



Contribution ID: 470

Type: Oral Presentation

## Coupling of single neutron and proton configurations to collective core excitations in $^{162}\text{Yb}$ .

Wednesday, 6 July 2016 10:00 (20 minutes)

**Abstract content** (Max 300 words) **Formatting** **Special chars**

The detailed spectroscopy of  $^{162}\text{Yb}$  was studied at iThemba LABS using the  $^{150}\text{Sm}(^{16}\text{O}, ^{162}\text{Yb})$  fusion-evaporation reaction. The 83 MeV  $^{16}\text{O}$  beam was provided by the Separated Sector Cyclotron (SSC) and used to bombard 3 mg/cm<sup>2</sup> target. The gamma rays emitted from the reaction were detected using the AFRODITE gamma-ray spectrometer equipped with eight escape-suppressed clover detectors. The exact structure of the  $K^\pi = 2^+ \gamma$  bands has not been properly established and all recent theoretical descriptions do not involve vibrations of the nuclear shape. The last standard spectroscopy of  $^{162}\text{Yb}$  was published in 1987[1]. The decay scheme resulted from this work shows that, the ground state band is known up to  $(28)\hbar$ . However a very little is known about the  $K^\pi = 2^+ \gamma$  band where only the bandhead  $2^+$  level at 798 keV and  $3^+$  at 992 keV have been well established. The core nucleus  $^{162}\text{Yb}$  has a very low-lying  $K^\pi = 2^+ \gamma$  band. Our aim is to search for the structures where an odd neutron or proton couple to this collective excitation. We also intend to look for extensions to the  $\gamma$  band and second vacuum  $O_{2^+}$  band in  $^{162}\text{Yb}$ . We further intend to search for high-K structures in  $^{162}\text{Yb}$ . The data collected from this experiment is being analysed and the results will be discussed in the South African Institute of Physics conference.

[1] J.N. Mo et al., Nucl. Phys. A624, 257 (1987)

**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 <br> submit a short paper <br> for the Conference <br> Proceedings (Yes / No)?**

no

**Please indicate whether<br>this abstract may be<br>published online<br>(Yes / No)**

yes

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**Session Classification:** Nuclear, Particle and Radiation Physics (1)

**Track Classification:** Track B - Nuclear, Particle and Radiation Physics