

An update on laser driven X-ray sources at ELI Beamlines

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Three main paths have been developed within the ELI Beamlines research program for transforming driving laser pulses into brilliant bursts of short wavelength radiation: High-order harmonic generation in gases [1], Plasma X-ray sources and sources based on relativistic electron beams accelerated in laser plasma [2]. For each of these research areas, dedicated beamlines are built to provide a unique combination of X-ray sources to the user community. The employment of these beamlines has a well-defined balance between fundamental science and applications in different fields of science and technology. Besides those beamlines, plasma betatron radiation source driven by the PW-class HAPLS laser system is being commissioned in the plasma physics platform [3] to serve as unique diagnostic tool for dense plasma and warm dense matter probing. Within this contribution we will also present a new scheme for interferometric gas jet characterization with increased sensitivity [4].

- [1] O. Hort et al., "High-flux source of coherent XUV pulses for user applications," *Opt. Express* 27, 8871 (2019).
- [2] J. Nejd et al., "Progress on laser-driven X-ray sources at ELI Beamlines", *Proc. SPIE* 11111, 11110I (2019).
- [3] S. A. Weber et al. "P3: An installation for high-energy density plasma physics and ultra-high intensity laser–matter interaction at ELI-Beamlines", *MRE* 2, 149 (2017).
- [4] J. Nejd et al. "Imaging Michelson interferometer for a low-density gas jet characterization", *RSI* 90, 065107 (2019).