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Dependence of the L-H Power Threshold on Magnetic Balance and Heating Method in NSTX

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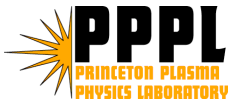
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- 3) Princeton Plasma Physics Laboratory
- 4) New York University

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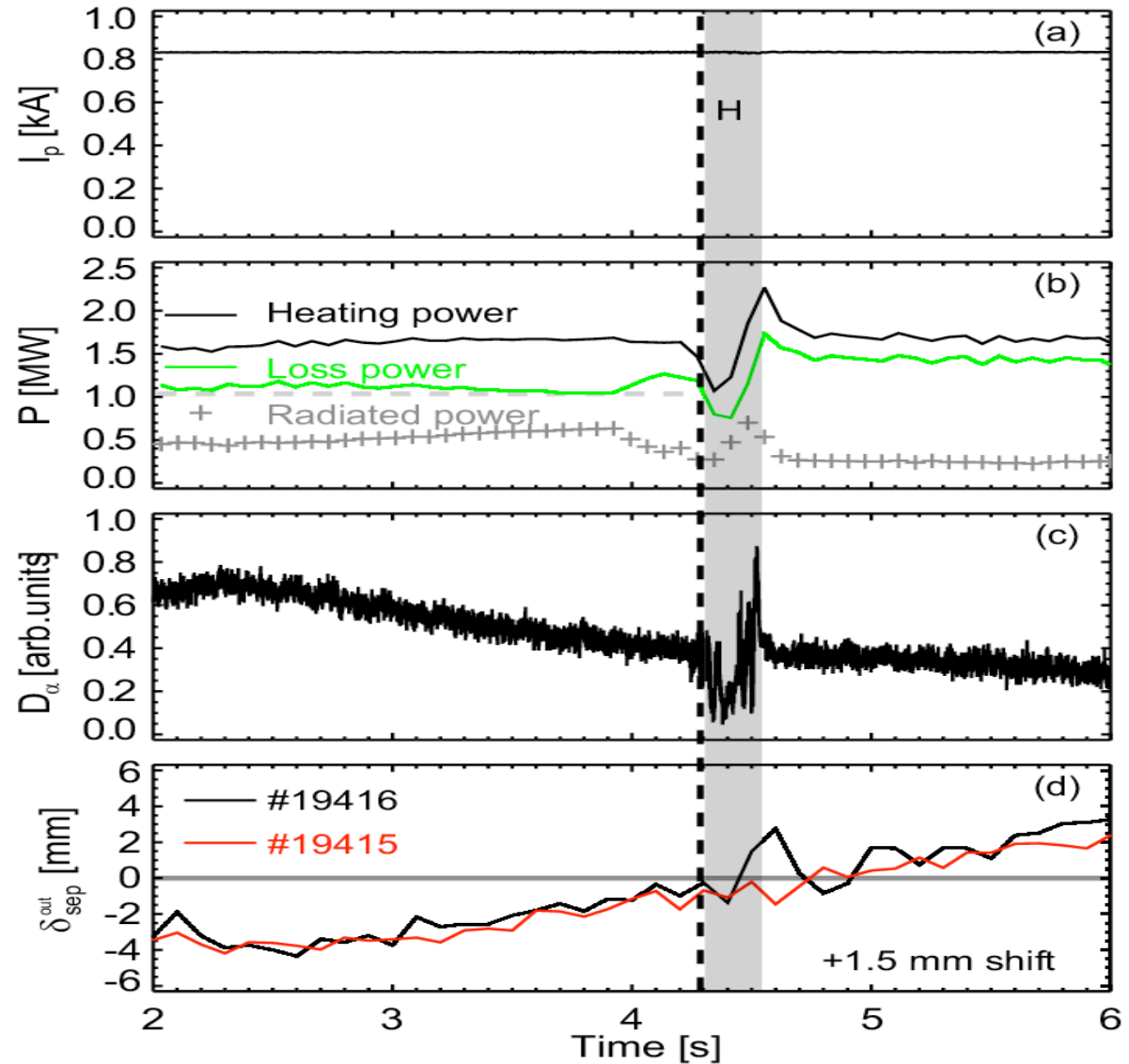
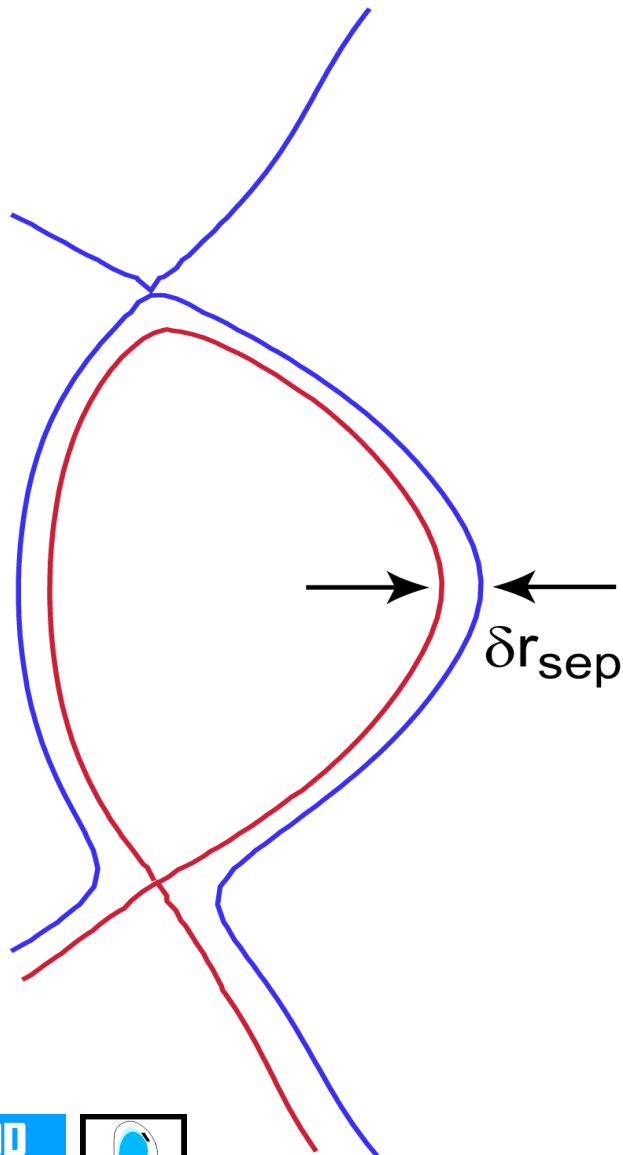
R. Maingi, APS 2007 oral



