

Abstract Submitted
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Interacting ultracold atomic kicked rotors: loss of dynamical localization PINQUAN QIN, ALEXEI ANDREANOV, HEE CHUL PARK, Center for Theoretical Physics of Complex Systems, Institute for Basic Science, SERGEJ FLACH, Center for Theoretical Physics of Complex Systems, Institute for Basic Science; Massey University — We study the fate of dynamical localization of two quantum kicked rotors with contact interaction, which relates to experimental realizations of the rotors with ultra-cold atomic gases. A single kicked rotor is known to exhibit dynamical localization, which takes place in momentum space. The contact interaction affects the evolution of the relative momentum k of a pair of interacting rotors in a non-analytic way. Consequently the evolution operator U is exciting large relative momenta with amplitudes which decay only as a power law $1/k^4$. This is in contrast to the center-of-mass momentum K for which the amplitudes excited by U decay superexponentially fast with K . Therefore dynamical localization is preserved for the center-of-mass momentum, but destroyed for the relative momentum for any nonzero strength of interaction.

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