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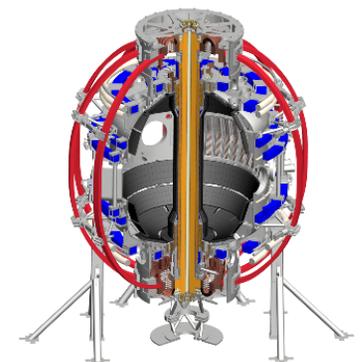
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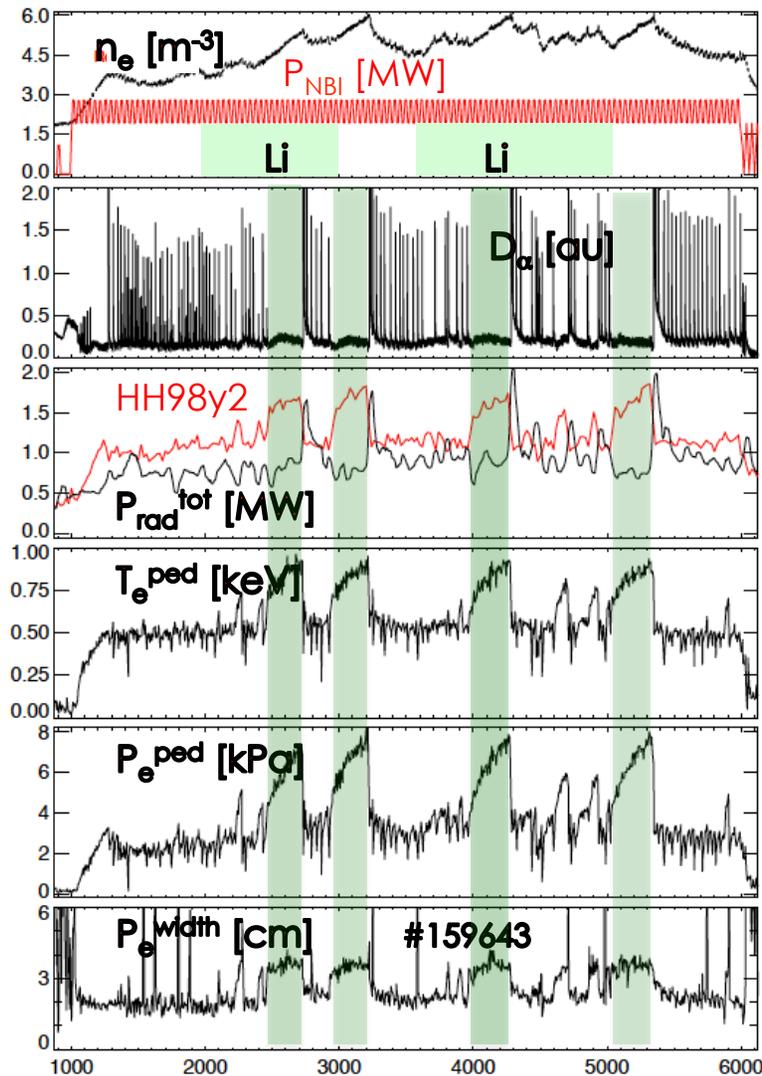
## Li powder injector for long pulse ELM control

R. Maingi

DIID-D National Campaign Brainstorming  
Boundary Science Group  
Princeton, NJ, Oct. 7, 2016