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Improved H-mode access very close to balanced double-null configuration in MAST and ASDEX-Upgrade



Lowest L-H Power in Balanced Double-Null Discharges in NSTX

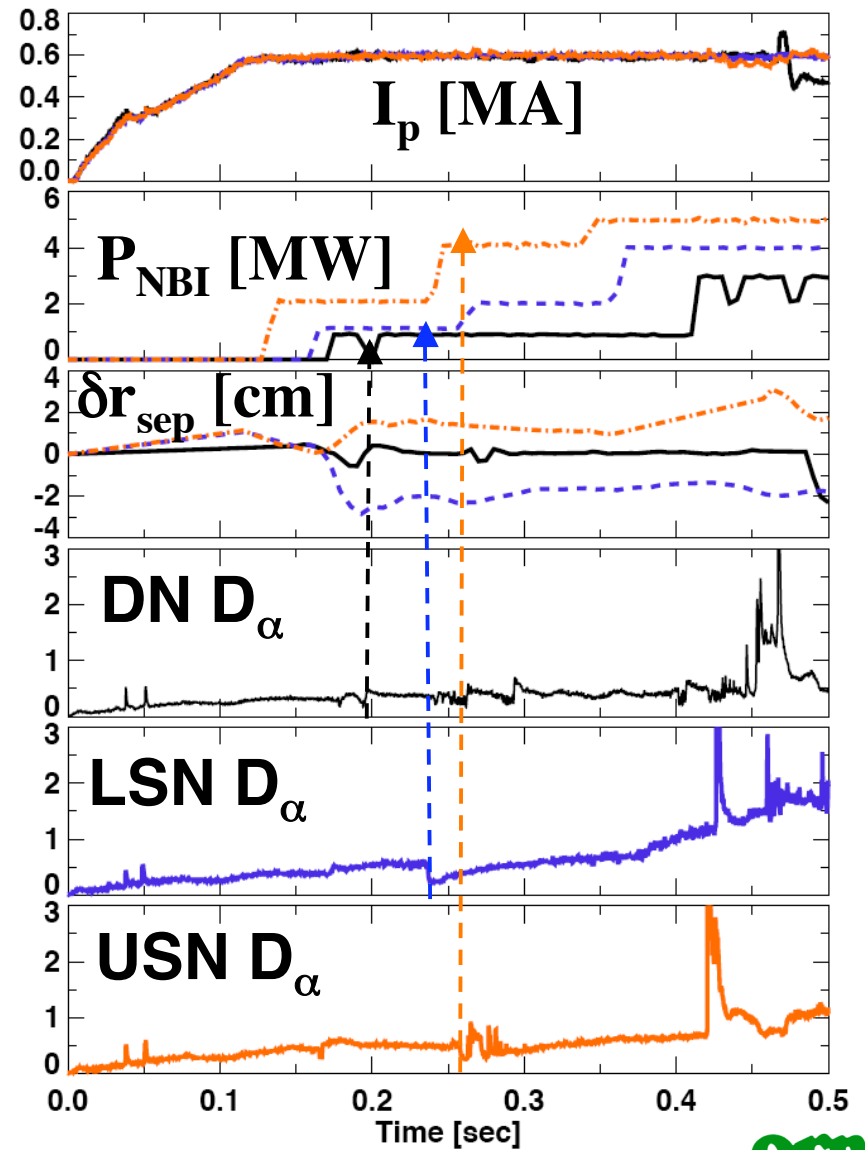
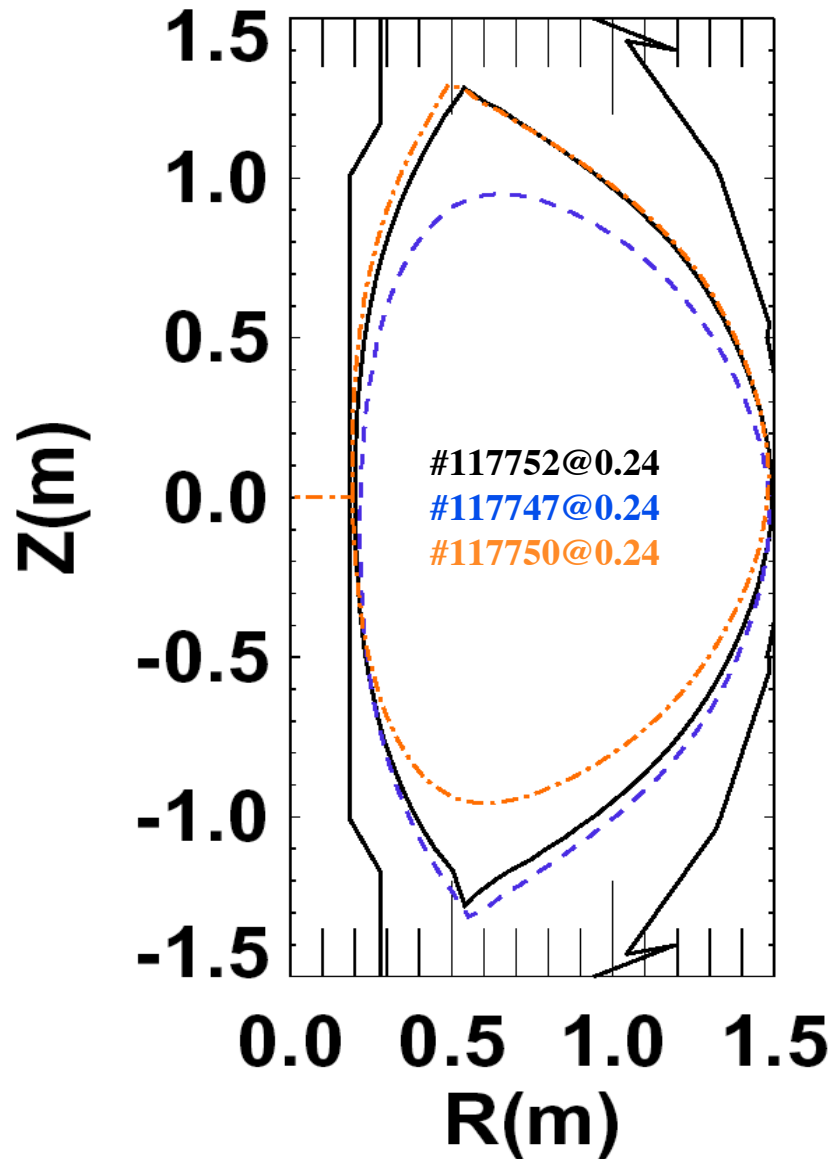


- Observed with NBI or RF heating
