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Calculation of parity-nonconserving amplitude in Ra^+ RUPSI PAL, DANSHA JIANG, MARIANNA SAFRONOVA, University of Delaware, ULYANA SAFRONOVA, University of Nevada — We have calculated parity-nonconserving $7s - 6d$ amplitude $E1_{PNC}$ in Ra^+ using relativistic high-precision all-order method where all single and double excitations of the Dirac-Hartree-Fock wave function are included to all orders of perturbation theory. Detailed study of the uncertainty of the PNC amplitude is carried out; additional calculations are performed to evaluate the effect of the triple excitations and to estimate some of the missing correlation corrections. A systematic study of the parity-conserving atomic properties, including the calculation of the transition matrix elements, lifetimes, hyperfine constants, as well as dipole and quadrupole ground state polarizabilities, is carried out. The comparisons are made between the size of the correlation corrections in Ba^+ and Ra^+. The results are compared with other theoretical calculations and available experimental values.

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