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Study of Poloidal Variation and Radial Wavenumber of Edge Turbulence in L- and H-mode with PCI on DIII-D,* J.C. Rost, M. Porkolab, J.R. Dorris, *Plasma Science and Fusion Center, MIT*, K.H. Burrell, *General Atomics* — The Phase Contrast Imaging (PCI) diagnostic has been used on DIII–D to measure plasma turbulence from 2 to 30 cm^{-1} using three roughly vertical beam paths: tangent at r/a=1; r/a = 0.75 (Phase I); and now r/a = 0.4 (Phase II). An optical filter provides localization. Comparison of measurements made in different beam paths shows poloidal variation and spectral structure that one measurement location does not provide. The observed group velocity of the turbulence spectrum decreases away from the midplane at high input power, but is constant at low input power, with no up-down asymmetry in v_g in either case. Measurements in L-mode are consistent with edge turbulence having a finite k_θ and a range in k_r centered at k_r=0. Measurements in H-mode are strongly asymmetric in wavenumber as observed by the PCI, indicating that edge turbulence is large at two radii with different flow velocities, one with a strong positive k_r and one a strong negative k_r.

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