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$W^{\pm}$ production measurement at mid-rapidity in 510 GeV polarized $p+p$ collisions at PHENIX NERANGIKA BANDARA, DAVID KAWALL, University of Massachusetts - Amherst, PHENIX COLLABORATION — Measurement of parity violating longitudinal single spin asymmetries of W production is a complementary approach, free from fragmentation uncertainties compared to Semi-inclusive Deep Inelastic Scattering measurements, probing the flavor-separated polarized sea quark distributions in the proton. At mid-rapidity range of $|\eta| < 0.35$, candidate $W^{\pm}/Z$ events are identified through their $e^{\pm}$ decay channels. In 2013, PHENIX at the Relativistic Heavy Ion Collider recorded data with an integrated luminosity of $\sim$146 pb^{-1} in longitudinally polarized $p+p$ collisions at $\sqrt{s} = 510$ GeV, approximately three times the statistics from 2009, 2011 and 2012 combined and average beam polarization of 52%. The analysis status on the single spin asymmetry of the run 2013 will be presented.

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