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Signatures of local acceleration of quark-gluon plasma in the dilepton production

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Dilepton emissions represent a key probe for characterising the Quark-Gluon Plasma (QGP). A central role in computing dilepton yields is played by the imaginary part of the electromagnetic current-current correlation, or equivalently, of the photon polarisation tensor [1]. In this work, we investigate the influence of local acceleration on dilepton production. We compute this quantity in a thermal medium subject to acceleration. We assume the acceleration is sufficiently small so that it can be treated as a perturbation. We employ the thermal Dirac propagator in an accelerated frame, recently formulated within the imaginary-time formalism in [2]. Using a small acceleration expansion, we evaluate the imaginary part of the photon polarization tensor. Our perturbative results are then compared with the case of vanishing acceleration, allowing us to clearly isolate and identify the effects introduced by local acceleration.

Keywords: Dilepton production rate, Accelerated medium, Quark gluon plasma.

References:
[1] L. D. McLerran and T. Toimela, Phys. Rev. D 31, 545 (1985).
[2] V. E. Ambruş and M. N. Chernodub, Phys. Lett. B 855, 138757 (2024).

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