

Abstract Submitted  
for the DAMOP08 Meeting of  
The American Physical Society

**Raman excitation of ultracold atoms to higher vibrational bands in an optical lattice** PATRICIA LEE, NATHAN LUNDBLAD, JOHN OBRECHT, WILLIAM PHILLIPS, TREY PORTO, National Institute of Standards and Technology — Cold atoms with orbital degrees of freedom in an optical lattice could lead to novel effects and quantum phases. We present experiments using stimulated Raman transition to excite atoms initially in the ground band to higher vibrational bands in a 3D optical lattice while simultaneously changing the hyperfine state of the atoms. The combination of spin and vibrational coupling allow us to create higher orbital states with different spins and observe the dynamics of such a system.

Patricia Lee  
National Institute of Standards and Technology

Date submitted: 01 Feb 2008

Electronic form version 1.4