Abstract Submitted
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The Effects of Parallel Ion Motion of Zonal Flow Generation in Ion-Temperature-Gradient Mode Turbulence J. ANDERSON, K. MIKI, K. UZAWA, J. LI, Y. KISHIMOTO, Department of Fundamental Energy Science, Kyoto University, Gokasho, Uji, 611-0011 Japan — The ubiquitous phenomenon of Zonal Flows driven by drift-type turbulence have been intensively investigated in recent years since it was shown that Zonal Flows (ZF) reduces the anomalous transport generated by such turbulence in magnetic confinement devices. The generation of ZF in ion-temperature-gradient (ITG-) mode turbulence has been studied previously using different analytical and numerical models, however, the effects of parallel ion motion have not been considered. In the present work the role of parallel ion motion for ZF generation by ITG mode turbulence is studied analytically and numerically using a fluid description. The analytical modeling is based on the coherent mode coupling models[1,2] using the fluid model in Ref. [3] extended for treating the parallel ion motion. Numerical studies are performed to corroborate the findings in the analytical models. It is found that the ratio of the growth rate and the frequency is decreasing with increasing η_i (Ln is fixed). It is indicated that in the region close to the linear ITG threshold the ZF are stationary and may have a significant stabilizing effect on the background turbulence whereas at higher η_i the ZF becomes oscillatory. [1] L. Chen, Z. Lin and R. White, Phys. Plasmas 7, 3129 (2000)[2] J. Li and Y. Kishimoto, Phys. Plasmas 9 1241 (2002)[3] J. Anderson, H. Nordman, R. Singh et al, Phys. Plasmas 9, 4500 (2002)

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