

Abstract Submitted
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High-Order Quantum Resonances Observed in a Periodically-Kicked Bose Condensate CHANGHYUN RYU, MIKKEL ANDERSEN, NIST, ALIPASHA VAZIRI, MICHAEL D'ARCY, Kings College, JOSHUA GROSSMAN, Adelphi Univ., KRISTIAN HELMERSON, WILLIAM PHILLIPS, NIST — We have observed high-order quantum resonances in a realization of the quantum δ -kicked rotor, using Bose-condensed Na atoms subjected to a pulsed standing wave of laser light. These resonances occur for pulse intervals that are rational fractions of the Talbot time, and are characterized by ballistic momentum transfer to the atoms. The condensate's narrow momentum distribution not only permits the observation of the quantum resonances at $3/4$ and $1/3$ of the Talbot time, but also allows us to study scaling laws for the resonance width in quasimomentum and pulse interval.

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