

Very low- p_T di-muon production in peripheral Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV at STAR

The strong electromagnetic field generated by the colliding nuclei in heavy-ion collisions can be represented by a spectrum of photons, leading to photon-induced interactions. While such interactions are traditionally studied in ultra-peripheral collisions (UPC) without any nuclear overlap, significant enhancements of dilepton pair and J/ψ production at very low transverse momentum (p_T) above the expected hadronic interaction yields have been observed experimentally. The observed excess yields exhibit a much weaker centrality dependence compared to the hadronic production and are consistent with photon-induced interactions. The measurements of very-low- p_T particle production in peripheral heavy-ion collisions provide a unique opportunity to study photoproduction in heavy-ion collisions with well-defined and smaller impact parameters compared to that in UPC.

In 2014 and 2016, the STAR experiment recorded large samples of Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV. In this presentation, we will present new measurements of very-low- p_T dilepton and J/ψ production in peripheral Au+Au collisions via the $\mu^+\mu^-$ channel using these datasets. The dimuon channel provides complementary measurement to the previous dielectron results and improves the precision. Distributions of invariant mass, p_T^2 and angular modulation will be shown. Physics implications will also be discussed together with model comparisons.

Submitted on behalf of a Collaboration?

Yes

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Session Classification: WG4: QCD with Heavy Flavours and Hadronic Final States

Track Classification: WG4: QCD with Heavy Flavours and Hadronic Final States