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The pump-probe laser infrastructure of the SXP instrument at the European XFEL

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This contribution presents the femtosecond pump-probe laser infrastructure of the Soft X-ray Port (SXP) scientific instrument at the European XFEL. This experimental platform is primarily designed for time- and spinresolved photo-electron spectroscopy, but investigations of complex chemical and bio-inorganic molecular systems by means of fluorescence spectroscopy as well as research on highly charged ions is also envisioned. It is located behind the SASE3 soft X-ray undulator providing FEL radiation with variable polarization in the photon energy range between 260eV and 3000eV (4.8nm to 0.4nm) with 0.1 to 2x10e14 photons per pulse and up to 27000 pulses per second. Two high-quality elliptical mirrors in Kirkpatrick-Baez configuration will focus the femtosecond FEL pulses to a FWHM spot size of approximately 1µm in diameter, resulting in an intensity of more than 10e18 W/cm2 in the interaction region. Together with a powerful synchronized laser amplifier system, whose wavelength range is currently extended into the infrared as well as extreme ultraviolet region, it will pave the way for ultrafast pump-probe investigations at the SXP instrument combining intense and tunable soft X-rays with versatile optical laser capabilities.

Primary authors: GRYCHTOL, Patrik (European XFEL); Dr VARDANYAN, Vahagn (European XFEL); Dr DOBLAS-JIMENEZ, David (European XFEL); Dr IZQUIERDO, Manuel (European XFEL)

Presenter: GRYCHTOL, Patrik (European XFEL)

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