

Abstract Submitted
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Measurements of power dissipation in a capacitive sheath DAVID GAHAN, MICHAEL B. HOPKINS, ALBERT R. ELLINGBOE, Dublin City University, Ireland — An experimental system is presented to investigate collisionless power coupling through a capacitively coupled rf sheath. An electrode is mounted in the downstream region of an inductively coupled discharge and driven using a separate power source. The frequency of the power delivered to the electrode is sufficiently different to that of the plasma power source to avoid interference. A DC power supply is used to bias the electrode slightly more negative than the self bias and hence alter the sheath electron density profile to exclude losses at the end of the rf cycle. This enables comparison with theoretical collisionless heating models which assume no electron loss [1] and a recent model [2] which suggests that there is a significant difference in power coupling if electron loss is included or not. The power absorbed by the plasma is measured using a customised current / voltage sensor which enables both time averaged and phase resolved power measurements. Initial results show that the collisionless power decreases as electrons are retarded while the rf electrode voltage is held constant. The phase resolved measurements confirm that the drop in power occurs in the region where electron loss is expected, consistent with the latter model mentioned above. References: [1] M. A. Lieberman, IEEE Trans. Plasma Sci., vol 16, p. 638, 1988 [2] G. Gozadinos *et al*, Phys. Rev. Lett., vol 87(13), 2001

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