	0.003	31.58	0.026	0.009	31.68	0.028	0.006	31.58	0.009	0.004	31.63	0.017	0.005
33.14	0.027	0.004	32.57	0.040	0.012	32.68	0.018	0.005	32.58	0.036	0.007	32.63	0.013	0.005
34.15	0.022	0.004	33.57	0.025	0.009	33.68	0.019	0.005	33.57	0.044	0.008	33.62	0.016	0.005
35.17	0.018	0.003	34.56	0.025	0.009	34.67	0.015	0.005	34.57	0.023	0.006	34.62	0.015	0.005
36.18	0.018	0.003	35.56	0.022	0.008	35.67	0.019	0.005	35.56	0.011	0.004	35.61	0.014	0.005
37.19	0.017	0.003	36.55	0.017	0.008	36.67	0.013	0.004	36.56	0.004	0.002	36.61	0.009	0.004
38.20	0.020	0.004	37.55	0.016	0.007	37.67	0.012	0.004	37.55	0.011	0.004	37.61	0.006	0.003
39.21	0.016	0.003	38.54	0.016	0.007	38.66	0.020	0.005	38.54	0.005	0.003	38.60	0.010	0.004
40.23	0.017	0.003	39.54	0.009	0.005	39.66	0.013	0.004	39.54	0.013	0.004	39.60	0.010	0.004
41.24	0.023	0.004	40.53	0.011	0.006	40.66	0.013	0.004	40.53	0.012	0.004	40.60	0.010	0.004
42.25	0.023	0.004	41.52	0.012	0.006	41.66	0.017	0.005	41.53	0.003	0.002	41.59	0.003	0.002
43.26	0.022	0.004	42.52	0.015	0.007	42.66	0.010	0.004	42.52	0.013	0.004	42.59	0.013	0.005
44.27	0.017	0.003	43.51	0.003	0.003	43.65	0.017	0.005	43.52	0.007	0.003	43.58	0.008	0.004
45.28	0.021	0.004	44.51	0.016	0.007	44.65	0.013	0.004	44.51	0.006	0.003	44.58	0.003	0.002
46.30	0.019	0.004	45.50	0.019	0.008	45.65	0.017	0.005	45.51	0.010	0.004	45.58	0.005	0.003
47.31	0.023	0.004	46.50	0.009	0.005	46.65	0.022	0.006	46.50	0.009	0.004	46.57	0.005	0.003
48.32	0.024	0.004	47.49	0.031	0.010	47.64	0.010	0.004	47.50	0.013	0.004	47.55	0.002	0.002
49.33	0.011	0.003	48.49	0.016	0.007	48.64	0.0	0.0	48.49	0.009	0.003	48.56	0.003	0.002
49.94	0.0	0.0	49.48	0.010	0.006	49.59	0.0	0.0	49.49	0.0	0.0	49.56	0.0	0.0

TABLE 14. (Continued)

HELIUM-3 FROM A = 12C BOMBARDED BY 62 MEV. PROTONS.

60 DEG - RUN 7123			65 DEG - RUN 2045			70 DEG - RUN 2027			75 DEG - RUN 2022			82 DEG - RUN 2026		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
13.72	0.001	0.001	13.79	0.001	0.001	13.79	0.004	0.002	13.88	0.002	0.001	13.79	0.003	0.002
14.72	0.005	0.002	14.79	0.002	0.002	14.79	0.003	0.002	14.88	0.002	0.001	14.79	0.008	0.003
15.72	0.005	0.002	15.79	0.004	0.003	15.79	0.002	0.001	15.88	0.004	0.001	15.78	0.004	0.002
16.71	0.010	0.003	16.79	0.004	0.003	16.78	0.012	0.004	16.88	0.007	0.001	16.78	0.005	0.002
17.71	0.011	0.003	17.78	0.009	0.004	17.78	0.015	0.004	17.89	0.005	0.001	17.78	0.007	0.002
18.71	0.009	0.003	18.77	0.012	0.004	18.77	0.004	0.002	18.89	0.008	0.001	18.77	0.005	0.002
19.71	0.013	0.003	19.77	0.011	0.004	19.77	0.009	0.003	19.89	0.006	0.001	19.77	0.004	0.002
20.71	0.012	0.003	20.76	0.005	0.003	20.76	0.003	0.002	20.89	0.007	0.001	20.76	0.003	0.002
21.70	0.013	0.003	21.76	0.015	0.005	21.76	0.010	0.003	21.89	0.004	0.001	21.76	0.004	0.002
22.70	0.011	0.003	22.76	0.009	0.004	22.76	0.011	0.004	22.90	0.007	0.001	22.75	0.009	0.003
23.70	0.009	0.003	23.75	0.009	0.004	23.75	0.008	0.003	23.90	0.007	0.001	23.75	0.009	0.003
24.70	0.007	0.002	24.75	0.013	0.005	24.75	0.002	0.002	24.90	0.007	0.001	24.75	0.005	0.002
25.70	0.013	0.003	25.74	0.008	0.004	25.74	0.010	0.004	25.90	0.004	0.001	25.74	0.006	0.002
26.69	0.013	0.003	26.74	0.008	0.004	26.74	0.019	0.005	26.90	0.006	0.001	26.74	0.003	0.002
27.69	0.014	0.003	27.74	0.013	0.005	27.74	0.010	0.004	27.91	0.006	0.001	27.73	0.005	0.002
28.69	0.011	0.003	28.73	0.006	0.003	28.73	0.006	0.003	28.91	0.006	0.001	28.73	0.008	0.003
29.69	0.006	0.002	29.73	0.009	0.004	29.73	0.013	0.004	29.91	0.009	0.001	29.72	0.008	0.003
30.69	0.006	0.002	30.72	0.002	0.002	30.72	0.010	0.004	30.91	0.007	0.001	30.72	0.003	0.002
31.68	0.014	0.003	31.72	0.016	0.005	31.72	0.004	0.002	31.91	0.003	0.001	31.72	0.004	0.002
32.68	0.009	0.003	32.72	0.017	0.005	32.72	0.010	0.003	32.92	0.005	0.001	32.71	0.003	0.002
33.68	0.019	0.004	33.71	0.008	0.004	33.71	0.014	0.004	33.92	0.003	0.001	33.71	0.008	0.003
34.68	0.012	0.003	34.71	0.012	0.004	34.71	0.006	0.003	34.92	0.004	0.001	34.70	0.001	0.001
35.67	0.006	0.002	35.70	0.008	0.004	35.70	0.005	0.002	35.92	0.001	0.001	35.70	0.003	0.001
36.67	0.007	0.002	36.70	0.007	0.003	36.70	0.004	0.002	36.92	0.004	0.001	36.70	0.005	0.002
37.67	0.011	0.003	37.69	0.006	0.003	37.69	0.002	0.002	37.93	0.002	0.001	37.69	0.002	0.001
38.67	0.005	0.002	38.69	0.003	0.002	38.69	0.0	0.0	38.93	0.002	0.001	38.69	0.002	0.001
39.67	0.008	0.003	39.69	0.003	0.002	39.69	0.005	0.002	39.93	0.001	0.001	39.68	0.001	0.001
40.66	0.006	0.002	40.68	0.000	0.001	40.68	0.001	0.001	40.93	0.001	0.001	40.68	0.003	0.002
41.66	0.003	0.002	41.68	0.004	0.002	41.68	0.007	0.003	41.93	0.002	0.001	41.67	0.000	0.000
42.66	0.005	0.002	42.67	0.006	0.003	42.67	0.0	0.0	42.94	0.002	0.001	42.67	0.001	0.001
43.66	0.004	0.002	43.67	0.0	0.0	43.67	0.002	0.002	43.94	0.000	0.000	43.67	0.001	0.001
44.66	0.005	0.002	44.67	0.003	0.002	44.67	0.001	0.001	44.94	0.001	0.001	44.66	0.001	0.001
45.65	0.004	0.002	45.66	0.0	0.0	45.66	0.004	0.002	45.94	0.001	0.000	45.66	0.001	0.001
46.65	0.005	0.002	46.66	0.006	0.003	45.66	0.003	0.002	45.94	0.002	0.001	46.65	0.001	0.001
47.65	0.002	0.001	47.65	0.002	0.002	47.65	0.002	0.001	47.95	0.001	0.001	47.65	0.001	0.001
48.65	0.0	0.0	49.65	0.004	0.003	48.65	0.002	0.002	48.95	0.0	0.0	48.64	0.0	0.0

