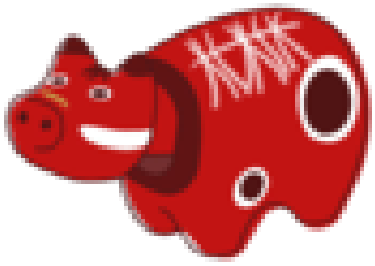

Contribution ID: **72** Type: **not specified**

Measurement of interaction cross sections for neutron-rich nuclei in the vicinity of Z=14 at RIBF

Wednesday, 5 March 2025 15:38 (1 minute)

The interaction cross section is a key physical quantity for deducing nuclear radii and plays an essential role in understanding nuclear structure, particularly for neutron-rich isotopes. In this study, we measured the interaction cross sections of Al, Si, and P isotopes near Z=14 to investigate their mass-number dependence and explore nuclear deformation effects.
The experiment was carried out at the RI Beam Factory (RIBF) of RIKEN utilizing the BigRIPS separator. A primary 70Zn beam was accelerated to 345 MeV/u and directed onto Be target positioned at F0, generating a secondary beam that included the isotopes of interest. This secondary beam, with an approximate energy of 250 MeV/u, was subsequently transported through BigRIPS, where particle identification was achieved via the TOF-Bρ-ΔE method. The time-of-flight (TOF) was measured using plastic scintillators placed at the F3, F5, and F7 focal planes, while the energy loss (ΔE) was measured with ionization chambers (ICs) at F3 and F7.
A wedge-shaped C target with a central thickness of 1.5 g/cm² was placed at the F5 focal plane. The interaction cross sections were determined using the transmission method, which evaluates the exponential attenuation of particle counts due to nuclear reactions within the target. By comparing the particle identification results before and after the target, the interaction cross sections were extracted.
The obtained interaction cross sections exhibit an increasing trend with mass number. Further analysis will focus on extracting nuclear radii from the measured cross sections and exploring possible contributions from nuclear deformation and differences in proton and neutron distributions.

Type of contribution

poster

Are you a student or postdoc?

yes

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