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Exploring the gluon polarization using inclusive jet and dijet production in polarized proton-proton collisions at $\sqrt{s} = 510$ GeV at RHIC

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One of the primary goals of the RHIC spin program is to determine the polarized gluon distribution function, Δg , within the proton. At the leading order, proton-proton collisions involve a mixture of quark-quark, quark-gluon, and gluon-gluon scatterings. At RHIC kinematics, the quark-gluon and gluon-gluon contributions dominate, which makes RHIC an ideal tool to study Δg .

The STAR Collaboration has recently published measurements of the longitudinal double-spin asymmetry, A_{LL} , for inclusive jet and dijet production at midrapidity in polarized proton-proton collisions at a center-of-mass energy of $\sqrt{s} = 510$ GeV, based on the high luminosity data sample collected by the STAR experiment in 2013. These measurements complement and improve the precision of previous STAR measurements at the same center-of-mass energy that probe the polarized gluon distribution function within the partonic momentum fraction range of $0.015 < x < 0.25$.

The dijet asymmetries are separated into four jet-pair topologies and measured with good precision at low dijet invariant mass, which provide further constraints on the x dependence of the polarized gluon distribution function.

These recently published midrapidity A_{LL} results will be presented and compared to previous measurements, along with comparisons to current next-to-leading-order global analyses.

Submitted on behalf of a Collaboration?

Yes

Participate in poster competition?

No

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