TABLE 14. (Continued)

HELIUM-3 FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

90 DEG - RUN 7121			99 DEG - RUN 133			110 DEG - PUN 7122			135 DEG - RUN 2057			160 DEG - RUN 2062		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
13.93	0.003	0.001	13.85	0.004	0.001	13.75	0.001	0.001	13.60	0.003	0.001	13.52	0.004	0.001
14.92	0.002	0.001	14.85	0.001	0.001	14.75	0.003	0.002	14.59	0.001	0.000	14.51	0.002	0.001
15.92	0.004	0.001	15.85	0.003	0.001	15.75	0.003	0.002	15.58	0.003	0.001	15.50	0.004	0.001
16.92	0.006	0.002	16.85	0.005	0.001	16.75	0.004	0.002	16.57	0.002	0.001	16.48	0.002	0.001
17.92	0.004	0.002	17.85	0.004	0.001	17.75	0.005	0.002	17.56	0.002	0.001	17.47	0.004	0.001
18.92	0.005	0.001	18.86	0.004	0.001	18.74	0.002	0.001	18.55	0.003	0.001	18.45	0.002	0.001
19.92	0.004	0.002	19.86	0.003	0.001	19.74	0.001	0.001	19.54	0.001	0.001	19.44	0.001	0.001
20.91	0.005	0.002	20.86	0.004	0.001	20.74	0.004	0.002	20.53	0.002	0.001	20.42	0.002	0.001
21.91	0.005	0.001	21.86	0.003	0.001	21.74	0.003	0.002	21.52	0.001	0.001	21.41	0.002	0.001
22.91	0.005	0.001	22.86	0.004	0.001	22.74	0.004	0.002	22.51	0.002	0.001	22.39	0.001	0.001
23.91	0.007	0.002	23.86	0.003	0.001	23.74	0.005	0.002	23.50	0.001	0.001	23.38	0.001	0.001
24.91	0.004	0.001	24.86	0.003	0.001	24.74	0.004	0.002	24.49	0.002	0.001	24.36	0.002	0.001
25.91	0.002	0.001	25.87	0.004	0.001	25.73	0.000	0.001	25.48	0.001	0.000	25.35	0.001	0.001
26.90	0.004	0.001	26.87	0.004	0.001	26.73	0.003	0.002	26.47	0.001	0.001	26.33	0.000	0.000
27.90	0.003	0.001	27.87	0.004	0.001	27.73	0.004	0.002	27.46	0.001	0.001	27.32	0.001	0.001
28.90	0.007	0.002	28.87	0.003	0.001	28.73	0.003	0.002	28.45	0.001	0.001	28.31	0.003	0.001
29.90	0.006	0.002	29.87	0.004	0.001	29.73	0.003	0.002	29.45	0.001	0.000	29.29	0.000	0.000
30.90	0.003	0.001	30.87	0.001	0.001	30.73	0.003	0.002	30.44	0.002	0.001	30.28	0.001	0.001
31.90	0.005	0.002	[illegible]	0.003	0.001	31.72	0.002	0.001	31.43	0.001	0.001	31.26	0.001	0.001
32.89	0.003	0.001	[illegible]	0.002	0.001	32.72	0.001	0.001	32.42	0.000	0.000	32.25	0.001	0.001
33.89	0.004	0.001	[illegible]	0.002	0.001	33.72	0.005	0.002	33.41	0.001	0.000	33.23	0.000	0.000
34.89	0.002	0.001	[illegible]	0.002	0.001	34.72	0.0	0.0	34.40	0.0	0.0	34.22	0.0	0.0
35.89	0.002	0.001	[illegible]	0.003	0.001	35.72	0.0	0.0	35.39	0.000	0.000	35.20	0.0	0.0
36.89	0.000	0.000	[illegible]	0.001	0.001	36.72	0.001	0.001	36.38	0.001	0.000	36.19	0.001	0.001
37.89	0.002	0.001	[illegible]	0.002	0.001	37.71	0.0	0.0	37.37	0.0	0.0	37.17	0.0	0.0
38.88	0.002	0.001	[illegible]	0.001	0.001	38.71	0.001	0.001	38.36	0.000	0.000	38.15	0.0	0.0
39.88	0.001	0.001	39.89	0.001	0.001	39.71	0.0	0.0	39.35	0.0	0.0	39.15	0.0	0.0
40.88	0.002	0.001	40.88	0.001	0.001	40.71	0.0	0.0	40.34	0.001	0.000	40.13	0.0	0.0
41.88	0.001	0.001	41.88	0.001	0.000	41.71	0.0	0.0	41.33	0.0	0.0	41.12	0.0	0.0
42.88	0.000	0.000	42.89	0.0	0.0	42.71	0.0	0.0	42.32	0.000	0.000	42.10	0.0	0.0
43.88	0.0	0.0	43.90	0.001	0.000	43.70	0.0	0.0	43.31	0.0	0.0	43.09	0.0	0.0
44.87	0.001	0.001	44.90	0.000	0.000	44.70	0.0	0.0	44.30	0.0	0.0	44.07	0.0	0.0
45.87	0.000	0.000	45.90	0.001	0.000	45.70	0.0	0.0	45.30	0.0	0.0	45.06	0.0	0.0
46.87	0.001	0.001	46.90	0.000	0.000	46.70	0.0	0.0	46.29	0.0	0.0	46.04	0.0	0.0

