

Determination of the Hyperon Induced Polarization and Polarization–Transfer Coefficients for Quasi-Free Hyperon Photoproduction off the Bound Neutron

Colin Gleason

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Measurement of the spectrum of the excited nucleon (N^*) states provides key information on the relevant degrees of freedom within the nucleon. The determination of the N^* spectrum requires an extensive set of high-quality experimental observables, cross sections and polarizations, for a large number of nuclear reactions and over a broad kinematic range. In particular, measurements of polarization observables of strangeness photoproduction are of high importance as many of the resonances that are predicted by quark models, but not observed in pion-nucleon channels, are expected to couple strongly to kaon-hyperon (KY) channels. While in the last decade a large body of polarization and cross-section data has been published for strangeness photoproduction off the proton, data off the neutron are very scarce. In this work we determine the polarization observables P , C_X , and C_Z in the reaction $\gamma d \rightarrow K^0 \Lambda(p)$, where the deuteron is used as a neutron target. The data was collected in experiment E06-103 with the CLAS detector at Thomas Jefferson National Accelerator Facility (JLab) using a circularly polarized photon beam and an unpolarized LD2 target. In this talk we will show preliminary results for P , C_X , and C_Z for the quasi-free photoproduction of $K^0 \Lambda$ off the bound neutron for E_γ between 0.9 and 2.6 GeV and $\cos\theta_{K^0}^{CM}$ between -0.9 and 1 . We will discuss the effect of neutron binding on the observables and the comparison of our results with theoretical predictions. Our study is part of a larger program carried out at JLab to provide a complete set of observables for strangeness photoproduction off the nucleon.