Title:	Generalized thermalization for integrable system under quantum quench
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Abstract:	We investigate equilibration and generalized thermalization of the quantum Harmonic chain under local quantum quench. The quench action we consider is connecting two disjoint harmonic chains of different sizes and the system jumps between two integrable settings. We verify the validity of the generalized Gibbs ensemble description for this infinite-dimensional Hilbert space system and also identify equilibration between the subsystems as in classical systems. Using Bogoliubov transformations, we show that the eigenstates of the system prior to the quench evolve toward the Gibbs Generalized Ensemble description. Eigenstates that are more delocalized (in the sense of inverse participation ratio) prior to the quench, tend to equilibrate more rapidly. Further, through the phase space properties of a generalized Gibbs ensemble and the strength of stimulated emission, we identify the necessary criterion on the initial states for such relaxation at late times and also find out the states that would potentially not be described by the generalized Gibbs ensemble description.
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