Measuring Azimuthal Angular Resolutions in $p\uparrow+p \rightarrow jet + X$ and $p\uparrow+ p \rightarrow jet + \pi\pm + X$

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Measurements of particle production from polarized-proton collisions at Brookhaven National Laboratory's Relativistic Heavy Ion Collider (RHIC) give insight into proton spin structure. One way to study spin effects such as those due to quark transversity or the Sivers parton distribution function is to analyze spin-dependent asymmetries in the final-state particles produced in transversely polarized-proton collisions. The large angular acceptance of the Solenoidal Tracker at RHIC (STAR) allows the reconstruction of full jets in addition to inclusive hadron production. Analyzing spin-dependent azimuthal asymmetries in $p\uparrow+p \rightarrow jet + X$ (e.g. Sivers Mechanism) and $p\uparrow+ p \rightarrow jet + \pi\pm + X$ allows one to isolate contributions from the Sivers and Collins effects. Measuring the resolution of the relevant azimuthal angles is critical to quantifying the systematic uncertainties of the asymmetry measurements. A useful means to study the resolutions and response of the STAR detector in light of pile-up backgrounds is to embed simulated events into real zero-bias data. In 2009 and 2011, STAR collected data from polarized-proton collisions at $\sqrt{s} = 500$ GeV. These samples provide an opportunity to study the angular resolution of inclusive jets at 500 GeV from embedded simulated events, and the progress of these studies will be shown.

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