Blobs at the high field side of the FT-2 tokamak

J. Vicente[a], S.I. Lashkul[b], M. Tendler[c], S.V. Shatalin[d], E.O. Vekshina[d], A.V. Sidorov[d], and L.A. Esipov[b]

National Institute for Fusion Science,322-6 Oroshi-cho, Toki 509-5292, Japan
[a] Instituto de Plasmas e Fusão Nuclear, Av. Rovisco Pais, 1049-001, Lisbon, Portugal
[b] Ioffe Physico-Technical Institute, St. Petersburg, Russia
[c] Alfvén Laboratory, KTH, Stockholm, Sweden
[d] St. Petersburg State Polytekhnical Institute, St. Petersburg, Russia

jvicente@ipfn.ist.utl.pt

It is well-known that turbulent plasma processes are responsible for enhanced transport, determining to a great extent the plasma confinement in magnetic fusion devices. The study of edge turbulence at both tokamaks and stellarators has shown that the same basic properties emerge in different devices. Namely, spatial-temporal "events" have been detected since the early 90s [1] and are now recognized as turbulence-induced high density filaments which have been called *blobs* since later in that decade. A first model for individual blob dynamics, considering a generation of these filaments on the low field side of fusion devices and a drift movement towards the wall, was suggested in [2] and has since then been significantly extended.

The particle radial drift flux in the peripheral region of the high field side of the FT-2 tokamak is obtained from the signals of Langmuir probe measurements and a time resolved analysis is used to detect the existence of blobs and estimate their radial velocities and radial scale lengths. These results report to new experiments with enhanced Lower Hybrid Heating ($P_{LHH} \approx 180$kW) and a fast data acquisition system with 50 MHz sampling rate.

The detection of blobs on the high field side of the FT-2 tokamak is observed together with a dual direction of movement. Some blobs move inward and others outward in radial direction. This is not understood theoretically since only the outward direction is expected, let alone that only the low field side is taken into account in the theoretical models. The magnitude of values for the estimates of blob sizes and velocities are however comparable with the ones proposed theoretically. The correlation between blob size and blob velocity is also studied and compared to a different set of analytical expressions proposed in theory.

[1] M. Endler, *et al*, *20th EPS Conf. on Contr. Fusion and Plasma Phys. Lisbon,* **17C**, *1993.*
[2] S.I. Krasheninnikov, Phys. Lett. A **283** (2001) 368.