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Measurement of pulse mode ICP plasma using multi-frequency floating probe¹ MYUNG-SUN CHOI, SEOK-HWAN LEE, GON-HO KIM, Division of Energy Systems Engineering, Seoul National University, Seoul, 151-744 Korea — Recently in plasma process, pulse mode operation of plasma source is getting popular for various processing products and it interests more in the in-situ property of pulse mode plasma. Newly a floating probe method which uses harmonic distortion of current has been introduced for in-situ plasma monitoring with a minimum perturbation and it may suit to pulse mode plasma measuring. Harmonic distortion of probe current due to sheath nonlinearity which is a strong function of electron temperature is analyzed in the frequency domain by Fast Fourier Transform(FFT), and the plasma density is obtained from the Bohm current model. To eliminate the sheath displacement current and stray current, multi-frequency correction is used which draws out the sheath conduction current by extrapolation of current-frequency relation. This multi-frequency floating probe method is evaluated with the Langmuir probe data in CW and pulse mode ICP argon plasma. The work on pulse mode plasma characteristic such as an EEDF and the transitions of plasma density and electron temperature and its effect to the floating probe measurement will be discussed.

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