Single-Spin Transverse Asymmetry in Neutral Pion Production at PHENIX

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The Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory (BNL) inaugurated its operation as the first polarized proton collider during the 2001-2002 run. From the data collected in this run, the PHENIX experiment measured the single-spin transverse asymmetry (A_N) for neutral pion production at $x_F \sim 0$ over a p_T range of 1.0 to $\sim 8.0 GeV/c$ from polarized proton-proton interactions at a center of mass energy ($\sqrt{s}$) of $200 GeV$. Interest in these measurements arises from the observation of large ($\sim 30\%$) single-spin transverse asymmetries in $pp_{\uparrow} \longrightarrow \pi X$ at forward angles by the E704 collaboration at Fermilab ($\sqrt{s} = 19.4 GeV$) and single-spin, azimuthal asymmetries in semi-inclusive deep inelastic scattering by the HERMES collaboration at DESY. Such large asymmetries were initially surprising because, at leading-order twist, pQCD predicts only small effects. Recently it has been realized that large asymmetries may be produced by initial-state effects (*e.g.* the Sivers' effect), final-state effects (*e.g.* the Collin's effect), higher-twist contributions, or a combination of the three. In this talk, we will report on the results of this experimental effort.