

1 Measurement of  $\Lambda$  hyperon spin-spin correlations  
2 in  $p+p$  collisions by the STAR experiment

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4 About 50 years ago, it was discovered that  $\Lambda$  hyperons are produced po-  
5 larized in collisions of unpolarized protons on beryllium. Since then, the  $\Lambda$   
6 polarization has been observed in various collision systems, including  $e^+e^-$   
7 collisions. Majority of current results indicate the importance of final state  
8 effects, such as hadronization or fragmentation, in polarization of the  $\Lambda$  hy-  
9 perons. A recently proposed technique for the investigation of the  $\Lambda$  hyperon  
10 polarization is a measurement of  $\Lambda\bar{\Lambda}$ ,  $\Lambda\Lambda$ , and  $\bar{\Lambda}\bar{\Lambda}$  spin-spin correlations. This  
11 technique is expected to help understand if the  $\Lambda$  polarization has any contri-  
12 bution from the early stage of the  $p+p$  collisions, e.g., from initial state parton  
13 spin correlation, or if it is exclusively a final state effect.

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