1. Title:	Compact EUV Source and Optics System for Metrology and Material Interaction Studies
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3. Abstract body:
We present a compact table-top EUV source based on a laser-plasma produced in a pulsed gas jet, generating soft x-ray radiation in the spectral range from 1-20 nm. Depending on the employed target gas, both characteristic line spectra as well as quasi-continuous spectra are achievable. The system is employed for the characterization of EUV optics, such as multilayer mirrors and grazing incidence optics, as well as for the development and characterization of EUV metrology tools.

In order to produce a focus of high energy density at a wavelength of 13.5 nm, a modified Schwarzschild objective was developed and adapted to the EUV source. It consists of two spherical mirrors with Mo/Si multilayer coatings, providing a transmittance of around 42% (reflectivity ~65% per mirror @ 13.5 nm). By demagnified (10x) imaging of the source an EUV spot of 30µm diameter with an energy density of ~100mJ/cm² is generated. We present first applications of this integrated source and optics system, demonstrating its potential for high-resolution modification and structuring of surfaces. In particular, the generation of surface-near color centers in LiF crystals was investigated. Moreover, the interaction of 13.5 nm radiation with polymer surfaces was examined, showing direct EUV-induced photo-ablation. In case of PMMA, as a potential resist material for 13 nm lithography, ablation rates as a function of the applied EUV fluence were determined. Possible interaction mechanisms are discussed.