

Abstract Submitted
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Characterizing Interchange Turbulence In A Dipole Confined Plasma¹ B.A. GRIERSON, M.W. WORSTELL, S. STATTEL, M.E. MAUEL, Columbia University — The dipole magnetic field has closed field-lines without magnetic shear, and this confinement configuration allows large-sized fluting instabilities. When dipole-confined plasma is produced with ECRH, fast Hot Electron Instabilities (HEI) appear at low densities, and slower turbulent fluctuations occur at higher densities. The global mode structures of the fast HEI instability and centrifugal interchange are understood. However, the characteristics of the turbulent interchange fluctuations (that occur between HEI bursts and when the HEI is suppressed by fueling) are less well understood. These low frequency, non-stationary fluctuations exhibit a power-law like turbulence spectrum and intermodal coupling. Correlation analysis, modal decomposition Hilbert methods, time-frequency spectrograms, and bicoherence are used to characterize interchange turbulence in a dipole and to form a basis for understanding nonlinear plasma mixing.

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