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ZaP Flow Z-pinch EUV Light Source for Lithography K.A. MUNSON, U. SHUMLAK, B.A. NELSON, Aerospace and Energetics Research Program, University of Washington — The density of features on semiconductor integrated chips (ICs) can increase as the wavelength of the light used for lithography decreases. Present lithography operates at 193 nanometer (nm) wavelength to produce ICs with features at the 90 nm node. By 2015, the semiconductor industry's goal is to operate lithography at the 44 nm node. To accomplish this, an extreme ultraviolet (EUV) light source operating at 13.5 nm wavelength is required, at a power of at least 115 Watts. Using a xenon gas, the ZaP experiment is expected to produce plasma that will emit EUV radiation at the 13.5 nm wavelength. The ZaP Flow Z-Pinch Experiment is presently studying the effect of sheared flow on gross plasma stability. In the experiment, hydrogen gas has been used to produce plasma with quiescent periods in the magnetic mode activity which are 2000 times longer than other plasma concepts for creating EUV light, with 300 times the volume. Similar results have been found with xenon gas. Presently, an EUV detector is being designed using an AXUV100, Silicon/Zirconium filtered photodiode with an 11-18 nm band pass to detect any EUV emissions within that spectrum and the total power of the emissions. The design allows for other photodiodes with narrower band passes to be installed. The design of the detector and initial results will be presented.

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