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Title:

Bose-Hubbard Haldane Model

Abstract:

We study the tight-binding model on the honeycomb lattice introduced by Haldane for bosons. We analyze the ground state topology and quasi- particle properties in the Mott phase by applying bosonic dynamical mean field theory, strong-coupling perturbation theory, exact diagonalization and numerical evaluations of sample Hall conductivity. The phase diagram also contains two different superfluid phases, distinguished by chiral symmetry breaking. The quasiparticle dynamics, number fluctuations, and local currents are measurable in cold atom experiments.