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Demonstration of Large Bandwidth Mode with a Spatially Tilted Beam at SwissFEL

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X-ray absorption spectroscopy (XAS) with a SASE signal can be improved if the full XAS and reference spectrum are taken on a shot-to-shot basis, thus eliminating the impact of the intrinsic SASE fluctuations in the spectrum. This can be further improved if the FEL pulse has the frequency information encoded in its spatial position. The spatial encoding is achieved when a spatially tilted electron beam with a strong energy chirp is injected into a focusing-free undulator channel. We report on the demonstration of this mode at the hard X-ray beamline Aramis at SwissFEL. Possible applications and an outlook for further studies are discussed.

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Primary authors: REICHE, Sven (Paul Scherrer Institut); PRAT, Eduard (Paul Scherrer Institut); FERRARI, Eugenio (DESY); JURANIC, Pavle (Paul Scherrer Institut); BACELLAR CASES DA SILVEIRA, Camila (Paul Scherrer Institut); DIJKSTAL, Philipp (Paul Scherrer Institut)

Presenter: REICHE, Sven (Paul Scherrer Institut)

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