

Abstract Submitted  
for the DNP08 Meeting of  
The American Physical Society

**Longitudinal Double-Spin Asymmetry and Cross Section for Inclusive  $\pi^0$  Production in Polarized  $p+p$  Collisions at RHIC** OLEKSANDR GREBENYUK, LBNL, STAR COLLABORATION — Important insight into the spin structure of the nucleon is provided by studying the gluon spin contribution to the spin of proton. Recent STAR measurements of inclusive jet production provide sensitive constraints on the integral of gluon polarization  $\Delta g(x, Q^2)$  for fractional gluon momenta  $0.03 < x < 0.3$  and hard scales. We present measurements of the longitudinal double-spin asymmetry and differential cross section for neutral pions produced in  $p+p$  collisions at  $\sqrt{s} = 200$  GeV. The measured cross section is in good agreement with NLO pQCD calculations for all measured  $p_T$ ,  $2 < p_T < 16$  GeV/ $c$ , corresponding to seven orders in magnitude, and can provide constraints on fragmentation functions. The longitudinal double-spin asymmetry data disfavor large and positive gluon polarization in the polarized nucleon. They provide sensitive constraints that are complementary to those obtained with inclusive jet probes.

Oleksandr Grebenyuk  
LBNL

Date submitted: 01 Jul 2008

Electronic form version 1.4