

Deformations and Magnetic Moments in High- K Isomeric States of Heavy and Superheavy Nuclei

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We study the effects of quadrupole-octupole deformations on the energy and magnetic properties of high- K isomeric states in even-even heavy and superheavy nuclei [1-3]. The neutron two-quasiparticle (2qp) isomeric energies and magnetic dipole moments are calculated within a deformed shell model with pairing interaction over a wide range of quadrupole and octupole deformations. We found that in most cases the magnetic moments exhibit a pronounced sensitivity to the octupole deformation, while the 2qp energies indicate regions of nuclei in which the presence of high- K isomeric states may be associated with the presence of octupole softness or even with octupole deformation. The obtained results motivate the extension of the study to higher deformation multipolarities, such as $\lambda = 4, 5, 6$, as well as the involvement of selfconsistent model approaches to get a deeper microscopic insight into the influence of different kinds of deformations on the formation of high- K isomeric states. Preliminary work in these directions will be discussed.

References

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