

LASERIX : an open facility for developments of Soft X-ray and EUV lasers and Applications.

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Abstract. LASERIX is a high-power laser facility designed to produce *High-repetition-rate XUV laser beams pumped by a Titanium:Sapphire laser*. The objectives are to develop soft X-ray lasers (SXRL) at various wavelengths and use them for applications. The facility is based on a titanium-doped sapphire (Ti:Sa), delivering pulse energy of 2 J at 10 Hz repetition rate at the exit of the front-end and 40 J before compression at 0.1 Hz repetition rate (using a Ti:Sa crystal amplifier of 10 cm in diameter).

The large width of the Ti:Sa spectrum opens the way to short pulses and to new SXRL schemes. Thus, LASERIX will provide the opportunity to study a large variety of SXRL schemes beside the conventional "transient collisional" one (OFI pumping, inner shell X-ray lasers, ...).

The 40-J beam will be basically divided in two parts that can be independently compressed, resulting in two beams of 10 J with a pulse duration which is continuously tunable between 40 fs and 500 ps. Three different EUV and soft x-ray beam lines will run simultaneously: An EUV DGRIP/GRIP laser line at 10Hz, a femtosecond EUV high order harmonic laser line at 10Hz and a high energy soft x-ray laser line at 0.1Hz.

This configuration highly enhances the scientific opportunities of the facility. Indeed it will be possible to perform both Soft X-ray laser experiments and more generally pump/probe experiments, mixing IR and EUV sources. Then, this facility will be useful for the community, **opening a large scale of Laser Interaction with Matter investigations**.

In this contribution, the main results concerning both the perspectives of the development of EUV and soft x-ray laser sources and their use for scientific applications will be presented.

Finally, we will indicate the perspectives of the LASERIX facility in the near future, especially taking into account the national (Institut de la Lumière Extrême: ILE project, laboratories working on the development of the XUV sources) and international (Extreme Light Infrastructure project) contexts.