

Abstract Submitted
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Phase Contrast Imaging Measurements of Edge Turbulence Across an H-mode Transition¹ J.C. ROST, A. MARINONI, M. PORKOLAB, MIT, K.H. BURRELL, GA — The Phase Contrast Imaging (PCI) diagnostic on DIII-D provides a line-integrated measurement of density fluctuations. Analysis of previous PCI data taken during QH mode plasmas has revealed turbulence with short radial wavelengths and high frequencies which is generated by the well in the radial electric field E_r . Application of these results allows us to study the rapid evolution in turbulence at an L-H transition. The dominant effect of the L-H transition on turbulence is a 70% drop in fluctuation amplitude. However high frequency fluctuations are seen to arise on the same time scale as the L-H transition (i.e. a few ms). Interpretation of the 2d spectrum $S(k, f)$ of the PCI data of the line-integrated fluctuation, especially the Doppler shift and the ratio $S(k_{pci})/S(-k_{pci})$, indicates that the high frequency fluctuations are located on the inner edge of the E_r well. There is in addition a region of turbulence the PCI detects which is located outside the minimum of the E_r well. This ongoing work will provide quantitative information on the evolution of the E_r well at high time resolution across the L-H transition, important to understanding the interaction between turbulence and flow shear at the H-mode transition.

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