

Abstract Submitted
for the GEC11 Meeting of
The American Physical Society

The Langmuir Paradox: can the ion acoustic instability at the sheath edge thermalize the ions too?¹ CHI-SHUNG YIP, NOAH HER-SHKOWITZ, University of Wisconsin - Madison, GREG SEVERN, University of San Diego — Recently there was a theoretical prediction² that in single-species plasmas, ion collisional friction in the plasma will be enhanced by ion acoustic instability. The theory predicted that instability will not only enhance the thermalisation of the the electrons, but will also, near the sheath-edge, thermalize the non- Maxwellian of an ion velocity distribution function (IVDF), caused by charge exchange in the presheath. The theory also predicted that this instability will disappear through collisional damping as neutral pressure of the plasma increases. This experiment aims to verify this theory by measuring the IVDFs near the sheath edge in a multipole chamber discharge in Xenon gas at a variety of neutral pressures. The IVDFs are determined by Laser-Induced Florescence, the electron temperature is measured by a Langmuir probe and the plasma potential towards the boundary is measured by an emissive probe.

¹Work is supported by NSF Grant Nos. CBET-0903832,0903783

²S.D. Baalrud, et al., Phys. Rev. Lett. **102** 245005 (2009).

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Date submitted: 15 Jul 2011

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