

Lawrence Berkeley National Laboratory

Recent Work

Title

n-p ELASTIC SCATTERING IN THE CMS ENERGY RANGE 1400-2000 MEV. TABLES OF CROSS-SECTIONS AND LEGENDRE POLYNOMIAL COEFFICIENTS.

Permalink

<https://escholarship.org/uc/item/6hk701p3>

Authors

Berge, J.P.
Herndon, D.J.
Longacre, R.
et al.

Publication Date

1970-01-02

UCRL 20223 (Suppl.)

C.2

RECEIVED
UNIVERSITY
RADIATION LABORATORY
JAN 20

LIBRARY AND
DOCUMENTS SECTION

University of California

Ernest O. Lawrence
Radiation Laboratory

TWO-WEEK LOAN COPY

*This is a Library Circulating Copy
which may be borrowed for two weeks.
For a personal retention copy, call
Tech. Info. Division, Ext. 5545*

Berkeley, California

UCRL-20223 (suppl.)
C.2

DISCLAIMER

This document was prepared as an account of work sponsored by the United States Government. While this document is believed to contain correct information, neither the United States Government nor any agency thereof, nor the Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or the Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof or the Regents of the University of California.

RECEIVED
LAWRENCE
RADIATION LABORATORY

JAN 20 1971

LIBRARY AND
DOCUMENTS SECTION

SUPPLEMENT 1 TO SLAC-PUB-789

UCRL-20223

(Not to be Published)

C.2

π^-p ELASTIC SCATTERING IN THE CMS ENERGY RANGE 1400-2000 MEV*

TABLES OF CROSS-SECTIONS AND LEGENDRE
POLYNOMIAL COEFFICIENTS

A. D. Brody,** R. J. Cashmore, A. Kernan,***
D. W. G. S. Leith, B. S. Levi, B. C. Shen***

Stanford Linear Accelerator Center
Stanford University, Stanford, California 94305

J. P. Berge[†], D. J. Herndon, R. Longacre, L. R. Price^{††}
A. H. Rosenfeld, P. Söding^{†††}

Lawrence Radiation Laboratory
University of California, Berkeley, California 94720

* Work supported by the U. S. Atomic Energy Commission.

** Present address is CERN, Geneva, Switzerland.

*** Present address is University of California, Riverside, California.

[†] Present address is Department of Nuclear Physics, Oxford University,
Oxford, England.

^{††} Present address is University of California, Irvine, California.

^{†††} Present address is DESY, Hamburg, West Germany.

34w

C.2

UCRL-20223 (Suppl. 1)

In this supplement the results of π^-p elastic scattering are given in tabular form for each C.M.S. energy at which we have made measurements.

The tables contain the following information

- (1) C.M.S. energy
- (2) Number of events
- (3) The differential cross-section $\frac{d\sigma}{d\Omega}$. Values of the cross-section near $\theta = 0^\circ$ ($\cos\theta > 0.95$) are unreliable due to biases present in bubble chamber data and are not given
- (4) The Legendre polynomial coefficients in the expansion of the elastic scattering distribution

$$\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$$

- (5) The total elastic cross-section evaluated as

$$\sigma_{el} = 4\pi A_0$$

- (6) The differential cross-section at 0° , $\frac{d\sigma}{d\Omega}(\theta=0)$, evaluated as

$$\frac{d\sigma}{d\Omega}(\theta=0) = \sum_n A_n$$

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1406$

Number of events = 534

$\sigma_{el} = 10.24 \pm 0.62$

$\frac{d\sigma}{d\Omega}(\theta=0) = 1.34 \pm 0.77$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925		A_0	0.82 ± 0.05
.85	1.02 ± 0.28	A_1	0.61 ± 0.12
.75	1.45 ± 0.24	A_2	0.54 ± 0.17
.65	1.54 ± 0.23	A_3	-0.46 ± 0.21
.55	1.16 ± 0.20	A_4	-0.16 ± 0.19
.45	1.48 ± 0.22	A_5	0.00 ± 0.17
.35	1.08 ± 0.19	A_6	
.25	1.19 ± 0.20		
.15	0.52 ± 0.13		
.05	0.64 ± 0.14		
-.05	0.35 ± 0.10		
-.15	0.29 ± 0.09		
-.25	0.44 ± 0.12		
-.35	0.26 ± 0.09		
-.45	0.26 ± 0.09		
-.55	0.23 ± 0.83		
-.65	0.58 ± 0.13		
-.75	0.55 ± 0.13		
-.85	0.74 ± 0.16		
-.95	0.93 ± 0.18		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1440$

Number of events = 421

$\sigma_{el} = 12.86 \pm 0.94$

$\frac{d\sigma}{d\Omega}(\theta=0) = 3.57 \pm 1.19$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925		A_0	1.02 ± 0.08
.85	3.03 ± 0.48	A_1	1.09 ± 0.19
.75	2.04 ± 0.35	A_2	1.31 ± 0.27
.65	1.56 ± 0.28	A_3	-0.04 ± 0.31
.55	1.87 ± 0.31	A_4	0.00 ± 0.27
.45	1.60 ± 0.28	A_5	0.20 ± 0.23
.35	0.80 ± 0.19	A_6	
.25	0.93 ± 0.21		
.15	0.89 ± 0.21		
.05	0.62 ± 0.17		
-.05	0.31 ± 0.12		
-.15	0.09 ± 0.06		
-.25	0.22 ± 0.10		
-.35	0.22 ± 0.10		
-.45	0.31 ± 0.12		
-.55	0.49 ± 0.15		
-.65	0.36 ± 0.13		
-.75	0.80 ± 0.19		
-.85	0.88 ± 0.21		
-.95	1.13 ± 0.24		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1472$

