Abstract Submitted
for the APR09 Meeting of
The American Physical Society

Measurement of Quark Transversity through the Collins Mechanism in Mid-Rapidity Jets in $p^{\uparrow}p$ Collisions at STAR ROBERT FERSCH, STAR COLLABORATION — The spin-dependent azimuthal distribution of leading charged hadrons within jets resulting from transversely polarized $p^{\uparrow}p$ collisions can be expressed as a convolution of three different quantities. The first of these, the quark transverse spin distribution ($\delta q(x, Q^2)$), quantifies the probability of the quark spin aligning with the transverse spin of the proton. There is also dependence upon a hard-scattering spin-transfer coefficient calculated using pQCD (estimated as $\sim$0.5 in the STAR detector acceptance and trigger). Finally, there is a dependence on the Collins fragmentation function ($\Delta D(z)$), previously extracted from measurements made by the Belle, HERMES, and COMPASS collaborations. Measurement of the asymmetry in the reaction $p^{\uparrow}p \rightarrow \text{jet} + X \rightarrow \pi + X$ should allow for an independent extraction of $\delta q(x, Q^2)$ via the same methods used in existing global analysis by Anselmino, et al. Transversely polarized ($\sim$58%) $p^{\uparrow}p$ collision data ($\sim$1 pb^{-1}) at $\sqrt{s}$ =200 GeV from the Solenoidal Tracker at RHIC (STAR) enable a statistically significant measurement of this asymmetry. The STAR detector provides full azimuthal coverage for both charged and neutral particle identification, and thus full jet reconstruction, in the mid-rapidity region ($|\eta| < 1$). Progress toward measurement of this asymmetry for leading charged pions will be presented.

Robert Fersch

Date submitted: 12 Jan 2009 Electronic form version 1.4