

Transverse Spin Dependent Azimuthal Correlations of Charged Pion Pairs in $p^\uparrow p$ collisions at $\sqrt{s} = 510$ GeV at STAR

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Abstract

1 Quarks that are transversely polarized inside a transversely polarized nucleon are
2 described by the transversity distribution, $h_1^q(x)$. Since $h_1^q(x)$ is a chiral-odd function,
3 the only way to access it is through a process where it couples to another chiral-odd
4 function, such as the spin-dependent interference fragmentation function (IFF) in $p^\uparrow p$
5 collisions. The coupling of $h_1^q(x)$ and IFF results in an experimentally measurable di-
6 hadron correlation asymmetry, A_{UT} . Precise measurements of A_{UT} at high center-of-
7 mass energies, \sqrt{s} , are essential for accessing $h_1^q(x)$ at high Q^2 . Previously, the STAR
8 experiment at RHIC has measured non-zero A_{UT} using $p^\uparrow p$ data at $\sqrt{s} = 500$ GeV
9 recorded in 2011 with an integrated luminosity of 25 pb^{-1} . In 2017, STAR collected
10 additional $\sim 350 \text{ pb}^{-1}$ of $p^\uparrow p$ data at $\sqrt{s} = 510$ GeV, which will significantly improve
11 the statistical precision of A_{UT} measurement and thus further constrain global fits of
12 $h_1^q(x)$, especially for $0.07 < x < 0.2$. We will present status updates on the A_{UT}
13 measurement based on 2017 data.