Number of events = 1019

$\sigma_{el} = 15.32 \pm 0.80$

$\frac{d\sigma}{d\Omega}(\theta=0) = 4.38 \pm 0.96$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925		A_0	1.22 ± 0.06
.85	3.19 ± 0.40	A_1	1.48 ± 0.16
.75	2.96 ± 0.35	A_2	1.66 ± 0.22
.65	2.65 ± 0.28	A_3	-0.08 ± 0.25
.55	1.94 ± 0.23	A_4	0.03 ± 0.21
.45	1.52 ± 0.20	A_5	0.08 ± 0.17
.35	1.39 ± 0.19	A_6	
.25	0.82 ± 0.14		
.15	0.74 ± 0.13		
.05	0.59 ± 0.12		
-.05	0.27 ± 0.08		
-.15	0.27 ± 0.08		
-.25	0.11 ± 0.05		
-.35	0.13 ± 0.05		
-.45	0.17 ± 0.06		
-.55	0.27 ± 0.08		
-.65	0.46 ± 0.10		
-.75	0.69 ± 0.13		
-.85	1.17 ± 0.19		
-.95	1.17 ± 0.19		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 14.96$

Number of events = 1820

$\sigma_{el} = 19.07 \pm 0.74$

$\frac{d\sigma}{d\Omega}(\theta=0) = 6.85 \pm 0.88$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925		A_0	1.52 ± 0.06
.85	4.88 ± 0.39	A_1	2.23 ± 0.15
.75	3.79 ± 0.31	A_2	2.42 ± 0.21
.65	3.04 ± 0.27	A_3	0.41 ± 0.29
.55	2.83 ± 0.26	A_4	0.07 ± 0.19
.45	1.95 ± 0.20	A_5	0.20 ± 0.15
.35	1.22 ± 0.15	A_6	
.25	1.02 ± 0.13		
.15	0.83 ± 0.12		
.05	0.38 ± 0.08		
-.05	0.25 ± 0.06		
-.15	0.15 ± 0.05		
-.25	0.06 ± 0.03		
-.35	0.07 ± 0.03		
-.45	0.18 ± 0.05		
-.55	0.38 ± 0.05		
-.65	0.46 ± 0.54		
-.75	0.88 ± 0.12		
-.85	0.98 ± 0.16		
-.95	1.10 ± 0.17		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1527$

Number of events = 2115

$\sigma_{el} = 19.91 \pm 0.71$

$\frac{d\sigma}{d\Omega}(\theta=0) = 7.30 \pm 0.85$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925		A_0	1.58 ± 0.06
.85	5.24 ± 0.37	A_1	2.45 ± 0.15
.75	4.46 ± 0.33	A_2	2.61 ± 0.20
.65	3.14 ± 0.25	A_3	0.69 ± 0.22
.55	2.75 ± 0.22	A_4	-0.10 ± 0.18
.45	2.22 ± 0.19	A_5	0.07 ± 0.14
.35	1.32 ± 0.14	A_6	
.25	0.70 ± 0.10		
.15	0.62 ± 0.09		
.05	0.42 ± 0.08		
-.05	0.20 ± 0.05		
-.15	0.09 ± 0.03		
-.25	0.15 ± 0.04		
-.35	0.14 ± 0.04		
-.45	0.33 ± 0.07		
-.55	0.42 ± 0.08		
-.65	0.57 ± 0.09		
-.75	0.80 ± 0.11		
-.85	0.93 ± 0.14		
-.95	0.86 ± 0.14		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1556$

Number of events = 571

$\sigma_{el} = 14.91 \pm 0.96$

$\frac{d\sigma}{d\Omega}(0=0) = 4.61 \pm 1.14$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925		A_0	1.19 ± 0.08
.85	3.17 ± 0.47	A_1	1.45 ± 0.19
.75	3.07 ± 0.46	A_2	1.52 ± 0.27
.65	2.14 ± 0.30	A_3	0.36 ± 0.30
.55	1.96 ± 0.29	A_4	-0.30 ± 0.25
.45	1.45 ± 0.25	A_5	0.39 ± 0.21
.35	1.05 ± 0.21	A_6	
.25	1.27 ± 0.23		
.15	0.54 ± 0.15		
.05	0.36 ± 0.12		
-.05	0.26 ± 0.10		
-.15	0.18 ± 0.08		
-.25	0.22 ± 0.09		
-.35	0.15 ± 0.07		
-.45	0.40 ± 0.12		
-.55	0.62 ± 0.15		
-.65	1.13 ± 0.21		
-.75	0.84 ± 0.18		
-.85	0.72 ± 0.19		
-.95	0.57 ± 0.16		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1589$

Number of events = 825

$\sigma_{el} = 14.47 \pm 0.84$

$\frac{d\sigma}{d\Omega}(\theta=0) = 5.35 \pm 0.99$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925		A_0	1.15 ± 0.07
.85	3.42 ± 0.44	A_1	1.22 ± 0.17
.75	2.50 ± 0.35	A_2	1.69 ± 0.24
.65	1.87 ± 0.24	A_3	1.04 ± 0.25
.55	1.24 ± 0.19	A_4	-0.14 ± 0.21
.45	0.94 ± 0.16	A_5	0.39 ± 0.18
.35	0.89 ± 0.15	A_6	
.25	0.56 ± 0.12		
.15	0.52 ± 0.11		
.05	0.19 ± 0.07		
-.05	0.26 ± 0.08		
-.15	0.40 ± 0.10		
-.25	0.28 ± 0.08		
-.35	0.59 ± 0.12		
-.45	0.66 ± 0.13		
-.55	0.87 ± 0.15		
-.65	1.38 ± 0.20		
-.75	0.91 ± 0.16		
-.85	0.90 ± 0.19		
-.95	0.46 ± 0.12		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1628$

