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## Octupole correlations in the rare earth $N = 88$ isotones

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**Abstract content &nbsp; (Max 300 words)<br><a href="http://events.saip.org.za/getFile.py/a" target="\_blank">Formatting &<br>Special chars</a>**

Three experiments have recently been performed at iThemba LABS using the AFRODITE array spectrometer with the digital electronics. The reactions  $^{150}\text{Nd} (4\text{He}, 4n) ^{150}\text{Sm}$ ,  $^{150}\text{Sm} (4\text{He}, 2n) ^{152}\text{Gd}$  and  $^{155}\text{Gd} (3\text{He}, 4n) ^{154}\text{Dy}$  have been studied at lower spins in order to investigate the collective and quasi-particle structures of the  $N = 88$  nuclei  $^{150}\text{Sm}$ ,  $^{152}\text{Gd}$  and  $^{154}\text{Dy}$  respectively. Structures built on the  $0_2^+$  states in these isotones are being investigated. The reaction  $^{150}\text{Nd} (4\text{He}, 4n) ^{150}\text{Sm}$  fills a gap in two of our previous studies of  $^{150}\text{Sm}$ ;  $^{148}\text{Nd} (4\text{He}, 2n) ^{150}\text{Sm}$  to low spin states and  $^{136}\text{Xe} (18\text{O}, 4n) ^{150}\text{Sm}$  at high spins [3, 4]. The difference in the structures populated in  $^{150}\text{Sm}$  in these two reactions is most unusual and needs to be understood. Of particular importance is the detailing of the structure of the  $K\pi = 2^+ \gamma$ -vibrational band which is only known to the first few states in  $^{150}\text{Sm}$ . The properties of such bands indicate if the nucleus is axially symmetric or not and how  $\gamma$ -soft it is. We are also looking for the  $K\pi = 2^+ \gamma$ -vibrational band built on the  $0_2^+ 2p-2h$  neutron state which possesses octupole characteristics [5]. The measurements we have made to  $^{152}\text{Gd}$  and  $^{154}\text{Dy}$  are motivated by the same considerations as our study of  $^{150}\text{Sm}$  and with the intention of determining the role that deformation plays in these isotones.

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**Apply to be<br> considered for a student <br> &  award (Yes / No)?**

NO

**Level for award<br>& (Hons, MSc, <br> &  PhD)?**

PhD

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

YES

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