Candidates for three-quasiparticle K-isomers in even-odd Fm-Cn nuclei

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In my talk, I will present the results of our extensive search for candidates of three-quasiparticle (3-q.p.) high-K isomers in the even-odd Fm-Cn nuclei with neutron numbers $N = 141 - 173$. This study builds upon our previous work on odd-even Md-Rg nuclei [1]. Significant axially symmetric deformation in both the ground and excited states in this region makes K a "good quantum number." Furthermore, our earlier calculations suggest that the reflection-asymmetric axial deformations of these nuclei are either negligible or absent [2], ensuring a well-defined intrinsic parity.

The analysis is performed within the macroscopic-microscopic approach, using the Yukawa-plus-exponential macroscopic energy [3] and the deformed Woods-Saxon single-particle potential [4]. The model parameters, well-tested for heavy nuclei, remain unchanged. We employ two pairing methods: the quasiparticle BCS approach and the particle number projection formalism. Energies for both ground states and $2\pi1\nu$ 3-q.p. configurations are determined by minimizing with respect to four axially- and reflection-symmetric deformations: β_2, β_4, β_6, and β_8.

I will highlight the most promising high-K isomer candidates and, where possible, compare them with available experimental data. Our selection criterion is based on identifying low-lying high-K 3-q.p. configurations. However, determining whether a candidate is a true isomer, in the context of hindered electromagnetic decay, remains a challenge given the current state of theoretical models.

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