

1 Precision Measurement of the Longitudinal Double-Spin  
2 Asymmetry for Dijet Production at Intermediate  
3 Pseudorapidity in Polarized Proton+Proton Collisions at  
4  $\sqrt{s} = 200$  GeV

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8 **Abstract**

9 Measurements of the longitudinal double-spin asymmetry,  $A_{LL}$ , by the STAR experiment  
10 have contributed significantly to our understanding of the gluon helicity distribution,  $\Delta g(x)$ ,  
11 inside the proton. Results from the 2009 inclusive jet measurement, when included into global  
12 analyses, indicated substantial positive polarization for gluons with partonic momentum  
13 fraction  $x$  greater than 0.05. In addition to the inclusive jets, analyses of dijet production  
14 extending to higher pseudorapidity (up to  $\eta \sim 1.8$ ) provide better constraints on the  $x$   
15 dependent behavior of  $\Delta g(x)$ . Recently, STAR published several new results at midrapidity  
16 (up to  $\eta \sim 1.0$ ) using the  $p + p$  data collected in 2012, 2013 and 2015 at both  $\sqrt{s} = 510$  and  
17 200 GeV. These new results confirm the previous findings and provide additional constraints  
18 in the largely unexplored region of  $x < 0.05$ . In this talk, the preliminary results of the  $A_{LL}$   
19 for dijet production at intermediate pseudorapidity (up to  $\eta \sim 1.8$ ) based on 2015 data, with  
20 twice the figure-of-merit of the 2009 data, will be presented. This result will be compared  
with the published ones, and its potential impact on  $\Delta g(x)$  will be discussed.