Contribution ID: **17** Type: **Contributed talk**

TRIGA-SPEC – recent developments and status

Friday, 12 June 2015 10:00 (20 minutes)

The TRIGA-SPEC experiment [1] at the research reactor TRIGA Mainz consists of a Penning-trap experiment for mass measurement (TRIGA-TRAP) and a collinear laser spectroscopy setup (TRIGA-LASER). These setups are the prototypes for the MATS- and the LASPEC-Experiments at FAIR [2] and are also used for technical developments to improve the sensitivity and accuracy of the techniques. For TRIGA-SPEC short-lived isotopes produced by neutron-induced fission of 235U, 239Pu or 249Cf in a target chamber located close to the reactor core are available. The fission products are transported to the on-line surface ionization source by a gas jet [3], where they are ionized. The ions are accelerated to 30 keV and mass-separated in a dipole magnet. To increase the detection efficiency of both experimental branches, a radiofrequency-quadrupol cooler and buncher (RFQCB) [4] is included in the common beamline. The energy spread and temporal width of the bunches have been characterized and optimized by time resolved collinear laser spectroscopy in the optical detection region of the TRIGA-LASER setup. This is very important for the injection into the Penning-trap system for precision mass spectrometry as well as for collinear laser spectroscopy.
Besides the on-line capabilities both experiments are equipped with off-line ion sources: a laser ablation source on the TRIGA-TRAP branch and a surface ion source on the TRIGA-LASER branch. Besides serving for the off-line development of the system, they were recently also used for mass measurements of trans uranium elements [5] and collinear laser spectroscopy of stable Ca+ ions were performed with improved accuracy compared to previous measurements.
A short overview of the TRIGA-SPEC setup and latest results will be presented.
[1] J. Ketelaer et al., Nucl. Instr. Meth. A 594, 162 (2008)
[2] D. Rodriguez et al., Eur. Phys. J. Special Topics 183, 1-123 (2010)
[3] M. Eibach et al., NIMA 613, 226 (2010)
[4] T. Beyer et al., Appl. Phys. B 114, 129 (2014)
[5] M. Eibach et al., Phys. Rev. C 89, 64318 (2014)

Supported by the max-Planck-Society, the Helmholtz Association, the Bundesministerium für Bildung und Forschung, PRISMA cluster of excellence, HIC for FAIR.

Primary author: Mr KAUFMANN, Simon (Institut für Kernchemie Uni-Mainz)

Co-authors: Mr GORGES, Christian (Institut für Kernphysik TU Darmstadt); DÜLLMANN, Christoph Emanuel (GSI, Darmstadt); Dr GEPPERT, Christopher (Institut für Kernchemie, Universität Mainz); Mr RENISCH, Dennis (Institut für Kernchemie, Universität Mainz); Mr SCHNEIDER, Fabian (Universität Mainz); GRUND, Jessica (Institut für Kernchemie, Universität Mainz); Prof. BLAUM, Klaus (Max-Planck-Institut für Kernphysik); Dr EBERHARDT, Klaus (Institut für Kernchemie, Universität Mainz); BLOCK, Michael (GSI, Darmstadt); Dr NAGY, Szillard (MPIK Heidelberg); Mr BEYER, Thomas (Max-Planck institute for nuclear physics); Prof. NOERTERSHAEUSER, Wilfried (TU Darmstadt)

Presenter: Mr KAUFMANN, Simon (Institut für Kernchemie Uni-Mainz)

Session Classification: Instrumentation

Track Classification: Instrumentation