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Upsilon production in Au+Au collisions at $\sqrt{(s\_NN\ )}$= 200 GeV with the STAR experiment

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Quark-Gluon Plasma (QGP), a new state of matter where quarks and gluons are de-confined, is believed to have existed up to a few milliseconds after the Big Bang. Quarkonia could dissociate in the QGP due to color screening of quark-antiquark potential by the surrounding partons in the medium, which was suggested as a signature of QGP formation in heavy-ion collisions. Moreover, different quarkonium states may dissociate at different temperatures depending on their binding energies. This so-called sequential melting phenomenon could be used to deduce the temperature of the QGP. However, other effects, such as regeneration from uncorrelated heavy quark-antiquark pairs, shadowing and antishadowing of nuclear structure functions, co-mover absorption, need to be taken into account when interpreting experimental results. Compared to charmonia, bottomonia is much less affected by regeneration contribution and co-mover absorption at RHIC energies, making them a cleaner probe to the QGP.

Measurements of Upsilon production have been traditionally studied via the di-electron channel at STAR. Since 2014, a new detector, the Muon Telescope Detector (MTD), has been fully installed and taking data, allowing measurements of Upsilon production via the di-muon channel. Compared to the di-electron channel, the di-muon channel has better sensitivity to different Upsilon states due to the reduced bremsstrahlung radiation. In this talk, we will present new results on Upsilon suppression in both the di-electron and di-muon decay channels in Au+Au collisions at $\sqrt{(s\_NN\ )}$= 200 GeV based on the full data sample taken in 2014. The measured results will be compared to those at the LHC and to theoretical calculations.

Summary

Presentation type

Oral

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