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The latest STAR results on quarkonium production

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The suppression of quarkonium production in high energy heavy-ion collisions relative to proton-proton collisions due to color screening was proposed as a signature of Quark-Gluon Plasma formation. Studies of quarkonium production in nuclear collisions can provide insight into the thermodynamic properties of the hot and dense medium created in relativistic heavy-ion collisions at RHIC. However, there are other effects that may affect the observed yields and complicate this simple picture, such as cold nuclear matter effects or recombination. Measurements of the quarkonium production and elliptic flow (v_2) in different colliding systems, centralities and collision energies may help to systematically understand their production mechanisms and interactions with nuclear matter.

In this talk, recent STAR quarkonium measurements will be highlighted. We will present J/ψ and Υ studies via the dielectron decay channel at various colliding systems and energies. Energy dependence of J/ψ production in Au+Au collisions at $\sqrt{s_{NN}}$ = 39, 62.4 and 200 GeV and in U+U collisions at $\sqrt{s_{NN}} = 193$ GeV will be shown. Υ production will be reported in $p + p$, d+Au and Au+Au collisions at $\sqrt{s_{NN}} = 200$ and in U+U collisions at $\sqrt{s_{NN}} = 193$ GeV. We will also present J/ψ v_2 results in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV and the first $\psi(2S)$ to J/ψ ratio measurement in $p + p$ collisions at $\sqrt{s} = 500$ GeV. Moreover, prospects of quarkonium measurements with the newly upgraded STAR detector will be reported.

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