

Viscous corrections to inelastic photon production channels in QGP

Photons emitted in heavy-ion collisions are sensitive to the entire history of the system evolution as they are emitted in all stages of the collision. As such they are excellent probes of the out-of-equilibrium nature of a fast evolving system. The degree of out-of-equilibrium is encoded in the transport coefficients (the shear and bulk viscosities) and the so-called δf corrections to the equilibrium density function. The importance of these corrections on hadronic observables has been shown in [1]. However, their effects on electromagnetic observables has been explored only for the 2-to-2 scattering channels [2]. Viscous corrections to the inelastic leading-order photon production channels have been lacking so far. In this work, we will present first calculations of the shear and bulk viscous correction to the Arnold-Moore-Yaffe (AMY) photon production rates which include bremsstrahlung and pair annihilation without relying on the Kubo-Martin-Schwinger (KMS) condition. We fold the rate with a hydrodynamic evolution in order to examine the phenomenological implications on photonic observables in AA collisions. Finally, we will discuss how the methods used in this calculation pave the way for the viscous correction to other processes in QGP where coherence between different scattering sites is important, such as jet-medium interaction.

[1] S. Ryu et. al., Phys. Rev. Lett. 115 no. 13, 132301 (2015).

[2] C. Shen et. al., Phys. Rev. C 91 no. 1, 014908 (2015).

Preferred Track

Electromagnetic Probes

Collaboration

Not applicable

Primary author: HAUKSSON, Sigtryggur (McGill University)

Presenter: HAUKSSON, Sigtryggur (McGill University)

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