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Final state electron distributions of $^6Li^+$ following β-decay of ^6He[1]
EVA SCHULHOFF, G.W.F. DRAKE, University of Windsor — When the isotope ^{6}He undergoes β–decay into $^6Li^+$ ($^6\text{He} \rightarrow {}^6\text{Li}^+ + e^- + \bar{\nu}_e$), there is a sudden change in the Coulomb potential binding the atomic electrons. In response, a given initial electronic state of ^{6}He relaxes into all possible final electronic states of $^6Li^+$. In this work we calculate the redistribution function. The method of calculation involves expanding the initial state of ^{6}He in terms of a complete set of final states of $^6Li^+$. A Hylleraas-type basis set was used to create a pseudospectrum (up to 797 states) which spans both the bound and continuum states of Li^+. Starting from both the $1\ ^1S_0$ and $2\ ^3S_1$ initial states ^{6}He, the excitation probabilities to the final $^6Li^+$ states, as well as the total ionization probabilities, were calculated in the sudden approximation with neglect of nuclear recoil. The transition probabilities from the $1\ ^1S_0$ initial state are compared with those of Wauters and Vaeck [Phys. Rev. C **53**, 497 (1996)] and Frolov and Ruiz [Phys. Rev. A **82**, 042511 (2010)]. Finally, the transition probabilities show resonant behavior near the energies corresponding to doubly-excited states.

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