Spin observables, Σ and G in charged pion photo-production from polarized neutrons in solid HD at Jefferson Lab

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Abstract

While QCD successfully describes most of the properties of mesons and baryons, their excited state spectrum presents challenges. There are still many resonances which are predicted by Lattice-QCD and quark models but have not been observed experimentally. N^* resonaces are generally broad and overlaping, and detailed partial wave analyses (PWA) of reactions with polarized beams and targets are needed to resolve resonance contributions. Data are patricularly sparce for polarized neutron targets. The Jlab E06-101 (*g14*) experiment was performed during 2011-2012 using the CLAS detector in Hall B with circularly and linearly polarized photons incident on longitudinally polarized Deuterons in frozen-spin targets of solid Hydrogen-Deuteride (HD). Spin asymmetries from the reaction of $\gamma + n\ (p) \to \pi^- + p + (p)$ have been used to extract the beam-target E asymmetries with the circularly polarized photons, and these have been publised recently [1]. In this presentation, preliminary results for Σ and G asymmetries with linearly polarized photon beams will be discussed.

[1] D. Ho *et al.,* Phys. Rev. Lett. **118**, 242002 (2017)