

Turbulence suppression by electrostatic biasing in the Texas Helimak

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The Texas Helimak[1] is a toroidal plasma device with one-dimensional equilibrium, magnetic curvature and shear, resembling closely the border and scrape-off layer of a Tokamak. The Texas Helimak vacuum vessel has a rectangular cross section with 0.6 m of internal radius, 1.6 m of external radius, and 2 m of height and the plasma is generated by electron cyclotron resonance heating. The Helimak typical regime turbulence presents intermittent density bursts that are responsible for an asymmetrical PDF with long tails. This machine has four sets of plates, where Langmuir probes are mounted and from where is possible to impose an external electrostatic bias. The electrostatic bias modify the radial electric field profile and change the turbulence regime, and it can even suppress the intermittent bursts[1]. In this work, we study the conditions for the intermittent turbulence suppression scenario by changing the density profile position in relation with the biasing plates. We acknowledge the financial support of FAPESP (grants 2014/07043-0, 2015/50122-0 and 2017/23128-3).

[1] K. W. Gentle and Huang He, *Plasma Sci. and Technology*, *10*, 284 (2008).