Experimental Tests of Turbulent Transport Near Marginal Stability*

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Data from DIII-D and NSTX at the plasma edge feature the presence of intermittent peaks and voids whose dynamics is convective and not diffusive. While the peaks move outward into the scrape-off layer (SOL), the voids move inward towards the core, i.e., these features move in opposite directions. Furthermore, the peaks also spread in space as they evolve. Furthermore, the peaks also spread in space as they evolve. While the peaks are responsible for thickening of the SOL, the voids may be responsible for directly thinning the near core or indirectly by providing the background noise so crucial in bifurcation theory for front penetration and thus play an important role in the shaping of the pedestal.

Marginal stability models have been built that include constraints of joint reflection symmetry on the flux and that predict the existence of ***both*** these features as well as their movement in opposite directions and their spread, which is due to local gradients. The symmetric motion of the features is also consistent with non-negative entropy production. Thus we present data that verifies the theoretical predictions of the aforementioned model and also study the location of the peak-void generation and how they depend on the edge profiles.

*Work supported by the US Department of Energy under DE-FG02-04ER54758, DE-FC02-04ER54698, DE-FG02-89ER53296, DE-AC04-94AL85000, W-7405-ENG-48, and DE-FG03-01ER54615.