



## Nuclear astrophysics and in-source laser spectroscopy using ISOLTRAP

The four trap mass spectrometer ISOLTRAP is an experiment primarily dedicated to precision mass measurements of radioactive nuclides. It is located at ISOLDE allowing investigations of ions produced via spallation, fission or fragmentation by impinging a 1.4 GeV proton beam on hot targets. The current ISOLTRAP setup consists of a linear segmented radio-frequency cooler and buncher, a multi-reflection time-of-flight mass separator (MR-ToF MS), a preparation Penning trap and a precision Penning trap. The unique combination of traps recently allowed us to study the very neutron-rich isotopes of Cadmium. The masses of  $^{129-131}\text{Cd}$  isotopes around the  $N = 82$  shell closure were determined. The studied masses are of great importance as they serve as input parameters to the astrophysical r-process. Furthermore, ISOLTRAP has the ability to assist the in-source laser spectroscopy program at ISOLDE by complementing the Resonance Ionization Laser Ion Source (RILIS). RILIS is a chemically selective ion source using multi-step resonant excitation of atoms. In combination with the MR-ToF MS we successfully obtained the hyperfine structure of Astatine isotopes, from which charge radii and electromagnetic moments can be extracted. In this contribution the current setup of ISOLTRAP will be presented as well as the techniques for mass measurements of Cd isotopes and furthermore the laser-spectroscopy measurements of the hyperfine structure in the isotopic chain of At.

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