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Holographic energy loss near critical temperature in an anisotropic background

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We study the energy loss of a quark moving in the strongly coupled $\mathcal{N} = 4$ supersymmetric Yang-Mills (SYM) plasma under the influence of spatial anisotropy. The heavy quark drag force, the diffusion coefficient and the jet quenching parameter are calculated within the Einstein-Maxwell-dilaton model, in which anisotropic background is specified by an arbitrary dynamical exponent A.It is shown that with anisotropic factor A increasing, the drag force and the jet quenching parameter go up, while the diffusion coefficient goes down. We find that the energy loss becomes larger when the quark moving perpendicular to anisotropy direction in transverse plane.The enhancement of drag forces for a fast moving heavy quark as well as jet quenching parameters near critical temperature T_c is observed, which presents one of typical features of QCD phase transition.

Theory / experiment

Theory

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