Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Analysis of the D_α Spectra Produced by Fast Ions in DIII-D[1]
Y. LUO, W.W. HEIDBRINK, UC-Irvine, K.H. BURRELL, GA — A diagnostic that measures the fast-ion distribution function through detection of the D_α light from neutralized fast ions acquired data during the 2005 campaign. In addition to the fast ion signal, there are impurity lines, bremsstrahlung and emissions from other neutrals in the D_α range. Background from visible bremsstrahlung and non charge-exchange impurity lines are subtracted by modulating the injected beam. Halo emission and charge-exchange impurity lines are fitted by using the method of nonlinear least squares. A bar at the exit focal plane of the spectrometer blocks bright interference from edge neutrals and injected neutrals. ELMs can devastate the spectrum by elevating the signal in the D_α range significantly. The ELM contaminated time slices are eliminated by applying a relative and absolute criterion based on the edge D_α signal. Pitch angle scattering and slowing down of beam ions are studied by varying the injection energy, beam angle, plasma density and electron temperature in quiescent plasma. Results are compared to classical theory.

[1]Work supported by US DOE under SC-G903402 and DE-FC02-04ER54698.

T.S. Taylor
General Atomics

Date submitted: 21 Jul 2005 Electronic form version 1.4