Abstract Submitted
for the APR17 Meeting of
The American Physical Society

Measurement of $W^{\pm}$ single spin asymmetries in polarized p+p collisions at $\sqrt{s} = 510$ GeV at RHIC[1] DEVIKA GUNARATHNE, Temple Univ, STAR COLLABORATION — The STAR experiment at RHIC has provided significant contributions to our understanding of the structure of the proton. The STAR experiment is well equipped to measure $W^{\pm\pm} + \nu$ in $\sqrt{s} = 510$ GeV longitudinally polarized $p + p$ collisions. The longitudinal single spin asymmetry in W production, A_L, measured as a function of decay positron (electron) pseudo-rapidity η for $W^+(W^-)$ is sensitive to the individual helicity polarizations of u and $\bar{d}$ (d and $\bar{u}$) quarks. Due to maximal violation of parity during the production, W bosons couple to left-handed quarks and right-handed anti-quarks and hence offer direct probes of their respective helicity distributions in the nucleon. The published STAR A_L results (2011, 2012 data combined) have been used by several theoretical analyses suggesting a significant impact in constraining the helicity distributions of $\bar{u}$, and $\bar{d}$ quarks. In 2013 STAR collected a dataset at $\sqrt{s} = 510$ GeV with a total integrated luminosity of $\sim$300 pb^{-1} with an average beam polarization of $\sim$54%, a figure of merit three times larger than the dataset used by previous analyses. We will present preliminary results of STAR 2013 W A_L measurement at mid-rapidity ($|\eta| < 1$) region.

[1](for the STAR collaboration)

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Date submitted: 28 Sep 2016 Electronic form version 1.4