Contribution ID: **74**   Type: **Invited talk**

Latest developments at the FRS Ion Catcher

Tuesday, 9 May 2023 16:40 (30 minutes)

Jiajun Yu, for the FRS Ion Catcher collaboration

In the FRS Ion Catcher (FRS-IC) [1-3] at GSI, short-lived nuclei produced at relativistic energies of up to 1 GeV/u at the fragment separator (FRS), are slowed down and thermalized in a cryogenic stopping cell (CSC) and identified/separated with a high-accuracy multiple-reflection time-of-flight mass spectrometer (MR-TOF-MS). High-accuracy mass measurements at the FRS-IC have been carried out over a wide range of the nuclear chart.

Over the past few years, significant technical upgrades and improvements have been incorporated into the FRS-IC setup. The IN-Cell REAction SystEm (INCREASE) experimental setup was constructed for multi-nucleon transfer and spontaneous fission experiments [4]. A slow control system has been developed to monitor, control, and log all components of the setup [5]. To ensure an ultra-pure gas condition, the gas lines, cold trap gas purifier, and trace gas line for charge-state manipulations of ions in the gas have been upgraded. Notably, the MR-TOF-MS has achieved one million mass resolving power, and a laser ablation carbon cluster ion source (LACCI) has been built and commissioned to provide calibrants for the MR-TOF-MS, achieving an accuracy of ~10-8 over the entire mass range. In addition, the 2D position sensitive MCP detector is being tested in MR-TOF-MS to enable quick system tuning. All of these latest developments at the FRS-IC will be presented in this contribution.

References:
[1] W.R. Plaß et al., Nucl. Instrum. Methods B, 317 (2013) 457
[2] W.R. Plaß et al., Int. J. Mass Spectrom. 394 (2013) 134
[3] T. Dickel et al., Nucl. Instrum. and Methods A, 777 (2015) 172
[4] R. Adrian et al., Nucl. Instrum. Methods B, 512 (2022) 83-90
[5] A.N. State et al., Nucl. Instrum. and Methods A 1034 (2022): 166772

Primary author: YU, Jiajun

Presenter: YU, Jiajun

Session Classification: Plenary Session 6