# Lithium injection induced a transient, larger pedestal width and higher pedestal pressure in DIII-D

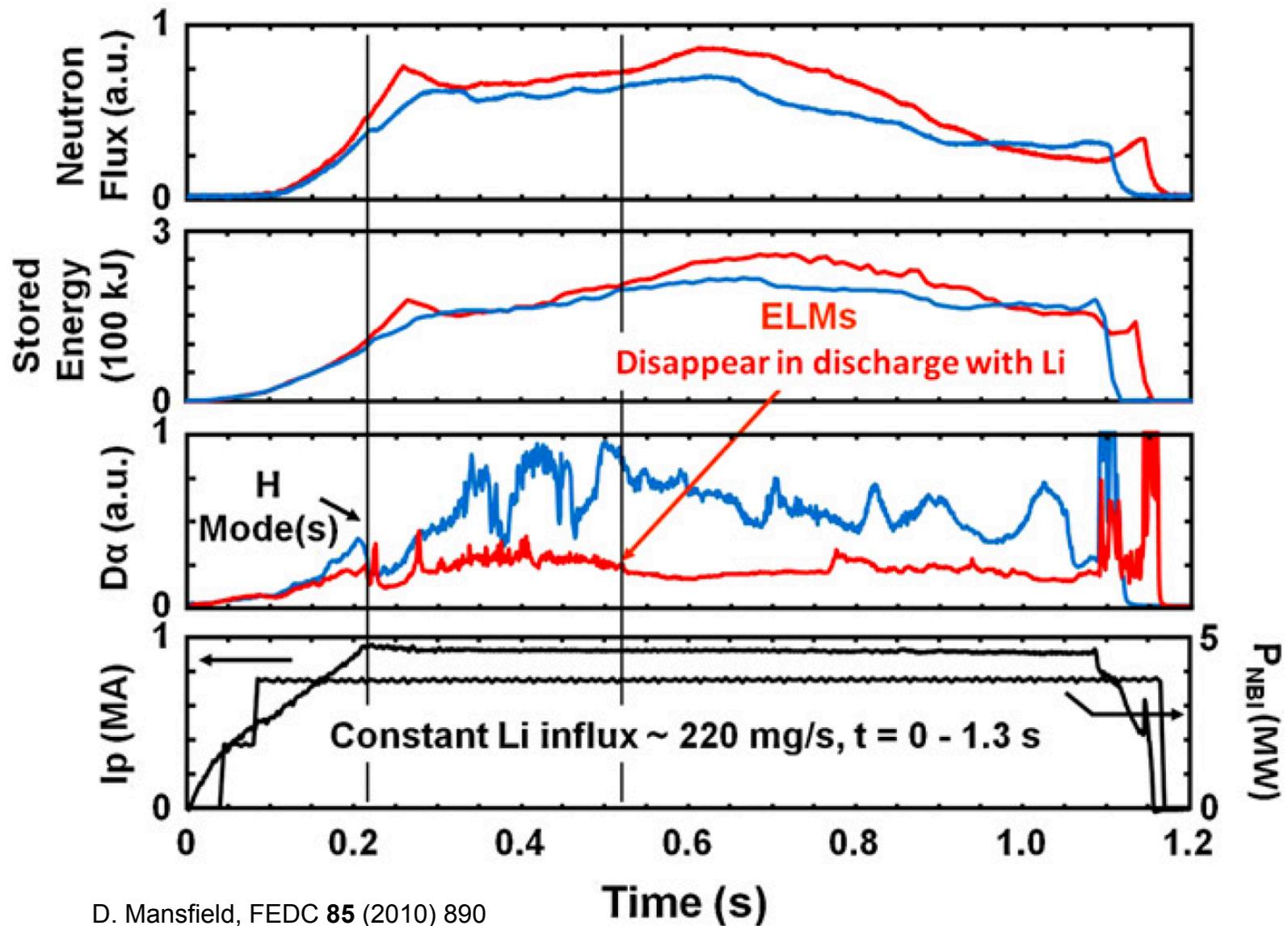


- ELM-free bifurcated state can be seen in  $D_\alpha$  emission
- $H_{98y2} \leq 1.8$  here, 2.0 in other discharges
- $T_e^{\text{ped}}$  nearly doubled during bifurcations
- $P_e^{\text{ped}}$  nearly tripled during bifurcations
- $P_e^{\text{width}}$  increased by 100%

How to make stationary? NSTX and EAST experiment clues?

