

**Abstract Submitted for the 51st Annual Meeting
Division of Plasma Physics
November 2–6, 2009, Atlanta, Georgia**

Study of the Variation of Turbulence With Poloidal Angle on DIII-D Using Phase Contrast Imaging,* J.C. Rost, M. Porkolab, J.R. Dorris, *MIT*; K.H. Burrell, *GA* — The Phase Contrast Imaging (PCI) diagnostic on DIII-D, which measures density fluctuations with $k < 30 \text{ cm}^{-1}$, has operated with three different beam paths; vertical through the last closed flux surface at the outboard midplane (edge), 11 degrees from vertical through the outer plasma reaching $r/a = 0.75$ (Phase I), and now vertical through $r/a = 0.4$ (Phase II). PCI measures modes propagating perpendicular to the beam path, i.e. $k_\theta < 0.1 k_r$ with the edge path and $k_\theta \sim k_r$ at the edge in Phase I and II. The beam paths also sample the turbulence at different poloidal angles. Results from the three beam paths combined provide a more complete description of the turbulence. Results from the edge and Phase I paths show that the turbulence phase velocity varies more with k_θ/k_r than is accounted for by Doppler shifts. Also, the spectra $S(k)$ show a complex variation in shape with θ and k_θ/k_r . Initial results from Phase II will be presented to help disambiguate the various possible dependencies.

*Work supported by the US DOE under DE-FG02-9954512 and DE-FC02-04ER54698.