Abstract Submitted
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Gyrokinetic analysis of vortex structures and distribution functions in slab ETG turbulence[1] MOTOKI NAKATA, Graduate University for Advanced Studies, TOMOHIKO WATANABE, HIDEO SUGAMA, National Institute for Fusion Science, WENDELL HORTON, Institute for Fusion Studies, University of Texas at Austin — The electron temperature gradient driven (ETG) turbulence is considered as one of the possible candidates causing the anomalous electron heat transport in a core region of magnetic fusion plasmas, and has been actively studied in recent years.In the present study, the ETG turbulence with weak collisionality in a slab configuration are investigated by means of a gyrokinetic Vlasov simulation with high phase-space resolution. Significant reduction of the electron heat flux accompanied with a spontaneous transition of vortex structures from turbulent to coherent states with the self-generated zonal flows has been found even for the large electron temperature gradient parameter η_e. The detailed comparisons between the stable coherent vortex structure and a steady solution of Hasegawa-Mima equation derived from gyrokinetic equation have been carried out. Fine scale fluctuations in the turbulent vortex state have been identified with high resolution spatial visualizations of the fields, and with spectral analysis of the perturbed distribution function.

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