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Dynamical many-body localization in an integrable model AYIN C. KESER, Condensed Matter Theory Center, University of Maryland, College Park, SRIRAM GANESHAN, Simon Center for Geometry and Physics, GIL REFAEL, Institute of Quantum Information and Matter, Caltech, VICTOR GALITSKI, Condensed Matter Theory Center and Joint Quantum Institute, University of Maryland, College Park — We investigate dynamical many-body localization and delocalization in an integrable system of periodically-kicked, interacting linear rotors. The linear-in-momentum Hamiltonian makes the Floquet evolution operator analytically tractable for arbitrary interactions. One of the hallmarks of this model is that depending on certain parameters, it manifest both localization and delocalization in momentum space. We explicitly show that, for this model, the energy being bounded at long times is neither a necessary nor a sufficient condition for dynamical localization. We present a set of integrals of motion, which can serve as a fundamental diagnostic of dynamical localization. We also propose an experimental scheme, involving voltage-biased Josephson junctions, to realize such many-body kicked models.

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