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1. Double-polarization observable G in neutral-pion photoproduction off the proton.

CBELSA/TAPS Collaboration

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Apr 11, 2016

Eur.Phys.J. A53 (2017) no.1, 8 (2017-01-18)

Abstract.

This paper reports on a measurement of the double-polarization observable G in $ \pi^0 photoproduction off the proton using the CBELSA/TAPS experiment at the ELSA accelerator in Bonn. The observable G is determined from reactions of linearly polarized photons with longitudinally polarized protons.

The polarized photons are produced by bremsstrahlung off a diamond radiator of well-defined orientation. A frozen spin butanol target provides the polarized protons. The data cover the photon energy range from 617 to 1325 MeV and a wide angular range. The experimental results for G are compared to predictions by the Bonn-Gatchina (BnGa), Jülich-Bonn (JüBo), MAID and SAID partial wave analyses. Implications of the new data for the pion photoproduction multipoles are discussed.Abstract (arXiv)

2. Photoproduction of η mesons from the neutron: Cross sections and double polarization observable E

CBELSA/TAPS Collaboration

D. Bayadilov, A. Gridnev, I. Lopatin at all.

Eur.Phys.J. A53 (2017) no.3, 58 (2017-03-23)

Abstract.

Results from measurements of the photoproduction of η mesons from quasifree protons and neutrons are summarized. The experiments were performed with the CBELSA/TAPS detector at the electron accelerator ELSA in Bonn using the $\eta\rightarrow 3\pi^{0}\rightarrow 6\gamma$ decay. A liquid deuterium target was used for the measurement of total cross sections and angular distributions. The results confirm earlier measurements from Bonn and the MAMI facility in Mainz about the existence of a narrow structure in the excitation function of $\gamma n\rightarrow n\eta$. The current angular distributions show a forward-backward asymmetry, which was previously not seen, but was predicted by model calculations including an additional narrow P_{11} state. Furthermore, data obtained with a longitudinally polarized, deuterated butanol target and a circularly polarized photon beam were analyzed to determine the double polarization observable E. Both data sets together were also used to extract the helicity-dependent cross sections $\sigma_{1/2}$ and $\sigma_{3/2}$. The narrow structure in the excitation function of $\gamma n\right narrow n\eta$ appears associated with the helicity-1/2 component of the reaction.

3. Photoproduction of η mesons from the neutron: Cross sections and double polarization observable E

CBELSA/TAPS Collaboration

D. Bayadilov, A. Gridnev, I. Lopatin at all.

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Eur.Phys.J. A53 (2017) no.3, 58 (2017-03-23)
Experiment: GSI-TAPS

Abstract.

Results from measurements of the photoproduction of η mesons from quasifree protons and neutrons are summarized. The experiments were performed with the CBELSA/TAPS detector at the electron accelerator ELSA in Bonn using the $\eta\rightarrow 3\pi^{0}\rightarrow 6\gamma$ decay. A liquid deuterium target was used for the measurement of total cross sections and angular distributions. The results confirm earlier measurements from Bonn and the MAMI facility in Mainz about the existence of a narrow structure in the excitation function of $\gamma n\rightarrow n\eta$. The current angular distributions show a forward-backward asymmetry, which was previously not seen, but was predicted by model calculations including an additional narrow P_{11} state. Furthermore, data obtained with a longitudinally polarized, deuterated butanol target and a circularly polarized photon beam were analyzed to determine the double polarization observable E. Both data sets together were also used to extract the helicity-dependent cross sections $\sigma_{1/2}$ and $\sigma_{3/2}$. The narrow structure in the excitation function of $\gamma n\rightarrow n\eta$ appears associated with the helicity-1/2 component of the reaction.

4. Structure effects in polarization and cross sections for A(p, p')X inelastic reactions on ^{40}Ca and ^{12}C nuclei at 1 GeV

O.V. Miklukho, A. Yu. Kisselev, G.M. Amalsky, V.A. Andreev, G.E. Gavrilov, A.A. Izotov, N.G. Kozlenko, P.V. Kravchenko, M.P. Levchenko, D.V. Novinskiy A.N. Prokofiev, A.V. Shvedchikov, S.I. Trush, A.A. Zhdanov

Phys.Atom.Nucl. 80 (2017) no.2, 299-306,
Yad.Fiz. 80 (2017) no.2, 175-182 (2017-04-26)

Abstract.

The polarization of secondary protons in the (p, p') inelastic reactions on ^{40}Ca and^{12}C nuclei at the initial proton energy of 1 GeV was measured over a wide range of scattered-proton momenta at a laboratory angle of $\Theta = 21°$. The reaction cross sections were also measured. Scattered protons were detected by means of magnetic spectrometer equipped with a polarimeter based on multiwire-proportional chambers. A structure in the polarization and cross-section data, which is probably related to scattering off nucleon correlations in the nuclei involved, was observed.