



Contribution ID: 326

Type: **Poster**

TH/P3-21: Interplay between MHD and Particle Transport during Sawteeth

Wednesday, 10 October 2012 08:30 (4 hours)

In this contribution, the plasma density evolution in sawtooth regime on the Tore Supra tokamak is studied. The density is measured using a novel fast-sweeping X-mode reflectometry technique, which is fast enough to allow tomographic reconstructions. There is strong evidence that temperature and density are governed by different mechanisms. Postcursor oscillations sometimes lead to the formation of a density plateau, which is explained in terms of the convection cells associated with the kink mode. A crescent-shaped density structure located inside the $q=1$ surface is often visible just after the crash and indicates that a significant part of the density withstands the crash and is reinjected inside the surface. 3D full bifluid and nonlinear MHD simulations with the XTOR-2F code recover this structure and show that it arises from the perpendicular flows emerging from the reconnection layer.

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Session Classification: Poster: P3

Track Classification: THS - Magnetic Confinement Theory and Modelling: Stability