

Abstract Submitted for the 56th Annual Meeting  
Division of Plasma Physics  
October 27–31, 2014  
New Orleans, Louisiana

Category Number and Subject:

Theory     Experiment

**Inference of Fast-Ion Density Profile from Tomographic Reconstructions of Fast-Ion  $D_\alpha$  Measurements,\*** L. Stagner, W.W. Heidbrink, C. Collins *UC Irvine*; B.A. Grierson, *PPPL* – The fast-ion  $D_\alpha$  (FIDA) diagnostic measures light that energetic particles emit in fusion plasmas. The diagnostic is sensitive to different velocity space regions depending on the viewing angle relative to the magnetic field. Consequently, viewing chords that share a radial location give different, yet still valid, results. Velocity space tomography allows for these viewing chords to be combined to infer the complete fast-ion distribution function from the different partial views. If this is done at many radial locations the fast-ion density profile is measured. We demonstrate this method for the case of a classically described, low power, MHD-quiescent plasma from actual FIDA measurements. FIDA measurements were taken at four radial positions, each with four different viewing angles. Simulation results are also shown.

\*Work supported by the US Department of Energy under SC-G903402, DE-FC02-04ER54698 and DE-AC02-09CH11466.