Contribution ID: **292** Type: **Poster Presentation**

Exploring the spectroscopy of the low and medium spin states in ^{148}Sm Nucleus.

Thursday, 6 July 2023 16:24 (1 minute)

The ^{148}Sm nucleus has Z=60 protons and N=86 neutrons. The neutron number represents only 4 neutrons above the N=82 shell gap. In the N=86 isotones, the competition between collective and single-particle modes of excitation results in a formation of different kinds of excited level structures.
The observed structures are interpreted as due to octupole vibrational states coupling with the single particle excitation resulting in alternating-parity bands linked by electric dipole 1 transitions. The dynamical fluctuations associated with the coupling to low-lying quadrupole and octupole vibrations(=) are also expected in these isotones. The low-lying quadrupole vibrational states in ^{148}Sm have not been measured, and the spins and parities in some states of this nucleus remains unknown. Thus, this work seeks to search for the low- and medium states in 148Sm, and to also determine the spins and parities of the excited states, which could subsequently allow one to understand the microscopic nature of the structures reported in the previous studies. In the present study, the excited states in ^{148}Sm are populated following the ^{148}Nd (^{4}He, 4n) ^{148}Sm reaction at a beam energy of 47.0 MeV. The iThemba LABS AFRODITE array is used for detection of γ- radiation from the reaction, the established level scheme will be expanded based on the $\gamma - \gamma$ coincidence measurements. The AFRODITE array consisted of 9 High-Purity Germanium (HPGe) detectors, 5 positioned at 90° and 4 at 135°. Spin and parity assignments are made based on angular distribution and linear polarization measurements

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

yes

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

MSc

Primary authors: ZUMA, Mfundo (none); Prof. SIFISO, Ntshangase (Supervisor)

Presenter: ZUMA, Mfundo (none)

Session Classification: Poster Session 2

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