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Attoseconds at Harmonics at the European XFEL: First Results at SASE3

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We report on the first observation of short, single-spike events generated at the SASE3 beamline of European XFEL via the “attosecond at harmonics method”. The approach was first proposed in [1]. We created bunching in the linear regime at around 0.5 keV and then, after bunching optimization by means of a magnetic chicane, we amplified the 4th harmonic bunching with a part of the undulator set to 2 keV. Due to the non-linear transformation of the bunching during the harmonic jump, radiation generated using this scheme occasionally exhibits single spike spectra (about a percent of the shots, which makes it attractive to use the method at high repetition-rate FELs). We expect those to correspond to single spikes in time-domain. We replicated the experiment numerically with the help of the GENESIS code.

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Yes

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