

Results from the double polarization program of the CBELSA/TAPS experiment

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In order to understand the dynamics inside the nucleons, their excitation spectrum needs to be measured and compared to theoretical models like constituent quark models or recent lattice calculations. Since the excitation spectrum consists of several strongly overlapping resonances, these resonances are difficult to disentangle and identify. To determine their exact contributions, a solution of the partial wave analysis has to be found. For an exact determination of the amplitudes, measurements of several single and double polarization observables in various final states are needed.

With the CBELSA/TAPS experiment, measurements have been performed to determine single and double polarization parameters in meson photoproduction. Unpolarized or longitudinally polarized electrons are provided by the accelerator ELSA, which allow either unpolarized, circularly or linearly polarized photon beams. For the measurement of double polarization data, a butanol target provides longitudinally or transversely polarized nucleons. The CBELSA/TAPS setup features a nearly full 4π angular coverage and a high detection efficiency for neutral photons, which gives an ideal condition for the study of final states comprising neutral mesons.

This talk will show how the polarization degree of the photons and the dilution factor of the butanol target are determined. Additionally, the new results of different polarization observables for single meson photoproduction will be shown.

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