LARGE-SCALE FLOW PATTERN IN FLUTE MODE TURBULENCE AND PREDATOR-PREY PHENOMENA

C. Zucca[1], Zh. N. Andrushchenko[2], and V. P. Pavlenko[3]

[1] *CRPP EPFL, Association EURATOM Suisse, Switzerland,* [2] *Swedish University of Agricultural Sciences, Uppsala, Sweden,* [3] *Uppsala University and EURATOM - VR Fusion Association, Uppsala, Sweden*

Two fields model that self-consistently describes the coupled spectral dynamics of flute mode-large scale flows turbulence is presented. This model has a characteristic form of a predator-prey system in which the populations of flute mode quanta (prey) growing via linear instability, generates large scale flows (predators) through the Reynolds stress. Concomitantly, the mean flow growth regulates the prey population. To understand the long term nonlinear evolution of one-prey two-predator system, a low-dimensional prototype of the model based on the assumption that the dynamics of such complex system can be described within a phenomenological zero-dimensional approach was constructed. It is shown in the frame of this model that the dynamic outcome of interactions between the three system components may lead depending on the system parameters to coexisting of them in the form of oscillatory solutions corresponding to quasiperiodic bursting of turbulence intensity level. These solutions are consistent with the time dependent behaviour of flute mode turbulence recently observed in numerical simulations.