

Abstract Submitted
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Many-body localization in the thermodynamic limit¹ DEEPAK IYER, BAOMING TANG, MARCOS RIGOL, Pennsylvania State Univ — We use thermalization indicators and numerical linked cluster expansions to probe the onset of many-body localization in a disordered one-dimensional hard-core boson model in the thermodynamic limit. We show that after equilibration following a quench, the momentum distribution indicates a freezing of one-particle correlations at higher values than if the system were in thermal equilibrium. The position of the delocalization to localization transition, identified by the breakdown of thermalization with increasing disorder strength, is found to be consistent with the value from the level statistics obtained via full exact diagonalization of finite chains. Our results strongly support the existence of a many-body localized phase in the thermodynamic limit.

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Deepak Iyer
Pennsylvania State Univ

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