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Anisotropic responses of heavy quark potential and diffusion coefficient to the magnetized QGP

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By means of real-time hard thermal loop resummed technique combined with dimension two gluon condensate, we (non-)perturbatively study how the strong magnetic field induced by colliding nuclei affects both heavy quark (HQ) potential and HQ momentum diffusion coefficient in the QGP. We show that HQ momentum diffusion coefficients become anisotropic, and with increasing temperature, the higher Landau levels become significant, which leads to the reduction of the anisotropic ratio (>1) and even overturn the behavior (<1) at high temperature. On the other hand, the anisotropy of the real part of potential is essentially encoded in the string tension. Whereas, the imaginary part of the potential from quark-loop elongates along the magnetic field direction even though using the angular-independent string tension.We also study the viscous quark matter response to magnetic field, then explore such non-equilibrium effect on HQ potential and diffusion coefficient.

Theory / experiment

Theory

Group or collaboration name

Primary author: ZHANG, He-Xia

Co-authors: ZHANG, Ben-Wei (Central China Normal University); Prof. WANG, Enke (South China Normal University)

Presenter: ZHANG, He-Xia

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