

Lifetime measurement in ^{103}Pd

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The structure of nuclei reveals intriguing phenomena even at low and moderate spin regime such as vibrations and rotations built upon prolate deformed shape. Different phenomenon observed in the yrast band of nuclei in $A \approx 100$ are band termination, collective rotational band, and single particle structure [1-3]. In many of these nuclei, with modest deformation, magnetic and anti-magnetic rotational bands have also been reported. Lifetime measurement of excited nuclear states gives an insight into the origins of the level structure and helps in understanding the underlying shapes and symmetries in the nucleus. In $^{101,105}\text{Pd}$ nuclei [4, 5] the band based on $\nu h_{11/2}$ was found to exhibit AMR behaviour based on lifetime measurements. A band based on $\nu h_{11/2}$ is also established in ^{103}Pd , however, AMR behaviour could not be confirmed in this band due to lack of lifetime information. In this work the main objective was thus, to probe this band for AMR phenomena by measuring the lifetime of states in this band.

The excited states of ^{103}Pd were populated via fusion evaporation reaction, $^{94}\text{Zr}(^{13}\text{C}, 4n)$ at beam energy of 55 MeV from 15UD pelletron accelerator based at Inter University Accelerator Centre (IUAC), New Delhi. Coincidence γ rays in two and higher fold were detected using Indian National Gamma array (INGA) [6]. Offline analysis is being done using CANDLE, INGASORT and RADWARE computer codes. The lifetime values are measured using the LINESHAPE Program [7]. Extracting lifetimes of the excited nuclear states of ^{103}Pd using Doppler shifted lineshapes will be reported in the workshop.

References:-

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