

Investigation of Luminescent Materials for EUV Metrology Applications

Oskar Hofmann^{1,2,3*}, Stefan Herbert^{1,2}, Lukas Bahrenberg^{1,2}, Serhiy Danylyuk^{1,2}, Larissa Juschkin^{2,3}, Peter Loosen^{1,2}, Silke Marienfeld⁴

¹*RWTH Aachen University, Chair for Technology of Optical Systems,
Steinbachstr. 15, 52074 Aachen, Germany*

²*JARA – Fundamentals of Future Information Technology,
Research Centre Jülich 52425, Germany*

³*RWTH Aachen University, Chair for Experimental Physics of Extreme Ultraviolet,
Steinbachstr. 15, 52074 Aachen, Germany*

⁴*ProxiVision GmbH, Robert Bosch Straße 34, 64625 Bensheim, Germany*

**Corresponding author: oskar.hofmann@tos.rwth-aachen.de*

In contrast to x-ray and ultraviolet excitation, properties of luminescent materials (i.e. phosphors and scintillators) under extreme ultraviolet irradiation have not been intensively and systematically investigated. In this contribution, the identification of promising materials for EUV metrology applications is presented. A table-top plasma source based setup, which is suitable for the investigation of conversion efficiency and degradation under EUV irradiation, is realised and will be discussed. Furthermore, experimental results on luminescent material properties under EUV irradiation will be presented and complemented with experimental investigations of self-absorbance, carried out with a commercial laser-based spectrometer setup. A summary of the most promising luminescent materials for EUV metrology applications and an outlook for material optimisation conclude this work.