

PhotonMEADOW 2023

Contribution ID: 31

Type: Poster

TRIXS end-station at FLASH for ultrafast high-resolution soft X-ray spectroscopy

We present the upgraded TRIXS (Time-Resolved Inelastic soft X-ray Scattering Spectrometer) end station at the PG1 monochromator beamline at the soft X-ray free-electron laser FLASH [1]. TRIXS was developed for studies of ultrafast processes in condensed matter, e. g. various types of interactions in strongly correlated electronic systems, by means of femtosecond pump-probe IXS technique with the energy resolution of about 50 - 100 meV. The spectral range of TRIXS spans from 40 eV to 250 eV and covers M-edges of the 3d transition metals and N-edges of rare earth elements. High brilliance and high repetition rate photon source as FLASH and high spectrometer collecting efficiency are mandatory for such type of experiments. A recent upgrade of the sample allows now to explore dynamics also in XAS in transmission as well as in reflectivity regimes with 0.01-degree angular resolution. FLASH synchronized femtosecond facility laser PIGLET provides 80 fs fwhm long pulses to pump samples with 1030 nm photons as well as with higher harmonics down to 257 nm. The overall time-resolution is in the range between 180 and 250 fs fwhm. First time-resolved RIXS measurements were already carried out with the new TRIXS chamber and further experiments are envisioned. New control system and machine-learning-based alignment and stabilization algorithms will provide a better user interface and even more stable operation, and cover new FLASH features that will become available after the FLASH2020+ upgrade.

[1] S. Dziarzhytski et al. Structural Dynamics 7, 054301 (2020), <https://doi.org/10.1063/4.0000029>

Journal of Synchrotron Radiation Special Issue: will you submit your contribution?

no

Primary author: Dr DZIARZHYTSKI, Siarhei (Deutsches Elektronen Synchrotron (DESY))

Co-authors: SINHA, Mangalika (DESY); WEIGELT, Holger (DESY); PRESSACCO, Federico (DESY); PLÖNJES, Elke (Deutsches Elektronen-Synchrotron DESY); BEYE, Martin (DESY); BRENNER, Günter (DESY)

Presenter: Dr DZIARZHYTSKI, Siarhei (Deutsches Elektronen Synchrotron (DESY))

Session Classification: Poster Session