Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Spectral characteristics and coherence in plasma turbulence INGMAR BROEMSTRUP, MICHAEL BARNES, KYLE GUSTAFSON, WILLIAM DORLAND[1], Univ. of Maryland, College Park, KAI SCHNEIDER, Universite de Provence, Marseille, MARIE FARGE, Ecole Normale Superieure, Paris — Direct numerical simulations of plasma turbulence have become an important tool for interpreting experimental data from tokamaks. There is, however, relatively little exploration of the fluctuation data that is produced by gyrokinetic simulations in the literature. In preparation for more detailed experimental validation of predictions from gyrokinetic simulations of plasma turbulence, we present studies of turbulence that is well described by simpler models: Hasegawa-Mima (with and without including the field-line-averaged potential term associated with parallel electron dynamics, and with and without strong background velocity shear), and reduced MHD. Numerical results from a spectral fluid code will be compared to the results obtained with a gyrokinetic code for each problem studied. To study coherent structures, the data is projected onto an orthogonal wavelet basis and a nonlinear thresholding is applied to the wavelet coefficients. The denoised data is then reconstructed in physical space. Using this procedure we analyze the spatial and frequency spectra and test them against theoretical expectations. We will also discuss the importance of conserved quantities in these systems.

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Date submitted: 21 Jul 2006 Electronic form version 1.4