- P_{LH} comparable with NBI and RF heating in balanced DN configuration

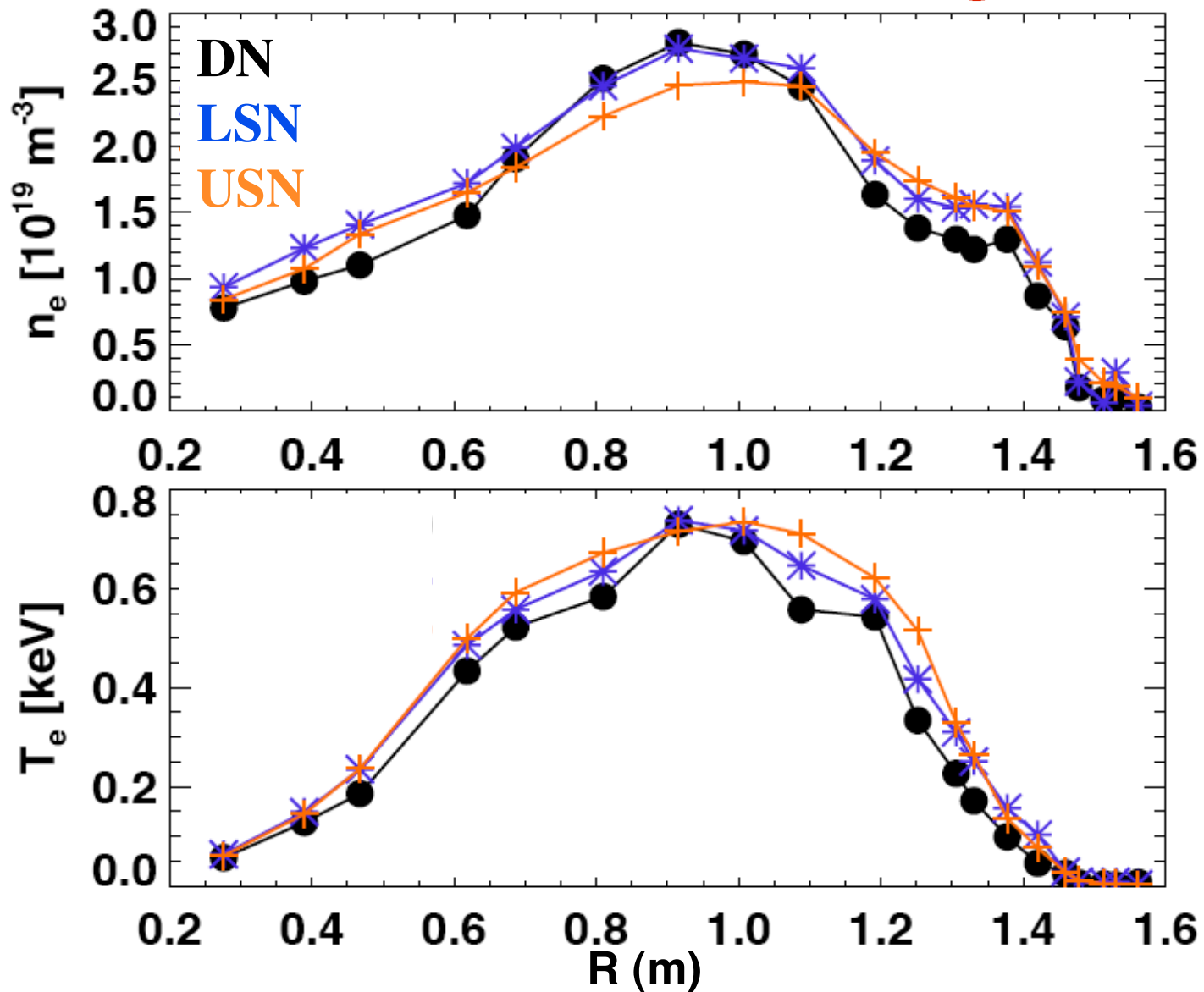
Outline

- DN, LSN, and USN comparisons
- NBI and RF comparisons
- Summary

