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3D ion flow measurements and simulations near a boundary at oblique incidence to a magnetic field[1] DEREK S. THOMPSON, West Virginia University, Department of Physics, SHANE KENILEY, RINAT KHAZIEV, DAVIDE CURRELI, University of Illinois at Urbana-Champaign, Department of Nuclear, Plasma, and Radiological Engineering, TIMOTHY N. GOOD, Gettysburg College, Department of Physics, MIGUEL HENRIQUEZ, JULIANNE MCILVAIN, M. UMAIR SIDDIQUI, EARL E. SCIME, West Virginia University, Department of Physics — Boundaries at oblique incidence to magnetic fields are abundant in magnetic confinement plasmas. The ion dynamics near these boundaries has implications for applications such as tokamak divertor wall loading and Hall thruster channel erosion. We present 3D, non-perturbative measurements of ion velocity distribution functions (IVDFs), providing ion temperatures and flows upstream of a grounded stainless steel limiter plate immersed in an argon plasma, oriented obliquely to the background axial magnetic field ($\psi = 74°$). The spatial resolution of the measurements is sufficient to probe the kinetic details of magnetic presheath structures, which span several ion Larmor radii ($\sim$1 cm). Furthermore, we report probe measurements of electron density and temperature, and of local electric potential. To complement these measurements, results from particle-in-cell and Boltzmann models of the same region are presented. These models allow for point-to-point comparison of simulated and measured electrostatic structures and IVDFs at high spatial resolution.

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