

Abstract Submitted  
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**Evolution of deformation across the main shell N=82-126<sup>1</sup>** M.-A. DELEPLANQUE, S.Y. CHU, LBNL, S. FRAUENDORF, Univ. of Notre-Dame, V. PASHKEVICH, A. UNZHAKOVA, JINR, Dubna — We show that the deviations of the experimental moments of inertia from the rigid-body values at high spins, as well as deviations of the binding energies from the liquid-drop values, are due to shell effects. They are called “shell moments of inertia” and “shell energies.” The semiclassical Periodic Orbit Theory (POT) calculates these shell effects in terms of contributions from a few classical periodic orbits in the nuclear potential. The comparison of shell energies obtained in quantal calculations and in POT provides a new perspective on the occurrence of spherical magic numbers and of deformation in nuclei. In particular the evolution of the nuclear deformation with neutron number in the main shell N = 82-126 will be discussed.

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