Improved real-time dynamics of thermal fields from lattice simulations

The determination of real-time information from lattice simulations at finite temperature is a central challenge in our quest to nonperturbatively connect first principles theory to experimental measurements. In the context of relativistic heavy-ion collisions, the shear viscosity of the quark-gluon plasma is one pertinent example, which with standard simulation methods is exponentially hard to obtain. In this talk I will discuss the challenges of computing real-time quantities via the extraction of spectral functions from standard lattice simulations and introduce a recent proposal of how to possibly circumvent these. In it, thermal fields are simulated on a lattice in a non-compact imaginary time, which allows one to resolve correlation functions in between the conventional Matsubara frequencies. Results from a (0+1)d proof-of-principles simulation are presented, which show that a significant improvement in the reconstruction of spectral features may be achieved.


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