Extracting the Proton Backward Spin Polarizability using Compton Scattering[1] HERACLITOS LEFCOCHILOS-FOGELQUIST, Georgetown University — The proton spin-polarizabilities (SPs) are properties that quantify the response of the proton spin to electromagnetic waves. The SPs can be expressed in a linear combination called the backward spin polarizability ($\gamma\pi$) which arises in the cross-section of a Compton scattering event in which the incident photon is scattered at 180 degrees. As the cross-section at this angle cannot be experimentally determined, measurements of $\gamma\pi$ are fitted using data with scattering angles close to 180 degrees. However, as the scattering angle is reduced the cross-section rapidly becomes determined by the values of the individual SPs, not $\gamma\pi$. This project investigated the viability of using cross-section data from different energy and angle bins to extract the $\gamma\pi$ in order to optimize future experiments for $\gamma\pi$ extraction. A Dispersion Relation was used to generate theory points based on randomly specified values of $\gamma\pi$ and SPs for data sets of different energy and scattering angle. This was repeated 2000 times and the $\chi2$ of each iteration was measured to determine if fits to a data set were dependent on the individual SPs values or $\gamma\pi$.

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