Probing the stability of many-body localization

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Many-body localization describes the phenomenon of localization and vanishing charge transport in closed quantum many-body systems. It is well accepted by now that MBL is stable in one dimension and many of its properties have been revealed. Much less is known in two dimensions. Here we present our recent results on the study of the stability of the localization in 2d bosonic lattice systems. We report on the observation of persistent localization when the system is in contact with a small quantum bath, but no localization is detectable for large baths. Finally, we report on recent progress on the study of an MBL-ergodic interface in two dimensions.