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Validation of Glauber model in centrality determination for small systems

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The initial motivation to study d+Au collisions was to study the cold nuclear matter effects and to use this as a control experiment to better understand the experimental signatures of Quark Gluon Plasma (QGP) in heavy ion collisions. From 2013, we have been observing unexpected results indicating the formation of QGP even in small system collisions. Suppression in the nuclear modification factor RAA of Pi0 and jets is observed in the central d+Au collisions, which could be attributed to formation of QGP droplets but, along with this, the results also indicate a counter-intuitive enhancement of RAA in peripheral events.

Our aim is to study the question whether the standard way to determine collision centrality - so successful in case of large systems - is still valid for small systems, like d+Au or p+Au. Since the QGP, even if formed, is transparent to high pT direct photons from initial hard scatterings, the high-pT photon RAA should be unity and independent of centrality. Furthermore, the ratio of direct photon yields to pi0 yields should exhibit the same centrality dependence as the pi0 RAA. Deviation from these expectations is a strong indication that the centrality definition is biased.

In this talk, I will highlight preliminary results from d+Au collisions and the status of analysis in p+Au system.

Is this abstract from experiment?

Yes

Name of experiment and experimental site

PHENIX, BNL

Is the speaker for that presentation defined?

Yes

Details

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Internet talk

Yes

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