Contribution ID: **66** Contribution code: **WEO03** Type: **Contributed Oral Presentation**

2-color pump probe optical delay line

Wednesday 17 September 2025 11:00 (20 minutes)

The SASE3 soft X-Ray beamline at the European XFEL is equipped with a magnetic chicane allowing two-color X-ray pump probe experiments. This chicane splits the undulator area in two, the first part generates photons with a specific wavelength, then the electron beam is delayed with respect to the produced photons and lasers in the second section at another wavelength. The Optical Delay Line (ODL) installed along the photon path will increase the variety of experiments achievable. The ODL consists in four flat mirrors mounted in a vertical chicane geometry creating a fix delay to the photons produced and allows, in combination with the variable magnetic chicane, the two pulses to be crossed with negative or zero-time delay. The device adjustments need a motion resolution down to tens of nanometer and very high stability due to the long distance to the experiment (⊠520m). All mechanics are mounted in UHV and particle free conditions and comply to the electron accelerator specifications. The ODL project is a collaborative effort of European XFEL and FMB Berlin GmbH. In this contribution, the conceptual design, final design, mechanical challenges and the first tests are described.

Footnotes

Funding Agency

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Session Classification: Beamlines Session 3

Track Classification: BEAMLINES: Optics