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Test of Rigid Triaxiality in 126-132Ce nuclei

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The structure of neutron deficient (N<82) light nuclei lying far from β-stability line are one of the most challenging and interesting area of the nuclear physics. These nuclei are short lived and the information on their nuclear spectra has become available only recently from the in-beam nuclear reaction experiments. The level pattern of these nuclei differs basically from (N>82) nuclei and thus their study is of current interest. The study of γ-g interband B(E2) ratios with Asymmetric Rotor Model (ARM) (also known as Davydov-Filippov (DF) Model) in medium and light mass even-even nuclei versus the asymmetric parameter γ0. Due to less availability of experimental data, only 134-136Ce nuclei were studied. Now with advancement in experimental techniques, we extend the search of rigid triaxiality in 126-132Ce nuclei using asymmetric parameter γ0. The values of E(2g), E(2γ), Eγ and Iγ are taken from NNDC website. The experimental B(E2) ratio for (2γ ⟶ 0/2) transition is plotted vs. γ0. The DF model predicts monotonic fall for B(E2,2γ ⟶ 0/2) with increasing γ0. The new data points lie in the region 16 ≤ γ0 ≤ 24. 132Ce nucleus for which R(4g/2g) = 2.64, γ0= 24.29 and the B(E2) ratio approaching the vibrational limit (ratio ⟶ 0). It indicates that 132Ce nucleus is γ-soft or O(6) in nature. 126-128Ce nuclei lie far from the DF curve with R(4g/2)=3.06, 2.93 and γ0 = 16.45, 18.89, respectively and the B(E2) ratios lie above the vibrational limit, it indicates that these nuclei are not rigid triaxial in nature.

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Primary author: Dr MITTAL, Harish Mohan (Dr. B. R. Ambedkar National Institute of Technology Jalandhar)

Co-author: Ms KUMARI, Parveen (Dr. B. R. Ambedkar National Institute of Technology, Jalandhar, Punjab, India. 144011)

Presenter: Dr MITTAL, Harish Mohan (Dr. B. R. Ambedkar National Institute of Technology Jalandhar)

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