Number of events = 452

$\sigma_{el} = 18.80 \pm 1.32$

$\frac{d\sigma}{d\Omega}(\theta=0) = 10.07 \pm 1.48$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925		A_0	1.50 ± 0.11
.85	4.65 ± 0.62	A_1	1.43 ± 0.26
.75	2.99 ± 0.58	A_2	3.04 ± 0.36
.65	1.47 ± 0.32	A_3	2.21 ± 0.38
.55	0.93 ± 0.24	A_4	0.78 ± 0.30
.45	0.76 ± 0.22	A_5	1.11 ± 0.30
.35	0.44 ± 0.16	A_6	
.25	0.60 ± 0.19		
.15	0.16 ± 0.10		
.05	0.49 ± 0.17		
-.05	0.33 ± 0.14		
-.15	0.38 ± 0.15		
-.25	0.38 ± 0.15		
-.35	0.54 ± 0.18		
-.45	0.71 ± 0.21		
-.55	1.09 ± 0.27		
-.65	2.02 ± 0.39		
-.75	1.80 ± 0.36		
-.85	2.06 ± 0.50		
-.95	1.03 ± 0.31		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1647$

Number of events = 4969

$\sigma_{el} = 21.62 \pm 0.46$

$\frac{d\sigma}{d\Omega}(\theta=0) = 13.27 \pm 0.50$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	8.82 ± 0.52	A_0	1.72 ± 0.04
.85	6.10 ± 0.31	A_1	1.85 ± 0.09
.75	2.89 ± 0.17	A_2	3.65 ± 0.12
.65	1.65 ± 0.12	A_3	3.17 ± 0.12
.55	0.79 ± 0.08	A_4	1.16 ± 0.10
.45	0.49 ± 0.06	A_5	1.72 ± 0.10
.35	0.54 ± 0.06	A_6	
.25	0.37 ± 0.05		
.15	0.40 ± 0.05		
.05	0.35 ± 0.05		
-.05	0.28 ± 0.04		
-.15	0.35 ± 0.05		
-.25	0.53 ± 0.06		
-.35	0.63 ± 0.07		
-.45	1.00 ± 0.09		
-.55	1.47 ± 0.11		
-.65	1.91 ± 0.13		
-.75	2.00 ± 0.14		
-.85	1.91 ± 0.16		
-.95	0.75 ± 0.08		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1660$

Number of events = 2413

$\sigma_{el} = 23.16 \pm 0.66$

$\frac{d\sigma}{d\Omega}(\theta=0) = 14.40 \pm 0.69$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	9.58 ± 0.72	A_0	1.84 ± 0.05
.85	6.53 ± 0.43	A_1	1.85 ± 0.13
.75	3.06 ± 0.25	A_2	4.06 ± 0.17
.65	1.72 ± 0.18	A_3	3.57 ± 0.17
.55	0.62 ± 0.10	A_4	1.26 ± 0.14
.45	0.41 ± 0.08	A_5	1.82 ± 0.14
.35	0.31 ± 0.07	A_6	
.25	0.30 ± 0.06		
.15	0.26 ± 0.06		
.05	0.28 ± 0.06		
-.05	0.26 ± 0.06		
-.15	0.35 ± 0.07		
-.25	0.57 ± 0.09		
-.35	0.82 ± 0.11		
-.45	1.23 ± 0.14		
-.55	1.70 ± 0.18		
-.65	2.11 ± 0.20		
-.75	2.35 ± 0.22		
-.85	2.04 ± 0.24		
-.95	0.98 ± 0.14		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1669$

Number of events = 4674

$\sigma_{el} = 26.42 \pm 0.58$

$\frac{d\sigma}{d\Omega}(\theta=0) = 17.92 \pm 0.62$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	12.95 ± 0.70	A_0	2.10 ± 0.05
.85	8.00 ± 0.41	A_1	2.42 ± 0.11
.75	3.64 ± 0.22	A_2	4.94 ± 0.15
.65	1.53 ± 0.13	A_3	4.50 ± 0.15
.55	0.68 ± 0.08	A_4	1.83 ± 0.12
.45	0.28 ± 0.05	A_5	2.13 ± 0.12
.35	0.19 ± 0.04	A_6	
.25	0.19 ± 0.04		
.15	0.27 ± 0.05		
.05	0.33 ± 0.05		
-.05	0.28 ± 0.05		
-.15	0.38 ± 0.05		
-.25	0.65 ± 0.07		
-.35	0.93 ± 0.09		
-.45	1.39 ± 0.12		
-.55	2.03 ± 0.15		
-.65	1.95 ± 0.15		
-.75	2.40 ± 0.17		
-.85	2.21 ± 0.20		
-.95	0.98 ± 0.11		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1674$

Number of events = 4415

$\sigma_{el} = 24.22 \pm 0.54$

$\frac{d\sigma}{d\Omega}(\theta=0) = 16.24 \pm 0.78$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	10.28 ± 0.56	A_0	1.93 ± 0.04
.85	7.25 ± 0.36	A_1	2.13 ± 0.11
.75	3.05 ± 0.19	A_2	4.38 ± 0.15
.65	1.74 ± 0.14	A_3	4.04 ± 0.17
.55	0.65 ± 0.08	A_4	1.64 ± 0.17
.45	0.33 ± 0.05	A_5	1.98 ± 0.13
.35	0.20 ± 0.04	A_6	0.14 ± 0.13
.25	0.33 ± 0.05		
.15	0.30 ± 0.05		
.05	0.28 ± 0.05		
-.05	0.34 ± 0.05		
-.15	0.43 ± 0.06		
-.25	0.49 ± 0.06		
-.35	0.90 ± 0.09		
-.45	1.33 ± 0.11		
-.55	1.77 ± 0.14		
-.65	2.03 ± 0.15		
-.75	2.25 ± 0.16		
-.85	2.08 ± 0.19		
-.95	0.89 ± 0.10		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1685$

