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Does a distinct quasi many-body localized phase exist? A numerical study of a translationally invariant system in the thermodynamic limit JESKO SIRKER, University of Manitoba — We consider a quench in an infinite spin ladder describing a system with two species of bosons in the limit of strong interactions. If the heavy bosonic species has infinite mass the model becomes a spin chain with quenched binary disorder which shows true Anderson localization (AL) or many-body localization (MBL). For finite hopping amplitude J of the heavy particles, on the other hand, we find an exponential polarization decay with a relaxation rate which depends monotonically on J. Furthermore, the entanglement entropy changes from a constant (AL) or logarithmic (MBL) scaling in time t for J=0 to a sub-ballistic power-law, Sentt with ¡1, for finite J. We do not find a distinct regime in time where the dynamics for J0 shows the characteristics of an MBL phase. Instead, we discover a time regime with distinct dephasing and entanglement times, different both from a localized and a fully ergodic phase.

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