

Abstract Submitted
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An exact study of lattice bosons with coupling to an ohmic bath¹ ARGHAVAN SAFAVI-NAINI, JILA, NIST, CU Boulder, BARBARA CAPOGROSSO-SANSONE, University of Oklahoma, ANA MARIA REY, JILA, NIST, CU Boulder — In an open quantum system the presence of strong coupling between the system and its environment can result in significant changes in the behavior of the system. For instance, in the spin-boson model the coupling between the spin and a heat bath induces a quantum (quantum coherences) to classical (absence of quantum coherences) transition. While systems consisting of one or few spins have been studied in detail, less is known about equivalent many-body models. Using Path Integral Quantum Monte Carlo algorithm we are able to obtain the phase diagram of a system of two-dimensional lattice bosons with ohmic coupling to an external reservoir. We explore the role of the competition between many-body effects and dissipation in stabilizing novel quantum phases, analogous to the recently observed bose liquid phase in a dissipative one-dimensional chain of bosons [1].

[1] Zi Cai, Ulrich Schollwöck, and Lode Pollet, Phys. Rev. Lett. 113, 260403, (2014).

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