

Determining the longitudinal double-spin asymmetry (A_{LL}) for π^0 production from STAR
2013 Endcap Calorimeter Data

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The Solenoidal Tracker at RHIC (STAR) located at Brookhaven National Laboratory uses longitudinally polarized proton-proton collisions to study the gluon spin contribution to the known proton spin of $\frac{1}{2}\hbar$. The relative contributions of the quarks and gluons to the spin of the proton remain uncertain. Using data from the 2013 longitudinally polarized proton-proton collisions we study the asymmetry of proton spin-dependent production of neutral pions (π^0 s) from these collisions. π^0 s rapidly ($8.5 \cdot 10^{-17}$ s) decay into 2 photons that are detected by the Endcap Electromagnetic Calorimeter. By comparing the number of π^0 s produced when protons collide with different helicities, the asymmetry of π^0 production (A_{LL}), which can be related to the contribution of the gluon spin to the spin of the proton, can be measured. The two-photon invariant mass spectrum is reconstructed and then fit using a skewed Gaussian function to represent the π^0 signal and a Chebyshev function to characterize the background. Various checks must be made to assure the quality of the data being analyzed. The status of this analysis will be presented.