TABLE 15

ALPHA FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

12 DEG - RUN 124			15 DEG - RUN 125			20 DEG - RUN 2012			25 DEG - RUN 2050			30 DEG - RUN 7124		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
11.70	0.18	0.07	11.66	0.16	0.04	11.62	0.19	0.03	11.60	0.15	0.03	15.89	0.69	0.03
12.70	0.29	0.09	12.66	0.48	0.07	12.63	0.37	0.04	12.59	0.35	0.04	16.89	0.59	0.03
13.70	0.83	0.16	13.66	0.50	0.07	13.63	0.73	0.05	13.59	0.64	0.06	17.89	0.55	0.03
14.71	0.692	0.145	14.66	0.813	0.094	14.64	0.756	0.056	14.58	0.711	0.062	18.88	0.455	0.025
15.71	0.992	0.144	15.67	0.694	0.087	15.64	0.668	0.052	15.58	0.759	0.064	19.88	0.349	0.022
16.72	0.718	0.148	16.67	0.670	0.085	16.65	0.663	0.052	16.58	0.651	0.059	20.88	0.353	0.022
17.72	0.654	0.141	17.67	0.548	0.077	17.66	0.600	0.050	17.57	0.550	0.054	21.87	0.313	0.021
18.72	0.451	0.117	18.67	0.561	0.078	18.66	0.517	0.046	18.57	0.476	0.050	22.87	0.289	0.020
19.73	0.394	0.109	19.67	0.550	0.077	19.67	0.326	0.037	19.56	0.432	0.048	23.87	0.253	0.019
20.73	0.469	0.119	20.67	0.394	0.066	20.67	0.413	0.041	20.56	0.371	0.045	24.86	0.276	0.019
21.74	0.319	0.098	21.67	0.260	0.053	21.68	0.276	0.034	21.55	0.377	0.045	25.86	0.206	0.017
22.74	0.406	0.111	22.67	0.277	0.055	22.69	0.274	0.034	22.55	0.318	0.041	26.86	0.223	0.017
23.74	0.243	0.086	23.67	0.358	0.063	23.69	0.321	0.036	23.54	0.207	0.033	27.85	0.151	0.014
24.75	0.258	0.089	24.67	0.383	0.065	24.70	0.270	0.033	24.54	0.200	0.033	28.85	0.174	0.015
25.75	0.350	0.103	25.68	0.219	0.049	25.70	0.254	0.032	25.53	0.232	0.035	29.85	0.167	0.015
26.76	0.369	0.106	26.68	0.233	0.050	26.71	0.239	0.031	26.53	0.211	0.034	30.84	0.177	0.016
27.76	0.223	0.082	27.68	0.220	0.049	27.72	0.233	0.031	27.53	0.263	0.038	31.84	0.151	0.014
28.76	0.216	0.081	28.68	0.260	0.053	28.72	0.221	0.030	28.52	0.183	0.031	32.83	0.123	0.013
29.77	0.264	0.089	29.68	0.138	0.039	29.73	0.215	0.030	29.52	0.148	0.028	33.83	0.090	0.011
30.77	0.180	0.074	30.68	0.199	0.047	30.73	0.182	0.027	30.51	0.191	0.032	34.83	0.109	0.012
31.78	0.278	0.092	31.68	0.222	0.049	31.74	0.166	0.026	31.51	0.203	0.033	35.82	0.129	0.013
32.78	0.238	0.085	32.68	0.126	0.037	32.75	0.144	0.024	32.50	0.130	0.026	36.82	0.097	0.012
33.78	0.241	0.086	33.68	0.234	0.051	33.75	0.144	0.024	33.50	0.154	0.029	37.82	0.216	0.017
34.79	0.301	0.095	34.68	0.195	0.046	34.76	0.174	0.027	34.49	0.116	0.025	38.81	0.097	0.012
35.79	0.030	0.030	35.69	0.121	0.036	35.76	0.113	0.022	35.49	0.129	0.026	39.81	0.085	0.011
36.80	0.062	0.043	36.69	0.086	0.031	36.77	0.094	0.019	36.49	0.089	0.022	40.81	0.092	0.011
37.80	0.240	0.085	37.69	0.228	0.050	37.78	0.154	0.025	37.48	0.138	0.027	41.80	0.085	0.011
38.80	0.085	0.051	38.69	0.090	0.031	38.78	0.069	0.017	38.48	0.161	0.029	42.80	0.067	0.010
39.81	0.249	0.087	39.69	0.127	0.037	39.79	0.094	0.019	39.47	0.135	0.027	43.80	0.062	0.009
40.81	0.042	0.036	40.69	0.120	0.036	40.79	0.107	0.021	40.47	0.116	0.025	44.79	0.068	0.010
41.82	0.049	0.039	41.69	0.143	0.040	41.80	0.083	0.019	41.46	0.091	0.022	45.79	0.049	0.008
42.82	0.167	0.071	42.69	0.079	0.029	42.81	0.079	0.018	42.46	0.057	0.018	46.79	0.074	0.010
43.82	0.166	0.071	43.69	0.087	0.031	43.81	0.078	0.018	43.45	0.079	0.021	47.78	0.056	0.009
44.83	0.091	0.053	44.69	0.104	0.034	44.82	0.080	0.018	44.45	0.108	0.024	48.78	0.041	0.008
45.83	0.090	0.052	45.70	0.078	0.029	45.82	0.081	0.018	45.44	0.056	0.017	49.78	0.036	0.007
46.84	0.070	0.049	46.70	0.025	0.016	46.83	0.061	0.016	46.44	0.075	0.020	50.77	0.052	0.008
47.84	0.073	0.047	47.70	0.053	0.024	47.84	0.076	0.018	47.44	0.060	0.018	51.77	0.044	0.008
48.84	0.046	0.037	48.70	0.073	0.028	48.84	0.094	0.020	48.43	0.050	0.016	52.76	0.032	0.007
49.85	0.075	0.048	49.70	0.083	0.030	49.85	0.052	0.015	49.43	0.036	0.014	53.76	0.038	0.007
50.85	0.061	0.043	50.70	0.051	0.024	50.85	0.069	0.017	50.42	0.038	0.014	54.76	0.031	0.006
51.86	0.000	0.002	51.70	0.063	0.026	51.86	0.039	0.013	51.42	0.064	0.019	55.75	0.027	0.006
52.86	0.151	0.068	52.70	0.057	0.025	52.87	0.057	0.015	52.41	0.024	0.011	56.75	0.018	0.005
53.86	0.091	0.053	53.70	0.104	0.034	53.87	0.070	0.017	53.41	0.061	0.018	57.75	0.036	0.007
54.87	0.061	0.043	54.70	0.091	0.030	54.88	0.076	0.018	54.40	0.043	0.015	58.74	0.008	0.003
55.87	0.091	0.053	55.71	0.084	0.030	55.88	0.040	0.013	55.40	0.033	0.013	59.74	0.014	0.004
56.88	0.0	0.0	56.71	0.044	0.022	56.89	0.040	0.013	56.40	0.038	0.014	60.74	0.003	0.002
57.88	0.030	0.030	57.71	0.035	0.020	57.90	0.037	0.012	57.39	0.054	0.017	61.73	0.0	0.0
58.88	0.0	0.0	58.71	0.090	0.031	58.90	0.037	0.012	58.39	0.011	0.008	62.73	0.0	0.0
59.89	0.0	0.0	59.71	0.081	0.030	59.91	0.038	0.013	59.38	0.035	0.014	63.73	0.0	0.0
60.89	0.121	0.061	60.71	0.0	0.0	60.91	0.031	0.011	60.38	0.040	0.015	64.72	0.0	0.0
61.90	0.042	0.036	61.71	0.033	0.019	61.92	0.012	0.007	61.37	0.027	0.012	65.72	0.0	0.0
62.90	0.079	0.049	62.71	0.057	0.025	62.93	0.037	0.012	62.37	0.0	0.0	66.72	0.0	0.0
63.90	0.0	0.0	63.71	0.041	0.021	63.93	0.012	0.007	63.36	0.011	0.008	67.71	0.0	0.0

