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## The cavity based FEL project at the European XFEL

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We present the first commissioning results of the XFEL laser oscillator (XFELO) demonstrator project, a joint European XFEL and DESY effort. XFELs promise unprecedented coherence, stability and Brilliance in the hard X-ray regime. Their successful realization would mean a leap forward for the field of FELs, opening new experimental opportunities [1] and facilitating the notoriously demanding experiments at FEL facilities due to the increase in reproducibility. The demonstrator setup constructed at the European XFEL facility aims to realize the first ever true multi-bunch XFELO by achieving seeding with a bandwidth of 0.02eV at a fixed X-ray photon energy of 7 keV. Our demonstrator project shall showcase the capability to produce XFEL photon pulses with mJ-level pulse energies and high pulse-to-pulse stability. The scope of the project with its inherent challenges as well as its current status shall be presented in this contribution.

### Footnotes

[1]: B. Adams et al., Scientific opportunities with an X-ray Free-Electron Laser Oscillator, arXiv preprint, arXiv:1903.09317 (2019)

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