**B.5.5. Other Projects Involving Atomic Systems**--*Toru Morishita, K.T. Chung* and C.D. Lin*

In the last grant period we carried out two other projects on atomic systems not described above. The first one is the analysis of doubly excited $1s2\ell2\ell'$ resonances and triply excited $2\ell2\ell'2\ell''$ resonances in $He^-$ (Publication #101). While the lower members of these resonances have been extensively studied in the literature, the identification of the higher members is less clear. Structure in the electron impact excitation cross section in the resonance energy region can be due to resonances, or can be due to threshold effects. Using the adiabatic hyperspherical potential curves, we were able to unequivocally identify some structures as due to resonances. In one case, the conclusion is less certain. For the latter, full scattering calculations have to be carried out.

In the last grant period we have also collaborated with Dr. K.T. Chung who has performed extensive, accurate calculations on the doubly excited states of $Li^+$, including the energy positions, widths, and other properties of doubly excited states. Our role in the collaboration is to sort out the 504 states that he has calculated and arrange them in order, using the K, T and A quantum numbers that we have developed, to show the regularity of the calculated levels. The full results are reported in Atomic and Nuclear Data Tables (Publication #99).

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