

**Measurement of longitudinal single-spin asymmetries for W^\pm boson production
in polarized $p + p$ collisions at $\sqrt{s} = 510$ GeV at RHIC**

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W^\pm boson production in longitudinally polarized $p + p$ collisions provides unique and clean access to the individual helicity polarizations of quarks and antiquarks in the colliding protons. Due to maximal violation of parity in the production, W^\pm bosons couple to left-handed quarks and right-handed anti quarks and hence offer direct probes of their respective helicity distributions in the nucleon. These can be observed in measured large parity-violating longitudinal single-spin asymmetries A_L , as a function of decay lepton pseudo-rapidity η , for W^\pm boson production at the STAR experiment at the Relativistic Heavy Ion Collider (RHIC).

The final results of $W A_L$ measured between $|\eta| < 1.1$ at $\sqrt{s} = 510$ GeV from the dataset collected in 2011 and 2012 running periods with an integrated luminosity of 86 pb^{-1} and an average beam polarization of $\sim 55\%$ will be presented. The status for the analysis of $W A_L$ from the larger dataset collected during 2013 (more than 3 times of 2012) at $\sqrt{s} = 510$ GeV with an average beam polarization of $\sim 54\%$ will be reported.