Abstract Submitted
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Many-body localization in periodically driven systems DMITRY ABANIN, PEDRO PONTE, ZLATKO PAPIC, Perimeter Institute for Theoretical Physics, FRANCOIS HUVENEERS, University of Paris — We consider disordered many-body systems with periodic time-dependent Hamiltonians in one spatial dimension. By studying the properties of the Floquet eigenstates, we identify two distinct phases: (i) a many-body localized (MBL) phase, in which almost all eigenstates have area-law entanglement entropy, and the eigenstate thermalization hypothesis (ETH) is violated, and (ii) a delocalized phase, in which eigenstates have volume-law entanglement and obey the ETH. MBL phase exhibits logarithmic in time growth of entanglement entropy for initial product states, which distinguishes it from the delocalized phase. We propose an effective model of the MBL phase in terms of an extensive number of emergent local integrals of motion (LIOM), which naturally explains the spectral and dynamical properties of this phase. Numerical data, obtained by exact diagonalization and time-evolving block decimation methods, suggests a direct transition between the two phases. Our results show that many-body localization persists for sufficiently weak periodic driving, and that MBL-delocalization transition can be induced by sufficiently strong driving. [1] P. Ponte, Z. Papic, F. Huveneers, D. A. Abanin,arXiv:14108518 [2] P. Ponte et al., arXiv:1403.6480

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