Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

**3D measurements and simulations of ion and neutral velocity distribution functions in a magnetized plasma boundary**[1] DEREK S. THOMPSON, West Virginia University, Department of Physics and Astronomy, SHANE KENILEY, DAVIDE CURRELI, University of Illinois Urbana-Champaign, Department of Nuclear, Plasma, and Radiological Engineering, MIGUEL F. HENRIQUEZ, DAVID D. CARON, ANDREW J. JEMIOLO, JACOB W. MCLAUGHLIN, MIKAL T. DUFOR, LUKE A. NEAL, EARL E. SCIME, West Virginia University, Department of Physics and Astronomy, M. UMAIR SIDDIQUI, Phase Four, Inc. — We present progress toward the first paired 3D laser induced fluorescence measurements of ion and neutral velocity distribution functions (I/NVDFs) in a magnetized plasma boundary. These measurements are performed in the presheath region of an absorbing boundary immersed in a background magnetic field that is obliquely incident to the boundary surface ($\psi = 74^\circ$). Parallel and perpendicular flow measurements demonstrate that cross-field ion flows occur and that ions within several gyro-radii of the surface are accelerated in the $\vec{E} \times \vec{B}$ direction. We present electrostatic probe measurements of electron temperature, plasma density, and electric potential in the same region. Ion, neutral and electron measurements are compared to Boltzmann simulations, allowing direct comparison between measured and theoretical distribution functions in the boundary region.

[1]NSF PHYS 1360278

Derek S. Thompson
West Virginia University, Department of Physics and Astronomy

Date submitted: 14 Jul 2017 Electronic form version 1.4