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Electroweak interaction, parity nonconservation in heavy finite fermi-systems and dynamical enhancement of weak interaction

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Nowadays the PNC in the finite Fermi-systems has a potential to probe a new physics beyond the Standard Model. We systematically apply our combined nuclear (relativistic mean field model) and QED many-body perturbation theory method [2] to precise studying spin- independent and spin-dependent (SD) PNC effects. There are listed new results of the calculating the nuclear magnetic moments, hf structure, PNC amplitudes for a set of elements: 133Cs, 137Ba+, 205Tl, 223Fr, 173Yb 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 other data [1] is done. As exciting example we list our QW value of 173Yb QW=-92.31 [the PNC amplitude 9.707x10^(-10)iea] that differs of the SM QW=-95.44. The nuclear SD PNC interactions due to nuclear anapole moment, Z- exchange interaction from nucleon axial-vector (AnVe) currents, the combined hyperfine and spin-independent Z exchange interaction from nucleon vector (VnAe) currents are computed. 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.

 K. Tsigutkin et al., Phys. Rev. Lett. 103, 071601 (2009); O. Khetselius, Phys. Scr. T135, 014023 (2009).
A. Glushkov et al., Nucl. Phys. A 734, 21 (2004); A. Glushkov, O. Khetselius, L. Lovett, Recent Adv. in Theory of At. and Mol. Syst. 20, 125 (2010).

Primary author: KHETSELIUS, Olga (Odessa State University -OSENU)Presenter: KHETSELIUS, Olga (Odessa State University -OSENU)Session Classification: Poster