Helicity Asymmetry E for $\gamma p \to \pi^0 p$ from JLAB CLAS g9a/FROST dataset with application of Machine Learning

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In pursuit of resolving the problem of missing baryon resonances, the measurement of the double polarization observable E for $\gamma p \to \pi^0 p$ was performed using a circularly polarized photon beam on longitudinally polarized proton target (FROzen Spin Target experiment) at W energies between 1450 MeV and 2050 MeV. The final state particles were detected with CEBAF Large Acceptance Spectrometer (CLAS) in Hall B at the Thomas Jefferson National Accelerator Facility. During analysis of the CLAS g9a/FROST data, various types of deep neural networks were tested and employed to control the effects of hydrogen contamination on carbon targets which emerged while polarizing nearby butanol targets via Dynamic Nuclear Polarization technique. The extracted data of helicity asymmetry E will be compared to the SAID, MAID and BnGa partial wave analysis predictions and included to GW SAID database to further investigate missing resonances.
In this talk, preliminary results of extracted helicity asymmetry E for $\gamma p \to \pi^0 p$ and applications of machine learning techniques will be presented.

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