Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Characteristics of nonlinear interaction in entropy cascade[1] T. TATSUNO, G.G. PLUNK, W. DORLAND, U Maryland, A.A. SCHEKOCHIHIN, U Oxford — Two-dimensional electrostatic turbulence in weakly-collisional magnetized plasmas can be described as a turbulent cascade of entropy in phase space [1]. Nonlinear phase mixing [2] introduces small structures of distribution function in both position and velocity space. By invoking the Kolmogorov-type phenomenology applied in the phase space, it is argued that entropy cascades to smaller scales as energy or enstrophy does in the Navier-Stokes turbulence. In this presentation, we report the detailed characteristics of nonlinear interaction in the gyrokinetic turbulence. We diagnose the triad interaction in the wave-number as well as in the velocity dual space using the AstroGK code [3], and see how quantitatively the theoretical assumptions are satisfied, namely, (a) the scale locality of nonlinear intercation, and (b) constancy of entropy flux both in position and in velocity space.

[1] T. Tatsuno *et al.*, Phys. Rev. Lett. **103**, 015003 (2009).
[2] W. Dorland and G. Hammett, Phys. Fluids B **5**, 812 (1993).
[3] http://www.physics.uiowa.edu/~ghowes/astrogk/

[1]This work is supported by Maryland Fusion Theory Program.

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Date submitted: 21 Jul 2009 Electronic form version 1.4