

Abstract Submitted
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One Dimensional Transport of Alkaline-Earth Atoms in a Harmonic Potential MICHAEL FEIG, Department of Physics, University of Colorado (JILA), ALEXEY V. GORSHKOV, Physics Department, Harvard University, ANA MARIA REY, Department of Physics, University of Colorado (JILA) — Recently it has been proposed that using the two clock states of alkaline earth atoms with non zero nuclear spin, it is possible to simulate clean Spin-Orbit many-body Hamiltonians [1]. These systems are particularly well suited for implementing atomic analogs of the Kondo Lattice model in which a band of localized spins interacts with a cloud of itinerant fermions. Here we report our investigations on the transport properties of alkaline earth atoms governed by the Kondo Lattice Model in the presence of a harmonic trapping potential. We discuss how the localized spins modify the dipole oscillations of the mobile atoms, which even in the non interacting case are known to violate the generalized Kohn theorem. [1] A. V. Gorshkov et al. Alkaline-earth atoms as few-qubit quantum registers. Arxiv 0812.3660.

Michael Feig
Department of Physics, University of Colorado (JILA)

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