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## Coupling of single proton configurations to collective core excitations in $^{162}\text{Yb}$ : the nucleus $^{161}\text{Tm}$

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

Most nuclei are deformed with some having axial symmetry and the rest being triaxial. For the study of nuclei more than two mass units away from the stability line, it is not possible to investigate their properties using direct reactions. Therefore gamma ray spectroscopy is the most productive way studying their structure. In recent years experimental evidence suggests that  $0^+$  bands do not have properties of  $\beta$  vibrations [1]. This contradicts old models. Single particle orbitals in odd  $A$  nuclei with even-even  $N=92$  as a core, will couple to any collective core excitations of that core. Previous experiments have been done on neutron deficient isotopes of Thallium [2]. In this research we focus on the ground state proton of  $^{161}\text{Tm}$  in  $[404]7/2^+$  Nilsson orbit that couples to any collective excitations in  $^{162}\text{Yb}$ . The experiment  $^{152}\text{Sm}(^{14}\text{N}, n)^{161}\text{Tm}$  was performed to study this at iThemba LABS. An AFRODITE spectrometer was used.

This presentation will discuss the results and analysis of data obtained in the experiment.

[1] J. F. Sharpey-Schafer et al., Eur. Phys. J. A47, 5(2011)

[2] C. Foin et al., Nucl. Phys. A417, 511(1984)

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Yes

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

MSc

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

SIFISO NTSHANGASE, Ntshangases@unizulu.ac.za

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**Primary author:** Ms JONGILE, SANDILE (UNIVERSITY OF ZULULAND/ ITHEMBA LABS/UNIVERSITY OF THE WESTERN CAPE)

**Co-authors:** Prof. SHARPEY-SCHAFER, JOHN (UNIVERSITY OF THE WESTERN CAPE); Dr BARK, ROB (iThemba Laboratory for Accelerator Based Sciences); Dr NTSHANGASE, SIFISO (UNIVERSITY OF ZULULAND); Mr MAJOLA, SIYABONGA (iThemba Laboratory for Accelerator Based Sciences); Ms BVUMBI, SUZAN (UNIVERSITY OF JOHANNESBURG); Dr DINOKO, TSHEPO (iThemba Laboratory for Accelerator Based Sciences)

**Presenter:** Ms JONGILE, SANDILE (UNIVERSITY OF ZULULAND/ ITHEMBA LABS/UNIVERSITY OF THE WESTERN CAPE)

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