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Measurements of line-averaged electron density of pulsed plasmas using a He-Ne laser interferometer in a magnetized coaxial plasma gun device D. IWAMOTO, I. SAKUMA, Y. KITAGAWA, Y. KIKUCHI, N. FUKUMOTO, M. NAGATA, University of Hyogo — In next step of fusion devices such as ITER, lifetime of plasma-facing materials (PFMs) is strongly affected by transient heat and particle loads during type I edge localized modes (ELMs) and disruption. To clarify damage characteristics of the PFMs, transient heat and particle loads have been simulated by using a plasma gun device. We have performed simulation experiments by using a magnetized coaxial plasma gun (MCPG) device at University of Hyogo. The line-averaged electron density measured by a He-Ne interferometer is $2\text{x}10^{21}$ m^{-3} in a drift tube. The plasma velocity measured by a time of flight technique and ion Doppler spectrometer was 70 km/s, corresponding to the ion energy of 100 eV for helium. Thus, the ion flux density is $1.4\text{x}10^{26}$ $\text{m}^{-2}\text{s}^{-1}$. On the other hand, the MCPG is connected to a target chamber for material irradiation experiments. It is important to measure plasma parameters in front of target materials in the target chamber. In particular, a vapor cloud layer in front of the target material produced by the pulsed plasma irradiation has to be characterized in order to understand surface damage of PFMs under ELM-like plasma bombardment. In the conference, preliminary results of application of the He-Ne laser interferometer for the above experiment will be shown.

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