

Abstract Submitted
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Numerical simulations of Brownian ratchets in dissipative optical lattices¹ ANTHONY RAPP, Miami University, DAVID CUBERO, Universidad de Sevilla, ALEX STARON, AJITHA MITHRA, SAMIR BALI, Miami University — Brownian ratchets are promising systems that allow work to be done on nanoscopic level without the need for directed forces. Remarkably, an increase in the noise actually enhances the efficiency of extracting useful work. Dissipative optical lattices are ideal candidates for studying Brownian ratchets because of the flexibility afforded to the experimenter in tuning the noise coupling the system to the environment. We propose to create semi-classical Monte-Carlo simulations to explore parameter space in order to predict conditions which yield efficient ratcheting action, specifically high Peclet numbers. This information is of vital importance for our ongoing experimental efforts to realize high-efficiency Brownian ratchets in cold atoms.

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