

Calculations of Di-Hadron Production via Two-Photon Processes in Relativistic Heavy-Ion Collisions

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Two-photon processes in relativistic heavy-ion collisions have emerged as a critical probe of quantum electrodynamics in ultra-intense electromagnetic fields, with recent focus extending beyond dileptons to hadronic final states. However, at present, quantitative studies of di-hadron production via two-photon interactions remain scarce. We employ the Equivalent Photon Approximation to obtain differential cross-section predictions for $\pi^+\pi^-$, K^+K^- , and $p\bar{p}$ pairs produced in ultra-peripheral Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV within the STAR acceptance, using experimental input from previous measurements at electron-positron colliders to model the two-photon production cross sections for these final states. The calculations deliver the unified baseline for light-meson and baryon pairs in this environment, supplying benchmarks for upcoming STAR measurements and guiding future systematic investigations of hadronic two-photon processes at RHIC and LHC facilities.

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