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**Relativistic CI+all-order calculations of U III energies, g-factors, transition rates and lifetimes**[1] IGOR SAVUKOV, Los Alamos National Laboratory, ULYANA SAFRONOVA, University of Nevada, Reno, NV, MARIANNA SAFRONOVA, University of Delaware, Newark, Delaware — Excitation energies, term designations, $g$-factors, transition rates and lifetimes of $U^{2+}$ are determined using a relativistic configuration interaction (CI) + all-order (linearized coupled-cluster, LCC) approach. The all-order energies are compared with CI+many-body-perturbation-theory (MBPT) and available experimental energies. Close agreement has been found with experiment, within hundreds of $cm^{-1}$. In addition, lifetimes of higher levels have been calculated for comparison with three experimentally measured lifetimes, and close agreement was found within t he experimental error. CI-LCC calculations constitute a benchmark test of the CI+all-order method in complex relativistic systems such as actinides and their ions with many valence electrons. The theory yields many energy levels, g-factors, transition rates, and lifetimes of $U^{2+}$ that are not available from experiment. The theory can be applied to other multi-valence atoms and ions, which would be of interest to many applications.

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