

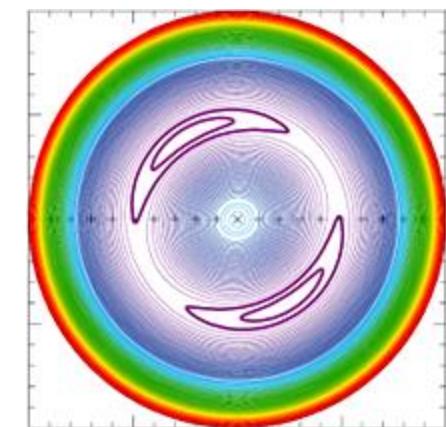
Tearing Modes stabilization by pellet injection



Background

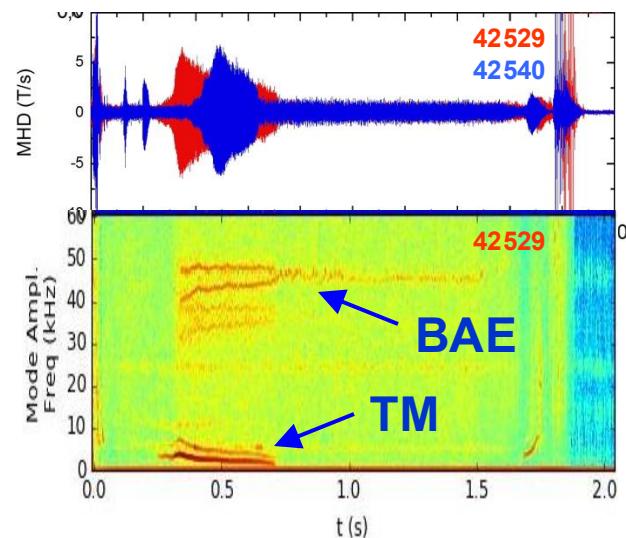
- A **Tearing Mode** (TM) is an instability that arises in magnetically confined plasma as a consequence of the plasma finite resistivity. It develops on rational magnetic surfaces and it is driven by the radial gradient of the toroidal current density.
- The study of the Tearing Mode stability is an important issue because the development of the **magnetic islands** characterizing the mode can deteriorate the confinement, leading to a decrease of the plasma energy content and sometimes to a plasma disruption.

