

Abstract Submitted
for the GEC08 Meeting of
The American Physical Society

Experimental studies of transverse metastable ion velocity distribution functions in the presheath of a weakly collisional argon plasma
GREG SEVERN¹, Dept. Physics, USD, San Diego CA 92110, DONGSOO LEE, Dept. Engineering Physics, UW-Madison, Madison, Wisconsin 53706, NOAH HERSHKOWITZ², Dept. Engineering Physics, UW-Madison, Madison, Wisconsin 53706 — Laser-induced fluorescence (LIF) measurements made with a diode laser have measured the transverse metastable ion velocity distribution function profile near a negatively biased plate in a low temperature ($T_e < 1\text{eV}$), low pressure ($p_0 < 1\text{mTorr}$) dc multidipole argon discharge plasma. The metastable argon ions in the $3s^23p^4(3P)3d^4F_{7/2}$ state are found to be characterized by a Maxwellian temperature transverse to the direction normal to the plate. For a neutral pressure of 0.3mTorr, the transverse temperature increases along the presheath from 0.026 eV in the bulk plasma to 0.058 eV at the presheath sheath boundary. This result is compared with PIC code simulations³ and experimental results⁴ found in the literature.

¹work funded by DOE grant No. DE-FG02-03ER54728

²work funded by DOE grant No. DE-FG02-97ER54437

³A. Meige, *et al.*, Phys. Plasmas, 14, 032104 (2007)

⁴N. Claire, *et al.*, Phys. Plasmas, 13, 062103 (2006)

Greg Severn
Dept. Physics, USD, San Diego CA 92110

Date submitted: 12 Jun 2008

Electronic form version 1.4