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

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We consider spectra of the barium isotopes and compute the internal conversion electron coefficients. The neutron- deficient nuclides of 125,127Ba 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 125,127Ba nuclides are calculated on basis of relativistic Dirac-Fock method. It is performed a comparison of the obtained theoretical data and data by Rossel et al. [3], which are 1.1×10^3 and 8.5×10^4 for M2 and E3, respectively, the 24-keV transition can be considered mainly an M2 transition. The other aK 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 transitions associated with the decay of 127La are deduced from the electron internal conversion measurements [1]. 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.

[1] T. Kibedi et al., Nucl. Instr. and Meth. A 589, 202 (2008); F. Rossel et al., Atomic Data Nucl. Data Tables 21, 91 (1978).
[2] A.V. Glushkov et al., Progr. in Theor. Phys and Chem. 18, 504 (2008); 22, 125 (2011); 26, 131 (2013).

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