

Modifications to Electromagnetic Turbulence with Increased Beta LAPD Plasmas

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The introduction of a new LaB6 cathode plasma source in the Large Plasma Device has enabled the study of pressure-gradient-driven turbulence and transport variations at significantly higher plasma β . Density fluctuations are observed to decrease with increasing β while magnetic fluctuations increase. Furthermore, the perpendicular magnetic fluctuations are seen to saturate while parallel (compressional) magnetic fluctuations increase continuously with β . These observations are compared to linear and nonlinear simulations with the GENE code. The results are consistent with the linear excitation of a Gradient-driven Drift Coupling mode (GDC) which relies on grad-B drift due to parallel magnetic fluctuations and can be driven by density or temperature gradients.

Relevant figures:

