Quench dynamics of a strongly interacting resonant Bose gas[1]

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We explore the dynamics of a Bose gas following its quench to a strongly interacting regime near a Feshbach resonance. Within a self-consistent Bogoliubov analysis we find that after the initial condensate-quasiparticle Rabi oscillations, at long time scales the gas is characterized by a nonequilibrium steady-state momentum distribution function, with depletion, condensate density and contact that deviate strongly from their corresponding equilibrium values. These are in a qualitative agreement with recent experiments on ^{85}Rb by Makotyn. Our analysis also suggests that for sufficiently deep quenches close to the resonance the nonequilibrium state undergoes a phase transition to a fully depleted state, characterized by a vanishing condensate density.

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