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Dynamics close to the many-body localization transition[1]
YEVGENY BAR LEV (KRIVOLAPOV), DAVID R. REICHMAN, Columbia University — It has recently been suggested that in a generic class of disordered and (short-ranged) interacting quantum systems a dynamical metal-insulator transition may occur at finite temperatures. This proposed phenomenon is called many-body localization (MBL). In this work we study the real-time dynamics of this transition for a range of parameters where the transition should manifest according to theory and recent numerical studies. For this purpose, we numerically solve the non-equilibrium quantum kinetic equations in the self-consistent second-Born approximation, the same approximation used in the original prediction of MBL. For accessible times, we observe a complex sequence of dynamical regimes. Surprisingly we find little change of behavior upon crossing the putative dynamical phase boundary as determined by previous numerical studies.

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