

PHENIX measurements of beam energy and centrality dependence of direct photon emission in heavy ion collisions

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PHENIX has observed that a large number of direct photons are radiated during the evolution of the strongly coupled QGP produced in Au+Au collision at 200 GeV to hadron resonance matter. The direct photons are emitted with a large azimuthal anisotropy. PHENIX has extended this study using large data samples from Au+Au collisions at 39, 62.4, and 200 GeV, and Cu+Cu collisions at 200 GeV. For a given beam energy the direct photon yield scales with the number of binary collisions N_{coll} for all centrality selections at all p_T . At high p_T the N_{coll} scaled direct photon yield from p+p collisions agrees with the heavy ion data as expected. However, at low p_T the yield from heavy ion collisions exceeds the yield from p+p significantly. Comparing the low p_T direct photon yield across beam energies as a function of the produced charged particle density $dN_{\text{ch}}/d\eta$ reveals that the yield is proportional to $(dN_{\text{ch}}/d\eta)^{1.25}$. In this talk we will discuss these new results and their implications. We will also show updated results on direct photon yields and azimuthal anisotropies v_2 and v_3 from high statistics Au+Au data at 200 GeV.

Summary

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