OPTICAL OPTICAL DOUBLE RESONANCE (OODR) OF THE LITHIUM DIMER: THE $a^3\Sigma_u^+$ AND $2^1\Sigma_u^+$ STATES

C. LINTON, *Physics Department, University of New Brunswick, P.O.Box 4400, Fredericton, NB, Canada E3B 5A3*; F. MARTIN, P. CROZET, A. J. ROSS, I. RUSSIER, A. YIANNOPOULOU[a], *Laboratoire de Spectrométrie Ionique et Moléculaire (CNRS UMR5579), and Université Lyon I, Campus la Doua, Bâtiment 205, 69622 Villeurbanne Cedex, France*; L. LI, *Department of Modern Applied Physics, Tchinghua University, Beijing, China*; and A. M. LYYRA, *Department of Physics, Temple University, Philadelphia, PA 19122, USA*.

Perturbation Facilitated Optical Optical Double Resonance (PFOODR) has been used to access the v=0,1 and 2 levels of the $2^3\Pi_g$ state of $^7Li_2$ via mixed $A^1\Sigma_u^+ \sim b^3\Pi_u$ levels. Fluorescence to the $a^3\Sigma_u^+$ state, recorded at high resolution on a Fourier transform spectrometer, gave transitions to the v=0-9 levels of the $a^3\Sigma_u^+$ state and allowed us to observe levels very close to the dissociation limit. A Near Dissociation Expansion (NDE) technique was used to determine the dissociation energy. The results of our analysis will be presented and the correlation with recent photoassociation data will be discussed.
In a separate OODR experiment, fluorescence from the $5d^1\Pi_g$ Rydberg state of $^7Li_2$ to the $C^1\Pi_u$ and $2^1\Sigma_u^+$ "Double Minimum" states was examined allowing us to extend the previous analysis of the $2^1\Sigma_u^+$ state. The spectra also provided new information on the v=0 and 1 levels of the $C^1\Pi_u$ state, from which we were able to make a more precise determination of its potential minimum and T_e value.

[a]Current address: Laboratoire Aimé Cotton (CNRS UPR3321), Campus d'Orsay, Bâtiment 505, 91405 Orsay, France