

Modification of edge profiles and stability with lithium wall coatings in NSTX

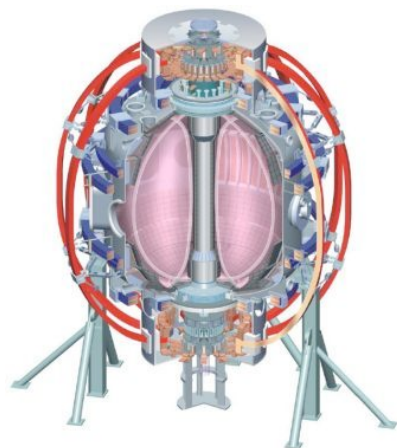
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and the NSTX Research Team

**APS DPP meeting
Atlanta, GA USA
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APS Outline (p. 1 of 2)



- ✓ Summarize effect of Lithium on discharges (M. Bell, H.Kugel)
- ✓ Show characteristics of how ELM disappear
 - Sequence of discharges
 - Compare first (ELMy) and final (ELM-free) discharges
 - Acknowledge prediction of ELMs disappearing in 2005 by LEZ
- Show edge profiles of n_e , T_e , P_e for ELMy and ELM-free discharges
 - ✓ Thomson multi-shot time slice analysis in good shape
 - Would like reflectometry for more detailed n_e profiles to see if profiles shift gradually as lithium coating is increased (Kubota, Wilgen/Kaita?)
 - Time permitting: power balance technique to locate separatrix: SOLPS, 2-point model (J. Canik, J. Rhoads)
- Discuss stability hypothesis: n_e gradient relaxes and profile shifts inward, moving peak P' to a region of reduced magnetic shear, responsible for ELM stabilization
 - ✓ requires proximity to second stability
 - ✓ Show PEST and ELITE stability calculations
 - Need analysis for discharge which goes from ELMy \rightarrow ELM-free (Osborne)
 - Apply new error analysis technique (f/DIII-D-JET study) (Osborne)

APS Outline (p. 2 of 2)



- Discuss aspects that we don't understand
 - ✓ Complete evolution: why do ELMs go away the way they do i.e. with increasing periods of quiescence?
 - ✓ Discuss apparent role of failed discharges/L-mode in observing ELMs on following discharges – importance of recycling?
 - ✓ ELITE calculations suggest diamagnetic stabilization should suppress ELMs in pre-lithium time slices also -> why this discrepancy?
 - Can we determine if SOLC is playing any role? (Takahashi)
 - New data in high δ discharges from 2009 – ELMs seem to go away more stubbornly (needs some analysis – Maingi, ???)
- ✓ Summarize main points