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

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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.

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