

Abstract Submitted  
for the DAMOP05 Meeting of  
The American Physical Society

**State-Selective Detection of Ultracold High- $v$  Ground-State Rb<sub>2</sub>, and Spectroscopy of the (2)  $^1\Sigma_u^+$  State** Y. HUANG, H. KIM, J. QI, D. WANG, E.E. EYLER, P.L. GOULD, W.C. STWALLEY, University of Connecticut — We have used single-color photoassociation (PA), followed by radiative stabilization, to form ultracold Rb<sub>2</sub> molecules in either the metastable triplet state,  $a\ ^3\Sigma_u^+$ , or the true ground state,  $X\ ^1\Sigma_g^+$ . Individual near-dissociation levels of the  $X\ ^1\Sigma_g^+$  state from  $v''=111$  to  $v''=117$  have been detected by resonant multiphoton ionization (REMPI) through the (2)  $^1\Sigma_u^+$  state. The (2)  $^1\Sigma_u^+$  state, which we have observed for the first time, has been studied over the wavelength range from 585 nm to 609 nm. The observed vibrational levels are determined to range from  $v'=26$  to  $v'=60$ . Similarly, we have formed  $a\ ^3\Sigma_u^+$  molecules by PA and detected them via REMPI through the (1)  $^3\Pi_g$  state. This work was supported by the National Science Foundation.

Edward Eyler  
Physics Department, University of Connecticut

Date submitted: 28 Jan 2005

Electronic form version 1.4