Number of events = 3820

$\sigma_{el} = 26.30 \pm 0.75$

$\frac{d\sigma}{d\Omega}(\theta=0) = 18.09 \pm 1.06$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	11.95 ± 0.83	A_0	2.09 ± 0.06
.85	8.24 ± 0.52	A_1	2.44 ± 0.16
.75	4.00 ± 0.28	A_2	5.07 ± 0.21
.65	1.39 ± 0.14	A_3	4.44 ± 0.23
.55	0.71 ± 0.09	A_4	2.00 ± 0.22
.45	0.26 ± 0.05	A_5	2.08 ± 0.15
.35	0.10 ± 0.03	A_6	-0.04 ± 0.15
.25	0.22 ± 0.05		
.15	0.22 ± 0.05		
.05	0.26 ± 0.05		
-.05	0.40 ± 0.06		
-.15	0.42 ± 0.07		
-.25	0.55 ± 0.08		
-.35	0.73 ± 0.09		
-.45	1.21 ± 0.12		
-.55	1.50 ± 0.14		
-.65	2.19 ± 0.19		
-.75	2.59 ± 0.21		
-.85	2.41 ± 0.22		
-.95	1.15 ± 0.13		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1695$

Number of events = 2035

$\sigma_{el} = 26.01 \pm 0.86$

$\frac{d\sigma}{d\Omega}(\theta=0) = 19.30 \pm 1.19$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	11.79 ± 0.92	A_0	2.07 ± 0.07
.85	8.88 ± 0.61	A_1	2.69 ± 0.18
.75	3.75 ± 0.33	A_2	5.22 ± 0.24
.65	1.70 ± 0.19	A_3	4.77 ± 0.27
.55	0.56 ± 0.10	A_4	2.18 ± 0.25
.45	0.15 ± 0.05	A_5	2.16 ± 0.17
.35	0.08 ± 0.04	A_6	0.17 ± 0.17
.25	0.09 ± 0.04		
.15	0.20 ± 0.06		
.05	0.15 ± 0.05		
-.05	0.28 ± 0.07		
-.15	0.36 ± 0.08		
-.25	0.54 ± 0.10		
-.35	0.68 ± 0.11		
-.45	1.31 ± 0.16		
-.55	1.59 ± 0.18		
-.65	1.94 ± 0.21		
-.75	2.16 ± 0.22		
-.85	2.36 ± 0.29		
-.95	0.90 ± 0.14		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1709$

Number of events = 971

$\sigma_{el} = 23.65 \pm 1.10$

$\frac{d\sigma}{d\Omega}(\theta=0) = 16.65 \pm 1.55$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	10.60 ± 1.30	A_0	1.88 ± 0.09
.85	7.78 ± 0.70	A_1	2.67 ± 0.24
.75	4.43 ± 0.49	A_2	4.75 ± 0.31
.65	1.94 ± 0.27	A_3	4.10 ± 0.34
.55	0.48 ± 0.12	A_4	2.01 ± 0.31
.45	0.18 ± 0.07	A_5	1.53 ± 0.22
.35	0.00 ± 0.01	A_6	-0.28 ± 0.21
.25	0.06 ± 0.04		
.15	0.21 ± 0.08		
.05	0.48 ± 0.12		
-.05	0.33 ± 0.10		
-.15	0.39 ± 0.11		
-.25	0.39 ± 0.11		
-.35	0.68 ± 0.15		
-.45	0.92 ± 0.18		
-.55	1.04 ± 0.19		
-.65	1.52 ± 0.23		
-.75	1.58 ± 0.24		
-.85	2.10 ± 0.32		
-.95	0.86 ± 0.18		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1720$

Number of events = 408

$\sigma_{el} = 19.48 \pm 1.35$

$\frac{d\sigma}{d\Omega}(\theta=0) = 14.50 \pm 1.97$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	10.36 ± 1.64	A_0	1.55 ± 0.11
.85	5.87 ± 0.82	A_1	2.35 ± 0.28
.75	3.15 ± 0.54	A_2	3.95 ± 0.38
.65	1.73 ± 0.37	A_3	3.45 ± 0.44
.55	0.90 ± 0.25	A_4	1.69 ± 0.42
.45	0.32 ± 0.15	A_5	1.20 ± 0.30
.35	0.06 ± 0.06	A_6	0.32 ± 0.29
.25	0.06 ± 0.06		
.15	0.26 ± 0.13		
.05	0.32 ± 0.15		
-.05	0.06 ± 0.06		
-.15	0.32 ± 0.15		
-.25	0.32 ± 0.15		
-.35	0.83 ± 0.24		
-.45	0.96 ± 0.26		
-.55	1.09 ± 0.28		
-.65	0.96 ± 0.26		
-.75	0.96 ± 0.26		
-.85	1.75 ± 0.39		
-.95	0.70 ± 0.22		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1730$

