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# Nuclear modification of hard scattering processes in small systems at PHENIX

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Collisions of small systems at RHIC exhibit a significant suppression of the nuclear modification factor $R_{xA}$ of jets and high momentum neutral pions in events with large event activity. This suppression is accompanied by an enhancement of $R_{xA}$ in events with low event activity. Since event activity is commonly interpreted as a measure of the centrality of the collisions, these results call into question any interpretation of the suppression in central collisions that invokes energy loss in a QGP produced small systems. In this talk, we will compare prompt photon to $\pi^0$ production measured by PHENIX in $d$+Au collision at $\sqrt{s_{NN}} = 200$ GeV to demonstrate that the apparent centrality dependence is not related to a nuclear modification of hard scattering processes, but likely due to deviations from the proportionality of event activity and centrality in the underlying standard Glauber model calculations. Furthermore, we will use prompt photon production in $d$+Au relative to $p + p$ collisions to empirically determine the effective number of binary collisions $N_{coll}$ of a given event sample. We find that for all event selections, except for those with the highest event activity, $R_{xA}$ of $\pi^0$ is consistent with unity. By comparing $p$+Au and $d$+Au collisions, we will investigate the significance of the remaining suppression of high $p_T$ $\pi^0$ production in events with high event activity.

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