Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

**Measurements of ion temperature and flow of pulsed plasmas produced by a magnetized coaxial plasma gun device using an ion Doppler spectrometer** Y. KITAGAWA, I. SAKUMA, D. IWAMOTO, Y. KIKUCHI, N. FUKUMOTO, M. NAGATA, University of Hyogo — It is important to know surface damage characteristics of plasma-facing component materials during transient heat and particle loads such as type I ELMs. A magnetized coaxial plasma gun (MCPG) device has been used as transient heat and particle source in ELM simulation experiments. Characteristics of pulsed plasmas produced by the MCPG device play an important role for the plasma material interaction. In this study, ion temperature and flow velocity of pulsed He plasmas were measured by an ion Doppler spectrometer (IDS). The IDS system consists of a light collection system including optical fibers, 1m-spectrometer and a 16 channel photomultiplier tube (PMT) detector. The IDS system measures the width and Doppler shift of HeII (468.58 nm) emission line with the time resolution of 1 $\mu$s. The Doppler broadened and shifted spectra were measured with 45 and 135 degree angles with respect to the plasmoid traveling direction. The observed emission line profile was represented by sum of two Gaussian components to determine the temperature and flow velocity. The minor component at around the wavelength of zero-velocity was produced by the stationary plasma. As the results, the ion velocity and temperature were 68 km/s and 19 eV, respectively. Thus, the He ion flow energy is 97 eV. The observed flow velocity agrees with that measured by a time of flight technique.

Yoshinobu Kitagawa
University of Hyogo

Date submitted: 13 Jul 2012 Electronic form version 1.4