Measurement of longitudinal spin transfer of the $\Lambda(\bar{\Lambda})$ hyperon in longitudinally polarized p+p collisions at $\sqrt{s} = 200$ GeV at RHIC-STAR

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Since the first surprising results on the spin structure of the proton by the EMC experiment in the late 1980s, much progress has been made in understanding the origin of the proton spin. However, the sea quark contribution to the proton spin, for example, the helicity distributions of the strange quark (anti-quark), $s(\bar{s})$, is still not well constrained by experimental data. Since the $s(\bar{s})$ is expected to carry a substantial fraction of the spin of the $\Lambda(\bar{\Lambda})$ hyperon, measurements of the longitudinal spin transfer, D_{LL}, of the $\Lambda(\bar{\Lambda})$ hyperon can thus shed light on the helicity distribution of the $s(\bar{s})$ and the longitudinally polarized fragmentation functions. In this talk, we will present the status of the $\Lambda(\bar{\Lambda})$ D_{LL} analysis using data collected at RHIC-STAR in 2015, for the pseudo-rapidity $|\eta| < 1.2$ and transverse momenta up to 8.0 GeV/c. The D_{LL} as a function of the longitudinal momentum fraction of the $\Lambda(\bar{\Lambda})$ hyperon in the jet is also investigated. This data set is about twice as large as the 2009 data used for the previously published D_{LL} results. In addition, the longitudinal double spin asymmetries, A_{LL}, of the $\Lambda(\bar{\Lambda})$ hyperon and the K_S^0 meson are investigated, which are also expected to be sensitive to the $s(\bar{s})$ helicity distributions.