

Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

Investigation of a resonantly coupled photoassociation resonance for production of ultracold, polar molecules in the absolute vibrational ground state PATRICK ZABAWA, AMY WAKIM, MAREK HARUZA, NICHOLAS BIGELOW, University of Rochester — We report on the discovery of a photoassociation (PA) resonance in NaCs which efficiently populates $X^1\Sigma^+(v=0)$, and on our progress in detecting these molecules. We found the resonance while performing PA spectroscopy detuned from the Cs $6^2P_{1/2}$ asymptote, and we discuss our analysis of this spectrum. The efficiency of the observed PA resonance in producing deeply bound $X^1\Sigma^+$ molecules is due to resonant coupling with $v=17$ in the $B^1\Pi$ electronic state. The rotational quanta 0-4 are coupled, though the strongest coupling appears in $J=1$ and 2. In order to detect the absolute vibrational ground state, we plan to perform two-color Resonance Enhanced Multi-Photon Ionization using the fundamental and 2nd harmonic output of a KDP crystal pumped with an infrared pulsed dye laser. We also discuss the prospects for trapping and accumulating molecules in the vibrational ground state.

Patrick Zabawa
University of Rochester

Date submitted: 04 Feb 2011

Electronic form version 1.4