

QCD critical point and thermal photons

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The beam energy scan programs at BNL Relativistic Heavy Ion Collider open up a new opportunity to explore the quark-gluon plasma (QGP) at finite densities. The quantitative success of hydrodynamic modeling motivates one to extend the model to lower energies to verify its applicability, to study the transport properties at finite densities, and ultimately to understand the phase structure of QCD, including the long-sought critical point.

One of the problems in the search for the critical point is that its signal in hadronic observables would be washed away if its location is far from freeze-out even if it exists. In this work, we propose to study thermal photon spectra and elliptic flow at finite baryon density using a (2+1)-dimensional hydrodynamic model. We investigate a possible signal of the QCD critical point in those observables because it would be visible regardless of its location on the T - μ plane owing to the fact that the QGP medium is electromagnetically transparent.

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