EXTREME ULTRAVIOLET LITHOGRAPHY

1. Title:	Laser and target optimization for the highest conversion to 13.5 nm EUV light with laser produced, minimum-mass tin plasma
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3. Abstract body:

Extreme Ultraviolet (EUV) emission from laser-produced Sn plasmas has been studied in order to provide experimental and theoretical databases aiming at clean and efficient EUV source generation. Systematic experiments were made to clarify dependences of EUV emission on laser and target conditions such as laser irradiance, pulse duration, and the initial densities of targets by taking energy deposition and plasma opacity for 13.5 nm light into consideration. A theoretical model was made to deal with power balance between incident laser and losses via plasma expansion and Planck radiation, showing a good agreement with experimental data of a wide range of parameters. Moreover minimum-mass targets including the punch-out targeta and Sn droplets, providing the highest conversion to EUV but substantially mitigating plasma debris, were experimentally investigated to quantify the minimum mass and spectra of the debris. In the presentation, the theoretical predictions and experimental results will be discussed as a guideline towards practical sources.

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