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Inclusive Jet Cross-section Measurements in pp Collisions at $\sqrt{s} = 200$ and 510 GeV with STAR

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Jets, clusters of collimated particles produced in high energy proton-proton (pp) collisions, are an excellent tool to study the internal structure of the proton. According to perturbative QCD calculations, for center of mass energies of $\sqrt{s} = 200$ and 510 GeV at RHIC, jet production in the mid pseudo-rapidity, $|\eta| < 1$, is dominated by quark-gluon and gluon-gluon scattering processes. These jets are sensitive to gluons in the proton with momentum fraction $0.01 < x < 0.5$. The STAR experiment has measured a series of jet double-spin asymmetries within $-1 < \eta < 2$, in longitudinally polarized pp collisions, to constrain the gluon helicity distribution function in the proton. Similarly, jet cross-section measurements from unpolarized pp collisions are effective at constraining the unpolarized gluon distribution in the proton. In this talk, we will present the STAR preliminary results on mid pseudo-rapidity inclusive jet cross-section measurements in pp collisions at $\sqrt{s} = 200$ and 510 GeV as well as the techniques used in this analysis. They include an off-axis cone underlying event correction to the jet transverse momentum, an unfolding procedure to map the measured jet spectra to physical particle jet spectra, and the determination of the leading systematic uncertainties.

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