Abstract Submitted
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Relativistic many-body calculation of energies, multipole transition rates, and lifetimes in molybdenum ions DADONG HUANG, Z. ZUHRIANDA, University of Delaware, M. S. SAFRONOVA, University of Delaware and JQI, NISTand the University of Maryland, U. I. SAFRONOVA, University of Nevada, Reno — Accurate calculations of atomic properties for systems with $3d^n$ valence configurations are complicated by strong correlation corrections. In this work, we apply the relativistic hybrid approach that combines the configuration interaction and the coupled cluster methods to this problem. We chose molybdenum ions with two, three, and four valence electrons as testing cases. The $4d^4$, $4d^3 5s$, $4d^3 5d$, $4d^3 6s$ even-parity states and the $4d^3 5p$ and $4d^2 5s 5p$ odd-parity states are considered for Zr-like Mo^{2+}. The $4d^3$ and $4d^2 5p$ states are considered for Y-like Mo^{3+}, and $4d^2$, $4d5s$, $4d5d$, and $4d5p$ states are considered for Sr-like Mo^{4+}. Energy levels, multipole (E1, M1, and E2) matrix elements, and lifetimes are evaluated for all three ions. The energy results are compared with the experimental values for benchmark tests of the method performance for these configuration

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