

Generation and Saturation of Large Scale Flows in ITG turbulence

I. Sandberg^{1,2}, H. Isliker², V. Pavlenko³, L. Vlahos², and K. Hizanidis¹

¹*Department of Electrical and Computer Engineering, National Technical University of Athens, GR-157 73 Athens, Greece*

²*Department of Physics, Aristotle University of Thessaloniki, GR-541 24 Thessaloniki, Greece*

³*Department of Astronomy and Space Physics, Uppsala University, Box 515, SE-751 20 Uppsala, Sweden*

ASSOCIATION EURATOM-HELLENIC REPUBLIC

The excitation and suppression of large-scale anisotropic flows during the temporal evolution of the toroidal ITG electrostatic instability is investigated. The non—linear formation of streamer and zonal flows is attributed to the inverse energy cascade towards large scales, as a result of the non--linear coupling with linearly unstable ITG modes. The growth, the saturation and the interplay between these large-scale structures are numerically investigated, and their dependence on diamagnetic and finite ion Larmor effects is depicted. The diffusion (spatial and energy) properties of test particles in the saturated fields is discussed.
