

Excess of J/ψ yield at very low p_T in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV and U+U at $\sqrt{s_{NN}} = 193$ GeV with STAR

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J/ψ suppression in heavy-ion collisions due to color screening of quark and antiquark potential in the deconfined medium has been proposed as a signature of the QGP formation. Other mechanisms, such as the cold nuclear matter effects and charm quark recombination, are likely to contribute to the observed modification of J/ψ production in heavy-ion collisions. Recently, a significant excess of J/ψ yield at very low p_T (< 0.3 GeV/c) has been observed by the ALICE collaboration in peripheral hadronic Pb+Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV at forward-rapidity, which can not be explained within the scenarios mentioned above. The observed excess may originate from the coherent photoproduction of J/ψ , which would be very challenging for the existing coherent photoproduction models. Measurements of J/ψ production at very low p_T in different collision energies, collision systems, and centralities can shed new light on the origin of the excess.

In this presentation we report on the STAR measurements of J/ψ production at very low p_T in hadronic Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV and U+U collisions at $\sqrt{s_{NN}} = 193$ GeV at mid-rapidity. Centrality dependence of J/ψ production and nuclear modification factors at very low p_T will also be presented. Physics perspectives with Zr+Zr and Ru+Ru collisions will be discussed.