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Determination of Polarization Observables in $\pi^0\eta$-Photoproduction off the Neutron

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Baryon spectroscopy has the aim to map out the full spectrum of baryon resonances and understand their properties, which requires precise data from both proton and neutron targets. However, most available data to date has been obtained using proton targets. Since some resonances may couple more strongly to neutrons than to protons, neutron-target experiments are essential for a complete understanding of the nucleon excitation spectrum. Final states with two mesons allow the investigation of sequential decays via intermediate states, providing important information about baryon dynamics. Polarization observables are indispensable for an unambiguous partial wave analysis used to extract the broad and overlapping resonances and their properties from the data. The use of polarized beams and targets allows for the determination of asymmetries that are sensitive to interference terms between different resonant and non-resonant amplitudes. At the *CBELSA/TAPS* experiment in Bonn, measurements are carried out using a polarized photon beam and various targets, including a deuterated butanol target with polarizable neutrons. However, since the neutrons which can be polarized are bound in deuterons, sophisticated analysis methods are required to suppress background contributions and to account for the Fermi motion of deuteron-bound neutrons. In this contribution, preliminary results for polarization observables in the reaction $\gamma n(p) \rightarrow n\pi^0\eta(p)$ will be presented. (Supported by DFG: 505387544)

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