Investigating π^0 and η Production from STAR 2013 Endcap Calorimeter Data

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The Solenoidal Tracker at RHIC (STAR) experiment, located at Brookhaven National Laboratory, uses collisions of longitudinally polarized proton beams produced in the Relativistic Heavy Ion Collider (RHIC) to study the gluon contribution to the proton spin. While the proton spin is known to be 1/2 ħ, the contribution from gluon spin is not precisely known. Our analysis uses 300 pb^{-1} of $\sqrt{s}$ = 510 GeV collisions to determine the asymmetry of spin-dependent production of neutral pions (π^0) and eta (η) mesons. This asymmetry is sensitive to the gluon contribution to the spin of the proton. Collisions at $\sqrt{s}$ = 510 GeV have enhanced sensitivity to low *x* gluons, where *x* is the fraction of the proton's momentum carried by the gluon, compared to other STAR analyses. π^0s and ηs are produced within the STAR detector via collisions of longitudinally polarized protons provided by RHIC. The π^0s and ηs rapidly decay into two photons, which are detected by the Endcap Electromagnetic Calorimeter stationed at a pseudorapidity range of $1.1 < \eta < 2.0$. An invariant mass spectrum is constructed from the photon pairs. From this, the total number of π^0s and ηs can be determined. Various quality assurance checks are performed to ensure a thorough understanding of the performance of the STAR detector system and to confirm the robustness of data collection at STAR. The current status of the asymmetry analysis, focusing on the 2013 dataset, will be presented.