

Particle-number conserving analysis of rotational bands in $^{247,249}\text{Cm}$ and ^{249}Cf

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The recently observed high-spin rotational bands in odd- A nuclei $^{247,249}\text{Cm}$ and ^{249}Cf [Tandel et al., Phys. Rev. C 82 (2010) 041301] are investigated by using the cranked shell model (CSM) with the pairing correlations treated by a particle-number conserving (PNC) method in which the blocking effects are taken into account exactly. The experimental moments of inertia and alignments and their variations with the rotational frequency ω are reproduced very well by the PNC-CSM calculations. By examining the ω -dependence of the occupation probability of each cranked Nilsson orbital near the Fermi surface and the contributions of valence orbitals to the angular momentum alignment in each major shell, the level crossing and upbending mechanism in each nucleus is understood clearly.

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