Abstract Submitted
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Drift Wave Turbulence Studies with the Phase Contrast Imaging Diagnostic in Alcator C-Mod[1] L. LIN, M. PORKOLAB, E.M. EDLUND, D.R. ERNST, M. GREENWALD, N. TSUJII, MIT PSFC — The Phase Contrast Imaging diagnostic (PCI) in Alcator C-Mod has measured density fluctuations with frequencies up to 500 kHz and wavenumbers up to 20 cm^{-1}, which corresponds to $k_R\rho_s \sim 1.6$. Furthermore, as the density increases in ohmic plasmas, the observed relative density fluctuation level decreases in the "linear" ohmic regime (low density, Alcator scaling, $\tau_{kin} \propto n_e$), whereas it increases in the high density "saturated" ohmic regime. Recent upgrades have enabled the PCI system to localize the short wavelength turbulence in the ETG range and resolve the direction of propagation (i.e., electron vs. ion diamagnetic direction) of even the longer wavelength turbulence in the ITG/TEM range. Initial analysis of the observed turbulence in purely ohmic plasmas indicates that $|\tilde{n}_+/\tilde{n}_-|$ in the frequency range of 100-400 kHz and wavenumber range of 2-8 cm^{-1} decreases monotonically but remains above 1.0 as the density is reduced. Here $\tilde{n}_+/\tilde{n}_-$ is the ratio of density fluctuations propagating in the ion diamagnetic direction to those propagating in the electron direction. We will compare these measurements with gyro-kinetic code predictions (e.g., GS2, GYRO).

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