Contribution ID: **144** Type: **Invited**

Mass measurements and studies for the r process at IGISOL

Tuesday, 6 September 2022 14:00 (30 minutes)

The Ion Guide Isotope Separator On-Line (IGISOL) facility [1] in the JYFL Accelerator Laboratory at the University of Jyväskylä offers plenty of opportunities for r-process studies. At IGISOL, neutron-rich nuclei relevant for the r process have been typically produced using proton-induced fission on natural uranium target. Recently, multinucleon-transfer (MNT) reactions to produce neutron-rich nuclei beyond the fission fragment region have been investigated at IGISOL [2]. A new ion guide gas cell and target platform have been designed and commissioned. The goal is to broaden the range of nuclei that can be studied at IGISOL via decay spectroscopy or high-precision mass measurements, which utilise the JYFLTRAP Penning trap [3] or the new Multi-Reflection Time-of-Flight mass spectrometer.

We have recently measured masses of dozens of neutron-rich nuclei with the JYFLTRAP Double Penning-trap mass spectrometer. With the Phase-Imaging Ion-Cyclotron Resonance (PI-ICR) technique at IGISOL [4,5], we have resolved the ground and isomeric states in several neutron-rich nuclei for the first time and improved the accuracy of the ground-state masses. In this contribution, I will give an overview on recent activities related to the r process at IGISOL, with a focus on high-precision mass measurements of fission fragments and prospects for the MNT reactions at IGISOL.

[1] I.D. Moore et al., Nucl. Instr. Meth. Phys. Res. 317 (2013) 208.
[2] A. Spataru, et al., Acta Phys. Polon. B 51 (2020) 817.
[3] T. Eronen et al., Eur. Phys. J. A 48 (2012) 46.
[4] D.A Nesterenko et al., Eur. Phys. J. A 54 (2018) 154.
[5] D.A Nesterenko et al., Eur. Phys. J. A 57 (2021) 302.

Field of work

Primary author: KANKAINEN, Anu

Presenter: KANKAINEN, Anu

Session Classification: Tuesday - Session 3