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The fate of the weakly bound ψ' in $p+p$, $d+Au$, $A+A$ collisions

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We present new results of a completed analysis from PHENIX of ψ' modification at midrapidity in 200 GeV $d+Au$ collisions. Strong differential suppression of the ψ' relative to the J/ψ is observed. This has also been reported recently by ALICE at forward and backward rapidity in 5.0 TeV $p+Pb$ collisions. In all cases the differential suppression is too strong to be explained by nuclear breakup effects, due to the short nuclear crossing times. Given the observation of long range correlations in $p(d)+A$ collisions at LHC and RHIC, consistent with hot matter effects, these observations raise very interesting questions about the mechanism of ψ' suppression when it is produced in a nuclear target.

In 2012, the PHENIX Collaboration installed the FVTX, a Silicon Tracker that precisely measures the pair opening angle prior to any multiple scattering in the muon arm absorber and thus provides an improved dimuon mass resolution. The FVTX also allows the ψ' to be separated from the J/ψ at forward and backward rapidity. During the 2012 data taking run, the PHENIX Collaboration collected a high statistics data sample of $p+p$ and $Cu+Au$ collisions. We present new results on the ψ' from this dataset.

On behalf of collaboration:

PHENIX

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