# Single-particle and collective motions from nuclear many-body correlation (PCM2025)



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## Measurement of Interaction Cross Sections through the TRIP-S3CAN Project at RIKEN RIBF

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The nuclear matter radius is one of the fundamental physical quantities, and the interaction cross section measurement is a method used to deduce this radius. Measurement of interaction cross sections using the transmission method achieves an accuracy of 0.5% with statistics from only 10^5 to 10^6 particles, owing to the large cross section and the ability to use thick targets. This corresponds to a nuclear radius determination accuracy of approximately 0.01–0.03 fm. The ability to determine radii with relatively high precision from a limited number of events makes this method applicable to unstable nuclei far from the stability line, enabling simultaneous measurement of over a dozen nuclei within a single cocktail beam. To extend these measurements to a broad range of nuclei, the S3CAN (Symbiotic Systematic and Simultaneous Cross-section Measurements for All over the Nuclear Chart) experiments have been launched.

In the 2024 fiscal year, we successfully measured the interaction cross sections of approximately 150 nuclides within 48 hours as part of this project. While each result will be detailed in poster presentations by the co-authors, this presentation will provide an overview of the experimental methodology for cross-section measurements, recent progress, and future plans.

### Type of contribution

poster

#### Are you a student or postdoc?

no

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