

SMI-2023: 14th International Conference on Stopping and Manipulation of Ions and Related Topics



Contribution ID: 38

Type: **contributed talk**

Status of the development of a MR-ToF MS for JetRIS for laser spectroscopy of heavy actinides at GSI/HIM

Tuesday, 9 May 2023 12:10 (20 minutes)

At GSI, Darmstadt, Germany we use the in gas-Jet Resonant Ionization Spectroscopy (JetRIS) apparatus [1] to perform laser spectroscopy of elements in the heavy actinide region to determine their atomic and nuclear properties. JetRIS presently utilizes α -decay detection to maximize sensitivity while minimizing the background from unwanted ions. However, for long-lived nuclides ($t_{1/2} > 10$ h) a decay-based detection will not be practical. Thus, a multi-reflection time-of-flight mass separator (MR-ToF MS) is being developed for the JetRIS apparatus, allowing a separation of ions according to their mass-to-charge ratios with a high mass-resolving power, opening the possibility of mass-selected ion detection. This will also allow measuring β -decaying species and long-lived isotopes. An overview of the MR-ToF MS design and its integration into the system will be given. Prospects for future measurements will be discussed.

[1] S. Raeder et al., NIM-B 2020, 463, 272–276.

Primary author: Mr MÜNZBERG, Danny (GSI Helmholtzzentrum für Schwerionenforschung, Darmstadt, DE; Helmholtz-Institut, Mainz, DE; Johannes Gutenberg-Universität, Mainz, DE)

Co-authors: BLOCK, Michael (GSI Helmholtzzentrum für Schwerionenforschung, Darmstadt, DE; Helmholtz-Institut, Mainz, DE; Johannes Gutenberg-Universität, Mainz, DE); BRIZARD, Alexandre (GANIL, Caen, France); CLAESSENS, Arno (KU, Leuven, Belgium); FERRER, Rafael (KU, Leuven, Belgium); FISCHER, Paul (Universität Greifswald, DE); LAATIAOUI, Mustapha (Johannes Gutenberg-Universität, Mainz, DE); LANTIS, Jeremy (Johannes Gutenberg-Universität, Mainz, DE); LECESNE, Nathalie (GANIL, Caen, France); RAEDER, Sebastian (GSI Helmholtzzentrum für Schwerionenforschung, Darmstadt, DE; Helmholtz-Institut, Mainz, DE); SAVAJOLS, Hervé (GANIL, Caen, France); SCHLAICH, Moritz (Technische Universität, Darmstadt, DE); SCHWEIKHARD, Lutz (Universität Greifswald, DE); STEMMLER, Matou (Johannes Gutenberg-Universität, Mainz, DE); VAN BEEK, Kenneth (GSI Helmholtzzentrum für Schwerionenforschung GmbH, Technische Universität, Darmstadt, DE); VAN DUPPEN, Piet (KU, Leuven, Belgium); WALTHER, Thomas (Technische Universität, Darmstadt, DE); WENDT, Klaus (Johannes Gutenberg-Universität, Mainz, DE); WIENHOLTZ, Frank (Technische Universität, Darmstadt, DE)

Presenter: Mr MÜNZBERG, Danny (GSI Helmholtzzentrum für Schwerionenforschung, Darmstadt, DE; Helmholtz-Institut, Mainz, DE; Johannes Gutenberg-Universität, Mainz, DE)

Session Classification: Plenary Session 4