



ID de Contribution: 73

Type: **Poster presentation**

## Rotation of pear-shaped $^{100}\text{Ru}$ nucleus

This research is focused on studying nuclear structure in the  $A \sim 100$  region, with a particular emphasis on the  $N \sim 56$  isotone group. The presence of the  $h_{11/2}$  intruder orbital in this group significantly impacts the nuclear shape. The main goal of this study is to investigate the existence of a two-quasi-neutron octupole band within this isotone group.

For this purpose, fusion-evaporation reactions were employed to populate the excited levels of the nucleus of interest,  $^{100}\text{Ru}$ . The experimental setup involved gamma-ray detection with an array of 11 hyper-pure Germanium detectors, each equipped with four-fold segmentations. The data acquisition system recorded approximately five billion two-fold coincidence events using the PIXIE-16 digitiser. Six detectors were positioned at a  $90^\circ$  angle to the beam direction to enhance the detection of E1 transitions, while two LEPS detectors were included for efficient detection of low-energy transitions. The remaining five Clover detectors were placed at angles of  $125^\circ$  and  $40^\circ$ .

Analysis of the obtained data was performed using the RADWARE and INGASORT software, which facilitated the examination of the angle-dependant and symmetric  $\gamma$ - $\gamma$  matrices.

The primary focus was to investigate stable octupole deformation, which exhibited characteristics such as parity doublet bands and relatively fast E1 transitions. To systematically study octupole-deformed nuclei across the periodic table, two variables, Moment of Inertia ( $J(1)$ ) and a spin-dependent parity splitting index ( $S(J)$ ), were selected. This systematic analysis helps to provide insights into the underlying physics of the observed level scheme. In this work, 7 new E1 transitions were placed between the assumed octupole bands. The  $B(E1)/B(E2)$  ratios for levels of  $^{100}\text{Ru}$  were determined using the experimental branching ratios. These values in the spin range  $11\hbar < I < 19\hbar$  show a significant enhancement compared to the low spin values of  $^{100}\text{Ru}$ . Where all the previous studies on octupole indicate to begin from the ground state band, this study reports the first observed case of an octupole band built on an unpaired configuration.

One limitation of this research is the absence of lifetime analysis due to the thin target experiment conducted.

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**Classification de Session:** Poster session - with cocktail and buffet

**Classification de thématique:** Nuclear Structure