$E^1\Sigma_g^+$ - $F^1\Sigma_g^+$ ENERGY LEVELS CROSSING AND LONG RANGE WINDOWS IN Li_2

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The potential energy curves of both the $E(3)^1\Sigma_g^+$ and $F(4)^1\Sigma_g^+$ states of Li_2 exhibit shelf regions at large internuclear distances and are in the same energy region. For these states the vibrational wavefunction has a significant amplitude at the outer turning point. This makes them extremely suitable intermediate states from which the long range part of higher and lower electronic states can be reached. However, the energy levels of interest of the F state predissociate, while the ones of the E state are not readily accessible from the ground state. Crossing of E and F levels was previously employed by Linton et al. to study the $A^1\Sigma_u^+$ state of $^6Li_2$[a]. In this work a high resolution data set of the E-F crossings at low J is presented and discussed. One of our goals is to provide an overlap region with the cold atom data for the $A^1\Sigma_u^+$ state by Abraham et al.[b] using high resolution triple resonance spectroscopy.

[a] C. Linton, F. Martin, I. Russier, A. J. Ross, P. Crozet, S. Churassy, and R. Bacis, *J. Mol. Spectrosc.* **175**, 340-353 (1996)
[b] E. R. Abraham, N. W. M. Ritchie, W. I. McAlexander, and R. G. Hulet, *J. Chem. Phys.* **103**(18), 7773-7778 (1995)