

Abstract Submitted
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Blue-detuned photoassociation in Rb₂¹ M.A. BELLOS, D. RAHMLOW, R. CAROLLO, J. BANERJEE, E.E. EYLER, P.L. GOULD, W.C. STWALLEY, University of Connecticut — We report on the observation of blue-detuned photoassociation as proposed in [1] and references therein. “Blue-detuned” refers to the location of vibrational levels — energetically above the corresponding atomic asymptote. ⁸⁵Rb atoms in a MOT were photoassociated to levels of the 1³Π_g state a few hundred wavenumbers above the 5S + 5P_{3/2} limit. These transitions were found to be strong even though they occur at short internuclear separations ($R_e=10 a_0$). Levels of the 1³Π_g state were detected by resonantly enhanced multi-photon ionization with time-of-flight spectroscopy (REMPI-TOF). We have observed most vibrational levels of the 1³Π_g state belonging to all its spin-orbit components (0_g⁺, 0_g⁻, 1_g, 2_g). Some of these levels spontaneously decay preferentially to the $v = 0$ level of the $a^3\Sigma_u^+$ state (FCF > 0.3). Therefore in Rb₂ it is possible to populate ground ro-vibrational levels of the $a^3\Sigma_u^+$ state using just one photoassociation laser. [1] M.-L. Almazor *et. al.*, Eur. Phys. J. D **15** 355 (2001).

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