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Development of a collective Thomson scattering system for laser-produced high-Z plasmas produced for soft X-ray light sources YUTA SATO, RAIMU FUKADA, FUMITAKA ITO, KENTARO TOMITA, KIICHIRO UCHINO, Kyushu University — We have developed a collective laser Thomson scattering system, which has been adapted to detect the ion feature spectra from EUV light source plasmas, and revealed spatial profiles of plasma parameters such as electron density (ne), electron temperature (Te), and averaged ionic charge (Z). [1], [2] However, this system is not sufficient to diagnose plasmas produced for soft X-ray light sources, with which less than 10 nm wavelength emission are required. This is because there is no information on the shape of ion feature due to a high number of averaged ionic charge. To solve this problem, we have been developing a new collective Thomson scattering system, which can detect both the ion feature and the electron feature, simultaneously. Using this system, ne can be fixed by the ion feature, and Te can be specified by the ne and electron feature. Then, Z can be determined from the ion feature even when Z is larger than 15, which is predicted for the water-window light (2.3- 4.4 nm) sources. In this research, the purpose is to achieve simultaneous measurement of the laser produced tin plasmas, whose Z is larger than 10. We have already succeeded to measure ion feature, however, S/N ratio of electron feature and self-emission of the plasmas is not sufficient. Therefore, we are trying to improve S/N ration by using Stimulated Brillouin Scattering system to compress probing laser pulse width . [1] Y. Sato et al. Jpn. J. Appl. Phys. 56, 036201 (2017) [2] K. Tomita et al. Sci. Rep. 7, 12328 (2017)

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