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Open heavy flavor in evolving anisotropic matter

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We derive the leading modifications of the transverse momentum broadening and medium-induced gluon spectrum in anisotropic flowing matter for the case of a heavy leading quark. We show that the broadening and radiation patterns develop new directional dependence due to an interplay of the quark mass and matter flow, absent in the massless case. In turn, the interplay of the medium anisotropy with the quark mass also leads to a considerable modification of the hydrodynamic gradient corrections to the soft-gluon spectrum. These results allow constructing heavy-flavor observables sensitive to the medium structure and evolution, constituting the next step toward tomographic studies of the quark-gluon plasma in heavy-ion collisions.

Category

Theory

Collaboration

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