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Coupling of single neutron configuration to collective core excitations in ^{162}Yb using ^{163}Yb

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In odd-nuclei the single nucleon can couple to collective excitations of its even-even core nucleus. These collective excitations lie within the pairing gap and are therefore the lowest energy excitations of the core. Our physics motivation is to search for structures where an odd neutron couples to collective excitations of the ^{162}Yb core. We also intend to search for high-K structures in this nucleus. The experiment $^{152}\text{Sm}(^{16}\text{O},n)^{163}\text{Yb}$ at Elab = 93 MeV was performed to study ^{163}Yb at iThemba LABS. The gamma-decays from the reaction products have been detected using the AFRODITE gamma-ray spectrometer equipped with 8 escape-suppressed clover detectors. After a comprehensive analysis, the level scheme of ^{163}Yb has been extended and new bands have been established in this current work, in particular the band based on the ground state has been built up to spin 43/2-. A High-K band has been established in the current work for the first time in this nucleus. An additional 16 new states in ^{163}Yb were observed and all decay to the Yrast band. DCO and polarization analysis were performed to determine the spin and parity of new levels. The Cranked Shell Model was used for comparison of experimental data in this work.

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

Yes

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

MSc

Main supervisor (name and email) and his / her institution

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Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

No

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