Measuring effective temperatures in a generalized Gibbs ensemble

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Abstract

The local physical properties of an isolated quantum statistical system in the stationary state reached long after a quench are generically described by the Gibbs ensemble, which involves only its Hamiltonian and the temperature as a parameter. If the system is instead integrable, additional quantities conserved by the dynamics intervene in the description of the stationary state. The resulting generalized Gibbs ensemble involves a number of temperature-like parameters, the determination of which is practically difficult. Here we argue that in a number of simple models these parameters can be effectively determined by using fluctuation-dissipation relationships between response and correlation functions of natural observables, quantities which are accessible in experiments.

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