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Double Excitations of Helium in Weak Static Electric Fields[1]
T. W. GORCZYCA, Western Michigan University, F. ROBICHEAUX, Auburn University, C. SÅTHE, M. STRÖM, J.-E. RUBENSSON, Uppsala University, R. RICHTER, Sincrotrone Trieste, M. ALAGIA, INFM-TASC, Trieste, S. STRANGES, Universitá di Roma — A dramatic electric field dependence has been observed in the photofluorescence yield spectrum of the doubly excited states in helium, where a rich phenomenology is encountered below the $N = 2$ threshold. Fluorescence yields of certain states can be tuned to zero, while other dipole-forbidden states are significantly enhanced, for fields much weaker than 1 kV/cm. Using an R-matrix multichannel quantum defect theory, spherical-to-parabolic frame transformation method, we are able to reproduce the main features of the observed spectrum, and we explain the qualitative behavior in terms of weak electric field mixing.

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