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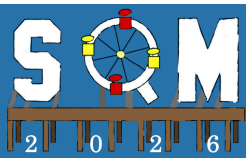

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Measurement of coherent K^+K^- photoproduction in Au+Au ultra-peripheral collisions at $\sqrt{s_{\rm NN}} = 200$ GeV with the STAR detector

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The nature of the high invariant mass region ($M_{K^+K^-} > 1.1$ GeV/c^2) in coherent K^+K^- photoproduction in ultra-peripheral heavy-ion collisions (UPCs) has remained an unresolved question in physics. Previous ALICE measurements have shown nontrivial structures in this region, but the underlying production mechanisms are stil under debate. The relative contributions from photon–nucleus (γA) processes - including coherent ϕ-meson decay and non-resonant Drell-Soding interference - and from the diphoton fusion ($\gamma\gamma$) are not yet unambiguously determined.

To shed light on these open issues, we present a new measurement of coherent K^+K^- photoproduction in Au+Au ultra-peripheral collisions at $\sqrt{s_{\rm NN}} = 200$ GeV with the STAR detector at RHIC. The K^+K^- pairs are identified using the TPC and TOF detectors, and a clear coherent signal is observed at low transverse momentum. The invariant mass distribution and differential cross sections are studied to explore the relative roles of resonant, non-resonant, and two-photon processes. This measurement provides new constraints on strangeness photoproduction and on the dynamics of photon-nucleus and two-photon processes in heavy-ion UPCs.

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