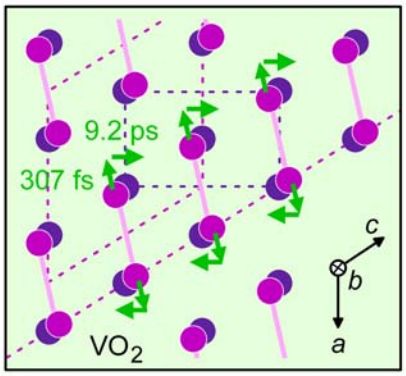
Munich-Centre
for Advanced Photonics (MAP)

Doktorarbeit / PhD Thesis

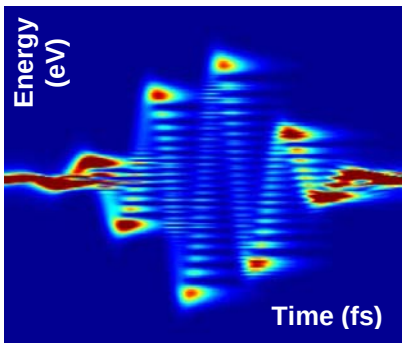
Attosecond Auger-Electron Streaking



Baum, Yang, Zewail, Science 318, 788 (2007).

The length and time scales of atoms in motion are *picometer* and *femtoseconds*; electrons can move within *attoseconds*. Ultrafast electron diffraction provides direct a visualization of atomic-scale action in all four dimensions of space and time – a 'movie' of what happens during processes like phase transformations, chemical reactions, or electronic transitions in solids.

Our group aims at shortening the electron pulse duration into the regime of attoseconds. Hence we first need to find a way for measuring such extremely short durations. One approach is based on 'streaking' in laser fields: The short electron pulses hit a surface and generate secondary Auger electrons, which are shifted in energy because they are created during the presence of a laser pulse. This provides 2D-spectrograms that allow reconstruction of, both, the laser's electric field and the electron pulse duration.



Your task will be to add this capability to an existing ultrafast diffraction apparatus, and operation of this experiment. Besides characterizing electron pulses, we will also obtain insight into the physics and timing of secondary electron generation with attosecond resolution. The research is part of the excellence cluster "Munich Centre for Advanced Photonics" (MAP) and is located at LMU in Garching.

We require enthusiasm for experimental work, experience with vacuum systems, femtosecond lasers, or electron beams, and excellent grades. Please contact us with a CV! (gerne auch auf deutsch)

Dr. Peter Baum
Max-Planck-Institute for Quantum Optics, and
Ludwig-Maximilians-Universität München
Am Coulombwall 1, 85748 Garching

Tel: +49 89 289 14102
Email: peter.baum@lmu.de
Web: *www.ultrafast-electron-imaging.de*