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Exotic configurations in seeded FELs for versatile FEL pulses

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Nowadays, free-electron lasers (FEL) are the brightest lightsources in the extreme ultraviolet and x-ray domain. The generation of multicolor multi-pulses either simultaneously or delayed with controlled frequency separation has led to experiments based on pump-probe or multiwave mixing. In addition, the generation of circularly polarized FEL light has enabled to study structural and symmetry properties of matter with circular dichroism experiments. More recently, the generation of XUV vortex beams has extended the characterisation possibilities of materials such as orbital angular momentum dichroism.

In seeded FELs, the amplification process is expedited by the use of an external seed. In that case, the FEL light inherits some properties of the seed laser such as the temporal coherence property and the control of the time duration and bandwidth. The combination of the aforementioned FEL capabilities has paved the way to a large amount of exotic configurations in seeded FELs. Exotic schemes implemented at the seeded FERMI FEL are presented.

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