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J/ψ production in isobaric collisions at $\sqrt{s_{NN}} = 200$ GeV with the STAR experiment

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J/ψ is an important probe to the properties of the quark-gluon plasma (QGP) created in heavy-ion collisions. Measurements from SPS, RHIC, and the LHC experiments show that J/ψ production in heavy-ion collisions is an interplay of several effects, including dissociation and regeneration in QGP and cold nuclear matter effects. Studying the properties of the QGP via J/ψ requires a good understanding of all these effects which is very challenging and requires high precision. In 2018, STAR collected a large sample of isobaric collisions ($^{96}_{44}\text{Ru} + ^{96}_{44}\text{Ru}$ and $^{96}_{40}\text{Zr} + ^{96}_{40}\text{Zr}$) at $\sqrt{s_{NN}} = 200$ GeV. The total number of good minimum bias triggered events is around 4 billion. This dataset provides a unique opportunity to perform centrality and transverse momentum (p_T) differential measurements of J/ψ yields with good precision and in fine bins.

In this contribution, precision measurements of inclusive J/ψ production in isobaric collisions at $\sqrt{s_{NN}} = 200$ GeV via the e^+e^- decay channel will be presented. The centrality and p_T dependences of the nuclear modification factor R_{AA} and $\langle p_T \rangle$ as a function of centrality will be shown. The first measurement of the ratio of $\psi(2S)$ yield over that of J/ψ in heavy-ion collisions at RHIC will also be presented.

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