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**Extracting the flavor dependence of the polarized sea quarks**

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The measurement of single spin asymmetry  $A_L$  of W bosons in longitudinally polarized pp collisions at RHIC provides an unique probe for the flavor separation of the nucleon spin structure, especially the polarization of sea quarks. The recent  $A_L$  results of W bosons from RHIC via leptonic decay provided significant new constraints on the helicity distributions of light sea quarks in addition to constraints from the semi-inclusive deep inelastic scattering data, which also indicated a symmetry breaking between anti-u and anti-d quark polarization in the nucleon. In 2013 the RHIC/STAR experiment collected a proton-proton collision data sample about 3 times larger than the previous data sample. The newest results of  $A_L$  analysis from RHIC W program and the impact on sea quark polarization will be discussed.