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PARITY NONCONSERVATION IN HEAVY FINITE FERMI-SYSTEMS AND DYNAMICAL ENHANCEMENT OF ELECTROWEAK INTERACTION

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Nowadays the parity non-conservation (PNC) effect in the heavy finite Fermi-systems has a potential to probe a new physics beyond the Standard Model. Speech is about an electroweak interaction and PNC as in heavy nuclear systems as in heavy atomic ones. We systematically apply our combined nuclear (relativistic mean field approach) and relativistic (QED) manybody perturbation theory method to precise studying spin- independent and spin-dependent (SD) PNC effect in heavy systems. There are presented the results of the calculating the nuclear magnetic moments, hfs, PNC amplitudes for a number of elements: ^{133}Cs, ^{137}Ba^{+}, ^{205}Tl, ^{223}Fr, ^{173}Yb with account of the exchange-correlation, Breit, weak e-e interactions, radiative, nuclear (magnetic moment distribution, finite size, neutron "skin") corrections. Comparison with the SM and available data (Safronova, Flambaumetc)data is done. As example we list our Q_W value of ^{173}Yb Q_W=-92.31 [the PNC amplitude $9.70710^{-10}ie_a$] that differs of the SM Q_W=-95.44. The nuclear SD PNC interactions due to nuclear anapole moment (k_a contribution), Z- exchange interaction from nucleon axial-vector (A_nV_e) currents (k_2), the combined hf and spin-independent Z exchange interaction from nucleon vector (V_nA_e) currents (k_{hf}) are studied. In quantum many-body systems with dense spectra of excited states weak perturbation can be significantly enhanced. The PNC enhancement is studied too and new possibilities are examined.

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