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Four independent decay properties in the super-deformed well of ^{143}Eu

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Abstract

The flow of γ-transitions through the superdeformed minimum of ^{143}Eu is investigated by studying the intensities of four different types of γ-rays of superdeformed origin, obtained with a variety of gating conditions. They can all be explained rather well by schematic simulation calculations assuming only well known statistical properties. Information on level density, competition between E1 and E2 strengths and rotational damping width in the SD well is obtained, yielding a rather complete picture of the feeding mechanism into different regions of the second minimum. © 1997 Elsevier Science B.V.

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In recent years, spectroscopy in the superdeformed (SD) minimum has progressed rapidly. Many SD excited bands have been identified in different mass regions [1,2] and in a few cases discrete transitions linking to the normal deformed (ND) states have also been found [3,4], allowing to fix the spin and the excitation energy of the SD yrast band. The SD rotational strength associated with excited states appear in unresolved spectra as ridges in $E\gamma_1 \times E\gamma_2$ matrices [5,6] stemming from decay along low lying SD bands, and as more smooth spectra for rotationally damped transitions [7]. Still, the mechanism for feeding and decay of the SD rotational bands has not been fully understood. Detailed simulation calculations [8–12] of γ-decay cascades are needed to elucidate the electromagnetic properties of the excited and coupled SD and ND states.

The population of the SD excited states is expected

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