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Theory Experiment

Analysis of High Frequency and Wavenumber Measurements From the DIII-D Phase Contrast Imaging Diagnostic,* J.C. Rost, M. Porkolab, J.R. Dorris, *MIT* – The phase contrast imaging (PCI) diagnostic on DIII-D was upgraded for the most recent run period to improve the response at high frequency and high wavenumber, extending the response to cover the ETG-range of plasma turbulence. This allows us to compare the response of the turbulence in the ETG and ITG ranges to various changes in the plasma, including variation in bulk parameters and confinement regime transitions. Previous analysis of PCI data interpreted the results in a Fourier space localized to the measurement location. However, there is little framework in transport theory to understand the observed characteristics, such as the relative amplitude of the inward and outward propagating modes or the strong correlation between frequency and wavenumber. We now calculate the PCI response to the eigenmodes predicted from numerical modeling and reinterpret the data as a measure of the relative amplitudes of these modes.

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