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Measurement of the Cross Section for W Boson Production at $\sqrt{s} = 500$ GeV at STAR 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. Precise tracking information, provided by the STAR Time Projection Chamber (TPC) at mid-rapidity, allows for a determination of the charge sign of the high p_T $e^{-(+)}$. The large acceptance of the TPC and Electromagnectic 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. The status of the W production cross section analysis from the STAR Collaboration's 2009 data at $\sqrt{s} = 500$ GeV will be presented.

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