

Back-to-back di- π^0 azimuthal correlations at forward rapidities at STAR

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Abstract

The back-to-back di- π^0 correlation functions in forward directions have been observed to be suppressed for $p(d)+A$ collisions relative to $p+p$ collisions [1, 2]. The nonlinear gluon dynamics in nuclei is one of the possible mechanisms responsible for the suppression. In addition, theorists pointed out that the double-parton scattering (DPS) can be an alternative explanation of the suppression [3, 4] in $d+A$ collisions. During the 2015 and 2016 RHIC runs, STAR collected data with the Forward Meson Spectrometer (FMS, $2.6 < \eta < 4.0$) in $p+p$, $p+Al$, $p+Au$, and $d+Au$ collisions at $\sqrt{s_{NN}} = 200$ GeV. The recorded datasets enable the measurements of di- π^0 azimuthal correlations in $p+p$ and $p+A$ collisions with different mass numbers. Meanwhile, a comparison of the correlations in $d+Au$ and $p+Au$ collisions provides an opportunity to study the impact of DPS. In this talk, we will present the results on di- π^0 correlations at forward rapidities in $p+p$ and $p+A$ collisions [2], together with the new preliminary results in $d+Au$ collisions.

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[3] M. Strikman and W. Vogelsang, Phys. Rev. **D83**, 034029 (2011), 1009.6123.

[4] T. Lappi and H. Mantysaari, Nucl. Phys. **A908**, 51 (2013), 1209.2853.