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The Decline and Fall of Nuclear β - and γ -Vibrations

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The conjecture of Bohr and Mottelson that the lowest $K\pi = 0+$ and $K\pi = 2+$ rotational bands in deformed nuclei could be identified as “vibrations” of the quadrupole shape, turns out to be fallacious.

The vast amount of current experimental data shows that the $K\pi = 0+$ rotational bands are $2p-2h$ states and that the $K\pi = 2+$ rotational bands are due to the energy being lowered by the nucleus favouring triaxiality and rotating about its intermediate axis.

The experimental data mitigates against current, but still fashionable, nuclear models such as the Interacting Boson Model (IBM) and interpretations involving phonon excitations.

It is significant that the deformed mean-field and single particle behaviour is valid all the way up to fission.

Apply to be considered for a student ; award (Yes / No)?

No

Level for award;(Hons, MSc, PhD, N/A)?

N/A

Primary author: SHARPEY-SCHAFER, John (UniZulu)

Presenter: SHARPEY-SCHAFER, John (UniZulu)

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