Transverse Spin Transfer of Λ and $\overline{\Lambda}$ Hyperons in Polarized p+p Collisions at $\sqrt{s} = 200$ GeV at RHIC-STAR

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Abstract

The transverse spin transfer, D_{TT}, of Λ and $\overline{\Lambda}$ hyperons in p+p collisions is expected to be sensitive to the strange and anti-strange quark transversity distributions in the proton and the transversely polarized fragmetation functions. In particular, the D_{TT} as a function of the fractional momentum of the hyperon within a jet can directly probe the transversely polarized fragmetation functions. The STAR experiment has published the first measurement of the transverse spin transfer of Λ and $\overline{\Lambda}$ hyperons in transversely polarized p+p collisions at $\sqrt{s} = 200$ GeV within pseudo-rapidity range of $|\eta| < 1.2$ and for the transverse momenta up to 8 GeV/c, based on the data taken in 2012. In 2015, a data sample of p+p collisions at $\sqrt{s} = 200$ GeV, about two times larger than the 2012 data, was collected. With this data sample, we measured the transverse spin transfer, D_{TT}, of Λ and $\overline{\Lambda}$ hyperon as a function of the hyperon transverse momentum and its fractional momentum within a jet.