TABLE 15. (Continued)

ALPHA FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

35 DEG - RUN 2005			40 DEG - RUN 2035			45 DEG - RUN 7127			50 DEG - RUN 2037			55 DEG - RUN 2044		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
14.42	0.635	0.020	11.59	0.188	0.025	15.91	0.610	0.029	11.59	0.159	0.015	11.61	0.185	0.017
15.43	0.598	0.020	12.58	0.337	0.033	16.91	0.537	0.028	12.58	0.336	0.021	12.60	0.379	0.025
16.44	0.53	0.02	13.58	0.67	0.05	17.91	0.38	0.02	13.58	0.66	0.03	13.60	0.67	0.03
17.46	0.45	0.02	14.57	0.70	0.05	18.91	0.35	0.02	14.57	0.68	0.03	14.59	0.58	0.03
18.47	0.39	0.02	15.57	0.60	0.04	19.91	0.34	0.02	15.57	0.61	0.03	15.59	0.56	0.03
19.48	0.33	0.01	16.56	0.62	0.05	20.90	0.25	0.02	16.56	0.51	0.03	16.59	0.50	0.03
20.49	0.285	0.014	17.55	0.493	0.040	21.90	0.241	0.018	17.56	0.442	0.025	17.58	0.383	0.025
21.50	0.230	0.012	18.55	0.389	0.036	22.90	0.227	0.018	18.55	0.386	0.023	18.58	0.309	0.022
22.52	0.228	0.012	19.54	0.390	0.035	23.90	0.183	0.016	19.55	0.326	0.021	19.58	0.280	0.021
23.53	0.223	0.012	20.54	0.312	0.032	24.90	0.209	0.017	20.54	0.246	0.018	20.57	0.247	0.020
24.54	0.200	0.011	21.53	0.328	0.033	25.89	0.158	0.015	21.54	0.211	0.017	21.57	0.151	0.016
25.55	0.172	0.011	22.53	0.242	0.028	26.89	0.146	0.014	22.53	0.185	0.016	22.56	0.164	0.016
26.56	0.157	0.010	23.52	0.210	0.026	27.89	0.155	0.015	23.52	0.174	0.015	23.56	0.166	0.016
27.58	0.178	0.011	24.52	0.186	0.025	28.89	0.130	0.014	24.52	0.147	0.014	24.56	0.124	0.014
28.59	0.144	0.010	25.51	0.140	0.022	29.88	0.121	0.013	25.51	0.166	0.015	25.55	0.105	0.013
29.60	0.135	0.009	26.51	0.144	0.022	30.88	0.116	0.013	26.51	0.163	0.015	26.55	0.081	0.011
30.61	0.136	0.009	27.50	0.156	0.023	31.88	0.093	0.011	27.50	0.139	0.014	27.54	0.116	0.014
31.62	0.146	0.010	28.50	0.160	0.023	32.88	0.096	0.012	28.50	0.107	0.012	28.54	0.096	0.012
32.64	0.117	0.009	29.49	0.155	0.023	33.88	0.106	0.012	29.49	0.105	0.012	29.54	0.085	0.012
33.65	0.122	0.009	30.48	0.107	0.019	34.87	0.060	0.009	30.49	0.081	0.011	30.53	0.097	0.012
34.66	0.133	0.009	31.48	0.098	0.018	35.87	0.089	0.011	31.48	0.068	0.010	31.53	0.063	0.010
35.67	0.097	0.008	32.47	0.116	0.020	36.87	0.062	0.009	32.48	0.076	0.010	32.53	0.060	0.010
36.68	0.049	0.006	33.47	0.098	0.018	37.87	0.125	0.013	33.47	0.090	0.011	33.52	0.062	0.010
37.70	0.079	0.007	34.46	0.065	0.015	38.86	0.044	0.008	34.47	0.047	0.008	34.52	0.051	0.009
38.71	0.005	0.008	35.46	0.074	0.016	39.86	0.057	0.009	35.46	0.055	0.009	35.51	0.059	0.010
39.72	0.062	0.006	36.45	0.061	0.014	40.86	0.047	0.008	36.46	0.041	0.007	36.51	0.032	0.007
40.73	0.054	0.006	37.45	0.055	0.014	41.86	0.037	0.007	37.45	0.084	0.011	37.51	0.050	0.009
41.74	0.058	0.006	38.44	0.120	0.020	42.86	0.042	0.008	38.45	0.063	0.009	38.50	0.041	0.008
42.76	0.049	0.006	39.44	0.037	0.011	43.85	0.035	0.007	39.44	0.028	0.006	39.50	0.031	0.007
43.77	0.044	0.005	40.43	0.060	0.014	44.85	0.031	0.007	40.43	0.046	0.008	40.50	0.032	0.007
44.78	0.041	0.005	41.43	0.065	0.015	45.85	0.021	0.005	41.43	0.024	0.006	41.49	0.018	0.005
45.79	0.048	0.005	42.42	0.047	0.012	46.85	0.024	0.006	42.42	0.029	0.006	42.49	0.021	0.006
46.80	0.041	0.005	43.41	0.060	0.014	47.84	0.027	0.006	43.42	0.023	0.006	43.48	0.011	0.004
47.82	0.036	0.005	44.41	0.027	0.009	48.84	0.026	0.006	44.41	0.014	0.004	44.48	0.018	0.005
48.83	0.030	0.004	45.40	0.042	0.012	49.84	0.020	0.005	45.41	0.022	0.005	45.48	0.013	0.005
49.84	0.030	0.004	46.40	0.019	0.008	50.84	0.017	0.005	46.40	0.017	0.005	46.47	0.010	0.004
50.85	0.027	0.004	47.39	0.019	0.008	51.84	0.031	0.007	47.40	0.025	0.006	47.47	0.009	0.004
51.86	0.031	0.004	48.39	0.033	0.010	52.83	0.014	0.004	48.39	0.026	0.006	48.47	0.015	0.005
52.88	0.024	0.004	49.38	0.047	0.012	53.83	0.011	0.004	49.39	0.010	0.004	49.46	0.012	0.004
53.89	0.023	0.004	50.38	0.028	0.010	54.83	0.004	0.002	50.38	0.011	0.004	50.46	0.013	0.005
54.90	0.024	0.004	51.37	0.011	0.006	55.83	0.014	0.005	51.38	0.011	0.004	51.45	0.007	0.003
55.91	0.020	0.004	52.37	0.019	0.008	56.82	0.010	0.004	52.37	0.019	0.005	52.45	0.007	0.003
56.92	0.020	0.004	53.36	0.016	0.007	57.82	0.011	0.004	53.37	0.009	0.004	53.45	0.010	0.004
57.94	0.016	0.003	54.35	0.035	0.011	58.82	0.004	0.002	54.36	0.003	0.002	54.44	0.005	0.003
58.95	0.015	0.003	55.35	0.012	0.006	59.82	0.001	0.001	55.36	0.006	0.003	55.44	0.005	0.003
59.96	0.008	0.002	56.34	0.018	0.008	60.82	0.005	0.003	56.35	0.006	0.003	56.43	0.002	0.002
60.97	0.003	0.001	57.34	0.0	0.0	61.81	0.0	0.0	57.34	0.005	0.003	57.43	0.005	0.003
61.98	0.0	0.0	58.33	0.010	0.006	62.81	0.0	0.0	58.34	0.005	0.003	58.43	0.005	0.003
63.00	0.002	0.001	59.33	0.022	0.009	63.81	0.0	0.0	59.33	0.008	0.003	59.42	0.001	0.001
64.01	0.001	0.001	60.32	0.011	0.006	64.81	0.0	0.0	60.33	0.0	0.0	60.42	0.004	0.002
65.02	0.0	0.0	61.32	0.0	0.0	65.80	0.0	0.0	61.32	0.001	0.001	61.42	0.0	0.0

