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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 spin-resolved 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 2×10^{14} 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 $1 \mu\text{m}$ in diameter, resulting in an intensity of more than 10^{18} W/cm^2 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.

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