Dimuon production at low transverse momentum in peripheral Au+Au collisions at $\sqrt{s_{\rm NN}} = 200$ GeV at STAR

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Abstract

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), significant enhancements of dilepton pairs and J/ψ production at very low transverse momentum ($p_{\rm T}$) above the expected hadronic interaction yields have been observed experimentally in non-UPC events. The observed excess yields are consistent with photon-induced interactions.

In 2014 and 2016, the STAR experiment recorded large samples of Au+Au collisions at $\sqrt{s_{\rm NN}} = 200$ GeV. In this contribution, we will present new measurements of very low $p_{\rm T}$ dilepton and J/ψ production in peripheral Au+Au collisions via the $\mu^+\mu^-$ channel using these datasets. These measurements are complementary to the previous dielectron results. Physics implications will also be discussed together with model comparisons.