(2, 1) magnetic island



Scenario

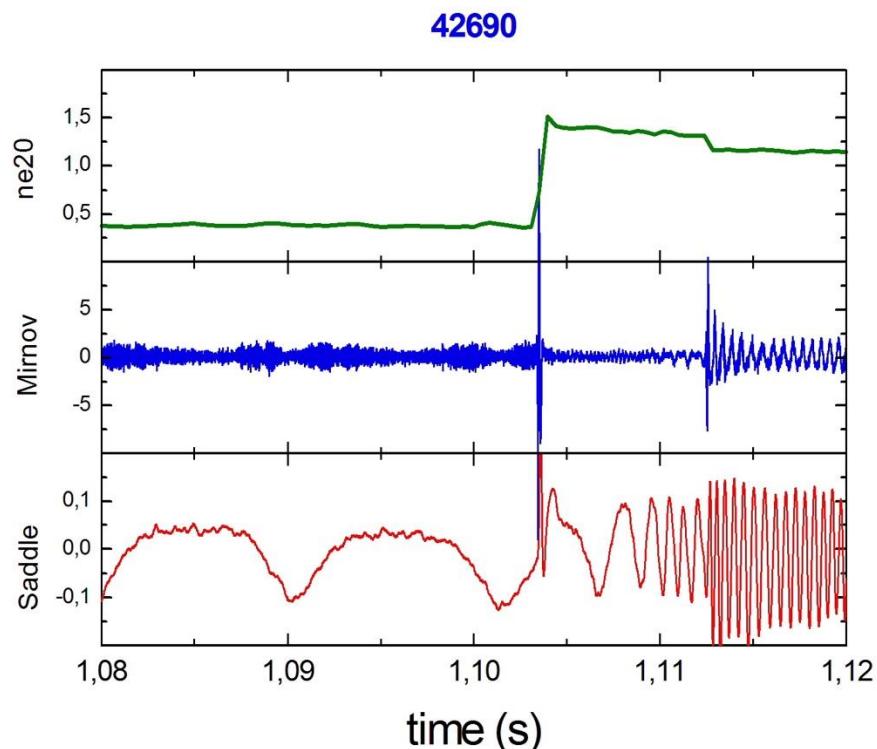
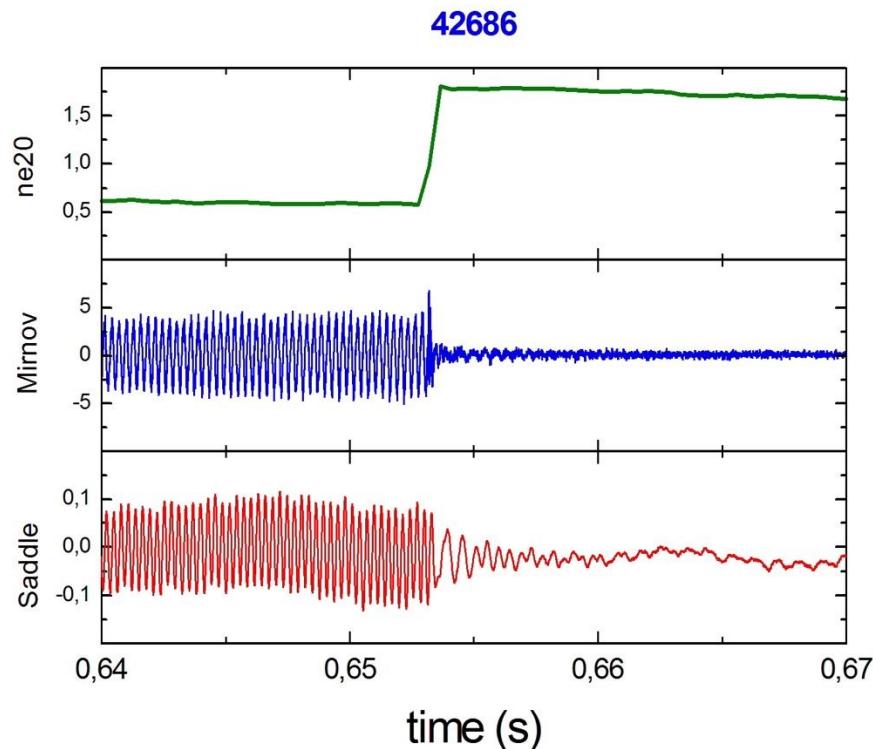
- In **saw-tooth free low density pulses**, magnetic islands formed by tearing instabilities around the $q=2$ surface can saturate at large amplitudes.
- Beta-induced Alfvén Eigenmodes (**BAE**) and Geodesic Acoustic Mode (**GAM**) are also observed in this scenario.



Goals

To study the effect of a D pellet injection on the temporal evolution of a magnetic island.

