



Institutskolloquium

Am **28. September 2005, 16:00 Uhr** spricht:

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über

**New features in strong-field double ionisation
and photodetachment**

Ort: Max-Born-Saal, MBI, Max-Born-Str. 2a

Interessenten sind herzlich eingeladen.

Prof. Dr. I. V. Hertel

New features in strong-field double ionization and photodetachment

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At moderate laser intensities ($2 - 4 \times 10^{13}$ W/cm²) and pulse lengths of approximately 100 fs we observe a pronounced variation of the yield of double ionization of xenon and krypton in the range between 800 and 1600 nm. We attribute the strong wavelength dependence to resonant excitation of the core-ion $ns^2 np^5 \rightarrow ns^1 np^6$, assisted by electron impact ionization of the excited ion by the rescattered electron.

In a second topic we describe results on selective detection of electrons formed in double ionization obtained by gated photoelectron coincident imaging with ion recognition. The angle-resolved momentum distribution of electrons from xenon reveals that emission along the polarization axis of the laser is largely avoided in double ionization while it is preferred in single ionization.

We also discuss experiments which explore the influence of the atomic polarizability on the momentum distribution in strong field photodetachment, comparing results for H^- and F^- in linear and circular polarization at near-infrared wavelengths.

In a final topic we propose to detect microscopic electric currents in ordered molecular media from the electromagnetic radiation field emitted by these currents. For typical molecular time scales this radiation falls into the GHz to THz range, a range which can be detected in a phase- and amplitude-sensitive fashion. This approach may serve to diagnose photoinitiated molecular dynamics, as well as its dissipation and decoherence.

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