



Contribution ID: 78

Type: **Poster**

Recent developments of ISOLTRAP's MR-ToF MS

Monday, 17 September 2018 17:47 (1 minute)

The Multi Reflection Time-of-Flight Mass Spectrometer (MR-ToF MS) of ISOLTRAP has been used successfully for several years for precision mass measurements and ion purification. Nevertheless, further improvements are still possible concerning, e.g. the ion optics, beam preparation and stability of the system. All these issues were addressed in a series of systematic studies reported here. High-precision mass measurements require a pulsed ion beam with a narrow spread in time and energy. Therefore, the ions are cooled and bunched in a gas-filled radiofrequency linear quadrupole trap. The effect of the buncher radiofrequency field on the beam quality and time-of-flight was studied with simulations and experimentally using an off-line alkali source. The energy width of the ion bunch was studied in different experimental conditions. This led to a reduction of the systematic mass dependent shifts and to more symmetric peak shapes. The stability of the MR-ToF MS was addressed in order to determine and reduce the impact of voltage fluctuations and to compensate for voltage drifts during data analysis. This allowed to improve and estimate the accuracy of MR-ToF MS measurements using off-line references. In addition, a new einzel lens was simulated, designed and implemented in order to improve the injection efficiency into the MR-ToF MS.

Primary author: STEINSBERGER, Timo Pascal (Max-Planck-Gesellschaft (DE))

Co-authors: ATANASOV, Dinko (Technische Universitaet Dresden (DE)); BLAUM, Klaus (Max-Planck-Gesellschaft (DE)); HERFURTH, Frank; Mr KARTHEIN, Jonas (Ruprecht Karls Universitaet Heidelberg (DE)); MANEA, Vladimir (Max-Planck-Gesellschaft (DE)); MOUGEOT, Maxime (Universit  Paris-Saclay (FR)); SCHWEIKHARD, Lutz Christian (Ernst Moritz Arndt Universitaet (DE)); WELKER, Andree (Technische Universitaet Dresden (DE)); WIENHOLTZ, Frank (CERN); ZUBER, Kai (Technische Universitaet Dresden)

Presenter: STEINSBERGER, Timo Pascal (Max-Planck-Gesellschaft (DE))

Session Classification: Poster Session 1

Track Classification: Ion traps and laser techniques