

Abstract Submitted
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The STAR W Physics Program at RHIC JUSTIN STEVENS, Indiana University, STAR COLLABORATION — The production of $W^{-(+)}$ bosons in longitudinally polarized p+p collisions at RHIC provides a new means of studying the spin-flavor asymmetries of the proton sea quark distributions. $W^{-(+)}$ bosons are produced in $\bar{u} + d$ ($\bar{d} + u$) collisions and can be detected through their leptonic decays, $e^- + \bar{\nu}_e$ ($e^+ + \nu_e$), where only the charged lepton is detected. At mid-rapidity, the charge sign of the high p_T $e^{-(+)}$ is determined from precise tracking information provided by the STAR Time Projection Chamber (TPC). At forward rapidity, new tracking capabilities will be provided by the Forward GEM Tracker, consisting of six triple-GEM detectors currently under construction. The large acceptance of the TPC and Electromagnetic Calorimeters is well suited to place isolation requirements on the $e^{-(+)}$ and to veto on the away side energy, which reduces the large QCD background by several orders of magnitude, yielding a clean W signal. In 2009 the STAR Collaboration collected an integrated luminosity of $\sim 12 \text{ pb}^{-1}$ at $\sqrt{s} = 500 \text{ GeV}$ with an average beam polarization of $\sim 39\%$. Preliminary results for the $W^{-(+)}$ production cross section and parity-violating single-spin asymmetry, A_L , from the 2009 data, as well as future projections for the STAR W spin program at mid-rapidity and forward rapidity, will be presented.

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