

# Frontiers in Gamma Ray Spectroscopy

## FIG18

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### Systematics of Band Termination at High-Spin in $N \sim 90$ Nuclei: How Robust and Pure Are These Special States?

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#### Content :

The light rare-earth nuclei near  $N = 90$ , are textbook examples (Refs. 1-10) of the evolution of nuclear structure with excitation energy and angular momentum. They display a variety of different phenomena, such as, multiple backbends, dramatic prolate to oblate shape changes associated with band termination plus a spectacular return to collectivity extending discrete gamma-ray spectroscopy into the so-called ``ultrahighspin regime`` ( $I = 50-70$ ).

Band termination represents a clear manifestation of mesoscopic physics, since the underlying finite-particle basis of the nuclear angular momentum generation is revealed. In  $^{158}\text{Er}$ , terminating states at values  $I_p = 40^+, 43^-, 46^+, 48^-,$  and  $49^-$ , have been observed, Other neighbouring nuclei have also been found to exhibit similar fully aligned states providing stringent tests of nuclear models since the wavefunctions for these special states are extremely pure.

The present work has been triggered by a comprehensive high-spin analysis of data from Gammasphere on  $^{157}\text{Ho}_{90}$  which showed remarkable similarities to the known band termination states in  $^{158}\text{Er}_{90}$ . A systematic analysis of favoured band terminations in neighboring nuclei has subsequently been carried out and will be discussed.

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