Research Labworks and Master Thesis on

Ionization dynamics with shaped XUV-pulses

High Harmonic Generation in a capillary enables controlling the spectral shape of XUV-pulses via temporally shaping of the driving laser field. The process of High Harmonic Generation automatically implies that this spectral shaping is connected to temporal shaping of the XUV-pulses in the attosecond timescale. In addition to that these XUV-pulses can be used to control chemical reactions.

The topic will include several of the listed subjects and activities:

**Covered subjects**

- Electron and ion time-of-flight spectrometry
- Femtochemistry and coherent control
- Light-matter-interaction in the strong-field regime
- Characterization of attosecond pulses

**Experimental and theoretical activities:**

- Implementation of an optimization algorithm for mass spectroscopy of ionization fragments in LabVIEW
- Investigation of ionization processes of IR/XUV-pulses with atoms and molecules
- Temporal characterization of the XUV source
- Simulation of IR/XUV-crosscorrelations with shaped pulses

**Related literature:**

[2] T. Pfeifer et al., Towards optimal control with shaped soft-x-ray light, Optics Express, DOI: 10.1364/OE.15.003409

**Contact for further information and application**

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