

Many-body dynamic localization effect in periodically driven finite clusters of spins 1/2 without disorder

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We investigate numerically and analytically the heating process in ergodic clusters of interacting spins 1/2 subjected to periodic pulses of an external magnetic field. Our findings indicate that many-body dynamic localization manifests itself as a cluster-size-dependent threshold for the pulse strength below which the heating is suppressed. This threshold decreases with the increase of the cluster size, approaching zero in the thermodynamic limit. Nevertheless, it should be observable in clusters with fairly large Hilbert spaces. We obtain the above threshold quantitatively as a condition for the breakdown of the golden rule in the second-order perturbation theory.

[1] K. Ji and B. V. Fine, Phys. Rev. Lett. 121, 050602 (2018).

[2] K. Ji and B. V. Fine, Phys. Rev. Lett. 107, 050401 (2011).