

## Laser heating of pinch plasma for EUV emission: Determination of plasma parameters and spectrally resolved tomography

A laser heated gas discharge plasma source is developed, and influence of the laser pulse on plasma properties and emission characteristics is analyzed. The source consists of a hollow cathode triggered gas discharge EUV source with a custom precision trigger and a pulsed CO<sub>2</sub> TEA laser at 10.6 μm for additional heating of the magnetically self-compressed plasma pinch. An increase of emitted EUV power and pulse duration is found.

The change in the transient plasma temperature and density is retrieved by a composition sensitive analysis method from measured spectra. The method is based on plasma emission modelling using the CHIANTY atomic data base and applying a constrained and regularized linear least squares algorithm. The 3-dimensional emitting volume is determined for certain emission lines by a model based tomographic reconstruction method.

Florian Melsheimer<sup>1,2,5</sup>, Detlev Grützmacher<sup>1,3,4</sup>, Larissa Juschkin<sup>1</sup>

1 Forschungszentrum Jülich GmbH, Institute for Semiconductor Nanoelectronics, Peter Grünberg Institute-9, 52425 Jülich Germany

2 RWTH Aachen University, Templergraben 55, 52056 Aachen, Germany

3 JARA-FIT, Forschungszentrum Jülich GmbH and RWTH Aachen University, Germany

4 Forschungszentrum Jülich GmbH, JARA-Institute for Green-IT, Peter Grünberg Institute -10, 52425 Jülich, Germany

5 Fraunhofer Institute for Laser Technology, Steinbachstraße 15, 52074 Aachen, Germany

Poster presentation, Author: Florian Melsheimer (f.melsheimer@fz-juelich.de)