

Measurement of transverse single-spin asymmetries for dijet production in polarized $p+p$ collisions at $\sqrt{s} = 200$ GeV at STAR

Huanzhao Liu, on behalf of the STAR collaboration
Indiana University, Center for Exploration of Energy and Matter

June 22 2020

Abstract

We report a new measurement of transverse single-spin asymmetries for pair-production of jets in collisions of transversely polarized protons at $\sqrt{s} = 200$ GeV with data taken in 2012 and 2015 at STAR. The correlation between the transverse momentum of a parton (\vec{k}_T) and the transverse spin (\vec{S}) of its proton, moving in the longitudinal (\vec{p}) direction, is probed at a high Q^2 scale (~ 160 GeV²). The corresponding Sivers $\langle k_T \rangle$ is calculated based on a simple kinematic model. By employing charge-tagging to separately enhance u - and d -quark contributions, we see non-zero Sivers effects for the first time in dijet production with transversely polarized proton collisions. The individual parton contributions (u , d , gluon+sea) to the measured $\langle k_T \rangle$ are extracted through bin-by-bin matrix inversion of the charge-sorted $\langle k_T \rangle$ results.