Number of events = 1693

$\sigma_{el} = 17.95 \pm 0.74$

$\frac{d\sigma}{d\Omega}(\theta=0) = 11.94 \pm 1.07$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	8.59 ± 0.93	A_0	1.43 ± 0.06
.85	5.87 ± 0.47	A_1	2.07 ± 0.16
.75	3.04 ± 0.30	A_2	3.40 ± 0.21
.65	1.54 ± 0.17	A_3	2.98 ± 0.23
.55	0.60 ± 0.10	A_4	1.37 ± 0.21
.45	0.16 ± 0.05	A_5	1.07 ± 0.16
.35	0.11 ± 0.04	A_6	-0.37 ± 0.14
.25	0.12 ± 0.04		
.15	0.27 ± 0.06		
.05	0.26 ± 0.06		
-.05	0.35 ± 0.07		
-.15	0.47 ± 0.08		
-.25	0.42 ± 0.08		
-.35	0.40 ± 0.08		
-.45	0.51 ± 0.09		
-.55	0.76 ± 0.11		
-.65	1.24 ± 0.15		
-.75	1.24 ± 0.15		
-.85	1.31 ± 0.18		
-.95	0.46 ± 0.09		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1740$

Number of events = 3809

$\sigma_{el} = 18.29 \pm 0.47$

$\frac{d\sigma}{d\Omega}(\theta=0) = 12.96 \pm 0.68$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	8.72 ± 0.52	A_0	1.46 ± 0.04
.85	6.43 ± 0.32	A_1	2.30 ± 0.10
.75	3.10 ± 0.18	A_2	3.65 ± 0.13
.65	1.67 ± 0.12	A_3	3.01 ± 0.15
.55	0.70 ± 0.07	A_4	1.62 ± 0.14
.45	0.27 ± 0.04	A_5	1.06 ± 0.10
.35	0.11 ± 0.03	A_6	-0.14 ± 0.10
.25	0.20 ± 0.04		
.15	0.20 ± 0.04		
.05	0.26 ± 0.04		
-.05	0.26 ± 0.04		
-.15	0.31 ± 0.05		
-.25	0.33 ± 0.05		
-.35	0.33 ± 0.05		
-.45	0.51 ± 0.06		
-.55	0.72 ± 0.07		
-.65	0.79 ± 0.08		
-.75	1.15 ± 0.10		
-.85	1.21 ± 0.14		
-.95	0.65 ± 0.09		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1761$

Number of events = 790

$\sigma_{el} = 13.66 \pm 0.78$

$\frac{d\sigma}{d\Omega}(\theta=0) = 9.46 \pm 1.14$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	6.77 ± 0.92	A_0	1.09 ± 0.06
.85	4.11 ± 0.49	A_1	1.68 ± 0.17
.75	2.35 ± 0.33	A_2	2.61 ± 0.22
.65	1.36 ± 0.22	A_3	2.26 ± 0.25
.55	0.61 ± 0.13	A_4	1.08 ± 0.24
.45	0.20 ± 0.07	A_5	0.89 ± 0.18
.35	0.11 ± 0.05	A_6	-0.14 ± 0.16
.25	0.18 ± 0.07		
.15	0.23 ± 0.08		
.05	0.29 ± 0.09		
-.05	0.34 ± 0.09		
-.15	0.14 ± 0.06		
-.25	0.23 ± 0.08		
-.35	0.29 ± 0.09		
-.45	0.52 ± 0.12		
-.55	0.52 ± 0.12		
-.65	0.86 ± 0.16		
-.75	0.88 ± 0.16		
-.85	0.74 ± 0.16		
-.95	0.33 ± 0.09		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1762$

Number of events = 1946

$\sigma_{el} = 15.01 \pm 0.50$

$\frac{d\sigma}{d\Omega}(\theta=0) = 10.16 \pm 0.74$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	7.22 ± 0.53	A_0	1.19 ± 0.04
.85	4.98 ± 0.38	A_1	1.89 ± 0.11
.75	2.82 ± 0.20	A_2	2.86 ± 0.15
.65	1.34 ± 0.14	A_3	2.38 ± 0.16
.55	0.54 ± 0.08	A_4	1.29 ± 0.16
.45	0.33 ± 0.06	A_5	0.72 ± 0.12
.35	0.12 ± 0.04	A_6	-0.17 ± 0.11
.25	0.24 ± 0.05		
.15	0.18 ± 0.04		
.05	0.23 ± 0.05		
-.05	0.31 ± 0.06		
-.15	0.41 ± 0.07		
-.25	0.33 ± 0.06		
-.35	0.31 ± 0.06		
-.45	0.45 ± 0.07		
-.55	0.45 ± 0.07		
-.65	0.58 ± 0.08		
-.75	0.95 ± 0.11		
-.85	0.94 ± 0.13		
-.95	0.49 ± 0.09		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1766$

Number of events = 1543

$\sigma_{el} = 15.73 \pm 0.61$

$\frac{d\sigma}{d\Omega}(\theta=0) = 11.90 \pm 0.90$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	8.06 ± 0.70	A_0	1.25 ± 0.05
.85	5.20 ± 0.41	A_1	2.08 ± 0.13
.75	2.89 ± 0.25	A_2	3.15 ± 0.18
.65	1.24 ± 0.15	A_3	2.73 ± 0.20
.55	0.48 ± 0.08	A_4	1.61 ± 0.19
.45	0.32 ± 0.07	A_5	1.03 ± 0.14
.35	0.19 ± 0.05	A_6	0.07 ± 0.13
.25	0.16 ± 0.05		
.15	0.17 ± 0.05		
.05	0.33 ± 0.07		
-.05	0.23 ± 0.06		
-.15	0.40 ± 0.08		
-.25	0.21 ± 0.05		
-.35	0.36 ± 0.07		
-.45	0.47 ± 0.08		
-.55	0.49 ± 0.09		
-.65	0.74 ± 0.11		
-.75	0.74 ± 0.11		
-.85	1.02 ± 0.19		
-.95	0.48 ± 0.11		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1787$