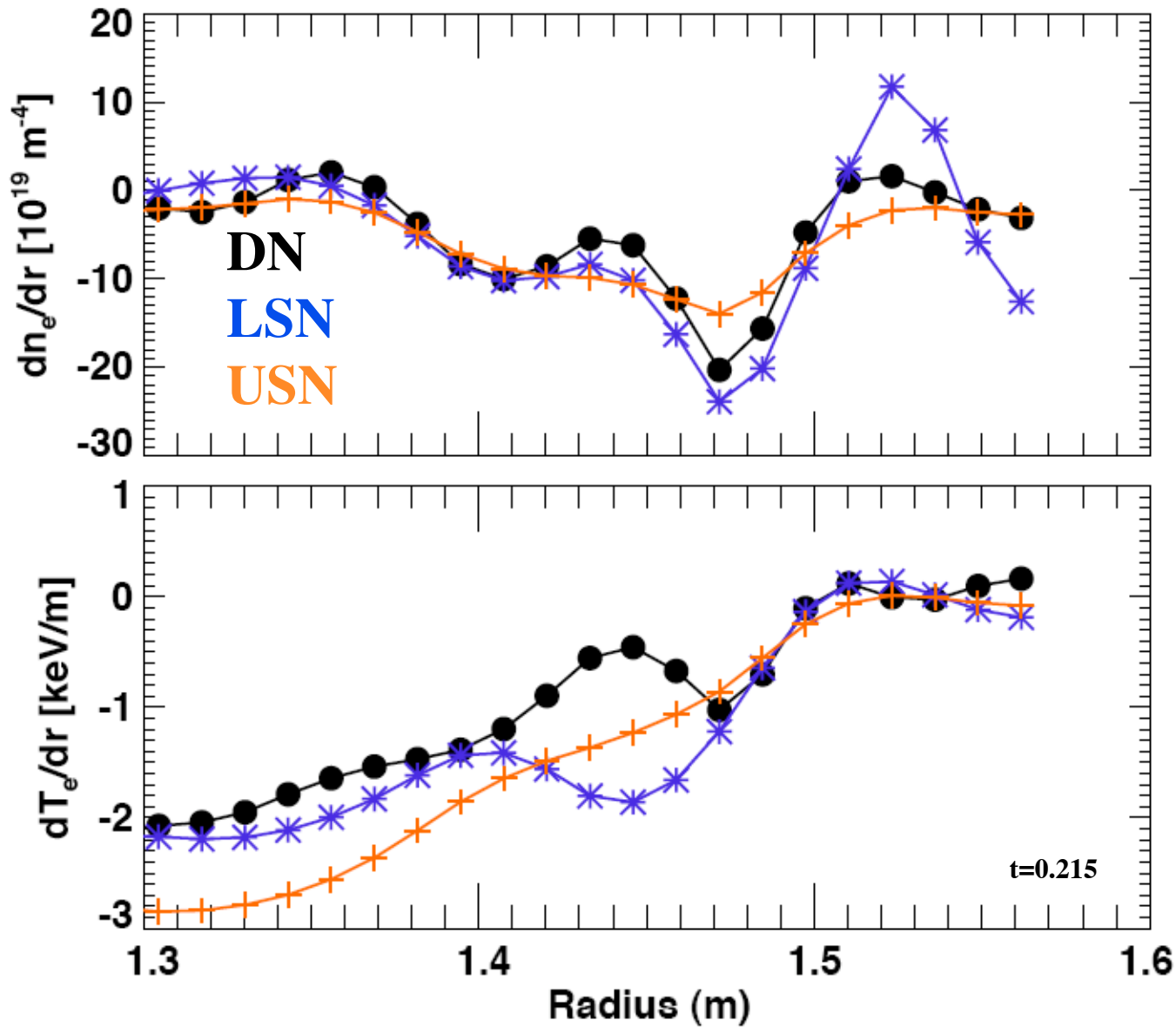
P_{LH} lowest in balanced DN with $\delta r_{sep} \sim 0$ w/NBI heating



Plasma profiles differ slightly before L-H transition

