

PHASE TRANSITIONS IN ALTERNATING PARITY BANDS OF HEAVY NUCLEI WITHIN THE FRAMEWORK OF COLLECTIVE MODEL

Mardyban E.V.^{1,2}, Shneidman T.M.^{1,3}, Kolganova E.A.^{1,2}, Jolos R.V.^{1,2}

¹ Bogoliubov Laboratory of Theoretical Physics, Joint Institute for Nuclear Research, Dubna, Russia; ² Dubna State University, Dubna, Russia; ³ Kazan Federal University, Kazan, Russia
E-mail: mardyban@theor.jinr.ru

Angular momentum dependencies of the parity splitting and electric dipole transitions in the alternating parity bands of heavy nuclei have been analyzed. It is shown that these dependencies can be treated in a universal way with a single parameter of critical angular momentum, which characterizes phase transition from octupole vibrations to the stable octupole deformation. Using collective model of axially-symmetric reflection-asymmetric mode, the analytical expressions for the parity splitting and electric dipole transitional moment have been obtained for various actinides. The results are in good agreement with the experimental data.

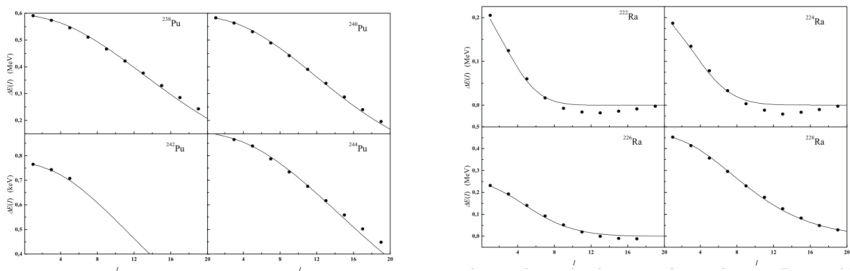


Fig. 1. Parity splitting as a function of angular momentum for various Pu and Ra isotopes. Experimental data (circles), the calculated parity splittings (lines).

1. E.V.Mardyban, T.M.Shneidman, E.A.Kolganova, R.V.Jolos, S.-G.Zhou // Chin. Phys. C. 2018. V.42. 124104.
2. R.V.Jolos and P. von Brentano // Phys. Rev. Lett. C. 2011. V.84. 024312.
3. R.V.Jolos, P. von Brentano, and J.Jolie // Phys. Rev. C. 2012. V.86. 024319.