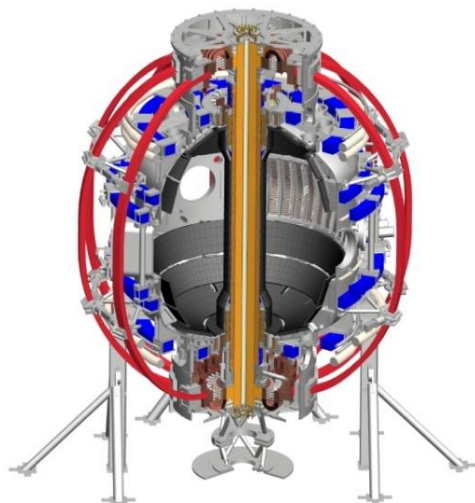


Re-establish ELM pacing via 3-D fields in NSTXU

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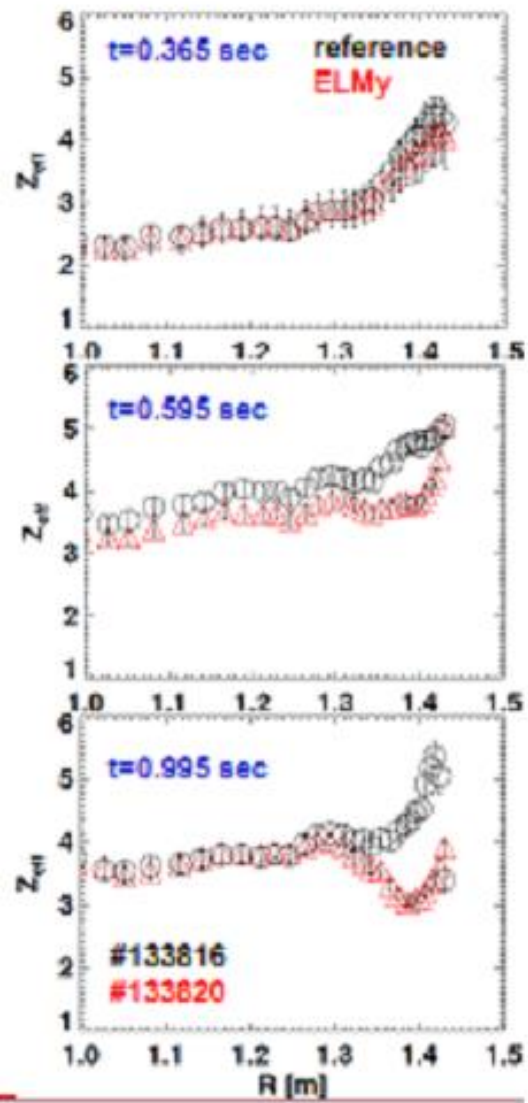
J.M. Canik, ORNL
J. Lore

NSTX-U Research Forum
Princeton, NJ
2/26/15

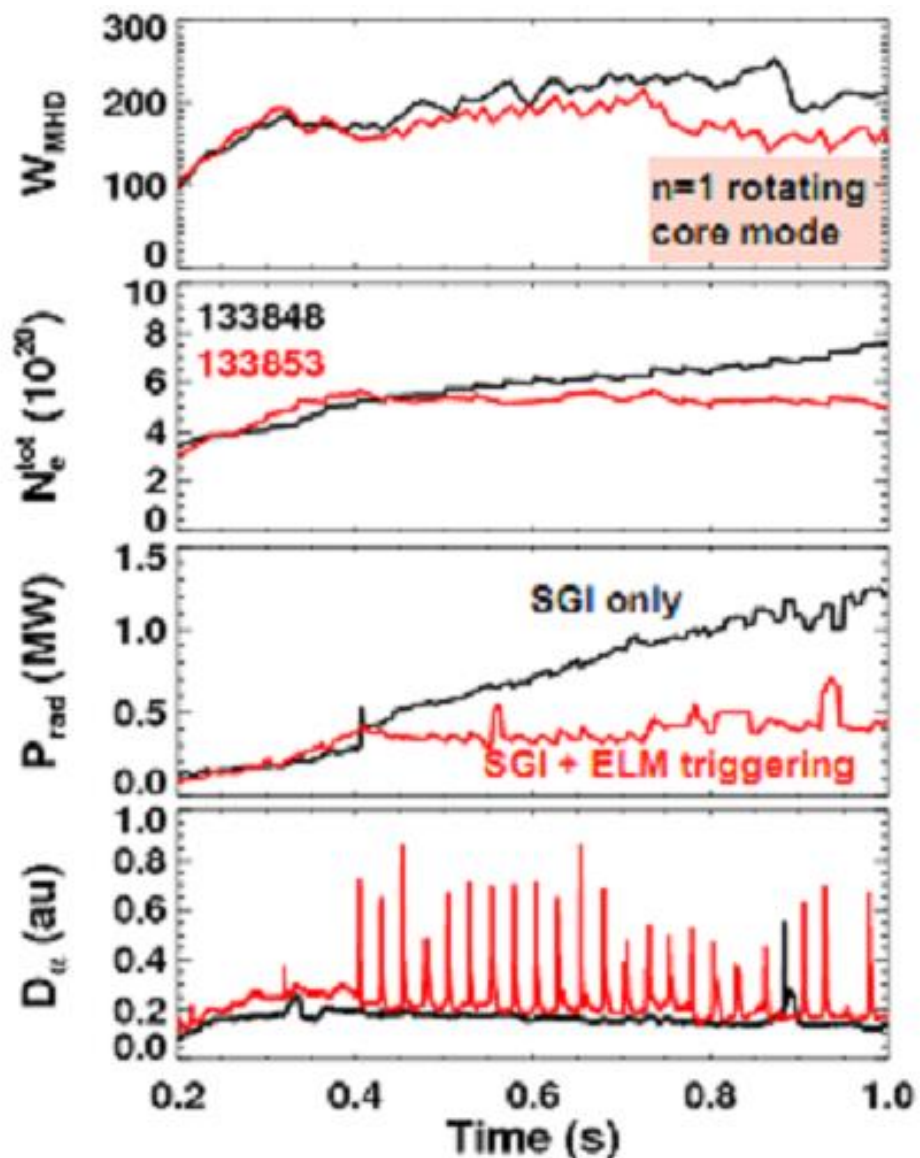


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ELM pacing with $n=3$ fields improved global particle control in NSTX (with some costs...)



- $n=3$ pulses trigger individual ELMs
- Ramp of n_e and P_{rad} can be stopped
- But at frequencies necessary confinement is degraded, core tearing modes triggered
- Central impurity accumulation is still strong



ELM triggering needs to be established in NSTX-U so it can be deployed/combined for particle control

- Basic idea is to apply $n=3$ fields via square waves as done in NSTX for pacing
 - Vary pulse height ($\sim 1\text{-}2$ kA) and duration ($\sim 5\text{-}10$ ms) to get reliable triggering for minimal core impact
- Start at NSTX-like parameters (high- δ , $I_p \sim 1\text{MA}$, $B_t \sim 0.5\text{T}$)
 - Connect to NSTX results; hopefully with little pain
- Establish pacing in a few candidate NSTX-U high performance scenarios (or maybe just pick one?)
 - High NI fraction
 - High stored energy
 - Very long pulse
 - Dependent on $I_p/B_t/P_{\text{NBI}}$ scans + scenario development
- Aims at Li-conditioning phase of operations