Beitrag ID: **37** Typ: **Poster**

Ionisation Phenomena in Stored Highly Charged Ions at Relativistic Laser Intensities

Montag, 15. September 2025 16:30 (1 h 30m)

Interaction of high-intensity lasers with highly charged atomic ions is
widely explored field in theory while there is still a lack in experimental data.
In the past, several experiments have analyzed high-intensity laser
ionization of gases. However, experiments of relativistic laser beams
targeting highly charged ions would allow for addressing only the
weakest bound electron in the target ion which can be described more
precisely by the elaborated theoretical models. Nevertheless, such experiments remain scarce due to the complexity of the needed setup
which calls for a combination of highly charged ions together with the
ability to trap, analyze and control the ions to pinpoint accuracy
while still being able to expose the ions to a high-intensity laser.
In our working HILITE setup, highly charged ions are created in an
electron beam ion trap, species selected by a Wien filter, and finally
stored, analyzed and confined a Penning trap for several seconds in a
defined position. We have connected this setup to the 200
Terawatt Femtosecond Laser system JETi200 and perform
ionization dynamics beyond 10^19 W/cm². We will present the experiment's purpose and preliminary results.

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Sitzung Einordnung: Poster Session