

Gyrokinetic simulation of turbulence at the FT-2 tokamak egde

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Predicting the dynamics of edge plasma is of particular importance for magnetic fusion devices. Indeed, the scrape-off layer (SOL) dynamics governs the power exhaust and plasma-surface interaction, which entails that it controls the influx of impurities, as well as the transition to improved confinement regimes via the formation of edge transport barriers (ETB) [1-5]. Because of the non-linear nature of the edge and SOL plasma dynamics, predictions have to rely on numerical simulations from first principle.

In this work, we use the global full-f particle-in-cell (PIC) gyrokinetic code ELMFIRE [6] to simulate circular limited tokamak plasmas from the magnetic axis to the SOL, including a simple PWI model. In order to simulate the FT-2 SOL, ELMFIRE uses the logical boundary condition to faithfully reproduce recover the sheath-limited SOL [7]. Here we characterise the dynamics of turbulence in the SOL of FT-2 and it's interaction with the confined plasma across the last-closed flux surface (LCFS).

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