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Isotopenforschung und Kernphysik

E I N L A D U N G

zum

V E R A - S E M I N A R

von

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The ILIAS project: Selective laser photodetachment in an RFQ ion cooler

The Ion Laser Interaction Setup ILIAS is a facility at the VERA Laboratory for studying laser photodetachment of negative ions. The aim of the project is to develop a novel technique for element-selective filtering of negative ion beams and to apply this method for isobar suppression in Accelerator Mass Spectrometry. It will allow the detection of long-lived radioisotopes, which are currently inaccessible due to strong interference from stable isobars.

The idea is that unwanted negative ion species can be selectively neutralized with a high intensity laser beam of appropriate energy, provided that the electron affinity of the radioisotope of interest is higher than that of its isobars. Since depletion factors of several orders of magnitude typically require ion laser interaction times of several ms, the keV-ions have to be decelerated inside a gas-filled radiofrequency quadrupole where the beam is cooled down to thermal energies by collision with a He buffer gas. During the latest experiments, cooled negative ion beams of more than 100nA were extracted from the ILIAS ion cooler. With a suitable high-power laser more than 99.99% of unwanted ions were neutralized by photodetachment.

Following a detailed description of the ion cooler setup, we will discuss the recent experimental results and give an outlook on the next steps of this project.

Donnerstag, 30. Oktober 2014, 16:30 Uhr

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