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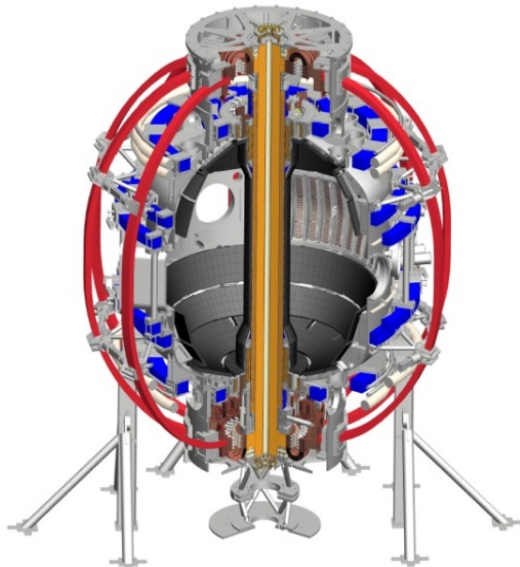
DIII-D experiment on “Impact of external perturbations on TAEs”

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and DIII-D EP group

PPPL, Room B252
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Main goal: explore effects of Magnetic Perturbations (via I-coils) on AE activity

-> *Can I-coils be used to “control” Alfvénic modes?*

Experiment run on July 8th, 2013

Plan:

Develop target scenario:

- Target ~zero rotation at mid-radius, L-mode
- Adjust NBI to excite AEs in ramp-up
- Add I-coils, $n=1$, $f \sim 500\text{Hz}$, 50% duty cycle, 40ms period

Parameter scan:

- Scan I-coils amplitude
- Substitute $n=1$, $f=500\text{Hz}$ with static perturbations

Overall summary of results

Develop target scenario:

- Reload #153499, $B_t=1.75$ T, $I_p=1.05$ MA, double null - **OK**
 - Add counter-NB, target \sim zero rotation at mid-radius - **OK**
 - Add I-coils, $n=1$, $f\sim 500$ Hz, 50% duty cycle, 40ms period - **OK**
 - Max. allowed I-coils amplitude to avoid locking, early disruption - **OK**
 - Adjust NBI to excite TAEs in ramp-up - **OK**

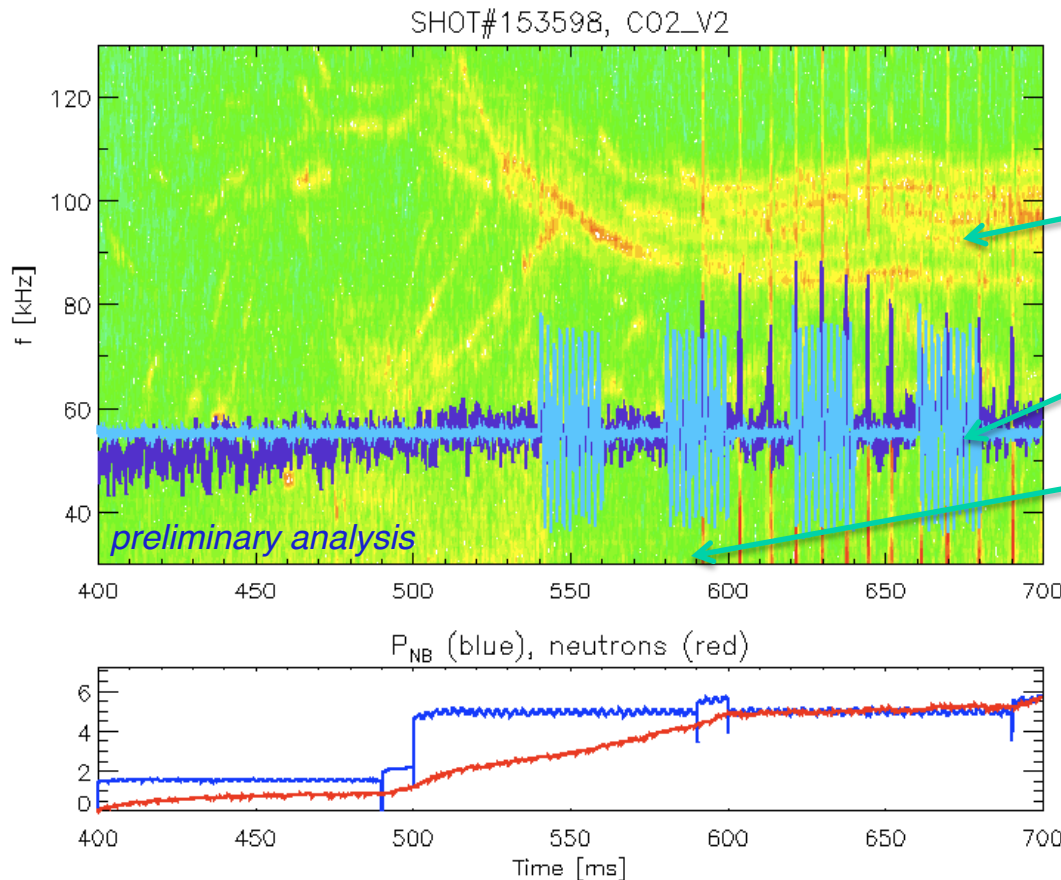
Parameter scan:

- Scan I-coils amplitude - **Missing: got 2 values, but for different scenarios**
- Substitute $n=1$, $f=500$ Hz with static perturbations - **1 case; need more**

We were able to achieve all the required conditions, but not in the same shot, and for sufficiently long time (>>10's of milliseconds).

Example of a “good case”

- Rotation near zero at $t > 600$ ms; robust TAE activity in ramp-up
- I-coils, $n=1$, $f \sim 500$ Hz, 50% duty cycle, 40ms period



Steady TAEs, $n=3 \dots 6$
Low rotation (slightly co-rotating)

Modulated I-coils

Transition to H-mode
appearance of ELMs

Early transition to H-mode complicates analysis, may affect I-coil perturbations

- Analysis still ongoing.
- No clear sign of AE activity modification observed so far, but...
- ... will revisit, optimizing target discharge.