

J/ψ production in Au+Au collisions at $\sqrt{s} = 54.4$ GeV

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Abstract

Heavy quarkonia are ideal probes of the Quark-Gluon Plasma. J/ψ is the most abundantly produced quarkonium state accessible experimentally and its suppression due to the color screening effects in hot and dense medium has been suggested as a signature of the formation of the QGP. Besides the screening effects, there are other mechanisms, such as the cold nuclear effects and charm quark recombination, which could affect the J/ψ yield in heavy-ion collisions. Measurements of J/ψ production in different collision energies and systems will help to understand the interplay of these mechanisms for J/ψ production. STAR has measured the suppression of J/ψ production at mid-rapidity in Au+Au collisions at $\sqrt{s} = 39$, 62.4 and 200 GeV. The nuclear modification factors show no significant collision energy dependence from SPS to RHIC top energy. However, uncertainties of the STAR measurements at 39 and 62.4 GeV are large. In 2017, STAR took a large sample of 54.4 GeV Au+Au collisions and the statistics is more than ten times of the 39 and 62.4 GeV Au+Au data. In this talk, we will present the measurement of inclusive J/ψ production in Au+Au collisions at $\sqrt{s} = 54.4$ GeV by STAR experiment and discuss physics implications.