

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Observations of highly sheared turbulence in the H-mode pedestal using Phase Contrast Imaging on DIII-D¹ J.C. ROST, A. MARI-
NONI, E.M. DAVIS, M. PORKOLAB, MIT, K.H BURRELL, GA — Highly sheared
turbulence with short radial correlation lengths has been measured near the top of
the H-mode pedestal, in addition to the previously measured highly-sheared tur-
bulence measured in the E_r well. Turbulence in regions of large velocity shear
is characterized by radial correlation lengths shorter than the poloidal wavelength
($L < \lambda \sim 2$ cm) and large Doppler-shifted frequencies ($f > 200$ kHz). The phase
contrast imaging (PCI) diagnostic on DIII-D is ideally suited to measuring this den-
sity turbulence due to the measurement geometry and high frequency bandwidth.
Radial localization is achieved by optical filtering, varying the ExB profile, and
shifting the plasma position. Reconfiguration of the E_r well, such as at the L-H
transition or the transition to wide pedestal QH-mode, shows a near-instantaneous
change ($t < 1$ ms) to the sheared turbulence in the E_r well (~ 1 cm inside the sep-
aratrix). In contrast, the sheared turbulence near the top of the pedestal (~ 2 cm
inside the separatrix) varies over times scales of tens of ms, consistent with pedestal
evolution.

¹Work supported by the US Department of Energy under DE-FG02-94ER54235 and
DE-FC02-04ER54698

Jon Rost
MIT

Date submitted: 06 Jul 2017

Electronic form version 1.4