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Heavy quark observables in magnetized medium

In this abstract I summarize some of our recent works about heavy quark potential and dynamics in a magnetized medium to discuss the effect of the magnetic field on various observables.

For the first part we present a calculation of the heavy quark momentum diffusion coefficients in a quark-gluon plasma under the presence of a strong external magnetic field, within the lowest Landau level (LLL) approximation where we analytically derive the full results for the longitudinal and transverse momentum diffusion coefficients for charm and bottom quarks beyond the static limit.

For the second part we explore the imaginary part of the heavy quark potential and subsequently the dissociation of heavy quarkonia at finite temperature and in a magnetic field using the general structure of the gauge boson propagator in a hot magnetized medium. We find a rich anisotropic structure of the complex heavy quark potential, which explicitly depends on the longitudinal and transverse distance.

Based on :

[1] Anisotropic tomography of heavy quark dissociation by using the general propagator structure in a finite magnetic field ; Ritesh Ghosh, Aritra Bandyopadhyay, Indrani Nilima, Sabyasachi Ghosh
Phys.Rev.D 106 (2022) 5, 5

[2] Heavy quark dynamics in a strongly magnetized quark-gluon plasma
Aritra Bandyopadhyay, Jinfeng Liao, Hongxi Xing
Phys.Rev.D 105 (2022) 11, 11

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