Number of events = 921

$\sigma_{el} = 12.45 \pm 0.59$

$\frac{d\sigma}{d\Omega}(\theta=0) = 7.80 \pm 0.86$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	6.24 ± 0.68	A_0	0.99 ± 0.05
.85	4.07 ± 0.38	A_1	1.62 ± 0.13
.75	2.49 ± 0.28	A_2	2.33 ± 0.17
.65	1.29 ± 0.17	A_3	1.94 ± 0.19
.55	0.69 ± 0.12	A_4	0.79 ± 0.18
.45	0.23 ± 0.07	A_5	0.41 ± 0.14
.35	0.09 ± 0.04	A_6	-0.29 ± 0.12
.25	0.04 ± 0.03		
.15	0.21 ± 0.06		
.05	0.28 ± 0.07		
-.05	0.14 ± 0.05		
-.15	0.32 ± 0.08		
-.25	0.35 ± 0.08		
-.35	0.26 ± 0.07		
-.45	0.30 ± 0.08		
-.55	0.51 ± 0.10		
-.65	0.51 ± 0.10		
-.75	0.74 ± 0.12		
-.85	0.63 ± 0.12		
-.95	0.24 ± 0.07		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1806$

Number of events = 217

$\sigma_{el} = 13.31 \pm 1.08$

$\frac{d\sigma}{d\Omega}(\theta=0) = 9.89 \pm 1.59$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	7.50 ± 1.27	A_0	1.06 ± 0.09
.85	3.98 ± 0.63	A_1	1.82 ± 0.22
.75	3.07 ± 0.54	A_2	2.76 ± 0.31
.65	1.13 ± 0.31	A_3	2.35 ± 0.35
.55	0.73 ± 0.25	A_4	1.28 ± 0.34
.45	0.16 ± 0.12	A_5	0.64 ± 0.26
.35	0.00 ± 0.06	A_6	-0.03 ± 0.25
.25	0.00 ± 0.06		
.15	0.32 ± 0.16		
.05	0.40 ± 0.18		
-.05	0.24 ± 0.14		
-.15	0.16 ± 0.12		
-.25	0.16 ± 0.12		
-.35	0.24 ± 0.14		
-.45	0.48 ± 0.20		
-.55	0.73 ± 0.25		
-.65	0.65 ± 0.23		
-.75	0.57 ± 0.22		
-.85	0.47 ± 0.20		
-.95	0.54 ± 0.21		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1811$

Number of events = 1314

$\sigma_{el} = 13.80 \pm 0.61$

$\frac{d\sigma}{d\Omega}(\theta=0) = 9.54 \pm 0.88$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	6.53 ± 0.70	A_0	1.10 ± 0.05
.85	4.67 ± 0.40	A_1	1.82 ± 0.13
.75	3.00 ± 0.30	A_2	2.64 ± 0.18
.65	1.18 ± 0.15	A_3	2.30 ± 0.19
.55	0.54 ± 0.09	A_4	1.26 ± 0.18
.45	0.18 ± 0.05	A_5	0.53 ± 0.14
.35	0.09 ± 0.04	A_6	-0.11 ± 0.12
.25	0.09 ± 0.04		
.15	0.13 ± 0.04		
.05	0.29 ± 0.06		
-.05	0.29 ± 0.06		
-.15	0.35 ± 0.07		
-.25	0.54 ± 0.09		
-.35	0.30 ± 0.07		
-.45	0.37 ± 0.08		
-.55	0.48 ± 0.09		
-.65	0.52 ± 0.09		
-.75	0.63 ± 0.10		
-.85	0.61 ± 0.12		
-.95	0.44 ± 0.09		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1821$

Number of events = 1277

$\sigma_{el} = 12.80 \pm 0.55$

$\frac{d\sigma}{d\Omega}(\theta=0) = 8.77 \pm 0.81$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	6.58 ± 0.66	A_0	1.02 ± 0.04
.85	4.24 ± 0.36	A_1	1.71 ± 0.12
.75	2.26 ± 0.24	A_2	2.38 ± 0.16
.65	1.28 ± 0.15	A_3	2.14 ± 0.18
.55	0.54 ± 0.09	A_4	1.12 ± 0.17
.45	0.27 ± 0.06	A_5	0.50 ± 0.13
.35	0.08 ± 0.03	A_6	-0.10 ± 0.11
.25	0.09 ± 0.03		
.15	0.24 ± 0.06		
.05	0.31 ± 0.07		
-.05	0.24 ± 0.06		
-.15	0.31 ± 0.07		
-.25	0.37 ± 0.07		
-.35	0.38 ± 0.07		
-.45	0.42 ± 0.08		
-.55	0.37 ± 0.07		
-.65	0.50 ± 0.08		
-.75	0.59 ± 0.09		
-.85	0.50 ± 0.10		
-.95	0.29 ± 0.07		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{\text{c.m.}} = 1843$

Number of events = 2371

$\sigma_{\text{el}} = 13.09 \pm 0.45$

$\frac{d\sigma}{d\Omega}(\theta=0) = 9.50 \pm 0.64$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	6.89 ± 0.50	A_0	1.04 ± 0.04
.85	4.33 ± 0.30	A_1	1.80 ± 0.10
.75	2.40 ± 0.21	A_2	2.52 ± 0.13
.65	1.21 ± 0.12	A_3	2.28 ± 0.14
.55	0.45 ± 0.06	A_4	1.31 ± 0.13
.45	0.21 ± 0.04	A_5	0.61 ± 0.10
.35	0.08 ± 0.02	A_6	-0.06 ± 0.09
.25	0.11 ± 0.03		
.15	0.19 ± 0.04		
.05	0.23 ± 0.04		
-.05	0.39 ± 0.06		
-.15	0.48 ± 0.07		
-.25	0.25 ± 0.05		
-.35	0.30 ± 0.05		
-.45	0.45 ± 0.06		
-.55	0.40 ± 0.06		
-.65	0.47 ± 0.07		
-.75	0.50 ± 0.07		
-.85	0.54 ± 0.09		
-.95	0.31 ± 0.06		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1853$

