Abstract Submitted
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Fluctuation Driven Plasma Current, Poloidal Rotation and Flow Structures WEIXING WANG, Princeton University Plasma Physics Laboratory, S. ETHIER, B. GRIERSON, Y. REN, PPPL, T.S. HAHM, SNU, Korea, P.H. DIAMOND, UCSD & NFRI, Korea, F.L. HINTON, UCSD, E. STARTEV, J. CHEN, E. FEIBUSH, PPPL — Gyrokinetic studies by including self-consistently neoclassical physics are found to lead to significant new features regarding nonlinear turbulence dynamics, which may have significant impact on a number of important transport issues in tokamak plasmas. The outstanding issues addressed in this paper include i) anomalous poloidal flow generation and its collisionality dependence, for which the poloidal Reynolds stress produced by ion temperature gradient driven fluctuations is shown to consistently account for experimental results of poloidal flow in DIII-D; ii) fluctuation induced non-inductive current generation and its characteristic dependence, for which collisionless trapped electron mode turbulence is found to significantly enhance the bootstrap current due to the residual stress induced nonlinear electron flow generation; iii) dominant geodesic acoustic mode and associated structures due to nonlinear interaction between turbulent and neoclassical physics and their impact/implications suggested for C-MOD Ohmic L-mode plasmas. Work supported by U.S. DOE Contract DE-AC02-09-CH11466.

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