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High-Resolution Pulse-to-Pulse Spectral Monitoring for SwissFel

Tuesday, 27 October 2020 11:00 (20 minutes)

The spectrum of SASE XFEL sources exhibits strong variations pulse-to-pulse. As a consequence, XFEL-driven experiments, XFEL optimization or "new-modes"development rely on X-ray spectrometers functioning on a shot-to-shot basis.
We will discuss the potentiality of the setup used at SwissFEL, as well as results obtained during its commissioning.
Several arrangements of transmission gratings, e.g. having a pitch of 100 nm, and bent crystals (e.g. Si(220)) with various bending radii (e.g. between 75-200 mm) allowed measuring the SASE spectrum with high resolution, e.g. about 0.4 eV (FWHM) at 7.1 keV was achieved without gratings. Possible "dependencies"with the FEL profile or bent crystals alignment, as well as "dispersive"XAS measurements will be presented.

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