The dynamics of the drift wave-zonal flow system in a cylindrical plasma device

Z.Yan, G.R.Tynan, J.H.Yu, M.Xu , S.H.Muller, C.Holland

University of California, San Diego, La Jolla, CA, 92093,USA

A radially sheared azimuthal plasma fluid flow is observed in a cylindrical magnetized helicon plasma device with no external sources of momentum input and is sustained by the turbulent Reynolds stress against collisional dissipation. This shear flow can be unstable and evolves with low frequency about couple hundred Hz. This frequency is the same as the modulation frequency of the turbulent Reynolds stress of the drift-wave fluctuations. The modulation of the divergence of the turbulent Reynolds stress as well as the radial wave number is also being studied and its relation with the low frequency shear flow evolution will be reported.