TABLE 15. (Continued)

ALPHA FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

60 DEG - RUN 7123			65 DEG - RUN 2045			70 DEG - RUN 2027			75 DEG - RUN 2022			82 DEG - RUN 2026		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
15.92	0.577	0.022	11.60	0.204	0.018	11.60	0.236	0.017	11.67	0.188	0.007	11.70	0.253	0.014
16.91	0.456	0.020	12.60	0.403	0.025	12.60	0.395	0.022	12.68	0.355	0.009	12.70	0.467	0.020
17.91	0.385	0.019	13.59	0.665	0.033	13.59	0.622	0.027	13.68	0.597	0.012	13.69	0.618	0.022
18.91	0.275	0.015	14.59	0.558	0.030	14.59	0.408	0.027	14.68	0.553	0.011	14.69	0.585	0.022
19.91	0.254	0.015	15.59	0.582	0.031	15.59	0.520	0.025	15.68	0.461	0.010	15.68	0.488	0.020
20.91	0.220	0.014	16.58	0.473	0.028	16.59	0.421	0.023	16.68	0.370	0.009	16.68	0.347	0.017
21.90	0.170	0.012	17.58	0.345	0.024	17.58	0.348	0.020	17.69	0.272	0.008	17.68	0.288	0.015
22.90	0.165	0.012	18.57	0.256	0.020	18.57	0.266	0.018	18.69	0.210	0.007	18.67	0.223	0.013
23.90	0.133	0.011	19.57	0.217	0.019	19.57	0.206	0.016	19.69	0.168	0.006	19.67	0.151	0.011
24.90	0.137	0.011	20.57	0.186	0.017	20.57	0.167	0.014	20.69	0.141	0.006	20.66	0.136	0.011
25.90	0.114	0.010	21.56	0.149	0.015	21.56	0.144	0.013	21.69	0.125	0.005	21.66	0.106	0.009
26.89	0.092	0.009	22.56	0.141	0.015	22.56	0.133	0.013	22.70	0.099	0.005	22.65	0.122	0.010
27.89	0.098	0.009	23.55	0.123	0.014	23.55	0.107	0.011	23.70	0.081	0.004	23.65	0.077	0.008
28.89	0.087	0.009	24.55	0.115	0.014	24.55	0.086	0.010	24.70	0.080	0.004	24.65	0.059	0.007
29.89	0.087	0.009	25.54	0.086	0.012	25.54	0.083	0.010	25.70	0.069	0.004	25.64	0.075	0.008
30.88	0.096	0.009	26.54	0.099	0.013	26.54	0.092	0.011	26.70	0.054	0.004	26.64	0.056	0.007
31.88	0.073	0.008	27.54	0.065	0.010	27.54	0.066	0.009	27.71	0.047	0.003	27.63	0.051	0.006
32.88	0.065	0.007	28.53	0.069	0.010	28.53	0.065	0.009	28.71	0.050	0.003	28.63	0.046	0.006
33.88	0.057	0.007	29.53	0.061	0.010	29.53	0.047	0.008	29.71	0.038	0.003	29.63	0.036	0.005
34.88	0.049	0.006	30.52	0.044	0.008	30.52	0.048	0.008	30.71	0.034	0.003	30.62	0.033	0.005
35.87	0.041	0.006	31.52	0.053	0.009	31.52	0.051	0.009	31.71	0.032	0.003	31.62	0.039	0.006
36.87	0.033	0.005	32.52	0.055	0.009	32.52	0.037	0.007	32.72	0.032	0.003	32.61	0.035	0.005
37.87	0.038	0.006	33.51	0.045	0.009	33.51	0.031	0.006	33.72	0.026	0.003	33.61	0.022	0.004
38.87	0.034	0.005	34.51	0.045	0.009	34.51	0.027	0.006	34.72	0.028	0.003	34.60	0.022	0.004
39.87	0.019	0.004	35.50	0.032	0.007	35.50	0.032	0.006	35.72	0.021	0.002	35.60	0.014	0.003
40.86	0.024	0.005	36.50	0.027	0.007	36.50	0.036	0.007	36.72	0.016	0.002	36.60	0.014	0.003
41.86	0.021	0.004	37.50	0.032	0.007	37.50	0.024	0.005	37.73	0.023	0.002	37.59	0.021	0.004
42.86	0.023	0.004	38.49	0.035	0.007	38.49	0.025	0.005	38.73	0.010	0.002	38.59	0.015	0.004
43.86	0.022	0.004	39.49	0.019	0.006	39.49	0.020	0.005	39.73	0.008	0.001	39.58	0.011	0.003
44.86	0.018	0.004	40.48	0.011	0.004	40.48	0.017	0.005	40.73	0.008	0.001	40.58	0.010	0.003
45.85	0.014	0.004	41.48	0.009	0.004	41.48	0.008	0.003	41.73	0.009	0.001	41.57	0.005	0.002
46.85	0.014	0.004	42.48	0.018	0.005	42.48	0.010	0.003	42.74	0.008	0.001	42.57	0.007	0.002
47.85	0.015	0.004	43.47	0.006	0.003	43.47	0.012	0.004	43.74	0.009	0.001	43.57	0.009	0.003
48.85	0.007	0.002	44.47	0.012	0.004	44.47	0.015	0.004	44.74	0.004	0.001	44.56	0.004	0.002
49.85	0.015	0.004	45.46	0.016	0.005	45.46	0.006	0.003	45.74	0.005	0.001	45.56	0.004	0.002
50.84	0.005	0.002	46.46	0.006	0.003	46.46	0.007	0.003	46.74	0.003	0.001	46.55	0.003	0.002
51.84	0.006	0.002	47.45	0.009	0.004	47.45	0.006	0.003	47.75	0.004	0.001	47.55	0.002	0.001
52.84	0.008	0.003	48.45	0.008	0.004	48.45	0.007	0.003	48.75	0.004	0.001	48.55	0.002	0.001
53.84	0.004	0.002	49.45	0.009	0.004	49.45	0.002	0.001	49.75	0.002	0.001	49.54	0.000	0.000
54.83	0.004	0.002	50.44	0.007	0.003	50.44	0.003	0.002	50.75	0.002	0.001	50.54	0.003	0.002
55.83	0.003	0.002	51.44	0.003	0.002	51.44	0.002	0.002	51.75	0.002	0.001	51.53	0.000	0.001
56.83	0.003	0.002	52.43	0.003	0.002	52.43	0.001	0.001	52.76	0.002	0.001	52.53	0.003	0.002
57.83	0.002	0.001	53.43	0.003	0.002	53.43	0.001	0.001	53.76	0.001	0.001	53.52	0.002	0.001
58.83	0.001	0.001	54.43	0.002	0.002	54.43	0.001	0.001	54.76	0.001	0.000	54.52	0.001	0.001
59.82	0.001	0.001	55.42	0.006	0.003	55.42	0.006	0.003	55.76	0.001	0.001	55.52	0.0	0.0
60.82	0.0	0.0	56.42	0.002	0.002	56.42	0.002	0.002	56.76	0.0	0.0	56.51	0.0	0.0
61.82	0.0	0.0	57.41	0.003	0.002	57.41	0.0	0.0	57.77	0.001	0.001	57.51	0.001	0.001
62.82	0.0	0.0	58.41	0.002	0.002	58.41	0.001	0.001	58.77	0.001	0.000	58.50	0.001	0.001
63.82	0.0	0.0	59.41	0.002	0.002	59.41	0.0	0.0	59.77	0.0	0.0	59.50	0.001	0.001
64.81	0.0	0.0	60.40	0.0	0.0	60.40	0.0	0.0	60.77	0.0	0.0	60.49	0.0	0.0
65.81	0.0	0.0	61.40	0.002	0.002	61.40	0.0	0.0	61.77	0.000	0.000	61.49	0.0	0.0