Number of events = 1655

$\sigma_{el} = 12.38 \pm 0.45$

$\frac{d\sigma}{d\Omega}(\theta=0) = 8.98 \pm 0.67$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	6.48 ± 0.53	A_0	0.99 ± 0.04
.85	3.97 ± 0.28	A_1	1.67 ± 0.10
.75	2.31 ± 0.21	A_2	2.34 ± 0.13
.65	1.06 ± 0.13	A_3	2.17 ± 0.14
.55	0.47 ± 0.08	A_4	1.32 ± 0.14
.45	0.13 ± 0.04	A_5	0.52 ± 0.11
.35	0.05 ± 0.02	A_6	-0.03 ± 0.10
.25	0.17 ± 0.04		
.15	0.22 ± 0.05		
.05	0.24 ± 0.05		
-.05	0.36 ± 0.06		
-.15	0.32 ± 0.06		
-.25	0.39 ± 0.07		
-.35	0.48 ± 0.08		
-.45	0.37 ± 0.07		
-.55	0.32 ± 0.06		
-.65	0.44 ± 0.07		
-.75	0.46 ± 0.07		
-.85	0.45 ± 0.09		
-.95	0.36 ± 0.08		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1872$

Number of events = 2565

$\sigma_{el} = 12.53 \pm 0.39$

$\frac{d\sigma}{d\Omega}(\theta=0) = 9.53 \pm 0.56$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	6.28 ± 0.44	A_0	1.00 ± 0.03
.85	4.37 ± 0.26	A_1	1.73 ± 0.08
.75	2.37 ± 0.18	A_2	2.37 ± 0.11
.65	0.90 ± 0.09	A_3	2.31 ± 0.12
.55	0.39 ± 0.05	A_4	1.45 ± 0.11
.45	0.17 ± 0.03	A_5	0.56 ± 0.09
.35	0.07 ± 0.02	A_6	0.11 ± 0.08
.25	0.10 ± 0.03		
.15	0.21 ± 0.04		
.05	0.27 ± 0.04		
-.05	0.41 ± 0.06		
-.15	0.43 ± 0.06		
-.25	0.37 ± 0.05		
-.35	0.40 ± 0.05		
-.45	0.49 ± 0.06		
-.55	0.37 ± 0.05		
-.65	0.37 ± 0.05		
-.75	0.39 ± 0.05		
-.85	0.36 ± 0.06		
-.95	0.33 ± 0.06		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1885$

Number of events = 1834

$\sigma_{el} = 12.34 \pm 0.50$

$\frac{d\sigma}{d\Omega}(\theta=0) = 9.92 \pm 0.72$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	7.06 ± 0.61	A_0	0.98 ± 0.04
.85	3.95 ± 0.33	A_1	1.74 ± 0.11
.75	2.08 ± 0.20	A_2	2.39 ± 0.15
.65	0.90 ± 0.12	A_3	2.37 ± 0.16
.55	0.35 ± 0.06	A_4	1.60 ± 0.14
.45	0.12 ± 0.03	A_5	0.64 ± 0.11
.35	0.07 ± 0.02	A_6	0.21 ± 0.09
.25	0.10 ± 0.03		
.15	0.25 ± 0.05		
.05	0.26 ± 0.05		
-.05	0.43 ± 0.07		
-.15	0.40 ± 0.07		
-.25	0.39 ± 0.07		
-.35	0.40 ± 0.07		
-.45	0.35 ± 0.06		
-.55	0.47 ± 0.08		
-.65	0.42 ± 0.07		
-.75	0.28 ± 0.05		
-.85	0.31 ± 0.07		
-.95	0.37 ± 0.08		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1904$ Number of events = 2582

$\sigma_{el} = 11.95 \pm 0.36$ $\frac{d\sigma}{d\Omega}(\theta=0) = 10.13 \pm 0.52$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	6.64 ± 0.43	A_0	0.95 ± 0.03
.85	4.07 ± 0.23	A_1	1.74 ± 0.08
.75	1.92 ± 0.15	A_2	2.36 ± 0.11
.65	0.90 ± 0.09	A_3	2.40 ± 0.11
.55	0.25 ± 0.04	A_4	1.67 ± 0.10
.45	0.10 ± 0.02	A_5	0.76 ± 0.08
.35	0.09 ± 0.02	A_6	0.25 ± 0.07
.25	0.15 ± 0.03		
.15	0.21 ± 0.04		
.05	0.29 ± 0.04		
-.05	0.33 ± 0.05		
-.15	0.35 ± 0.05		
-.25	0.52 ± 0.06		
-.35	0.31 ± 0.05		
-.45	0.42 ± 0.05		
-.55	0.34 ± 0.05		
-.65	0.31 ± 0.05		
-.75	0.29 ± 0.05		
-.85	0.26 ± 0.05		
-.95	0.28 ± 0.05		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1916$

Number of events = 2895

$\sigma_{el} = 10.87 \pm 0.36$

$\frac{d\sigma}{d\Omega}(\theta=0) = 8.71 \pm 0.52$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	0.18 ± 0.04	A_0	0.87 ± 0.03
.85	0.18 ± 0.04	A_1	1.59 ± 0.08
.75	0.19 ± 0.03	A_2	2.05 ± 0.11
.65	0.32 ± 0.05	A_3	2.13 ± 0.11
.55	0.33 ± 0.05	A_4	1.37 ± 0.10
.45	0.34 ± 0.05	A_5	0.52 ± 0.08
.35	0.45 ± 0.05	A_6	0.20 ± 0.06
.25	0.40 ± 0.05		
.15	0.37 ± 0.05		
.05	0.41 ± 0.05		
-.05	0.21 ± 0.03		
-.15	0.19 ± 0.03		
-.25	0.12 ± 0.02		
-.35	0.08 ± 0.02		
-.45	0.12 ± 0.03		
-.55	0.32 ± 0.05		
-.65	0.86 ± 0.09		
-.75	1.92 ± 0.16		
-.85	3.39 ± 0.23		
-.95	6.55 ± 0.45		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1933$

