Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Measurements of Short Wavelength Plasma Fluctuations Using the DIII-D Phase Contrast Imaging Diagnostic[1] J.R. DORRIS, J.C. ROST, M. PORKOLAB, MIT-PSFC, K.H. BURRELL, General Atomics — The DIII-D Phase Contrast Imaging (PCI) diagnostic has been upgraded and used to measure turbulence in the outer plasma region ($0.7 < r/a < 1$) covering an operational range of 10 kHz through 10 MHz and 2-30 cm^{-1}. A novel rotating mask has been used to measure turbulence as a function of propagation angle about the PCI chord. This technique provides localized measurements along the PCI chord for turbulence with $k_{\|} \sim 0$, and an estimate of the turbulence $k_{\|}$ value otherwise. Long wavelength ($|k| \lesssim 12$ cm^{-1}) turbulence is localized to within the instrumental width of the last closed flux surface (LCFS) ($r/a \gtrsim 0.9$). Modes with finite (and theoretically unexpected) *parallel wavenumber* have been seen to propagate at angles as large as $k_{\|}/k \sim 0.1 - 0.4$. Due to the finite $k_{\|}$, these modes cannot be localized with the present techniques. A theoretical explanation for these modes is lacking at the present time.

[1]Work supported by the US DOE under DE-FG02-94ER54235 and DE-FC02-04ER54698.

Craig Petty
General Atomics

Date submitted: 16 Jul 2010 Electronic form version 1.4