

## Constraining the Polarized Gluon Distribution Function of the Proton with Recent STAR Measurements

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The contribution of the gluon spin to the spin of the proton is being studied through the use of the unique capability of the Relativistic Heavy Ion Collider (RHIC) to collide longitudinally polarized protons at  $\sqrt{s} = 200 \text{ GeV}$  and  $\sqrt{s} = 510 \text{ GeV}$ . The kinematic coverage of the Solenoidal Tracker At RHIC (STAR) allows access to gluons through quark-gluon and gluon-gluon scattering processes which dominate particle production at low and medium transverse momentum. The polarized gluon distribution function,  $\Delta g(x)$ , can be constrained through global analyses of the longitudinal double-spin asymmetries ( $A_{LL}$ ) of inclusive jet and di-jet production. Published inclusive jet results from 2009 data at mid-rapidity ( $|\eta| < 1$ ) at  $\sqrt{s} = 200 \text{ GeV}$  have been included in global analyses and suggest a significant non-zero truncated first moment of  $\Delta g(x)$  for  $x > 0.05$ . An additional data sample of  $43 \text{ pb}^{-1}$  has been collected in 2015 at the same collision energy. This new data sample is over twice as large as the previous sample, providing an opportunity to improve the precision of  $\Delta g(x)$  for  $x > 0.05$ . The published results from the analysis of the 2015 data will be presented along with the status of the analysis using a large data sample of  $250 \text{ pb}^{-1}$  collected at  $\sqrt{s} = 510 \text{ GeV}$  in 2013.