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Measurements of parity violating spin asymmetries of the W boson, $W^{\pm} \to e^{\pm}$, at mid-rapidity with the PHENIX Detector at RHIC

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Precision measurements of polarized parton distributions (PDFs) lie at the heart of unraveling the nucleon spin puzzle. The u and d quark distributions are significantly better constrained than the anti-quark $\overline{u}$ and $\overline{d}$ distributions. A clean way to measure the anti-quark distributions directly, without the dilution of poorly known polarized fragmentation functions, is to measure the parity violating production with p+p collisions at $\sqrt{s}$ = 500 GeV and its subsequent decay $W \to e/\mu$. The PHENIX detector is capable of measuring both in the central and forward rapidity respectively. In this talk we will present the status of $W^{\pm} \to e^{\pm}$ asymmetry measurement based on ∼160 pb^{-1} data collected in 2011, 2012, and 2013.

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