

Polarization Observables in the $\vec{p}\vec{\gamma} \rightarrow \pi^+\pi^-p$ Reaction from FROST

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Double-pion photoproduction is an important tool in the study of baryon resonances. Double-pion production dominates the total photoabsorption cross section in the second resonance region and allows the study of resonance decay properties. The $\vec{p}\vec{\gamma} \rightarrow \pi^+\pi^-p$ reaction has been measured in Hall B at Jefferson Lab with linearly and circularly polarized tagged photon beams incident on longitudinally and transversely polarized protons. The experiment covered center-of-mass energies between 1.4 GeV and 2.3 GeV. The target was a FROzen Spin Target (FROST) and the final-state particles were detected by the CEBAF Large Acceptance Spectrometer (CLAS). Linear combinations of polarized yields allow for the extraction of the single-, P , $I^\odot$, and double- polarization observables, $P^\odot$, P^c , P^s . Most of these observables were extracted for the first time in this channel. Calculations of an effective Lagrangian model have been compared with the preliminary results and resemble some features of the data. The data will dramatically constrain model calculations and in that way test our understanding of nucleon structure, establish nucleon excitation and non-resonant reaction amplitudes, and possibly help to identify new baryon resonances.