

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

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7 Jets, clusters of collimated particles produced in high energy proton-proton  
8 ( $pp$ ) collisions, are an excellent tool to study the internal structure of the proton.  
9 According to perturbative QCD calculations, for center of mass energies  
10 of  $\sqrt{s} = 200$  and 510 GeV at RHIC, jet production in the mid pseudo-rapidity,  
11  $|\eta| < 1$ , is dominated by quark-gluon and gluon-gluon scattering processes.  
12 These jets are sensitive to gluons in the proton with momentum fraction  $0.01$   
13  $< x < 0.5$ . The STAR experiment has measured a series of jet double-spin  
14 asymmetries within  $-1 < \eta < 2$ , in longitudinally polarized  $pp$  collisions, to  
15 constrain the gluon helicity distribution function in the proton. Similarly, jet  
16 cross-section measurements from unpolarized  $pp$  collisions are effective at con-  
17 straining the unpolarized gluon distribution in the proton. In this talk, we will  
18 present the STAR preliminary results on mid pseudo-rapidity inclusive jet cross-  
19 section measurements in  $pp$  collisions at  $\sqrt{s} = 200$  and 510 GeV as well as the  
20 techniques used in this analysis. They include an off-axis cone underlying event  
21 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.