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A Stark broadening method to determine the electron temperature and density of the decay plasma in a LADPP 13.5 nm EUV source QIUSHI ZHU, Department of Energy Sciences, Tokyo Institute of Technology, TAKAHIRO MUTO, JUNZABURO YAMADA, NOZOMU KISHI, MASATO WATANABE, AKITOSHI OKINO, KAZUHIKO HORIOKA, EIKI HOTTA — In order to investigate the plasma expansion behaviors and the electrical recovery process after the maximum implosion in our tin fueled laser assisted discharge produced plasma (LADPP) 13.5 nm EUV source, we develop and evaluate a simple spectroscopic method to determine the electron temperature Te and density ne simultaneously using Stark broadenings of two Sn II isolated lines spontaneously emitted from the plasma. Spatial-resolved evolutions of Te and ne of the expansion plasma during 50-900 ns after the maximum implosion is obtained using this modified Stark broadening method. The expansion velocity of the electrons is estimated to be $\sim$1.2 $\times$ 104 ms^{-1}, and t he decay time constant of ne is measured to be 183$\pm$24 ns. Based on the theories of the plasma adiabatic expansion and the electron-impact ionization, the maximum repetition rate of our LADPP EUV source is estimated to be 16 kHz.

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