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Potential energy surfaces of nuclei around ^{186}Hg

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Abstract:

The potential energy surface of $^{182-186}\text{Pt}$, $^{184-188}\text{Hg}$, and $^{186-190}\text{Pb}$ in the 4D deformation parameters space (c, η, a_3, a_4) are evaluated within the macroscopic-microscopic approach using the so-called Fourier-over-Spheroid shape parametrization [1]. The LSD formula [2] is used to evaluate the macroscopic part of the energy, while the microscopic energy correction was obtained using the Yukawa-folded single-particle potential [3]. Pairing correlations are taken within the BCS approximation using an approximate particle-number projection. Each potential energy point at the (β, γ) plane was minimized with respect higher-order deformation parameters (a_3 and a_4).

A possible shape coexistence and appearance of the shape isomers is discussed.

References:

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