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Experimental test of a new method of generation of ultrashort pulses in X-ray FELs

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Typically, in Self-Amplified Spontaneous Emission Free Electron Laser (SASE FEL) based short-pulse schemes, pulse duration is limited by FEL coherence time. A method, proposed in [1], allows to overcome the coherence time barrier and to get much shorter pulses. When lasing part of an electron bunch is much shorter than coherence time, one can suppress the radiation in the long main undulator while preserving microbunching within that short lasing slice. Then a short radiation pulse is produced in a relatively short afterburner. We performed first experimental tests of this concept at the soft X-ray FEL user facility FLASH. The results are presented and discussed in this contribution.

[1] E. Schneidmiller, Phys. Rev. AB 25, 010701 (2022)

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Footnotes

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