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Structure and Energy of Isomeric States of some Well-Deformed Even-Even Rare-Earth and Actinide Nuclei, a Microscopic Approach

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The single particle (sp) structure of isomeric states of some well-deformed even-even nuclei in the rare-earth and actinide regions is studied within a self-consistent Hartree-Fock plus BCS approach (with blocking)[1]. The well studied Skyrme SIII parametrisation is used for the particle-hole part of the nuclear interaction and a seniority force for its residual part. The parameters of the latter have been carefully adjusted to reproduce the moments of inertia of the first 2^+ states separately in each region. The criterion to assess the relevance of our results is the fair reproduction of the isomeric energy as obtained from two independent self-consistent calculations [1,2]. The calculations will be limited to merely seniority-two states for each charge states (possibly combining them). A particular effort will be devoted to study the well-documented isomeric states around the ^{178}Hf nucleus. The polarisation effects due to the sp excitations from what is obtained in the ground states for time-even moments of the density will be discussed.

[1] P. Quentin, L. Bonneau, N. Minkov, D. Ivanova, J. Bartel, H. Molique, K. Meng-Hock, "Single-particle spectra, pairing correlations and spectroscopic properties of actinide and heavier nuclei ", *Bulg. Journ. Phys.* 48 (2021) 634-644.

[2] N. Minkov, L. Bonneau, P. Quentin, J. Bartel, H. Molique, D. Ivanova, "Energies of K-isomeric states in well-deformed heavy even-even nuclei ", submitted for publication in *Phys. Rev. C*.

Primary author: QUENTIN, Philippe (CENBG)

Presenter: QUENTIN, Philippe (CENBG)

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