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Transitional ^{150}Sm and ^{152}Gd

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Nuclei near $N=90$ are considered transitional, since they lie between nuclei that display vibrational spectra and nuclei that display rotational spectra. The structure of these transitional nuclei, in particular the nature of the low-lying first excited states $|0+2\rangle$ still pose a great challenge with various theoretical models competing. A new perspective to the understanding of the structure of the $N=88$ and $N=90$ nuclei is brought by the proposition that the low-lying first excited $0+$ states in these nuclei are not β -vibrations but constitute a second vacuum $|0+2\rangle$ coexisting with the ground state vacuum $|0+1\rangle$.

As part of a campaign studying nuclei near $N=90$, the low and high spin states of the $N=88$ nucleus ^{150}Sm have been populated via $^{148}\text{Nd}(\alpha, 2n)^{150}\text{Sm}$ at a beam energy of 25 MeV and $^{136}\text{Xe}(^{18}\text{O}, 4n)^{150}\text{Sm}$ at 75 MeV respectively. These experiments have been conducted on world-class multi-detector gamma-ray spectrometer arrays, namely JUROGAM at Jyväskylä in Finland as well as the AFRODITE at iThemba LABS Cape town here in South Africa. The isotone ^{152}Gd has been studied via $^{152}\text{Sm}(\alpha, 4n)^{152}\text{Gd}$ at 45 MeV fusion evaporation reaction taken with AFRODITE.

Preliminary results focusing on the observed band structures for the two isotones ^{150}Sm and ^{152}Gd will be presented.

Level (Hons, MSc, ☐ PhD, other)?

☐ PhD

Consider for a student ☐ award (Yes / No)?

☐ Yes

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

☐ Yes

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