

Abstract Submitted  
for the TSF07 Meeting of  
The American Physical Society

**Coherent Control of Trapped Bosons**<sup>1</sup> ANALABHA ROY, Graduate Student, Center for Complex Quantum Systems, University of Texas at Austin, LINDA REICHL, Director, Center for Complex Quantum Systems, University of Texas at Austin — We investigate the quantum behavior of a mesoscopic two-boson system produced by number-squeezing ultracold gases of alkali metal atoms. The quantum Poincare maps of the wavefunctions are affected by chaos in those regions of the phase space where the classical dynamics produces features that are comparable to  $\hbar$ . We also investigate the possibility for quantum control in the dynamics of excitations in these systems. Controlled excitations are mediated by pulsed signals that cause Stimulated Raman Adiabatic passage (STIRAP) from the ground state to a state of higher energy. The dynamics of this transition is affected by chaos caused by the pulses in certain regions of the phase space. A transition to chaos can thus provide a method of controlling STIRAP.

<sup>1</sup>The authors wish to thank the Robert A. Welch Foundation (Grant No. F-1051) for support of this work.

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Date submitted: 24 Sep 2007

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