

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Slow quench dynamics of a trapped one-dimensional Bose gas confined to an optical lattice JEAN-SEBASTIEN BERNIER, Centre de physique theorique, Ecole Polytechnique, GUILLAUME ROUX, LPTMS, Universite Paris-Sud, CORINNA KOLLATH, Centre de physique theorique, Ecole Polytechnique — We analyze the effect of a linear time-variation of the interaction strength on a trapped one-dimensional Bose gas confined to an optical lattice. The evolution of different observables such as the experimentally accessible onsite particle distribution are studied as a function of the ramp time using time-dependent exact diagonalization and density-matrix renormalization group techniques. We find that the dynamics of a trapped system typically display two regimes: for long ramp times, the dynamics are governed by density redistribution, while at short ramp times, local dynamics dominate as the evolution is identical to that of an homogeneous system. In the homogeneous limit, we show that the energy absorbed scales non-trivially with the ramp time.

Jean-Sebastien Bernier
Centre de physique theorique, Ecole Polytechnique

Date submitted: 18 Nov 2010

Electronic form version 1.4