

1 Measurement of Λ -hyperon spin-spin correlations
2 in $p + p$ collisions at $\sqrt{s} = 200$ and 510 GeV by
3 the STAR experiment

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5 About 50 years ago, it was discovered that Λ hyperons are produced po-
6 larized in collisions of unpolarized protons on beryllium. Despite enormous
7 experimental and theoretical efforts, the origin of this polarization remains in-
8 conclusive to date. The Λ polarization has also been observed in various collision
9 systems, from e^+e^- to heavy-ion collisions. A recently proposed technique for
10 the investigation of the Λ hyperon polarization is a measurement of $\Lambda\bar{\Lambda}$, $\Lambda\Lambda$,
11 and $\bar{\Lambda}\bar{\Lambda}$ spin-spin correlations. This technique is expected to help understand
12 if the polarization is generated at early stages of the collisions, e.g. from ini-
13 tial state parton spin correlation, or if it is a final state effect originating from
14 hadronization.

15 In this talk, we present a status of the first measurement utilizing this new
16 experimental method in $p + p$ collisions at $\sqrt{s} = 200$ and 510 GeV by the STAR
17 experiment. The Λ and $\bar{\Lambda}$ candidates are reconstructed at mid-rapidity ($|y| < 1$)
18 and in two transverse momentum (p_T) bins which allows us to extract the Λ -
19 hyperon spin-spin correlations for various p_T combinations of hyperons in $\Lambda\bar{\Lambda}$,
20 $\Lambda\Lambda$, and $\bar{\Lambda}\bar{\Lambda}$ pairs. This measurement will provide new insight into Λ hyperon
21 spin polarization in $p + p$ collisions at RHIC energies.