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Comparison of sheath thickness obtained from the theories of ion correction in the floating potential HYEONG SIK HAN, KWANG TAE HWANG, IK JIN CHOE, CHIN WOOK CHUNG, Hanyang University — In the cold plasmas, when the cylindrical probe is used to measure the ion density, an expansion of the sheath thickness related to the sheath voltage increases the ion current. The expansion of the sheath thickness results in an incorrect measurement of ion current. To measure ion density correctly, the sheath thickness should be considered. In the collisionless sheath, the sheath thickness can be calculated by the Child- Langmuir (CL) theory or the Allen-Boyd-Reynolds(ABR) theory. We measured the sheath thicknesses using the floating harmonics method [1] and the cut-off method by the microwave [2], and the results compared with the CL theory [3] and ABR theory [4] in the floating potential. The sheath thicknesses obtained from the ABR theory were in good agreement with the experimental results.

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