

Spatially Resolved Measurements of Two-dimensional Turbulent Structures in DIII-D Plasmas

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Abstract. Observation of modes consistent with the trapped-electron mode (TEM) has been made using the electron cyclotron emission imaging (ECEI) diagnostic on the DIII-D tokamak. The new measurements enable the extraction of spectral properties, including poloidal dispersion relations. The spatially correlated radial structure shows qualitative consistency with radially global linear gyrokinetic simulations, using the poloidal wavenumber selected in a narrow frequency band in the ECEI data. Simulations of trapped-electron modes (TEM) driven by the electron temperature gradient yield phase velocities in close agreement with measurements. As found previously in the outer core of DIII-D L-Mode plasmas, the electron temperature fluctuation levels from nonlinear gyrokinetic simulations fall below experiment.