Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Spatially Resolved Measurements of a Double Layer in an Argon Helicon Plasma[1] EVAN AGUIRRE, UMAIR SIDDIQUI, JOHN MCKEE, EARL SCIME, West Virginia Univ — We report 2-dimensional, spatially resolved observations of a double layer in an expanding helicon plasma. These new measurements investigate the origins of previously observed multiple ion beam populations in the downstream plasma. We use Laser Induced Fluorescence (LIF) to measure the ion velocity distribution functions (IVDFs) of argon ions and neutrals both parallel and perpendicular to the background magnetic field and an rf-compensated Langmuir probe to determine the local plasma potential. These are the first multi-dimensional LIF measurements of ion acceleration in a current-free double layer and were obtained with a recently installed, internal scanning probe system in the HELIX-LEIA experimental facility.

[1]This work is supported by US National Science Foundation grant number PHY-1360278.

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Date submitted: 15 Jul 2015 Electronic form version 1.4