



1. Title:	Development of a Gas Jet-Type Z pinch EUV Light Source for Lithography
2. Full names of all authors:	Naoya Iizuka, Nozomu Kishi, Smruti R. Mohanty, Masato Watanabe, Akitoshi Okino, Toru Kawamura, Kazuhiko Horioka and Eiki Hotta

### 3. Abstract body:

A high repetitive, compact and low-debris Xenon Z-pinch discharge system has been designed and fabricated as an EUV light source. We have developed a new gas jet-type Z-pinch source. It has a coaxial double nozzle and a diffuser. Xenon Z-pinch plasma that emits EUV light is produced between the inner nozzle and the corresponding diffuser. A cylindrical shell consisting of a He gas curtain produced by the outer nozzle is specially designed for shielding the debris and suppressing the inner gas expansion. Diffusers control the vacuum inside the chamber for measurement. EUV beam is collected from the side of pinched plasma in the radial direction. From this structure, we can also eliminate the effects of the axially released debris, which has the larger portion of debris generated in Z-pinch devices. We have also developed a new pulse power supply system, which has two magnetic pulse compression stages to achieve high discharge current. The preliminary experimental results will be shown and discussed.

This work is partly supported by New Energy and Industrial Technology Development Organization (NEDO) and the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Grant-in-Aid for Scientific Research (A).