Dynamic enhancement and chaos elements in theory of a nucleus and electron internal conversion in nuclides

Inga N. Serga
Odessa University, Odessa (Odessos), Ukraine
nucserga@mail.ru

We consider spectra of the barium isotopes and turn attention on definition of the corresponding internal conversion electron coefficients. It is continued discussion, which began in [1,2]. The neutron-deficient nuclides of $^{125,127}$Ba are theoretically studied and the level structures for high-spin states is interpreted within the framework of the RMF model. The electron internal conversion coefficients in the $^{125,127}$Ba nuclides are calculated on the basis of the relativistic Dirac-Fock method. It is performed a comparison of the obtained theoretical data and data by Rossel et al [3], which are $1.1 \cdot 10^3$ and $8.5 \cdot 10^4$ for M2 and E3, respectively, the 24.0-keV transition can be considered mainly an M2 transition. The other $\alpha_k$ values of the 79.4-, 114.3-, 128.7-, 134.3-, 220.4-, 243.0-, 253.3-, 269.6-, 285.6-, and 318.7-keV $\gamma$ transitions associated with the decay of $^{127}$La are deduced from the electron internal conversion measurements [4]. It is confirmed that the E1 transitions between parity doublets are characterized by a two to four orders of magnitude enhancement compared to those of more normal cases. A possibility of manifestation of stochastic elements (dynamic enhancement) and quantum chaos is discussed.

References