2004 Vol.41 No.3 pp.454-460 DOI:

Identification of Bandhead Spin and Identical Bands for Odd-A Nuclei in $A\sim190 $ Superdeformed Mass Region

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(Received: 2003-6-24; Revised:)

Abstract: The dynamical moment of inertia is estimated with its even-power expansion of the rotational frequency and in accordance we determine the intermediate spins of the superdeformed (SD) rotational bands. Using Marquardt method of nonlinear least-squares routines, we determine the expansion coefficients by fitting the proposed dynamical moment of inertia with its recent experimental data of the SD nuclei in the A=190 mass region. The comparison between our theoretical and available experimental data for the dynamic moment of inertia and spin shows good agreements. Also, we have calculated the static moment of inertia at three alternative values of spin. The value of spin at which the two moments of inertia are nearly equals is to be regarded as a bandhead spin of the corresponding band. These studies are carried out for eighteen bands of odd-A nuclei of the superdeformed region 190, namely ^{189}Hg(b1), ^{191}Hg(b1, b2, b3, b4), ^{193}Hg(b2, b3, b5), ^{195}Hg(b1, b2, b3, b4), ^{193}Tl(b1, b2, b3, b5), ^{189}Tl(b1), and ^{197}Bi(b1). We also notice the occurrence of identical SD bands with near identical transition energies among the considered SD bands.

PACS: 21.10.Re, 23.20.Lv, 27.80.+w,
Key words: superdeformed nuclei, odd-A of mass region 190, cranking model, Harris formula

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