



国立研究開発法人理化学研究所 仁科加速器科学研究センター  
第324回 RIBF核物理セミナー  
RIKEN Nishina Center for Accelerator Based Science  
The 324th RIBF Nuclear Physics Seminar

Mass measurement of  $^{123}\text{Pd}$  with the Rare-RI Ring  
at RIBF illuminates r-process abundances trend at  $A=122,123$

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The rapid neutron capture process (r-process) is responsible for producing about half of the elements heavier than iron.

Experimental masses of neutron-rich nuclei are essential for the simulation of the r-process and the improvement of the mass models. However, experimental measurement on the majority of nuclei relevant to the r-process is still very challenging due to their low yields and short half-lives.

To address these challenges, isochronous mass spectrometry, utilizing a storage ring, has emerged as a valuable technique for determining masses of short-lived exotic nuclei. The Rare RI Ring (R3) at the Radioactive Isotope Beam Factory (RIBF) is a recently commissioned cyclotron-like storage ring mass spectrometer specifically designed for studying nuclei located far from stability line. Unlike other storage rings, R3 allows for pre-identification and event-by-event measurement of the nucleus of interest, with an expected mass precision of  $10^{-6}$  within less than 1 ms. In this seminar, we present the mass measurements of isotones on the southwest of  $^{132}\text{Sn}$  using R3. We report an improved mass uncertainty for  $^{123}\text{Pd}$  and investigate the impact of this new mass data on the r-process abundance through the PRISM reaction network model.

Jul 4<sup>th</sup> (Tue), 2023 16:00 ~  
via Zoom Meeting System



\* The talk will be given in English language.  
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