Measurement of Λ hyperon spin-spin correlations in p+p collisions by the STAR experiment

Jan Vanek
(for the STAR collaboration)
Brookhaven National Laboratory

About 50 years ago, it was discovered that Λ hyperons are produced polarized in collisions of unpolarized protons on beryllium. Since then, the Λ polarization has been observed in various collision systems, including $e^+e^-$ collisions. Majority of current results indicate the importance of final state effects, such as hadronization or fragmentation, in polarization of the Λ hyperons. A recently proposed technique for the investigation of the Λ hyperon polarization is a measurement of ΛΛ, ΛΛ, and ΛΛ spin-spin correlations. This technique is expected to help understand if the Λ polarization has any contribution from the early stage of the $p+p$ collisions, e.g., from initial state parton spin correlation, or if it is exclusively a final state effect.

In this presentation, we present the preliminary results of the ΛΛ, ΛΛ, and ΛΛ spin-spin correlations in $p+p$ collisions at $\sqrt{s} = 200$ GeV collected by the STAR experiment in 2012. The Λ and Λ candidates are reconstructed at mid-rapidity ($|y| < 1$) with transverse momentum in range of $0.5 < p_T < 5.0$ GeV/c. This measurement will provide additional insight into the importance of the initial state effects for the Λ hyperon polarization.