DREB2022 - Direct Reactions with Exotic Beams



Contribution ID: 216

Type: Oral contribution

STRASSE: A silicon tracker for quasi free scattering measurement at the RIBF

Monday 27 June 2022 12:40 (20 minutes)

STRASSE (Silicon Tracker for RAdioactive-nuclei Studied at SAMURAI Experiments) is a tracker and cryogenic target for studying the structure of atomic nuclei at the RIKEN accelerator in Japan. Exploring the evolution of the nuclear structure towards the drip line, as characterized by the changes of magic numbers, deformations, and clustering structures, is a major focus in modern nuclear physics. Exotic combinations of protons and neutrons can significantly affect the underlying shell structure, and for weakly bound nuclei at or near the dripline, the proximity to continuum states may further alter nuclear properties. Benchmarking and constraining theory at the very limits of existence is critical. However, from the experimental point of view, the accessibility to the most exotic species is usually limited by the very low production intensities for these nuclei.

STRASSE's thick LH2 target will compensate for these low rates, while its compact silicon tracker array will ensure satisfactory missing mass resolution with excellent $^{\circ}0.5$ mm reaction vertex resolution (FWHM). STRASSE will be coupled to the high-efficiency array CATANA (Cesium iodide Array for γ -ray Transitions in Atomic Nuclei at high isospin Asymmetry) with a radius of ~ 20 cm to detect gamma rays in coincidence and measure the total kinetic energy of recoil protons at RIBF. This new device will allow us to combine in-beam gamma-ray and missing mass spectroscopy.

Topic

Experiment

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Session Classification: MON2