

Abstract Submitted  
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**Measurements of the Sheath Capacitance using a Tunnel Diode Oscillator in Inductively Coupled Plasmas** SEJIN OH, MINHYONG LEE, PYUNGWOO LEE, CHINWOOK CHUNG, Division of Electrical Engineering, Hanyang University — A tunnel diode oscillation method is one of techniques to measure the sheath capacitance in plasmas. [ B .M Oliver et. al., J . Physics. E. 5, 718 ] Using this method, we investigated the sheath capacitance of a ring probe in an Inductively Coupled Plasmas (ICPs). The effects of the RF fluctuation and the noise on the sheath capacitance were considered. We measured the change in the tunnel diode oscillation frequency to acquire the sheath capacitance of the probe. The probe was biased with probe potentials ranging from 0V to -45V. The result agreed well with that calculated from a Child- Langmuir theory when the probe was highly negative biased with respect to the probe floating potential. However, it was found that the measured sheath capacitance increases rapidly than that from the Child-Langmuir theory as the bias potential increases. This is understood by the Bohm sheath theory.

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