

Measurement of Interaction Cross Sections in the RIKEN TRIP-S3CAN program/理研 TRIP-S3CAN プ グラムにおける相互作用断面積測定

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RIKEN Transformative Research Innovation Platform of RIKEN Platforms (TRIP) project was launched in FY2023. The main objective of the TRIP project is to establish a next-generation research DX (digital transformation) platform by accumulating and integrating high-quality data to interconnect all RIKEN platforms. One of the experimental programs in the field of nuclear physics within the TRIP project is called Symbiotic Systematic and Simultaneous Cross-section measurements for All over the Nuclear chart (S³CAN). In the TRIP-S³CAN program, we are measuring interaction cross sections of various nuclei that have not yet been measured, aiming to efficiently accumulate comprehensive nuclear data. It is known that measurements of interaction cross sections provide an effective method to extract nuclear size properties such as density distributions and matter radii. The experiments are conducted at the Radioactive Isotope Beam Factory (RIBF) at RIKEN, which is an accelerator facility capable of producing a wide variety of nuclei. Thanks to recent improvements in the data acquisition system and rapid beam tuning at RIBF, it is now possible to measure interaction cross sections of approximately ten nuclei within about three hours under a single beam setting. So far, we have measured about 150 nuclei in FY2024, and another 150 nuclei in FY2025, covering atomic numbers in the range $Z = 14 - 60$. In this talk, we will present the details of these measurements and an overview of the recent results obtained from the TRIP-S³CAN program.

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