Contribution ID: **291** Type: **not specified**

Measurements of Jet Cross Sections in proton-proton Collisions at STAR

Tuesday, March 24, 2020 2:30 PM (18 minutes)

Jets, clusters of collimated particles, produced from parton scatterings in high energy proton-proton collisions are an effective tool to study the internal proton structure. At center of mass energies of $\sqrt{s} = 200$ and 510 GeV, jet production is dominated by the quark-gluon, qg and gluon-gluon, gg, scattering processes. The STAR experiment at the Relativistic Heavy Ion Collider (RHIC) has measured a series of jet asymmetries in the pseudo-rapidity range, $-1 < \eta < 2$, in longitudinally polarized pp collisions to constrain the gluon polarization in the proton. Similarly jet cross-section measurements for unpolarized pp collisions are an excellent probe to constrain the unpolarized gluon distribution. In this talk the STAR jet cross-section measurements in two η ranges, $|\eta| < 0.5$ and $0.5 < |\eta| < 0.9$ for 510 GeV pp data are presented. The techniques used in this analysis, such as the underlying event correction to the jet energy and the unfolding procedure that maps the detector-level jet quantities to physics quantities at the particle level are described. Their impact on the unpolarized proton parton distribution functions through re-weighting is discussed.

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Session Classification: Structure function and parton densities

Track Classification: Structure Functions and Parton Densities