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On the floating harmonics method in non-Maxwellian plasmas

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— The floating harmonics method applicable to measure electron temperature and ion density in processing plasmas assumes that electrons are in a Maxwellian distribution [1]. To investigate the effect of non-Maxwellian electron distributions to the floating harmonics method, the electron energy distribution functions (EEDFs) were measured. The electron temperatures from the EEDFs at floating potentials were compared with that from the floating harmonics method. Slight discrepancies between them were observed. A new approach to address this was proposed using the second harmonics and third harmonics of the probe current and was compared. This method was not affected by the displacement current due to the stray capacitance of the measure system. The results were in good agreement with the electron temperature from the EEDFs at floating potentials.

[1] M. H. Lee, S. H. Jang and C. W. Chung, J. Appl. Phys., 101, 033305 (2007)

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