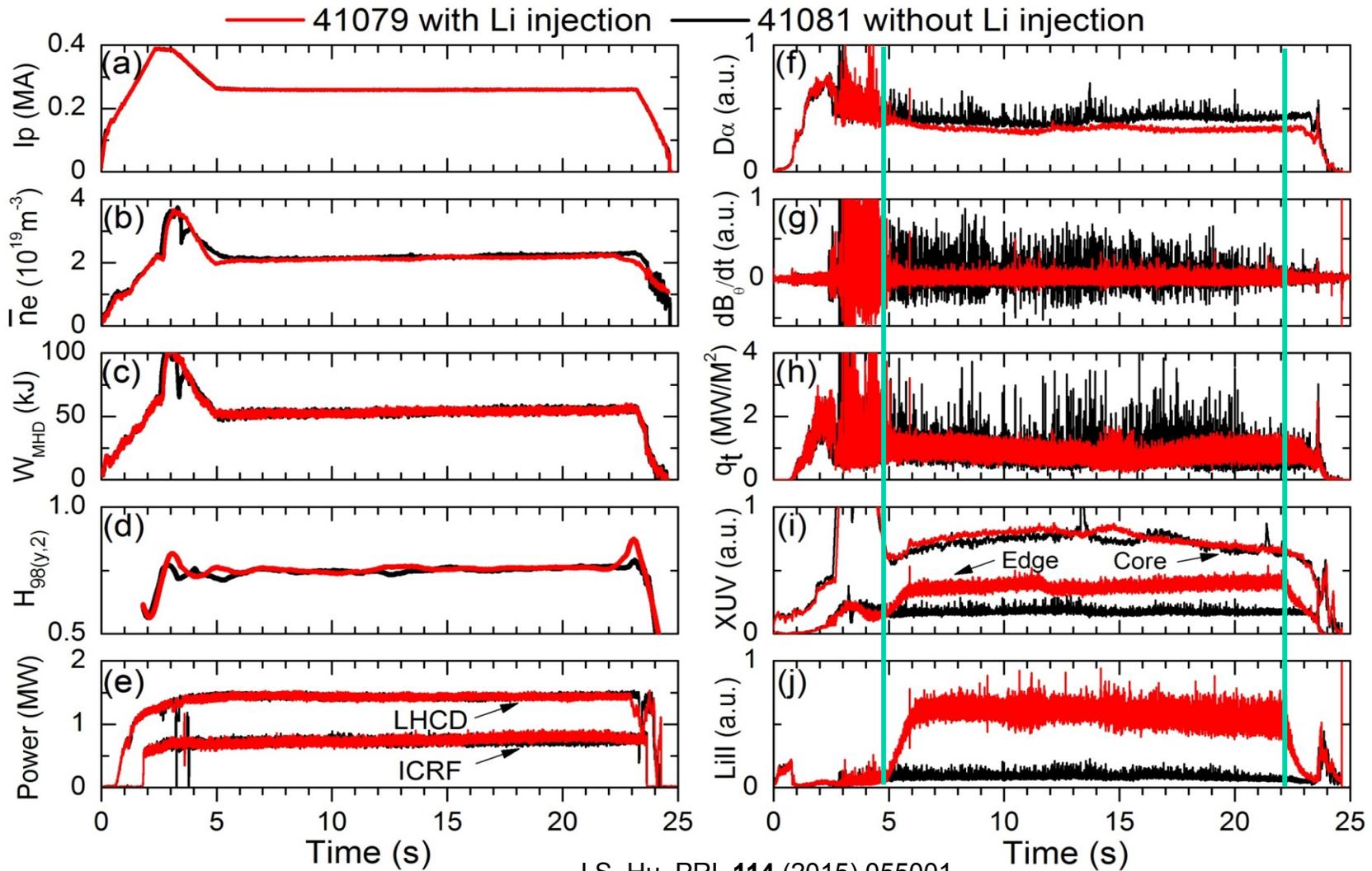
R. Maingi, H-mode WS, Oct. 2015

# Lithium dropper reduced recycling and eliminated ELMs in NSTX



D. Mansfield, FEDC 85 (2010) 890

# Radiated power and density remained steady during H-mode with eliminated ELMs in EAST



J.S. Hu, PRL 114 (2015) 055001



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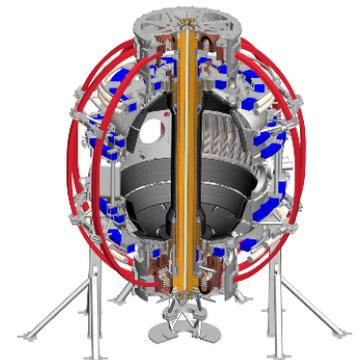
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## R/a scan between NSTX-U and DIII-D Impact on ELM pacing and edge stability

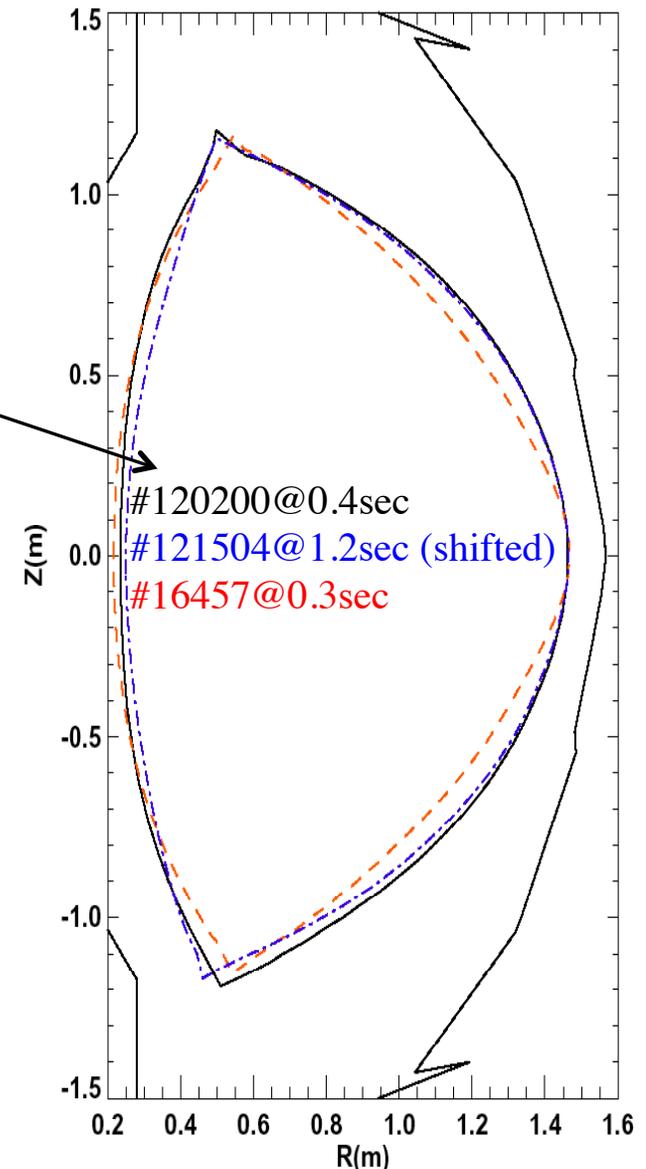
R. Maingi

DIII-D National Campaign Brainstorming  
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## Propose an R/a scan, with constant $v^*$ , $\beta$ , $\rho^*$ in NSTX/NSTX-U and DIII-D, keeping cross-sectional shape fixed

- Similar scan done as part of ITPA PEP expt in 2005 between NSTX, **MAST**, and **DIII-D**
  - Concluded that all machines were at peeling/ballooning boundary (Maingi, IAEA paper IT/P1-12)
  - Diagnostics and analysis now improved substantially
  - New tools: granule injector, RMP? to probe edge edge stability
  - LGI for ELM pacing
- Need to flesh out an experiment on edge stability vs. R/a, including control tools
  - High torque, high NBI, ELM control



# Existence proof of

