

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

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Abstract

1 J/ψ is an important probe to the properties of the quark-gluon plasma (QGP)
2 created in heavy-ion collisions. Measurements from SPS, RHIC, and the LHC
3 experiments show that J/ψ production in heavy-ion collisions is an interplay of
4 several effects, including dissociation and regeneration in QGP and cold nuclear
5 matter effects. Studying the properties of the QGP via J/ψ requires a good under-
6 standing of all these effects which is very challenging and requires high precision.
7 In 2018, STAR collected a large sample of isobaric collisions (${}^{96}_{44}\text{Ru} + {}^{96}_{44}\text{Ru}$ and ${}^{96}_{40}\text{Zr}$
8 $+ {}^{96}_{40}\text{Zr}$) at $\sqrt{s_{\text{NN}}} = 200$ GeV. The total number of good minimum bias triggered
9 events is around 4 billion. This dataset provides a unique opportunity to perform
10 centrality and transverse momentum (p_T) differential measurements of J/ψ yields
11 with good precision and in fine bins.

12 In this contribution, precision measurements of inclusive J/ψ production in
13 isobaric collisions at $\sqrt{s_{\text{NN}}} = 200$ GeV via the e^+e^- decay channel will be presented.
14 The centrality and p_T dependences of the nuclear modification factor R_{AA} and $\langle p_T \rangle$
15 as a function of centrality will be shown. The first measurement of the ratio of
16 $\psi(2S)$ yield over that of J/ψ in heavy-ion collisions at RHIC will also be presented.