

Measuring η Longitudinal Double-Spin Asymmetry A_{LL} with 2012 STAR Endcap Calorimeter Data

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Using the Solenoidal Tracker at RHIC (STAR) we can measure the longitudinal double-spin asymmetry (A_{LL}) in the production of η particles from the collisions of longitudinally polarized protons at $\sqrt{s} = 510$ GeV. The η particles decay into two photons. These photons produce electromagnetic showers in the Endcap Electromagnetic Calorimeter (EEMC) from which the energies and positions of the incoming photons are determined. From these data, we can then calculate the invariant mass of photon pairs and produce a two-photon invariant mass spectrum. In this spectrum, some pairs of photons are from η -decays and others are combinatorial background. The spectrum is then fitted using a Gaussian function to represent the η particles plus a polynomial function to describe the background photon pairs. The total number of η particles is then obtained from integrating the fitted Gaussian function. Finally, the A_{LL} is calculated from the number of η particles produced in collisions of protons with different spin alignments, from which we can infer information about the gluon contribution to the spin of the proton. The status of the analysis using the 2012 data set will be presented.