Measurement of the Helicity Difference in $\overrightarrow{\gamma}\overrightarrow{p} \to p\pi^+\pi^-$ with CLAS at Jefferson Laboratory

Sungkyun Park[(a)]

[(a)] Florida State University

The study of baryon resonances provides a deeper understanding of the strong interaction, because the dynamics and relevant degrees of freedom hidden within them are reflected by the properties of the excited states of baryons. Higher-lying excited states at and above 1.9 GeV are generally predicted to have strong couplings to the $\pi\pi N$ final states via $\pi\Delta$ or ρN intermediate states. Double-pion photoproduction is therefore important to inveatigate properties of high-mass resonances.

The CLAS g9a (FroST) experiment, as part of the $N^\star$ spectroscopy program at Jefferson Laboratory, has accumulated photoproduction data using linearly- and circularly-polarized photons incident on a longitually-polarized butanol target in the photon energy range 0.3 to 2.4 GeV. This CLAS frozen-spin experiment provides an important step toward a "complete" experiment. The butanol (C_4H_9OH) target of FroST has the hydrogen atoms polarized and unpolarized carbon and oxygen atoms. The dilution factor is used to distinguish the polarized data from FroST data. In this contribution, the method to calculate the dilution factor will be discussed. The extraction of the helicity difference for the reaction $\overrightarrow{\gamma}\overrightarrow{p} \to p\pi^+\pi^-$ will be described.

This work is supported by DOE # DE-FG02-92ER40735