

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

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 section 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. Our goal is to determine the polarization observables 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 LD_2 target. In this presentation we will discuss our analysis technique and show preliminary results of C_x and C_z for the quasi-free photoproduction of $K^0 \Lambda$ off the bound neutron. 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.