Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Study of the cross phase in the ion temperature gradient driven turbulence BYUNGHOON MIN, CHAN-YONG AN, CHANG-BAE KIM, Soongsil University — The evolution of cross phase, that is the phase difference between the electric potential and the pressure, is examined in the electrostatic ion temperature gradient fluid turbulence. It is important to study cross phase because the thermal transport is roughly proportional to cross phase. The evolution equation of cross phase is derived in a similar way as the energy evolutions are found in the Fourier space. Three-dimensional fluid simulations are performed in the BOUT++ platform [1] with the shifted metric coordinate system. It is found that the linear and nonlinear contributions to $\partial_t|\delta|^2$ change signs as the fluctuations become saturated and they add up to make $|\delta|^2$ steady. Effects of zonal flow on cross phase are investigated and will be discussed at the conference. [1] B. D. Dudson, M. V. Umansky, X. Q. Xu, P. B. Snyder, and H. R. Wilson, Comp. Phys. Comm. 180 1467 (2009).

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Date submitted: 13 Sep 2016 Electronic form version 1.4