

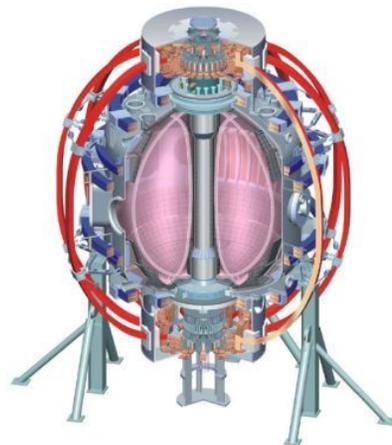
Reproduce medium triangularity Enhanced Pedestal H-mode Discharge

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Rajesh Maingi,



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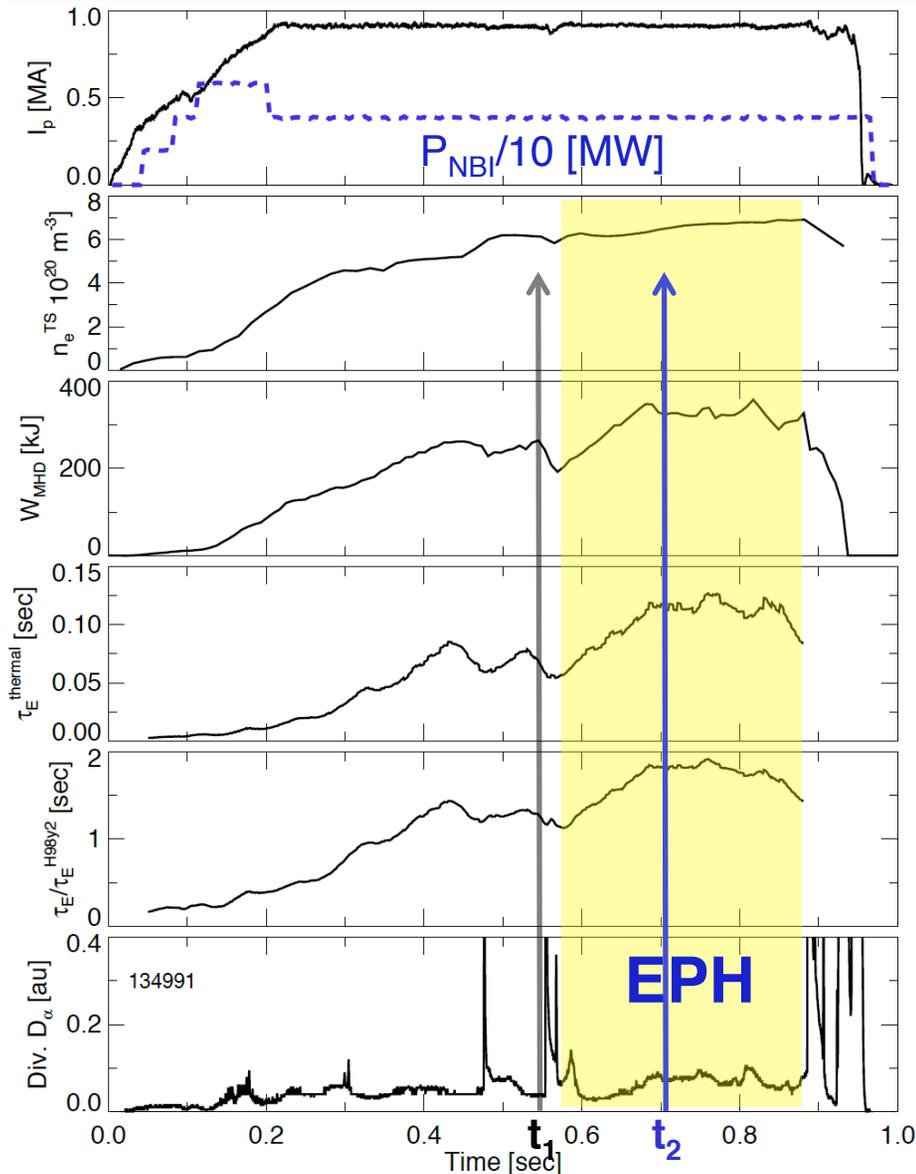


