



1. Title:	Characterization of Debris Mitigation Techniques for a Sn- and Xe-fueled DPP EUV Light Source
2. Full names of all authors:	Keith C. Thompson Shailendra Srivastava Erik L. Antonsen David N. Ruzic

3. Abstract body:

This work studies methods for enhancing the lifetime of optical components in situ of a commercial lithography tool. The source is an XTS 13-35 z-pinch with either Sn or Xe fuels. Characterization of the ejecta is performed with an electrostatic spherical sector energy analyzer (ESA). Neutral characterization is accomplished by a microchannel plate in direct line-of-sight with the source and an electric field is used to divert ions and electrons. These methods evaluate experimental debris mitigation schemes by monitoring the output intensity of the ion and neutral ejecta along with the use of witness plates. A RF plasma is placed between the pinch and the collector area to explore the possibility of improved ion mitigation through coulomb-enhanced scattering. Experiments have shown 33% reduction in the main $q=1$ ion species at 8keV and 44% reduction in the primary $q=2$ ion species at the same energy. Comparisons were made between the debris spectra of Sn- and Xe- fueled pinches. Both spectra show singly- and doubly-charged fuel ions are the dominant species, with Xe⁺ and Sn⁺ peak measured fluxes of 4100 ± 398 and 7600 ± 737 ions/eV•cm²•pinch, respectively. Xe⁺ ions are seen in a greater abundance at higher energies and the Xe⁺² and Sn⁺² spectra differ.