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Spatio-temporal overlap procedures for seeding at FLASH

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Externally seeded FEL schemes with harmonic up-conversion, e.g. Echo-Enabled Harmonic Generation (EEHG), deliver pulses with improved spectro-temporal properties and shot-to-shot stability at wavelengths down to the XUV and X-ray range. Such schemes rely on the manipulation of the longitudinal phase space of the electron beam at the wavelength of the seed laser, for which it is crucial that both beams overlap longitudinally and transversely inside a short undulator (modulator).
In preparation for the high repetition rate seeded FEL user operation planned for the FLASH2020+ upgrade of FLASH (DESY, Hamburg), EEHG is explored in the Xseed project. In this contribution, the recent optimization of the procedures for setting up and transversely maintaining the overlap is presented.

Footnotes

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