TABLE 15. (Continued)

ALPHA FROM A = 120 BOMBARDED BY 62 MEV. PROTONS.

90 DEG - RUN 7121			99 DEG - RUN 133			110 DEG - RUN 7122			135 DEG - RUN 2057			160 DEG - RUN 2062		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
16.12	0.476	0.014	11.69	0.133	0.006	11.61	0.447	0.021	11.47	0.365	0.009	11.41	0.381	0.012
17.12	0.334	0.012	12.70	0.365	0.010	12.60	0.517	0.078	12.46	0.580	0.012	12.39	0.546	0.015
18.12	0.248	0.010	13.70	0.559	0.013	13.60	0.549	0.092	13.45	0.729	0.013	13.38	0.657	0.016
19.12	0.212	0.009	14.70	0.524	0.012	14.60	0.537	0.091	14.44	0.578	0.012	14.36	0.530	0.015
20.12	0.148	0.008	15.70	0.417	0.011	15.60	0.438	0.021	15.43	0.416	0.010	15.35	0.373	0.012
21.11	0.122	0.007	16.70	0.318	0.009	16.60	0.314	0.018	16.42	0.295	0.008	16.33	0.258	0.010
22.11	0.098	0.006	17.70	0.231	0.008	17.60	0.249	0.016	17.41	0.206	0.007	17.32	0.172	0.008
23.11	0.077	0.006	18.70	0.169	0.007	18.60	0.175	0.013	18.40	0.146	0.006	18.30	0.126	0.007
24.11	0.063	0.005	19.71	0.141	0.006	19.59	0.115	0.011	19.39	0.097	0.005	19.29	0.089	0.006
25.11	0.059	0.005	20.71	0.098	0.005	20.59	0.095	0.010	20.38	0.077	0.004	20.27	0.066	0.005
26.11	0.055	0.005	21.71	0.070	0.004	21.59	0.081	0.009	21.37	0.055	0.004	21.26	0.044	0.004
27.10	0.044	0.004	22.71	0.068	0.004	22.59	0.059	0.009	22.36	0.050	0.003	22.25	0.033	0.004
28.10	0.045	0.004	23.71	0.060	0.004	23.59	0.044	0.007	23.35	0.034	0.003	23.23	0.030	0.003
29.10	0.034	0.004	24.71	0.047	0.004	24.59	0.046	0.007	24.34	0.029	0.003	24.22	0.019	0.003
30.10	0.027	0.003	25.72	0.043	0.003	25.59	0.026	0.005	25.33	0.020	0.002	25.20	0.016	0.003
31.10	0.028	0.003	26.72	0.028	0.003	26.58	0.035	0.006	26.33	0.019	0.002	26.19	0.013	0.002
32.10	0.028	0.003	27.72	0.028	0.003	27.58	0.022	0.005	27.32	0.016	0.002	27.17	0.011	0.002
33.09	0.023	0.003	28.72	0.023	0.003	28.58	0.022	0.005	28.31	0.011	0.002	28.16	0.009	0.002
34.09	0.024	0.003	29.72	0.019	0.002	29.58	0.015	0.004	29.30	0.010	0.002	29.14	0.008	0.002
35.09	0.019	0.003	30.72	0.017	0.002	30.58	0.013	0.004	30.29	0.009	0.001	30.13	0.007	0.002
36.09	0.016	0.003	31.73	0.017	0.002	31.57	0.021	0.005	31.28	0.006	0.001	31.11	0.004	0.001
37.09	0.009	0.002	32.73	0.014	0.002	32.57	0.008	0.003	32.27	0.004	0.001	32.10	0.003	0.001
38.09	0.019	0.003	33.73	0.011	0.002	33.57	0.008	0.003	33.26	0.003	0.001	33.08	0.003	0.001
39.08	0.009	0.002	34.73	0.013	0.002	34.57	0.007	0.003	34.25	0.004	0.001	34.07	0.003	0.001
40.08	0.007	0.002	35.73	0.011	0.002	35.57	0.006	0.002	35.24	0.003	0.001	35.06	0.003	0.001
41.08	0.004	0.002	36.73	0.001	0.001	36.57	0.005	0.002	36.23	0.002	0.001	36.04	0.003	0.001
42.08	0.007	0.002	37.74	0.010	0.002	37.56	0.009	0.003	37.22	0.001	0.001	37.03	0.001	0.000
43.08	0.003	0.001	38.74	0.004	0.001	38.56	0.005	0.002	38.21	0.002	0.001	38.01	0.001	0.001
44.07	0.002	0.001	39.74	0.005	0.001	39.56	0.005	0.002	39.20	0.001	0.001	39.00	0.001	0.001
45.07	0.007	0.002	40.74	0.005	0.001	40.56	0.004	0.002	40.19	0.002	0.001	39.98	0.001	0.000
46.07	0.003	0.001	41.74	0.005	0.001	41.56	0.004	0.002	41.18	0.001	0.001	40.97	0.001	0.001
47.07	0.004	0.001	42.74	0.003	0.001	42.56	0.003	0.002	42.17	0.002	0.001	41.95	0.0	0.0
48.07	0.002	0.001	43.74	0.003	0.001	43.56	0.003	0.002	43.17	0.001	0.000	42.94	0.0	0.0
49.07	0.001	0.001	44.75	0.001	0.001	44.55	0.002	0.001	44.16	0.0	0.0	43.92	0.0	0.0
50.06	0.002	0.001	45.75	0.003	0.001	45.55	0.002	0.001	45.15	0.001	0.000	44.91	0.0	0.0
51.06	0.003	0.001	46.75	0.001	0.000	46.55	0.001	0.001	46.14	0.001	0.000	45.89	0.0	0.0
52.06	0.002	0.001	47.75	0.000	0.000	47.55	0.002	0.001	47.13	0.0	0.0	46.88	0.0	0.0
53.06	0.000	0.000	48.75	0.001	0.001	48.55	0.0	0.0	48.12	0.000	0.000	47.87	0.0	0.0
54.06	0.0	0.0	49.75	0.001	0.000	49.55	0.0	0.0	49.11	0.0	0.0	48.85	0.0	0.0
55.06	0.001	0.001	50.74	0.001	0.000	50.54	0.0	0.0	50.10	0.0	0.0	49.84	0.0	0.0
56.05	0.000	0.000	51.74	0.000	0.000	51.54	0.0	0.0	51.09	0.0	0.0	50.82	0.0	0.0
57.05	0.0	0.0	52.74	0.001	0.000	52.54	0.0	0.0	52.08	0.0	0.0	51.81	0.0	0.0
58.05	0.0	0.0	53.74	0.0	0.0	53.54	0.0	0.0	53.07	0.0	0.0	52.79	0.0	0.0
59.05	0.0	0.0	54.74	0.001	0.000	54.54	0.0	0.0	54.06	0.0	0.0	53.78	0.0	0.0
60.05	0.0	0.0	55.74	0.0	0.0	55.54	0.0	0.0	55.05	0.0	0.0	54.76	0.0	0.0
61.05	0.0	0.0	56.77	0.001	0.000	56.53	0.0	0.0	56.04	0.0	0.0	55.75	0.0	0.0

