

Abstract Submitted
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Synthetic gauge potentials for cold atoms by shaking¹ FERNANDO SOLS, CHARLES E. CREFFIELD, Universidad Complutense de Madrid — Ultracold atoms held in optical lattice potentials provide an almost ideal arena for the study of coherent quantum phenomena. We first explore the generation of synthetic gauges by controlling the switching conditions of the driving force. For two-dimensional optical lattices, we propose a powerful and flexible scheme which generates synthetic magnetic fields that couple only to the atom center-of-mass. We briefly outline some possible applications.

[1] “Directed transport in driven optical lattices by gauge generation,” C.E. Creffield and F. Sols, Phys. Rev. A 84, 023630 (2011).

[2] “Comment on ‘Creating artificial magnetic fields for cold atoms by photon-assisted tunneling,’” C.E. Creffield and F. Sols, Europhysics Letters 101, 40001 (2013).

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