Polarization Observables for Double-Pion Photoproduction using a Linearly Polarized Photon Beam and a Transversely Polarized Target from FROST

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One of the prominent ways to understand quark-gluon interactions in baryons in the low energy regime is studying the baryon spectrum. The present world database of baryon resonances is inadequate to interpret the spectrum in terms of the relevant degrees of freedom. Double-pion photoproduction, which dominates the total photoabsorption cross section above 1.7 GeV, serves as an important reaction to get access to the higher mass resonances. Cross sections and polarization observables for the double-pion reaction will provide information about the scattering amplitudes and assist in isolating the resonant contributions to the reaction. Here we report on the analysis technique and preliminary results on polarization observables obtained from the study of $\pi^+\pi^-$ photoproduction using a transversely polarized FROzen Spin butanol Target (FROST) and a linearly polarized photon beam. The experiment was conducted at Jefferson Lab using the CLAS spectrometer. The coherent edge of the linearly polarized beam ranged from 0.9 to 2.1 GeV and we were able to bin the data in 3 kinematic variables . A salient feature of this analysis was the use of an event-based quality factor technique to separate signal from background that originated from bound nucleons present in the target.