

Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Evolution of Phase Space Sensitivity for Energetic Ion Loss Measurements in DIII-D¹ N. COTHARD, U. Rochester, D.C. PACE, General Atomics — The Fast Ion Loss Detector (FIELD) diagnostic system installed on the DIII-D tokamak is a scintillator-based magnetic spectrometer that measures the energy and pitch angle of energetic ions that escape confinement and reach the diagnostic on the outer wall. Different areas of the FIELD scintillator correspond to the energies and pitch angles of the impacting ions. This strike map is dependent on the local magnetic field vector that sets the geometry of the ion orbits upon entering the detector. The phase space sensitivity of the FIELD, therefore, varies with plasma conditions. The FIELD combines a slow camera (100 Hz) viewing the entire scintillator simultaneously with narrow viewing photomultiplier tubes that provide fast time-resolved (1 MHz) measurements in narrow bands of energy and pitch angle. New analysis methods allow for tracking the phase space coverage throughout shots, thereby improving the fidelity of ion loss measurements due to plasma instabilities that change in time.

¹Work supported in part by the National Undergraduate Fellowship Program in Plasma Physics and Fusion Energy Sciences and the US Department of Energy under DE-FC02-04ER54698.

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Date submitted: 10 Jul 2014

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