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Extreme ultraviolet emission from a laser-produced lithium plasma by use of quasi mass-limited target TAKESHI HIGASHIGUCHI, KEITA KAWASAKI, NAOTO DOJYO, MASAYA HAMADA, WATARU SASAKI, SHOICHI KUBODERA, University of Miyazaki — Usage of two laser pulses is an efficient way to produce EUV emission, since a density and temperature of a plasma formed by the first laser pulse are regulated by the second laser pulse. By adjusting the delay of the second pulse, one could maximize the EUV emission at 13.5 nm. A mass-limited lithium aqueous target with several tens μm diameter was formed in a vacuum chamber through a small capillary nozzle. A subpicosecond Ti:Sapphire laser at a wavelength of 800 nm produced a maximum energy around 30 mJ. The beam was divided by a Michelson interferometer, which produced two laser pulses with energies of 5 mJ. The pulse duration was adjusted around 300 fs (FWHM). Both beams were focused on a micro-jet using a lens with a focal length of 15 cm. The delay time between the two pulses was varied from 100 to 800 ps by use of an optical delay line. Clear enhancement of the EUV emission was observed when the delay between the two pulses was around 500 ps. The experimentally observed delay agrees well with that of a plasma to expand to its critical density of 10^{21} cm^{-3}.

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