TWO-ELECTRON WAVEFUNCTIONS FOR THE GROUND AND EXCITED STATES OF ALKALI NEGATIVE IONS

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In order to propose a long range model including ionic covalent interaction in the determination of highly excited state potential curves of alkali dimers, a model has been developped to compute the energies and wave functions of the ground state and various excited states of alkali negative ions. In case of the ground state (*Magnier et al. J. Phys. B : At. Mol. Phys. 32 5639 (1999)*), a two-electron correlated wave function has been suggested in the framework of a model potential method in which core polarization effects have been included. This method based on the formalism developped with success for H^- (*Le Sech, J. Phys. B : At. Mol. Phys. 30 L47 (1997)*), gives very good results for all alkali negative ions since the ground state energy is reproduced with an accuracy of 10^{-6} a.u.(≈ 0.2 cm^{-1}). For the excited states, energies and wave functions have been determined through interaction configuration calculations involving highly excited Slater type orbitals. Comparison with available experimental and theoretical data is satisfying.