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Probing spectral properties of the QGP with real-time lattice simulations

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We present a novel method to obtain spectral properties of a non-Abelian gauge theory in the region where occupation numbers are high. The method to measure the (single-particle) spectral function is based on linear response theory and classical-statistical lattice simulations. Although we use a system close to its nonthermal fixed point, a situation that typically occurs in the weak-coupling picture during the initial stages of a heavy-ion collision, its extracted spectral function can be understood within the hard-thermal loop (HTL) formalism and thus resembles thermal equilibrium at high temperatures. This allows us to obtain quantities like the life time of quasiparticles that are beyond the leading order and difficult to compute within HTL. Moreover, the approach has the potential to measure transport coefficients and can be employed beyond the range of validity of HTL.

Summary

We present a new method to obtain the spectral function in a non-Abelian gauge theory.

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