

Abstract Submitted  
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**PHENIX Measurements of the Double Helicity Asymmetry in Neutral Pion Production in Polarized p+p Collisions at  $\sqrt{s} = 200$  and 500 GeV** KIERAN BOYLE, RIKEN BNL Research Center, PHENIX COLLABORATION — Measurement of the gluon's contribution to the proton spin,  $\Delta G$ , is an important component of the RHIC spin program. One particular avenue for constraining  $\Delta G$  is through the  $\pi^0$  double helicity asymmetry,  $A_{LL}$ . The large  $p+p \rightarrow \pi^0$  cross section coupled with the high resolution of the PHENIX EM-Calorimeter make this an attractive measurement. Significant constraints have already come from 2005 and 2006 PHENIX measurements in  $\sqrt{s} = 200$  GeV polarized proton collisions. In 2009,  $\sqrt{s} = 200$  GeV running saw a near doubling in the figure of merit ( $P^4L$ ) compared to 2006, due to a large increase in luminosity ( $L$ ) with  $\sim 57\%$  polarization ( $P$ ). Also, the first data at  $\sqrt{s} = 500$  GeV were recorded, which will push the constraints to lower momentum fraction  $x$ . The status of the 200 and 500 GeV analyses will be presented.

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