



Contribution ID: 357

Type: **Contributed Oral Presentation**

Level lifetime measurement of ^{93}Ru and ^{94}Ru by IDATEN: Seniority symmetry breaking

Thursday, 29 May 2025 17:30 (15 minutes)

Lifetimes of the low-lying excited states in the yrast bands of ^{93}Ru and ^{94}Ru were measured using the γ - γ - ΔT method. The experiment was carried out at the Radioactive Isotope Beam Factory (RIBF) at RIKEN. The ^{93}Ru and ^{94}Ru were produced by in-flight fragmentation of a ^{124}Xe primary beam, impinging on a ^9Be target. These ions were transported through the BigRIPS and Zero Degree Spectrometer (ZDS) and implanted into a segmented plastic-based active stopper at F11, one of the focal positions. The γ rays emitted from the isomeric decays were detected by the IDATEN (International Detector Assembly for fast-Timing measurements of Exotic Nuclei) array, which consists of 48 LaBr₃(Ce) detectors.

Recent studies have reported the anomalous enhancement of the reduced transition probabilities for the $4^+ \rightarrow 2^+$ transition in ^{94}Ru , compared to the theoretical prediction based on the large-scale shell model with partial seniority conservation. This enhancement has been attributed to a small mixing of $\nu = 4$ and 2 seniorities. However, the previous results are inconsistent, and the additional high-precision experimental data are required to better understand the seniority mixing. In this presentation, we report new level lifetime values for ^{93}Ru and ^{94}Ru and discuss their implications for the seniority symmetry breaking.

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Session Classification: Parallel Session

Track Classification: Nuclear Structure