TABLE 16

PROTON FROM A = 120 BOMBARDED BY 29 MEV. PROTONS.

15 DEG - RUN 11			30 DEG - RUN 2			125 DEG - RUN 20								
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
4.33	8.622	0.367	2.33	0.089	0.022	2.43	0.058	0.004						
5.33	9.170	0.379	3.33	0.519	0.053	3.44	0.130	0.006						
6.33	10.463	0.405	4.33	0.927	0.070	4.44	0.329	0.010						
7.34	11.938	0.432	5.34	1.098	0.077	5.45	0.495	0.012						
8.34	12.247	0.438	6.34	1.408	0.087	6.45	0.787	0.015						
9.34	9.283	0.381	7.34	1.978	0.103	7.45	0.875	0.016						
10.34	11.912	0.432	8.34	2.079	0.106	8.46	0.893	0.016						
11.34	12.722	0.446	9.34	1.945	0.102	9.46	0.611	0.013						
12.34	12.885	0.449	10.35	2.242	0.110	10.46	0.673	0.014						
13.34	12.488	0.442	11.35	2.384	0.113	11.47	0.605	0.013						
14.35	12.190	0.437	12.35	2.343	0.112	12.47	0.591	0.013						
15.35	12.180	0.437	13.35	2.826	0.123	13.48	0.551	0.013						
16.35	12.250	0.438	14.35	2.729	0.121	14.48	0.483	0.012						
17.35	11.398	0.422	15.36	3.067	0.128	15.48	0.421	0.011						
18.35	11.876	0.431	16.36	3.110	0.129	16.49	0.362	0.010						
19.35	11.168	0.418	17.36	3.050	0.128	17.49	0.333	0.010						
20.35	10.842	0.412	18.36	2.667	0.120	18.50	0.336	0.010						
21.35	11.577	0.426	19.36	2.771	0.122	19.50	0.296	0.009						
22.36	10.698	0.409	20.37	2.774	0.122	20.50	0.248	0.009						
23.36	9.214	0.380	21.37	2.807	0.123	21.51	0.209	0.008						
24.36	7.686	0.347	22.37	2.947	0.126	22.51	0.172	0.007						
25.36	7.790	0.349	23.37	2.672	0.120	23.51	0.152	0.007						
26.36	8.943	0.374	24.37	2.013	0.104	24.52	0.141	0.006						
27.36	10.810	0.411	25.38	2.525	0.116	25.52	0.285	0.009						
28.36	12.177	0.690	26.38	6.096	0.181	26.53	0.123	0.006						
0.0	0.0	0.0	27.38	6.290	0.184	27.30	0.038	0.005						

TABLE 17

DEUTERON FROM A = 120 BOMBARDED BY 29 MEV. PROTONS.

15 DEG - RUN 11			30 DEG - RUN 2			60 DEG - RUN 5			90 DEG - RUN 6			125 DEG - RUN 20		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
5.13	0.020	0.018	5.14	0.046	0.016	5.15	0.011	0.002	5.26	0.012	0.002	5.19	0.014	0.002
6.13	0.088	0.037	6.14	0.078	0.020	6.16	0.035	0.004	6.26	0.037	0.004	6.20	0.028	0.003
7.13	0.194	0.055	7.14	0.111	0.024	7.16	0.086	0.006	7.27	0.052	0.004	7.20	0.038	0.003
8.14	0.235	0.061	8.14	0.150	0.028	8.17	0.119	0.007	8.27	0.074	0.005	8.21	0.044	0.004
9.14	0.511	0.089	9.14	0.182	0.031	9.17	0.146	0.007	9.28	0.075	0.005	9.21	0.047	0.004
10.14	0.349	0.074	10.15	0.287	0.039	10.18	0.171	0.008	10.29	0.091	0.005	10.21	0.058	0.004
11.14	0.291	0.068	11.15	0.352	0.043	11.18	0.193	0.009	11.29	0.114	0.006	11.22	0.063	0.004
12.14	0.497	0.088	12.15	0.275	0.038	12.19	0.147	0.007	12.30	0.078	0.005	12.22	0.048	0.004
13.14	0.788	0.111	13.15	0.396	0.046	13.19	0.256	0.010	13.30	0.109	0.006	13.23	0.067	0.004
14.14	0.634	0.100	14.15	0.486	0.051	14.20	0.248	0.010	14.31	0.105	0.006	14.23	0.043	0.004
15.15	0.862	0.116	15.16	0.540	0.054	15.20	0.288	0.010	15.32	0.128	0.006	15.23	0.051	0.004
16.15	1.130	0.133	16.16	0.693	0.061	16.21	0.304	0.011	16.32	0.093	0.006	16.24	0.040	0.003
17.15	0.896	0.118	17.16	0.463	0.050	17.21	0.196	0.009	17.33	0.081	0.005	17.24	0.031	0.003
18.15	0.607	0.097	18.16	0.379	0.045	18.22	0.185	0.008	18.33	0.076	0.005	18.24	0.032	0.003
19.15	1.161	0.135	19.16	0.634	0.058	19.22	0.217	0.009	19.34	0.078	0.005	19.25	0.034	0.003
20.15	4.891	0.277	20.17	1.503	0.090	20.23	0.785	0.017	20.35	0.203	0.008	20.25	0.075	0.005
21.15	9.988	0.395	21.17	3.290	0.133	21.23	1.107	0.020	21.35	0.201	0.008	21.26	0.060	0.004
22.16	7.335	0.339	22.17	2.709	0.121	22.24	0.021	0.003	22.36	0.000	0.000	22.26	0.0	0.0
23.16	0.0	0.0	23.17	0.016	0.009	23.24	0.001	0.001	23.36	0.000	0.000	23.26	0.0	0.0
23.83	0.0	0.0	23.85	0.0	0.0	23.89	0.000	0.000	23.94	0.0	0.0	23.89	0.0	0.0

TABLE 18

TRITON FROM A = 120 BOMBARDED BY 29 MEV. PROTONS.

