

System size and collision energy dependences of J/ψ production at RHIC from the STAR experiment

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Abstract

Charm quarks are an important probe to study the properties of the quark-gluon plasma (QGP) created in heavy-ion collisions. The J/ψ anisotropy flow, v_2 , gives information about the charm quark thermalization and J/ψ regeneration effect. On the other hand, J/ψ nuclear modification factor in p+Au collisions, R_{pA} , can be used to probe cold nuclear matter effects, while in Au+Au collisions R_{AA} is sensitive to the hot nuclear matter effect in QGP. Measurements of J/ψ v_2 and R_{AA} in different collision systems and energies can help to better understand the J/ψ production and the QGP properties. The STAR isobar program (Ru+Ru and Zr+Zr collisions at $\sqrt{s_{NN}} = 200$ GeV) provides a unique opportunity to study the J/ψ regeneration and dissociation contributions in a modest size system between p+Au and central Au+Au system.

In this talk, the J/ψ v_2 as a function of transverse momentum and centrality using high statistics isobar collision data will be shown. Additionally, the J/ψ nuclear modification factors will be presented in p+Au, Ru+Ru and Zr+Zr at $\sqrt{s_{NN}} = 200$ GeV as well as in Au+Au $\sqrt{s_{NN}} = 54.4$ GeV.