

Probing heavy ion collisions with photons at low and high center-of-mass energies

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Photons are penetrating probes of the strongly-coupled nuclear plasma created in relativistic heavy-ion collisions. The entire spacetime evolution of the Quark-Gluon Plasma (QGP) is imprinted in their spectrum and momentum anisotropies, making them effective probes the earlier stage of heavy ion collisions. In this talk we use photons to study the complex initial dynamics of lower energy collisions across RHIC's beam energy scan. We show that photons can distinguish different scenarios of energy deposition in lower energy collisions. We present results for both the momentum and rapidity dependence of photon production.

We combine these study of thermal and prompt photon production in low energy collisions with calculations at LHC energies to clarify the dependence of photon production on the center-of-mass energy of collisions. We discuss our finding in light of the recent scaling in direct photons identified by the PHENIX collaboration [1].

[1] PHENIX Collaboration (2018) arXiv:1805.04084

Summary

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