

## Examining real-time functions on the lattice using inverse propagator and self-energy

The inverse of a Euclidean correlation function has an analytic relation to the inverse of a corresponding retarded propagator in real time.

We argue that this analyticity is exploited in the analysis of real-time functions with Euclidean correlator obtained in lattice QCD Monte Carlo simulations complementary to the standard analysis of spectral functions.

We analyze the inverse of quark correlator obtained on the quenched lattice, and demonstrate that the inverse correlator contains information to constrain the form of the quark propagator in real time in addition to the standard analysis.

For elementary fields the inverse correlator is directly related to the imaginary part of the self-energy in real time, which physically represents the rates of scattering processes due to the optical theorem.

Implications of the present analysis to these microscopic aspects of the dynamical properties are addressed.

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