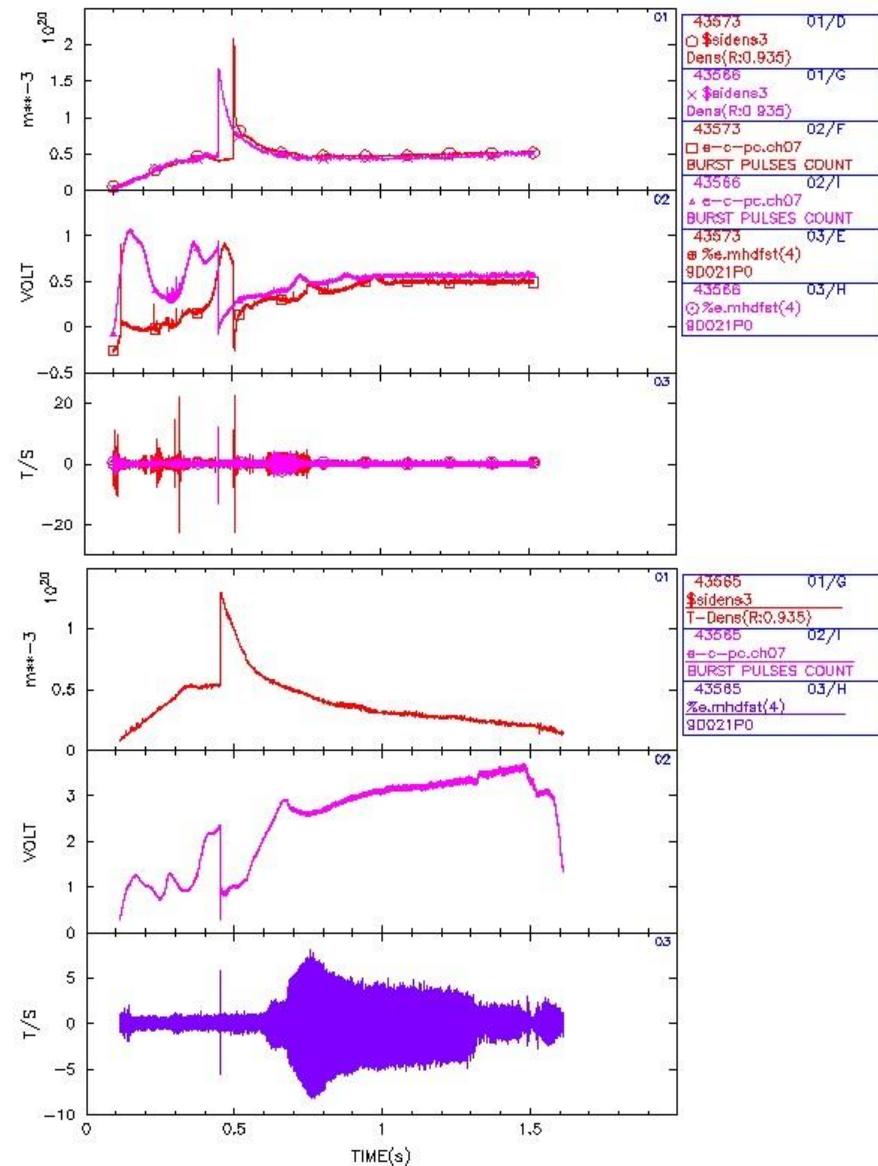
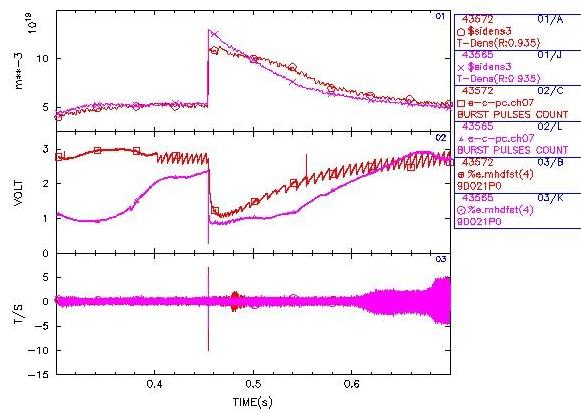
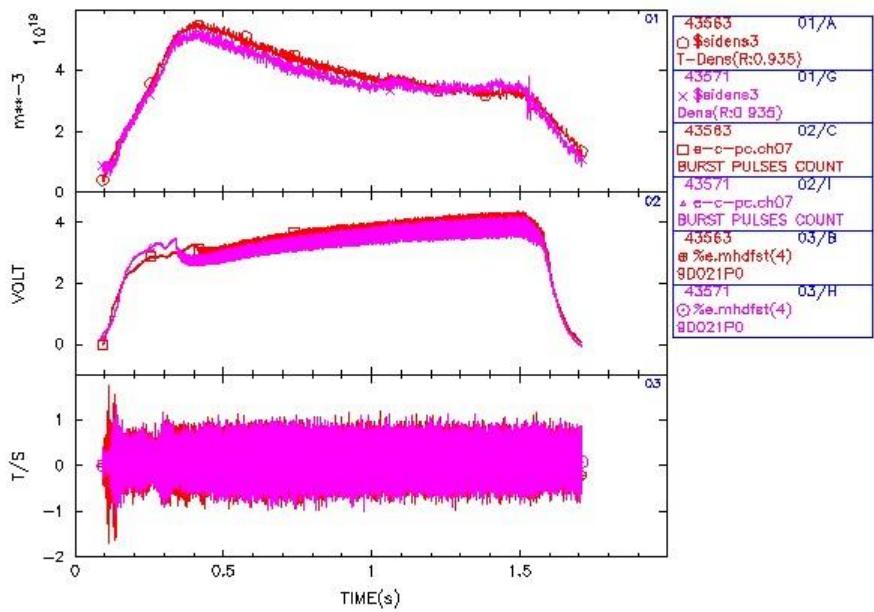
Tearing Modes stabilization by pellet injection



- A fast TM stabilization has been observed after a pellet injection in presence of a “rotating” magnetic island, possibly providing a new MHD stabilization strategy, through fast reconnection processes.

- A pellet injected in presence of a “quasi-locked” magnetic island has induced a stable rotation, preventing a dangerous total locking.

Tearing Modes stabilization by pellet injection



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