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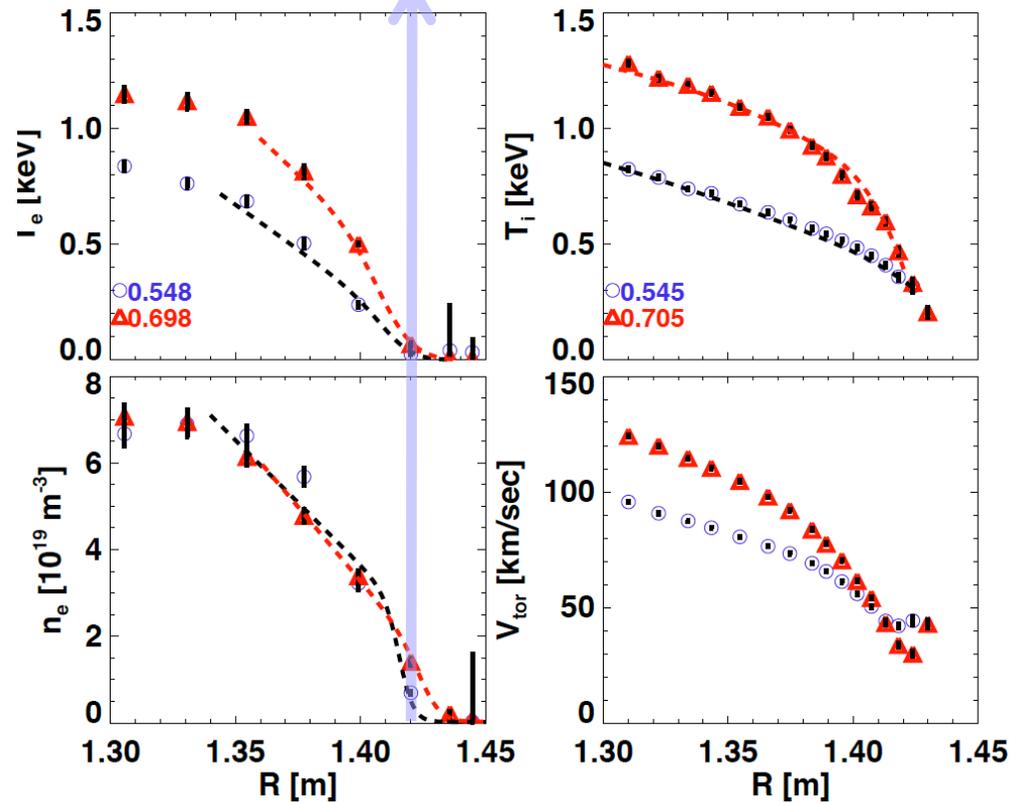
Goals and Background

- Goal: reproduce the long pulse EP H-mode, 134991
 - Use beta feedback to extend pulse
 - Document the turbulence characteristics
- The longest duration EP H-mode, 134991, was a medium triangularity discharge with some HFS plus SGI fueling
 - Triggered by ELM; additional ELMs seem to cause transition to H-mode
 - Edge pedestal T_e , T_i increased substantially; no increase in edge n_e
 - Confinement improved: $H_{98} \leq 1.7$
 - Large spatial region of high $E \times B$ shear, compared with H-mode
 - EP-H lasted for 300 ms in 134991 ($\sim 3 \tau_E$); most EP-H's last $\leq \tau_E$
- Here we propose to reproduce the long pulse EP-H and document
 - A handful of attempts to reproduce 134991 have produced very high confinement discharges, but no EP-H modes during the flat-top
 - * ***This is an NSTX contribution to FY11 JRT: scenarios with separation of particle and energy transport channels, as compared with H-mode***