Number of events = 1567

$\sigma_{el} = 11.69 \pm 0.49$

$\frac{d\sigma}{d\Omega}(\theta=0) = 10.73 \pm 0.69$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	0.19 ± 0.05	A_0	0.93 ± 0.04
.85	0.20 ± 0.06	A_1	1.79 ± 0.10
.75	0.19 ± 0.05	A_2	2.40 ± 0.14
.65	0.26 ± 0.05	A_3	2.55 ± 0.15
.55	0.40 ± 0.07	A_4	1.79 ± 0.13
.45	0.44 ± 0.07	A_5	0.87 ± 0.10
.35	0.42 ± 0.07	A_6	0.41 ± 0.09
.25	0.33 ± 0.06		
.15	0.31 ± 0.06		
.05	0.36 ± 0.06		
-.05	0.23 ± 0.05		
-.15	0.21 ± 0.05		
-.25	0.12 ± 0.03		
-.35	0.10 ± 0.03		
-.45	0.05 ± 0.02		
-.55	0.25 ± 0.05		
-.65	0.65 ± 0.09		
-.75	2.08 ± 0.22		
-.85	3.98 ± 0.31		
-.95	6.79 ± 0.61		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1935$

Number of events = 1281

$\sigma_{el} = 10.39 \pm 0.47$

$\frac{d\sigma}{d\Omega}(\theta=0) = 8.99 \pm 0.68$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	5.61 ± 0.56	A_0	0.83 ± 0.04
.85	3.42 ± 0.31	A_1	1.53 ± 0.10
.75	1.78 ± 0.19	A_2	2.02 ± 0.14
.65	0.68 ± 0.11	A_3	2.13 ± 0.15
.55	0.27 ± 0.06	A_4	1.47 ± 0.13
.45	0.10 ± 0.03	A_5	0.68 ± 0.11
.35	0.09 ± 0.03	A_6	0.34 ± 0.09
.25	0.17 ± 0.05		
.15	0.19 ± 0.05		
.05	0.27 ± 0.06		
-.05	0.25 ± 0.05		
-.15	0.31 ± 0.06		
-.25	0.34 ± 0.07		
-.35	0.44 ± 0.08		
-.45	0.38 ± 0.07		
-.55	0.37 ± 0.07		
-.65	0.26 ± 0.06		
-.75	0.19 ± 0.05		
-.85	0.15 ± 0.05		
-.95	0.20 ± 0.07		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1963$

Number of events = 3199

$\sigma_{el} = 10.21 \pm 0.29$

$\frac{d\sigma}{d\Omega}(\theta=0) = 9.60 \pm 0.44$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	6.37 ± 0.40	A_0	0.81 ± 0.02
.85	3.56 ± 0.23	A_1	1.56 ± 0.06
.75	1.46 ± 0.07	A_2	2.09 ± 0.09
.65	0.63 ± 0.06	A_3	2.20 ± 0.09
.55	0.20 ± 0.03	A_4	1.65 ± 0.09
.45	0.09 ± 0.02	A_5	0.84 ± 0.07
.35	0.12 ± 0.02	A_6	0.45 ± 0.05
.25	0.18 ± 0.03		
.15	0.21 ± 0.03		
.05	0.19 ± 0.03		
-.05	0.25 ± 0.04		
-.15	0.31 ± 0.04		
-.25	0.35 ± 0.04		
-.35	0.34 ± 0.04		
-.45	0.27 ± 0.04		
-.55	0.34 ± 0.04		
-.65	0.25 ± 0.04		
-.75	0.16 ± 0.03		
-.85	0.13 ± 0.03		
-.95	0.23 ± 0.04		

$\pi^- p \rightarrow \pi^- p$ Angular Distribution

$E_{c.m.} = 1980$

Number of events = 3076

$\sigma_{el} = 9.82 \pm 0.33$

$\frac{d\sigma}{d\Omega}(\theta=0) = 9.25 \pm 0.46$

$\cos\theta$	$d\sigma/d\Omega$ (mb./ster)	Coefficients	in Expansion $\frac{d\sigma}{d\Omega} = \sum_n A_n P_n(\cos\theta)$
.925	6.02 ± 0.39	A_0	0.78 ± 0.03
.85	3.39 ± 0.25	A_1	1.56 ± 0.07
.75	1.54 ± 0.13	A_2	2.01 ± 0.10
.65	0.57 ± 0.06	A_3	2.15 ± 0.10
.55	0.18 ± 0.03	A_4	1.59 ± 0.09
.45	0.09 ± 0.02	A_5	0.80 ± 0.07
.35	0.12 ± 0.02	A_6	0.37 ± 0.05
.25	0.15 ± 0.02		
.15	0.20 ± 0.03		
.05	0.29 ± 0.04		
-.05	0.32 ± 0.03		
-.15	0.31 ± 0.04		
-.25	0.29 ± 0.04		
-.35	0.32 ± 0.04		
-.45	0.26 ± 0.03		
-.55	0.25 ± 0.03		
-.65	0.21 ± 0.03		
-.75	0.11 ± 0.02		
-.85	0.09 ± 0.02		
-.95	0.13 ± 0.03		

