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Dilepton production from the quark-gluon plasma using (3+1)-dimensional anisotropic dissipative hydrodynamics

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We compute dilepton production from the deconfined phase of the quark-gluon plasma using leading-order (3+1)-dimensional anisotropic hydrodynamics. The anisotropic hydrodynamics equations employed describe the full spatiotemporal evolution of the transverse temperature, spheroidal momentum-space anisotropy parameter, and the associated three-dimensional collective flow of the matter. The momentum-space anisotropy is also taken into account in the computation of the dilepton production rate, allowing for a fully self-consistent description of dilepton production from the quark-gluon plasma. For our final results, we present predictions for high-energy dilepton yields as a function of invariant mass, transverse momentum, and pair rapidity. We demonstrate that highenergy dilepton production is extremely sensitive to the assumed level of initial momentum-space
anisotropy of the quark-gluon plasma. As a result, it may be possible to experimentally constrain the early-time momentum-space anisotropy of the quark-gluon plasma generated in relativistic heavy ion collisions using high-energy dilepton yields.

Summary

Based on :R.Ryblewski, M.Strickland, forthcoming

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