Abstract ID : **44**

Shape coexistence in the superheavy nucleus ^{286}No

Content

Covariant density functional theory is applied on a three-dimensional lattice in a microscopic and fully self-consistent manner, without imposing any symmetry restrictions [1], to investigate the superheavy nucleus ^{286}No. Our findings reveal that the ground state exhibits a distinct non-axial octupole shape, which coexists with a tetrahedral isomeric state. The energy difference between these states is merely 0.12 MeV, and they are separated by a potential barrier of approximately 0.5 MeV. We analyze the presence of octupole correlations by examining the evolution of single-particle levels near the Fermi surface, which are influenced by octupole deformations [2].

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[1] B. Li, Z.X. Ren, P. W. Zhao, Phys. Rev. C 102 (2020) 044307
[2] F. F. Xu, B. Li, P. Ring, P. W. Zhao, Phys. Lett. B 856 (2024) 138893

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Status: SUBMITTED

Submitted by **DE GREGORIO, Giovanni** on **Friday, 14 March 2025**