EPH-mode phase observed for several τ_E , up to ~ 300 msec



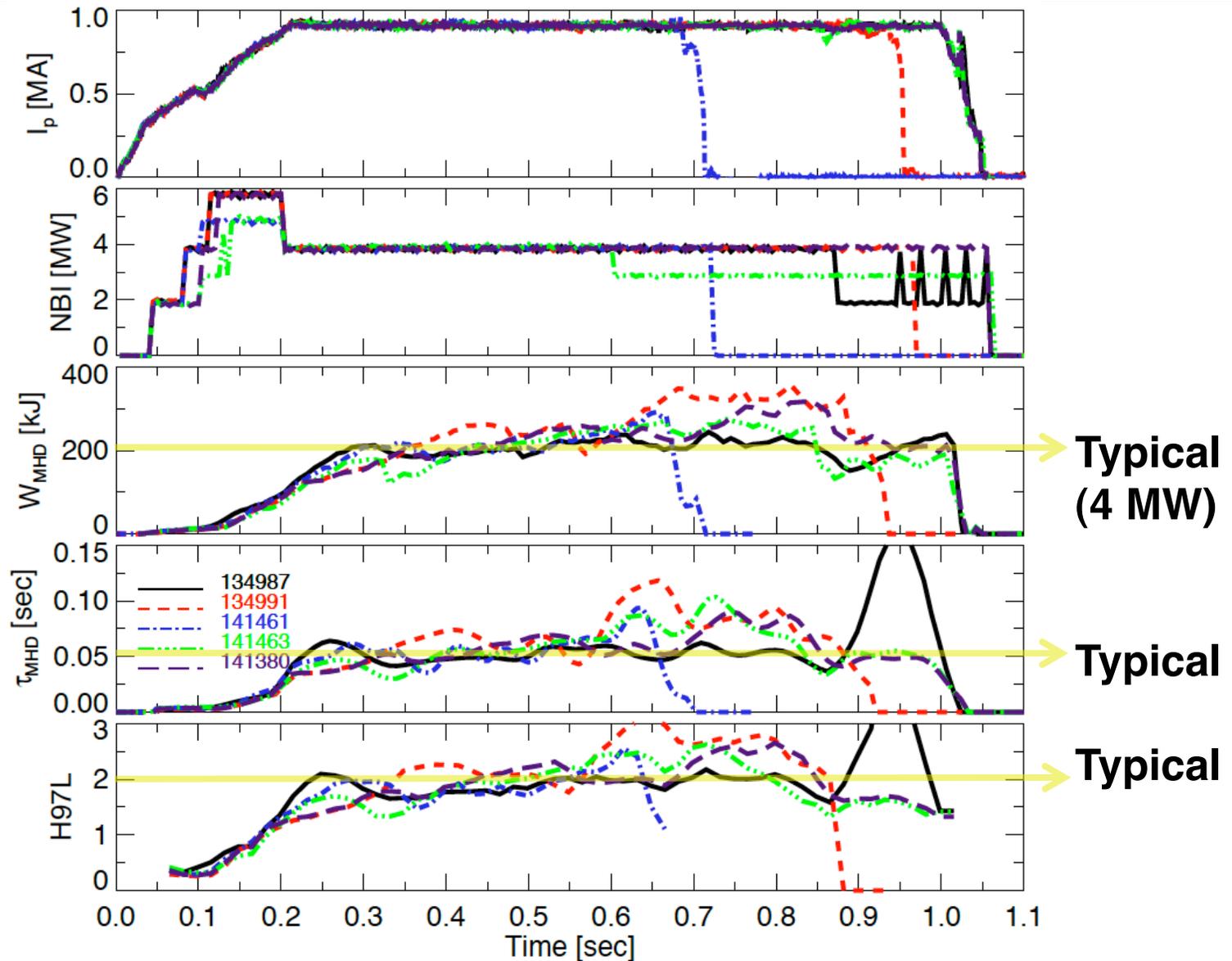
EP H-mode
H-mode
 separatrix



Maingi, PRL 2010

Several of these medium δ discharges have high τ_E and H-factor

* Only
134991
 and
 134987
 were EP-H



Experimental Plan (1 day)

- Reproduce 134991, if possible, and document the profiles
 - May have to vary the lithium amount to optimize for EP H-mode access
 - May have to trigger ELMs to induce EP H-mode
 - May have to optimize SGI fueling for EP H-mode access
- Apply beta feedback to avoid high β_N instabilities
- Do a small I_p and B_t scan to document the operational window
- Measure turbulence characteristics to determine what is responsible for flattening of the density profile