

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Relationship of the cross phase and the zonal flow in electrostatic ion-temperature-gradient turbulence BYUNGHOON MIN, CHANYONG AN, CHANG-BAE KIM, Soongsil university — The cross phase δ , that is the phase difference between the electric potential and the ion pressure, is examined in the electrostatic ion-temperature-gradient fluid turbulence. It is important to study the cross phase because the thermal transport Γ is roughly proportional to $\sin\delta$. Three-dimensional numerical simulations are performed in the BOUT++ platform with the shifted metric coordinate system. The cross phase seems to show an interesting feature such that it is almost constant when the zonal flow V is in the direction of the electron diamagnetic drift and the time evolution of the cross phase oscillates near zero at low poloidal wave number and Γ is small. These phenomena are closely correlated with the fluctuation level and depend closely on the curvature V'' of the zonal flow.

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Date submitted: 12 Jul 2017

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