Determining π^0 A_{LL} 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 contribution to the spin of the proton. Using data collected in 2013 at $\sqrt{s} = 510$ GeV, the spin-dependent asymmetry of neutral pion (π^0) production, A_{LL}, can be determined by analyzing π^0s reconstructed from decayed photons, as detected in the Endcap Electromagnetic Calorimeter (EEMC). The EEMC, covering an intermediate pseudorapidity range of $1.1 < \eta < 2$, is able to measure the energy and position of the electromagnetic shower from an incoming photon. From these measurements, the two-photon invariant mass spectrum can be reconstructed. This spectrum is then fitted using a skewed Gaussian function to represent the π^0 signal and a Chebyshev function to characterize the random two-photon background. Integrating the resulting Gaussian peak will yield the total number of π^0s. The π^0 A_{LL} is calculated from the number of π^0s produced in collisions of protons with different spin alignments. Numerous checks must be made to authenticate the quality of the data being analyzed in this very large data set. The status of this analysis will be presented.