BOUND-BOUND SPECTROSCOPY OF ULTRACOLD KRb MOLECULES

KANG-KUEN NI, S. OSPELKAUS, M. MIRANDA, A. PE'ER, B. NEYENHUIS, J. J. ZIRBEL, J. YE, D. S. JIN, *JILA, NIST and University of Colorado, Boulder*; S. KOTOCHIGOVA, *Physics Department, Temple University*; P. JULIENNE, *JQI, NIST and University of Maryland*.

Starting with a near quantum degenerate gas of ^{40}K and ^{87}Rb atoms, we create an ultracold dense gas of weakly bound KRb molecules near a magnetic-field tunable Feshbach resonance. These Feshbach molecules have a binding energy of 300 kHz and a density of $10^{12}/\mathrm{cm}^3$. We plan to transfer these molecules to more deeply bound states using coherent optical transitions and thus create an ultracold dense gas of polar molecules. In support of this goal we have performed single-photon spectroscopy of KRb* excited states and high precision two-photon spectroscopy of KRb ground-state molecules. We will present results of this spectroscopy of KRb molecules near the dissociation limit.