

# Dimuon production at low transverse momentum in peripheral Au+Au collisions at $\sqrt{s_{\text{NN}}} = 200$ 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) without any nuclear overlap, significant enhancements of dilepton pairs and  $J/\psi$  production at very low transverse momentum ( $p_{\text{T}} < 0.2$  GeV/c) above the expected hadronic interaction yields have been observed experimentally in non-UPC events. 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  $p_{\text{T}}$  vector meson and dilepton production in peripheral heavy-ion collisions provide a unique opportunity to study photoproduction in collisions with well-defined and smaller impact parameters compared to that of UPC.

In 2014 and 2016, the STAR experiment recorded large samples of Au+Au collisions at  $\sqrt{s_{\text{NN}}} = 200$  GeV. In this presentation, we will present new measurements of very low  $p_{\text{T}}$  dilepton and  $J/\psi$  production in peripheral Au+Au collisions via the  $\mu^+\mu^-$  channel using these datasets. These measurements are complementary to the previous dielectron results. Distributions of invariant mass,  $p_{\text{T}}^2$ , and nuclear modification factor will be shown. Physics implications will also be discussed together with model comparisons.