Abstract Submitted
for the GEC20 Meeting of
The American Physical Society

RF distortion effect by the external load on the floating harmonic method. JAEGU HWANG, KYUNG-HYUN KIM, CHIN-WOOK CHUNG, Hanyang university — It is well known that the floating potential is far from the plasma potential due to the self-bias. So, in the floating Langmuir probe, I-V curve around floating potential is difficult to be distorted by RF fluctuations. However, there are situations in which RF distortion occurs even with small RF fluctuations on the floating harmonic method. RF distortion which arises from the amplification of RF fluctuations owing to the series resonance of the probe sheath and the external load is expected. To verify this series resonance effect, changes of RF fluctuations around the probe with choke filters of ω_{RF}, $\omega_{\mathrm{RF}} \pm 1$, $\omega_{\mathrm{RF}} \pm 2$ [MHz] were observed. In cases of choke filters except for driving and its harmonic frequencies, it is found that RF fluctuations can be greatly affected and high electron temperatures are measured. This phenomenon can be explained by the series resonance of equivalent circuit between the probe sheath and the choke filter. Choke filters with incorrectly compensated for driving and its harmonic frequencies can overestimate electron temperatures than even without a filter.

JaeGu Hwang
Hanyang university

Date submitted: 12 Jun 2020 Electronic form version 1.4