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Behavior of a new type quantum accelerator mode in phase-modulated optical potential WAKUN LAM, Oklahoma State Univ, SANDRO WIMBERGER, Università di Parma, SIAMAK DADRAS, JIATING NI, GIL SUMMY, Oklahoma State Univ, DEPARTMENT OF PHYSICS, OKLAHOMA STATE UNIVERSITY COLLABORATION, DIPARTIMENTO DI FISICA E SCIENCE DELLA TERRA, UNIVERSITÀ DI PARMA COLLABORATION — Many efforts based on this model have been made in study of dynamical localization, quantum accelerator mode (QAM), to name but a few. QAM is a dynamical phenomenon in which the momentum of atoms exposed to a pulsed accelerating optical standing wave manifest linear growth. In many applications, we expect to improve the transport rate and suppress localization. A recent technique utilizing the phase modulation on the optical potential to produce transporting islands [PRE 68, 026209 (2003) and PRA 87, 013631 (2013)] has been discussed. In this presentation we study the stability of such islands in classical phase space of a modified DKR system in which the phase of the optical potential is modulated by a certain phase in each kick. Numerically simulations testify the existence of QAM even in small perturbation on the modulated phase. We also investigate the momentum distribution experimentally and numerically and report a new type of QAM which exposed in stationary optical potential instead. The interesting structure of the area of the transport islands against wide range of dynamical parameters in phase space is observed to be quite distinct to the regular one.

Jiating Ni
Oklahoma State Univ

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