

Abstract Submitted  
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The production of  $W^{-(+)}$  bosons in polarized proton-proton collisions provides an ideal tool to study the spin-flavor structure of the proton, namely the polarized and unpolarized light quark sea asymmetries.  $W^{-(+)}$  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 respective charged lepton is measured. The discrimination of  $\bar{u} + d$  ( $\bar{d} + u$ ) quark combinations requires distinguishing between high  $p_T$   $e^{-(+)}$  through their opposite charge sign, which in turn requires precise tracking information. In spring 2009, STAR recorded its first data set at  $\sqrt{s} = 500\text{GeV}$  which allows for a first measurement of the cross section and single helicity asymmetry for  $W^{-(+)}$  production at mid-rapidity in polarized proton-proton collisions. The status of the  $W^{-(+)}$  production analysis will be presented.

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