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Self-Synchronized and Cost-Effective Time-Resolved Measurements at X-Ray Free-Electron Lasers with Femtosecond Resolution

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Temporal diagnostics of FEL pulses are generally of great benefit to FEL facilites, in particular to provide information to users and for the setup of special modes such as fresh-slice schemes. In this contribution we present FEL power profile measurements with femtosecond resolution at SwissFEL. The FEL temporal profiles are obtained from the longitudinal phase-space of the electrons after the undulator section. We use the transverse wakefields of a corrugated structure to horizontally streak the electron beam, and vertical dispersion to access the energy information. The advantages of this approach, in comparison to the standard streaking using transverse deflecting rf structures, are cost-effectiveness and stability against arrival time jitter.

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Yes

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