Contribution ID: **51** Type: **not specified**

FEL and HHG-based time-of-flight momentum microscopy: 3 time-resolved photoemission modalities in 1 experiment

Time-resolved photoemission spectroscopy with ultrashort pump and probe photon pulses is an emerging technique with wide application potential. The ultimate combination of valence-band and core-level spectroscopy with photoelectron diffraction in a single experiment for electronic, chemical, and structural dynamics analysis specifically requires tunable monochromatic VUV or soft X-ray pulses at a high repetition rate as well as highly efficient single-shot electron detectors with increased multi-hit capabilities. Thus, combining the table-top experiment with a big scale facility sets the stage for measuring the k_z-dependent ultrafast dynamics of 3D electronic structure, including band structure, Fermi surface, and carrier dynamics in 3D materials as well as 3D orbital dynamics in molecular layers. We have realized such a 3-in-1 ultrafast photoemission experiment at a high-harmonic-generation (HHG) table-top source in combination with PG2/FLASH, DESY merging free-electron-laser capabilities with a multi-dimensional recording scheme.
During the training period, the candidate will take part in two beamtimes at the free-electron laser FLASH, as well as be involved in laboratory-based experiments. The proportion of typical daily work will be distributed as follows: "physics" –40 %, "computing" –25% and "engineering" –35%.
Since this experimental technique produces multi-dimensional data and deals with "big data", candidates with a focus on the area "B2: Data processing (software-oriented)"are also very welcome to apply.

Field

A1: Solid-state physics and nanoscience (application oriented)

DESY Place

Hamburg

DESY Division

FS

DESY Group

FS-FLASH-O

Special Qualifications:

Good team skills, good English language skills, experience in programming,

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