

Abstract Submitted
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Dynamics of phase separation in cold-atom boson-fermion mixtures¹ DMITRY SOLENOV, Department of Physics, Clarkson University, Potsdam, New York 13699-5820, DMITRY MOZYRSKY, Theoretical Division (T-4), Los Alamos National Laboratory, Los Alamos, NM 87545 — We study the kinetics of the first order phase separation transition in boson-fermion cold atom mixtures. At low enough temperatures such a transition is driven by quantum fluctuations responsible for the formation of critical nuclei of a stable phase. Based on a microscopic description of interacting boson-fermion mixtures we derive an effective action for the critical droplet and obtain an asymptotic expression for the nucleation rate in the vicinity of the phase transition and near the spinodal instability of the mixed phase. We show that in the former case the transition rate is significantly modified by dissipation due to interaction with fermion excitations. The regimes where quantum nucleation can be experimentally observed in cold atom systems are identified.

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