

# Prospects for the measurement of the D0 transverse single spin asymmetry in transversely polarized proton collisions at sPHENIX

In 2024, the sPHENIX experiment at the Relativistic Heavy Ion Collider at Brookhaven National Laboratory completed its first ever transversely polarized proton data taking, collecting approximately 100 billion unbiased collisions. The sPHENIX tracking system, composed of a vertex detector with monolithic active pixel sensor technology, an intermediate silicon strip detector, and a compact time projection chamber, along with our novel streaming readout data acquisition architecture, is particularly well-suited for precision heavy flavor measurements. One such measurement, uniquely available at sPHENIX, is the D0 meson transverse single spin asymmetry (TSSA). This measurement serves as a remarkably clean probe of the initial-state twist-3 trigluon correlator and is directly related to the gluon Sivers Transverse Momentum Dependent distribution. In this poster, I will present the sPHENIX tracking performance in the 2024 polarized proton run and the prospects for the world's first measurement of the D0 TSSA.

**Primary author:** LOOMIS, Devon

**Presenter:** LOOMIS, Devon

**Session Classification:** Parallel

**Track Classification:** Three-dimensional structure of the nucleon: transverse momentum dependent parton distributions