

Unveiling Sea Quark Dynamics: Measuring Sivers Asymmetry with Polarized Target at SpinQuest

SpinQuest is a cutting-edge, high-luminosity Drell-Yan experiment utilizing polarized hydrogen and deuterium targets to measure the Sivers asymmetry for the light sea quarks in the nucleon. Detecting a nonzero Sivers asymmetry would provide clear evidence for nonzero orbital angular momentum of sea quarks. The Sivers asymmetry presents itself as an azimuthal asymmetry in the production of virtual photons via the Drell-Yan process, and SpinQuest will be able to measure this asymmetry using the existing SeaQuest dimuon spectrometer. In addition to making measurements sensitive to the sea quark Sivers function, we will also measure the azimuthal asymmetry in the production of J/ψ particles, which is sensitive to the gluon Sivers function. Additionally, observing a sign change in the Sivers asymmetry between this measurement and future measurements at the Electron-Ion Collider would be a test of a fundamental prediction of Quantum Chromodynamics. In this poster we will review the physics and technology underpinning the experiment. This work was supported in part by US DOE grant DE-FG02-94ER40847.

Primary author: KURUPPU, Chatura (New Mexico State University)

Presenter: KURUPPU, Chatura (New Mexico State University)

Session Classification: Poster Session