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Transverse Spin Transfer of Lambda and Anti-Lambda in Polarized Proton-Proton Collisions at 200 GeV at STAR

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The transverse spin transfer from polarized proton to Λ and $\bar{\Lambda}$ hyperons is expected to be sensitive to the transversity distribution of the nucleon, and to the transversely polarized fragmentation function. We report the first measurement of the transverse spin transfer of Λ and $\bar{\Lambda}$ along the polarization direction of the fragmenting quark, D_{TT} , in transversely polarized proton+proton collisions at $\sqrt{s} = 200\text{GeV}$ with the STAR experiment at RHIC. The data correspond to an integrated luminosity of 18.4 pb^{-1} , which cover a kinematic range of pseudo-rapidity $|\eta| < 1.2$ and hyperon transverse momentum p_T up to $8\text{ GeV}/c$. The prospect of hyperon polarization measurements in the forward pseudo-rapidity region ($2.5 < \eta < 4$) in proton+proton collisions in 2021+ will also be discussed, which is based on the STAR forward detector upgrade plan including a forward tracking system and a forward calorimeter system.

Author: XU, Qinghua (Shandong University)

Co-author: BIELCIKOVA, Jana (Acad. of Sciences of the Czech Rep. (CZ))

Presenter: XU, Qinghua (Shandong University)

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