

Probing Gluon's Contribution to the Proton's Spin using the STAR Endcap Electromagnetic Calorimeter: Data Reconstruction and Quality Assurance

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Measuring the gluon spin contribution to the proton's spin is an important goal of the STAR experiment at the Relativistic Heavy Ion Collider (RHIC). Our group is aiding this effort by studying the STAR data taken in 2013 from $\sqrt{s} = 510$ GeV longitudinally polarized proton-proton collisions. Those data were gathered using the Endcap Electromagnetic Calorimeter (EMC) which is stationed at a pseudorapidity range of $1.1 < \eta < 2.0$ and detects photons from decays of neutral pions (π^0 s). We analyze STAR data and store the results in a series of three ROOT trees, containing C++ objects, for each STAR run. We previously reconstructed π^0 s from 1583 runs of the 2013 data, but many were incomplete due to the partial availability of data on disk. Recently, we executed a new reconstruction campaign to add additional files and complete the set of runs. After reconstruction, we assessed the quality of the data including a consideration of the mean invariant mass, number of towers hit, and signal fraction. Eventually, the data will be used to calculate the spin-dependent asymmetry of π^0 production (A_{LL}), sensitive to the gluon spin contribution to the proton's spin. I will present the procedure and the impact of the reconstruction campaign and quality assurance effort.