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Transversally Separated Crossed Polarized FEL Subpulses

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The extension of four-wave mixing (FWM) technique to the extreme ultraviolet and soft X-ray ranges allows to monitor the dynamics of coherent excitations of matter, when realized with the exquisite coherent property of bright FEL pulses. We show for the first time a scheme to provide transversally separated pulses with parallel or crossed linear polarizations, realized at FERMI FEL. This configuration paves the way to explore additional features of pump&probe and FWM techniques, and, in particular, the possibility to excite a transient polarization grating on the sample. For this reason, such a technique is important the detection of circular dichroism and chiral properties of matter and the characterization of spin waves and magnons. By tailoring the electrons trajectory along the undulator line, we demonstrate the possibility of deliver balanced and stable couple of pulses with an horizontal separation of the order of millimeters at the experimental station.

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Yes

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