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Jet energy loss in a flowing plasma

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We present new results on the energy loss of light partons traversing a highly dynamical strongly coupled quark-gluon plasma. As QGP has large gradients in both temperature and the fluid velocity, it is crucial to study energy loss without assuming a homogeneous plasma, especially as it is known that energy loss depends on the virtuality of the partons, which evolves in the plasma. In a holographic description, we consider several subsequent improvements of the hydrodynamic background by keeping increasing orders in the gradient expansion. Varying temperature and velocity profiles in ideal hydrodynamics considerably modifies the energy loss, with further corrections from viscous effects. We then perform a numerical analysis of jet energy loss of an ensemble of jets in a boost-invariant and transversely-expanding droplet of QGP, for both small and large systems. Including flow increases the nuclear modification factor and reduces the narrowing of the jet shapes. We end with the modifications of the jet width and mass distributions, both for a flowing and non-flowing medium.

Summary

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