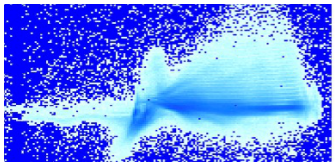

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Near-field X-ray ptychography using a laser driven X-ray source

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X-ray ptychography (NFP) is a coherent imaging technique widely used at synchrotron facilities, due to the ability to retrieve quantitative phase information of extended objects at a micrometric image resolution [1]. The advent of novel bright sources, an alternative to large-scale facilities, is paving the way for the translation of coherent X-ray imaging techniques outside synchrotrons and free electron lasers [2].
The ELI Beamlines facility of the Extreme Light Infrastructure ERIC near Prague has recently commissioned a laser-driven plasma X-ray source (PXS), based on a 20 mJ, sub-20 femtosecond, 1 kHz laser interacting with a copper tape to generate copper K-alpha emission at 8 keV with sub-ps pulses.
We present here a proof-of-concept for translating x-ray near field ptychography to laser-driven x-ray sources. In particular, we report the ELI PXS source characterization toward coherent diffraction imaging and the results of the first near field ptychographic imaging performed at a laser source. We discuss the results, limitations, perspectives and future developments.

[1] Stockmar et al., Sci Rep 3, 1927 (2013).
[2] Batey et al , Physical Review Letters, 126, 193902, (2021)

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