

Table 4.22 from (1992TI02): Measurements and analyses of cross sections for proton scattering on ^4He

E_p (MeV)	Measurement	$\theta_{\text{c.m.}}$ (deg) or $-t$ (GeV/c) ²	Description ^a	Refs.
1050	$\sigma(\theta)$	3 – 47 (lab)	Compared with various theoretical calculations.	1974BA14
85	$\sigma(\theta)$	10 – 168	Compared with various theoretical calculations.	1974VO05
580, 720	$d\sigma/dt$	$-t = 0.13 - 0.55$	Measured ^4He recoils.	1975VE09
3.47 – 8.94	A_y	$\theta \approx 90$	Determined angle for $A(E, \theta) = 0$. Phase-shift analysis.	1976BR17
2.24 – 5.90	$\sigma(\theta)$	168.8, 104.4	Determined angle for $A(E, \theta) = 0$. Phase-shift analysis.	1976BR17
600	$\sigma(\theta)$	$-t = 0.12 - 0.51$	Used Coulomb-nuclear interference to determine NN amplitudes at 600 MeV.	1976FA09
18 – 48	σ_R		Compared to various calculations.	1976SO01
350, 650, 1050, 1150	$\sigma(\theta)$	$-t = 0.02 - 0.71$	Studied first diffraction minimum. Theoretical analyses.	1977AS01
770	$\sigma(\theta)$	not given	(p, p) measurements made for DWBA analysis of (p, d) cross section.	1977BA19
11 – 14	$\sigma(\theta)$	19 – 167	R -matrix analysis for data $E = 0 - 17$ MeV.	1977DO01
11.93, 17.00	A_y	119 – 134, 37 – 157	Abs. precision ± 0.01 . Tabular presentation.	1977HA06
560 – 1730	$\sigma(\theta)$	$-t = 0.006 - 1.2$	Studied diffraction minimum. Compared with other data.	1977KL08
7.3 – 11.05	A_y	55 – 135	Tested procedure for polarimeter calibration.	1977ME06
200, 350, 500	$\sigma(\theta), A_y$	3.5 – 15	Studied dependence on momentum transfer and energy.	1977ST30
1050	$\sigma(\theta)$	≈ 180	Studied sharp backward peak.	1978BE30
1750, 2510, 4130	$d\sigma/dt$	$-t = 0.002 - 0.04$	Studied proton-nucleon amplitude.	1978DU15
788	$d\sigma/dt$	$-t = 0.11 - 4.19$	Evidence for backward diffraction-like structure.	1978FO33

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E_p (MeV)	Measurement	$\theta_{\text{c.m.}}$ (deg) or $-t$ (GeV/c) 2	Description ^a	Refs.
20 – 55	$\sigma(\theta)$	10–170	Phase-shift analysis.	1978HO17
185 – 500	$\sigma(E, \theta), A_y$	144–168	Studied structure in excitation functions.	1978MC06
2680	$d\sigma/dt$	$-t = 0.15 - 0.66$	Studied shape.	1978NA13
560 – 1730	$\sigma(E, \theta), A_y$	$-t = 0.0057 - 1.21$	Compared with theory.	1979CO01
205 – 520	A_y	17, 15, 24	High-precision calibration standards.	1979GR08
45, 52, 60, 65	$\sigma(E, \theta), A_y$	15 – 160 (lab)	Obtained data for polarization analyzer.	1979IM01
100 – 700	$\sigma(E, \theta)$	180	Explored role of inelastic pion channels at large momentum transfers. ${}^4\text{He}(p, p)$ and ${}^4\text{He}(p, {}^3\text{He})$.	1979KA19
200, 350, 500	$\sigma(E, \theta), A_y$	4 – 168 (lab)	Compared with theory.	1980MO09
500	$\sigma(E, \theta), A_y$	65, 90, 120, 160	Inclusive scattering measurements. ${}^4\text{He}(p, x)$.	1981RO03
992		$-t = 0.0109 - 0.0897$	Deduced σ_{total} and diffraction cone parameter.	1982VE03
1000	$d^2\sigma/dpd\Omega$	156	Plot invariant cross section versus p^2 for (p, p').	1983AN18
500	R	15 – 50	Measured Wolfenstein R parameter.	1983MO01
1000	$\sigma(E, \theta)$	$\approx 2 - 60$	Analyzed by Glauber-Sitenko theory.	1985AL09
46	A_z	30 – 60	Studied parity nonconservation, weak πN coupling constants.	1985LA01 , 1986LA29
98.7, 149.3	$\sigma(E, \theta), A_y$	17.5 – 60	Measured continuum yields for (\vec{p} , p') and (\vec{p} , d).	1985WE12
700 – 1000	$d\sigma/dt$	$-t = 0.0132 - 0.0799$	Deduced σ_{total} and diffraction cone parameter.	1985VE13
65	$\sigma(E_p, \theta_p), A_y$	20 – 130	Measured for (p, p') and (p, p ³ H) breakup. Observed peaks for ${}^4\text{He}$ excited states.	1986FU05
71.9	$\sigma(E, \theta), A_y$	25 – 169	Phase-shift analysis of data at 71.9 and 30 – 72 MeV.	1989BU01

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E_p (MeV)	Measurement	$\theta_{\text{c.m.}}$ (deg) or $-t$ (GeV/c) ²	Description ^a	Refs.
25.68	A_y	117.5 (lab)	Presented new method for precise calibration of beam polarization.	1989CL04 , 1989HA28
695, 793, 890, 991	$d\sigma/dt$	$-t \approx 0.005 - 0.08$	Detected scattered particles and recoils. Phase-shift analysis.	1989GR20
25.68	A_y	117.5	Developed new method for calibration.	1989HA28 , 1989CL04
14 - 18	A_y	52	Developed high-efficiency polarimeter.	1988SA41
695, 793, 890, 991	$\sigma(\theta_p, \theta_r)$	small angles	Extracted diffraction slope parameters.	1989GR20
1.5 - 2.2	A_y	87	Described design, calibration of polarimeter.	1990PR04

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^a Elastic scattering, except as noted.