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Many-body localization in the quantum random energy model[1]
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— The quantum random energy model is a canonical toy model for a quantum spin glass with a well known phase diagram. We show that the model exhibits a many-body localization-delocalization transition at finite energy density which significantly alters the interpretation of the statistical "frozen" phase at lower temperature in isolated quantum systems. The transition manifests in many-body level statistics as well as the long time dynamics of on-site observables.

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