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Measuring the gluon spin contribution to the proton spin in polarized p+p collisions with the PHENIX experiment

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A primary goal of the RHIC Spin program has been to measure Δg , the gluon spin contribution to the proton spin, through the double helicity asymmetry, A_{LL} . The PHENIX detector is designed with very good electromagnetic calorimetry, allowing for a high statistics $\pi^0 A_{LL}$ measurement. PHENIX results from 2005 and 2006 at $\sqrt{s} = 200$ GeV have been used in the DSSV global analysis, and were shown to significantly constrain Δg . PHENIX also has made measurements of charged pion, direct photon and heavy flavor A_{LL} . Measurements of neutral pions at large rapidity ($3.1 < |\eta| < 3.9$) will significantly extend the x range probed in PHENIX towards lower x . Analysis is also underway for these channels in the large $\sqrt{s} = 500$ GeV data taken in 2011-2013. The status of the PHENIX A_{LL} measurements will be presented, including the final results for the 2009 $\pi^0 A_{LL}$ at $\sqrt{s} = 200$ GeV.

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