Abstract Submitted
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Interaction-induced transport of ultra-cold atoms in 1D optical lattices[1] DANIEL GRUSS, Oregon State University, CHIH-CHUN CHIEN, Los Alamos National Laboratory, MASSIMILIANO DI VENTRA, University of California, San Diego, MICHAEL ZWOLAK, Oregon State University — The study of time-dependent, many-body transport phenomena is increasingly within reach of ultra-cold atom experiments. These systems not only allow experimental emulation of solid state systems, but allow us to probe the dynamics of transport at a previously unreachable level of detail. We will discuss computational results for the dynamics of electronic/atomic transport and, in particular, simulation of interacting fermionic atoms via a micro-canonical transport formalism using approximations that go beyond mean-field. We will discuss applications of this in terms of simulating particle currents under the influence of applied current and potentials, differing spin-spin interactions, and inhomogeneous lattice impurities. Finally, we will discuss these results in the context of present-day cold atom experiments.[2]

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[2]C.C. Chien, D. Gruss, M. Di Ventra, and M. Zwolak.
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