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Back-to-back di- π^0 correlations at STAR

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Two-particle azimuthal correlation has been proposed to be one of the most direct and sensitive channels to access the nonlinear gluon dynamics in nuclei. Color Glass Condensate (CGC) predicts a suppression of back-to-back correlation in $p(d)+A$ collisions compared to $p+p$ collisions. In $d+A$ collisions, the double-parton scattering (DPS) can be an alternative explanation of the suppression \cite{Strikman:2010bg}. A comparison of suppression in $d+A$ and $p+A$ with the same kinematics provides an opportunity to study the impact of DPS. During the 2015 and 2016 RHIC runs, STAR collected data with the Forward Meson Spectrometer (FMS, $2.6 \leq \eta \leq 4.0$) in $p+p$, $p+Al$, $p+Au$ and $d+Au$ collisions at $\sqrt{s_{NN}} = 200$ GeV, which enables the measurements of azimuthal correlations of neutral pions in the forward region. In this talk, we will present the preliminary results on forward di- π^0 correlations as a function of event activity and π^0 's transverse momenta in $p+p$, $p+Al$ and $p+Au$ collisions, together with an analysis update of the same measurements in $d+Au$ collisions.

\bibitem{Strikman:2010bg}

M. Strikman and W. Vogelsang, Phys. Rev. D \textbf{83}, 034029 (2011), 1009.6123.

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