

New insights into ultrafast molecular dynamics with femtosecond pulses of a higher harmonic source

The current status of project P2 “Ultrafast charge transfer and isomerization dynamics of molecules” will be presented. The goal is to resolve the early-stage dynamics of energy relaxation concomitant with structural rearrangements in Fe(CO)₅ in the gas phase. Photoexcitation generates a metal-to-ligand charge transfer in Fe(CO)₅ that launches a sequence of processes on time scales of 20-30 fs before the molecule dissociates after approximately 150 fs. The aim is to resolve these early steps with pump-probe valence-band photoelectron spectroscopy with femtosecond VUV pulses from high-order harmonic generation. The table-top source for this and an outline of the principles of higher harmonic generation and of the Fe(CO)₅ experiments will be presented.

Primary author: Mr SCHRÖDER, Henning (Helmholtz-Zentrum Berlin)

Co-authors: FÖHLISCH, Alexander (Helmholtz-Zentrum Berlin für Materialien und Energie); Mr DRUBE, Hardy (Helmholtz-Zentrum Berlin); SORGENFREI, Nomi (Universität Hamburg, Department of Physics and Center for Free-Electron Laser Science); WERNET, Phillipe (Helmholtz-Berlin für Materialien und Energie); MITZNER, Rolf (Helmholtz-Zentrum Berlin für Materialien und Energie)

Presenter: Mr SCHRÖDER, Henning (Helmholtz-Zentrum Berlin)

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