

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**Evolution of Hard-Core Bosons in a Time-Dependent Trap**

ADITYA RAGHAVAN, MARCOS RIGOL, STEPHAN HAAS, Department of Physics and Astronomy, University of Southern California — We present a study of the time evolution of hard-core bosons (HCB) in a one-dimensional, time-varying optical trap. Previous results have shown that one-dimensional HCBs can form superfluid and Mott-insulator phases. Using numerical techniques in the Bose-Hubbard model, we explore different types of time variations, such as sinusoidally varying trap curvature, using either initial configurations (filling & trap curvature) of a superfluid or a Mott-insulator. When the curvature of the optical trap is suddenly increased, we observe a “melting” of the Mott-insulator. The approximate numerical technique used to study time-varying traps is discussed.

Aditya Raghavan  
Department of Physics and Astronomy, University of Southern California

Date submitted: 30 Nov 2006

Electronic form version 1.4