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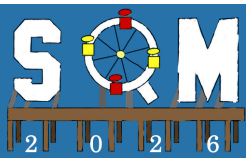

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Measurement of coherent J/Ψ and K^+K^- photoproduction in UPCs at $\sqrt{s_{NN}}$ = 200 GeV with the STAR experiment

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In ultra-peripheral collisions (UPCs), photon-induced production mechanisms include resonant vector-meson photoproduction, the non-resonant Drell-Soding process, and $\gamma\gamma$ processes. Coherent vector meson photoproduction provides a sensitive probe of the gluonic structure of heavy nuclei; vector mesons of different mass (e.g. ϕ and J/Ψ) offer insights into different x regions corresponding to different QCD scales. Moreover, hadron antihadron photoproduction via the non-resonant Drell-Soding and $\gamma\gamma$ processes, require further measurements to be better understood. Measurements of the differential cross-sections for coherent vector-meson (ϕ and J/Ψ) and K^+K^- photoproduction offer a direct probe of nuclear gluon structure and help clarify the roles of the Drell-Soding and $\gamma\gamma$ processes.

In this presentation, we present the first measurement of coherent J/ψ photoproduction cross section in isobaric (Ru+Ru/Zr+Zr) UPCs at $\sqrt{s_{NN}}$ = 200 GeV. The differential cross-sections are reported as functions of rapidity and forward neutron multiplicity. Photon flux-corrected cross sections at a photon–nucleon center-of-mass energy of 25 GeV are compared with Au+Au results and shown as a function of the nuclear mass number A to investigate colliding system size dependencies. We also report measurements of coherent ϕ and K^+K^- photoproduction in Au+Au UPCs at $\sqrt{s_{NN}}$ = 200 GeV. The differential cross sections are studied to explore the relative roles of resonant, non-resonant, and $\gamma\gamma$ processes and their interference term. Our results offer novel insights into both the gluon structure and new constraints on dynamics of Drell-Soding and $\gamma\gamma$ processes in heavy-ion UPCs.

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