

Abstract Submitted
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Atomic properties of actinide ions with particle-hole configurations MARIANNA SAFRONOVA, University of Delaware, ULYANA SAFRONOVA, University of Nevada, Reno, MIKHAIL KOZLOV, Petersburg Nuclear Physics Institute of NRC, Russia — We study the effects of higher-order electronic correlations in the systems with particle-hole excited states using a relativistic hybrid method that combines configuration interaction and linearized coupled-cluster approaches. We find the configuration interaction part of the calculation sufficiently complete for eight electrons while maintaining good quality of the effective coupled-cluster potential for the core. Excellent agreement with experiment was demonstrated for a test case of La^{3+} . We apply our method for homologue actinide ions Th^{4+} and U^{6+} which are of experimental interest due to a puzzle associated with the resonant excitation Stark ionization spectroscopy (RESIS) method. These ions are also of interest to actinide chemistry and this is the first precision calculation of their atomic properties.

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