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Upsilon measurements in heavy-ion collisions at RHIC-STAR

Summary

Quark-gluon-plasma (QGP), composed of deconfined quarks and gluons, is produced in ultra-relativistic heavy-ion collisions. Measurements of heavy quarkonium production in heavy-ion collisions have played an essential role in understanding the properties of the QGP. Quarkonium suppression caused by the color-screening effect in the heavy-ion collisions is considered as a strong evidence for deconfinement and QGP creation. However, interpretation of the observed quarkonium suppression is far from being simple as only due to the color-screening effect. Other effects, such as the cold nuclear matter effects and the recombination could also modify the quarkonium production in heavy-ion collisions and must be accounted for. Compared to charmonia, bottoming not only gain less contribution from regeneration due to the smaller b-quark production cross-section, but are also less affected by the CNM effects. Furthermore, different bottomonium states of different masses are expected to be screened and dissociate at different temperatures. Measurement of suppression of different bottomonium states can therefore help constrain the temperature of the medium.

In this talk, we will present the latest Υ measurements in Au+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV from the STAR experiment. By combining datasets taken in 2011, 2014 and 2016, the Υ production is measured with good precision. The nuclear modification factors for the ground and excited states will be shown as functions of transverse momentum and centrality, and compared to measurements from the LHC and to theoretical calculations.

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