15 DEG - RUN 11			30 DEG - RUN 2			60 DEG - RUN 5			90 DEG - RUN 6			125 DEG - RUN 20		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
6.18	0.047	0.027	6.19	0.050	0.016	6.21	0.017	0.003	6.31	0.006	0.001	6.25	0.007	0.001
7.19	0.086	0.037	7.19	0.046	0.016	7.21	0.027	0.003	7.32	0.015	0.002	7.25	0.010	0.002
8.19	0.123	0.044	8.19	0.045	0.015	8.22	0.040	0.004	8.32	0.021	0.003	8.26	0.013	0.002
9.19	0.120	0.043	9.19	0.084	0.021	9.22	0.057	0.005	9.33	0.030	0.003	9.26	0.016	0.002
10.19	0.207	0.057	10.20	0.085	0.021	10.23	0.063	0.005	10.34	0.030	0.003	10.26	0.015	0.002
11.19	0.225	0.059	11.20	0.130	0.026	11.23	0.071	0.005	11.34	0.030	0.003	11.27	0.015	0.002
12.19	0.260	0.064	12.20	0.151	0.028	12.24	0.077	0.005	12.35	0.035	0.003	12.27	0.023	0.003
13.19	0.292	0.068	13.20	0.227	0.035	13.24	0.071	0.005	13.35	0.027	0.003	13.28	0.013	0.002
14.19	0.166	0.051	14.20	0.090	0.022	14.25	0.036	0.004	14.36	0.017	0.002	14.28	0.010	0.002
15.20	0.280	0.066	15.21	0.125	0.026	15.25	0.052	0.004	15.37	0.025	0.003	15.28	0.009	0.002
16.20	0.229	0.060	16.21	0.186	0.032	16.26	0.084	0.006	16.37	0.034	0.003	16.29	0.013	0.002
17.20	0.496	0.088	17.21	0.309	0.041	17.26	0.093	0.006	17.38	0.030	0.003	17.29	0.016	0.002
18.20	0.640	0.100	18.21	0.419	0.047	18.27	0.099	0.006	18.38	0.042	0.004	18.29	0.014	0.002
19.20	0.475	0.086	19.21	0.269	0.038	19.27	0.071	0.005	19.39	0.015	0.002	19.30	0.005	0.001
20.20	0.517	0.090	20.22	0.104	0.024	20.28	0.040	0.004	20.40	0.044	0.004	20.30	0.010	0.002
21.20	1.299	0.143	21.22	0.378	0.045	21.28	0.271	0.010	21.40	0.009	0.002	21.31	0.0	0.0
21.86	0.0	0.0	21.87	0.0	0.0	21.91	0.0	0.0	21.96	0.0	0.0	21.91	0.0	0.0

TABLE 19

HELIUM-3 FROM A = 120 BOMBARDED BY 29 MEV. PROTONS.

15 DEG - RUN 11			30 DEG - RUN 2			60 DEG - RUN 5			90 DEG - RUN 6			125 DEG - RUN 20		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
13.74	0.047	0.027	13.75	0.0	0.0	13.84	0.001	0.001	14.01	0.002	.001	13.93	0.001	0.000
14.75	0.027	0.020	14.75	0.002	0.003	14.85	0.002	0.001	15.01	0.002	0.001	14.93	0.002	0.001
15.75	0.044	0.026	15.76	0.009	0.007	15.85	0.003	0.001	16.02	0.004	0.001	15.94	0.002	0.001
16.75	0.0	0.0	16.76	0.011	0.008	16.86	0.005	0.001	17.03	0.000	0.000	16.94	0.0	0.0
17.75	0.0	0.0	17.76	0.0	0.0	17.86	0.001	0.001	18.03	0.0	0.0	17.94	0.0	0.0
18.75	0.0	0.0	18.76	0.0	0.0	18.87	0.000	0.000	19.04	0.0	0.0	18.95	0.0	0.0
19.75	0.0	0.0	19.76	0.0	0.0	19.87	0.000	0.000	20.04	0.0	0.0	19.95	0.0	0.0
20.75	0.0	0.0	20.77	0.005	0.005	20.88	0.0	0.0	21.05	0.0	0.0	20.95	0.0	0.0

TABLE 20

ALPHA FROM A = 120 BOMBARDED BY 29 MEV. PROTONS.

15 DEG - RUN 11			30 DEG - RUN 2			60 DEG - RUN 5			90 DEG - RUN 6			125 DEG - RUN 20		
ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR	ENERGY (MEV)	SIGMA (MB/SR-MEV)	ERROR
11.59	0.069	0.033	11.60	0.046	0.016	11.68	0.057	0.005	11.90	0.064	0.005	11.82	0.070	0.005
12.59	0.179	0.053	12.60	0.109	0.024	12.69	0.108	0.006	12.90	0.120	0.006	12.82	0.117	0.006
13.59	0.176	0.053	13.60	0.215	0.034	13.69	0.131	0.007	13.91	0.107	0.006	13.83	0.110	0.006
14.60	0.165	0.051	14.60	0.192	0.032	14.70	0.119	0.007	14.91	0.087	0.005	14.83	0.077	0.005
15.60	0.252	0.063	15.61	0.213	0.034	15.70	0.119	0.007	15.92	0.075	0.005	15.83	0.049	0.004
16.60	0.173	0.052	16.61	0.152	0.029	16.71	0.091	0.006	16.93	0.054	0.004	16.84	0.039	0.003
17.60	0.250	0.063	17.61	0.204	0.033	17.71	0.088	0.006	17.93	0.045	0.004	17.84	0.031	0.003
18.60	0.198	0.056	18.61	0.178	0.031	18.72	0.077	0.005	18.94	0.038	0.004	18.85	0.019	0.002
19.60	0.250	0.063	19.61	0.170	0.030	19.72	0.071	0.005	19.94	0.030	0.003	19.85	0.016	0.002
20.60	0.194	0.055	20.62	0.151	0.028	20.73	0.069	0.005	20.95	0.033	0.003	20.85	0.012	0.002
21.61	0.124	0.044	21.62	0.134	0.027	21.73	0.065	0.005	21.96	0.026	0.003	21.86	0.011	0.002
22.61	0.321	0.071	22.62	0.148	0.028	22.74	0.057	0.005	22.96	0.016	0.002	22.86	0.009	0.002
23.61	0.186	0.054	23.62	0.172	0.030	23.74	0.034	0.004	23.97	0.013	0.002	23.87	0.008	0.002
24.61	0.178	0.053	24.62	0.143	0.028	24.75	0.036	0.004	24.97	0.013	0.002	24.87	0.006	0.001
25.61	0.156	0.049	25.63	0.176	0.031	25.75	0.033	0.004	25.98	0.010	0.002	25.87	0.004	0.001
26.61	0.183	0.054	26.63	0.086	0.021	26.76	0.035	0.004	26.99	0.010	0.002	26.88	0.003	0.001
27.61	0.226	0.059	27.63	0.094	0.022	27.76	0.030	0.003	27.99	0.004	0.001	27.88	0.001	0.001
28.61	0.103	0.040	28.63	0.065	0.019	28.77	0.012	0.002	29.00	0.001	0.001	28.88	0.001	0.000
29.62	0.071	0.033	29.63	0.062	0.018	29.77	0.009	0.002	30.00	0.003	0.001	29.89	0.000	0.000
30.62	0.302	0.069	30.64	0.140	0.027	30.78	0.014	0.002	31.01	0.0	0.0	30.89	0.0	0.0
31.57	0.0	0.0	31.59	0.0	0.0	31.66	0.0	0.0	31.76	0.0	0.0	31.72	0.0	0.0