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On harmonic diagnostic method using two frequencies in a floating Langmuir probe DONG-HWAN KIM, YOUNG-DO KIM, SUNG-WON CHO, YU-SIN KIM, CHIN-WOOK CHUNG, Hanyang University — Plasma diagnostic methods using harmonic currents analysis of floating probes were experimentally investigated. When dual-frequency voltage (ω_1, ω_2) was applied to a probe, various harmonic currents ($\omega_1, 2\omega_1, \omega_2, 2\omega_2, \omega_2 \pm \omega_1, \omega_2 \pm 2\omega_1$) were generated due to the nonlinearity of the probe sheath. The electron temperature can be obtained from the ratio of the two harmonics of the probe currents. According to the combinations of the two harmonics, the sensitivities in measurement of the electron temperature differs and this results in the difference in the electron temperature. From experiments and simulation, it is shown that the difference is caused by the random and systematic noise.

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