Abstract Submitted
for the HAW09 Meeting of
The American Physical Society

Transverse Spin Asymmetries in Back-to-Back Di-Hadron Correlations in the PHENIX Experiment at RHIC JOHN LAJOIE, Iowa State University, PHENIX COLLABORATION — The measurement of transverse single spin asymmetries gives us an opportunity to probe the parton structure of transversely polarized nucleons. We present an analysis of single nucleon transverse spin asymmetries using di-hadron correlations in transversely polarized p+p collisions as measured by the PHENIX experiment. The Sivers effect predicts that a non-zero k_t in transversely polarized nucleons can lead a very small azimuthal asymmetry in back-to-back di-jets events. Because the PHENIX detectors do not have full phase space coverage it is problematic to fully reconstruct jets. Instead, we use di-hadron correlations in our analysis and measure the sum of two leading back-to-back hadrons' transverse momentum as q_t, which contains contributions both from partonic k_t and fragmentation. Because of this, such measurements may also include contributions from spin-dependent fragmentation. We present yields and asymmetries of the projection of q_t on the direction perpendicular to the spin orientation, which is the most sensitive to the small asymmetry due to Sivers effect. These correlations are performed for both midrapidity di-hadron pairs, as well as correlations between midrapidty hadrons and hadrons detected at forward rapidity in the PHENIX muon arms. These measurements offer the potential to elucidate the origin of large transverse single-spin asymmetries observed at RHIC.

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Date submitted: 01 Jul 2009 Electronic form version 1.4