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Quark self-energy in an ellipsoidally anisotropic quark-gluon plasma

We calculate the quark self-energy in a quark-gluon plasma that possesses an ellipsoidal momentum-space anisotropy in the local rest frame. By introducing additional transverse momentum anisotropy parameters into the parton distribution functions, we generalize previous results which were obtained for the case of a spheroidal anisotropy. Our results demonstrate that the presence of anisotropies in the transverse directions affects the real and imaginary parts of quark self-energy and, consequently, the self-energy depends on both the polar and azimuthal angles in the local rest frame of the matter. Our results for the quark self-energy set the stage for the calculation of the effects of ellipsoidal momentum-space anisotropy on quark-gluon plasma photon spectra and collective flow.

Preferred Track

Collective Dynamics

Collaboration

Not applicable

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