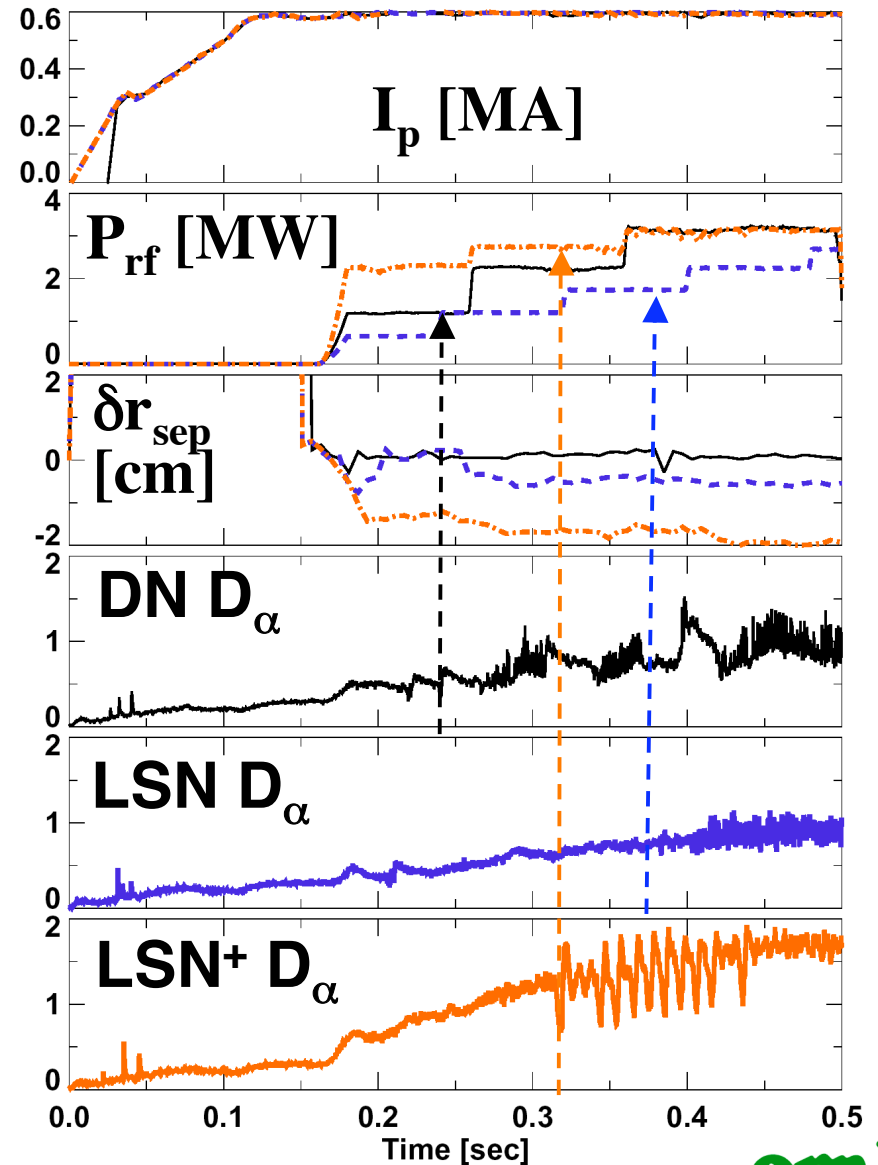
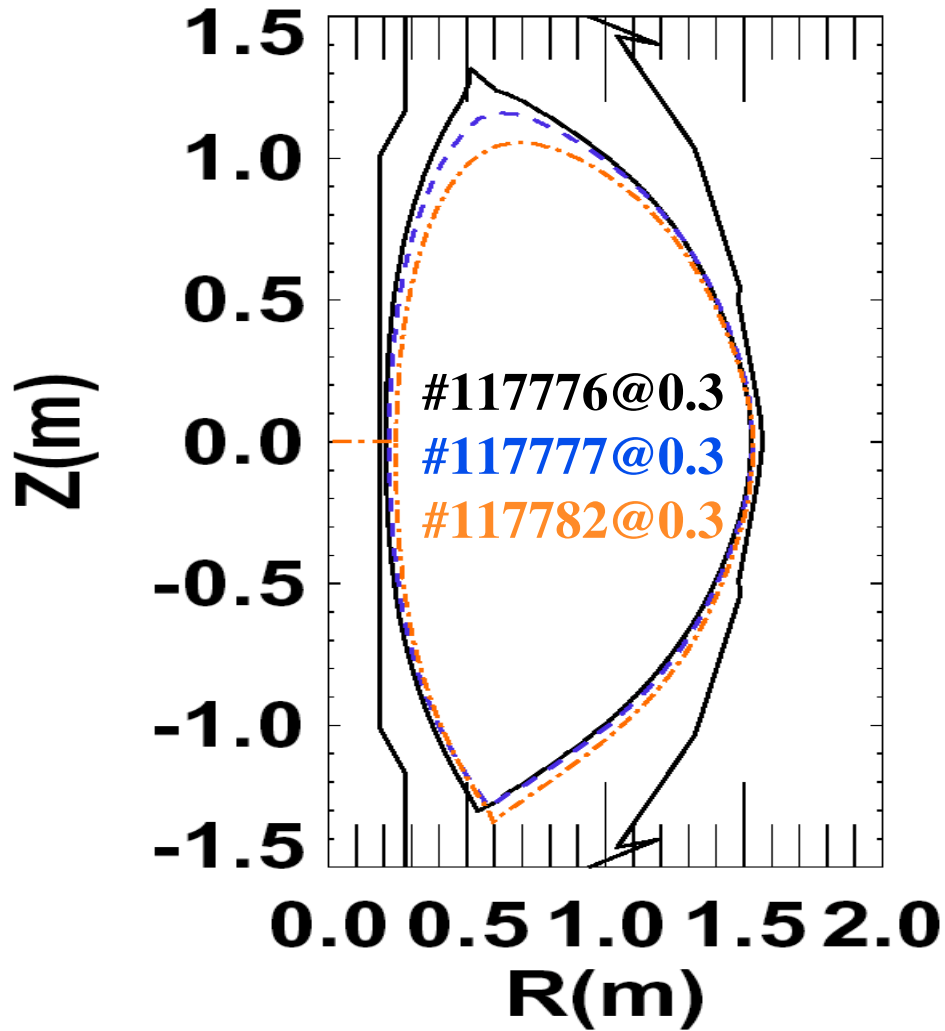


Edge gradients appear largest in LSN configuration

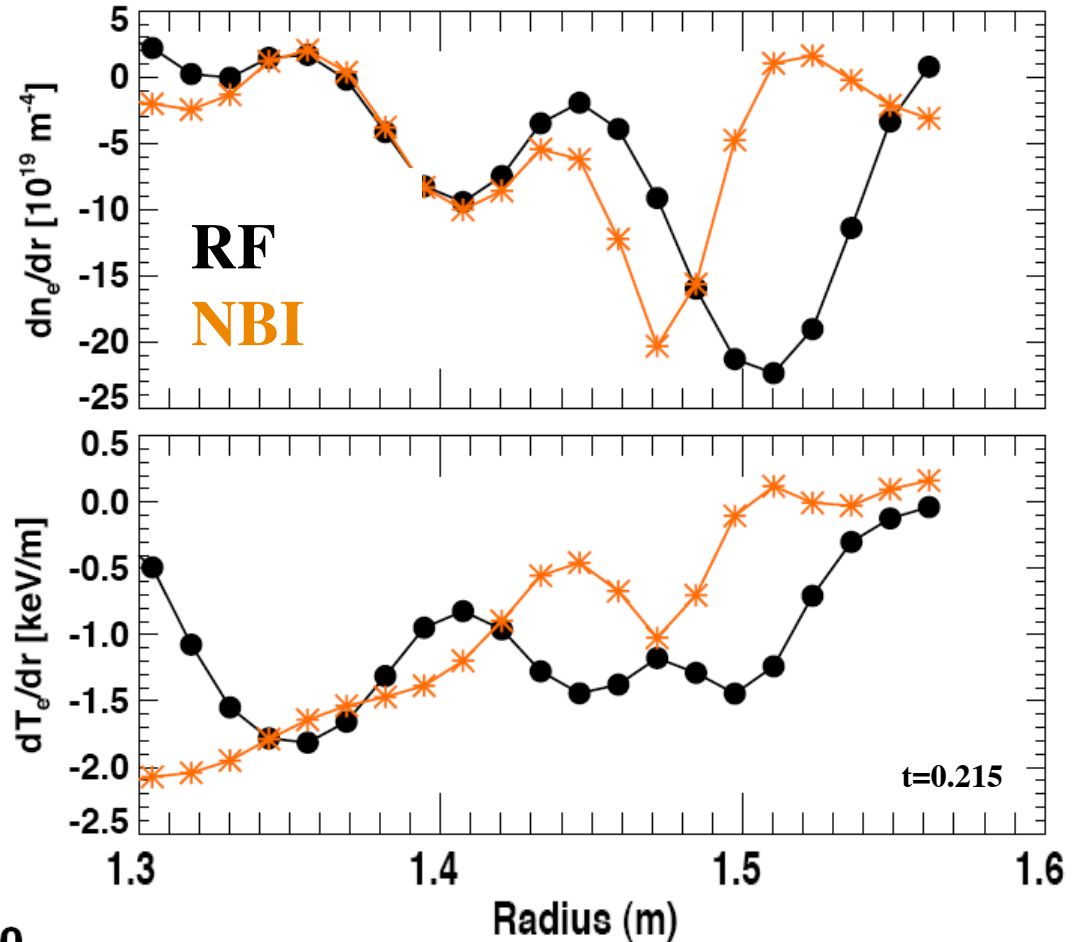
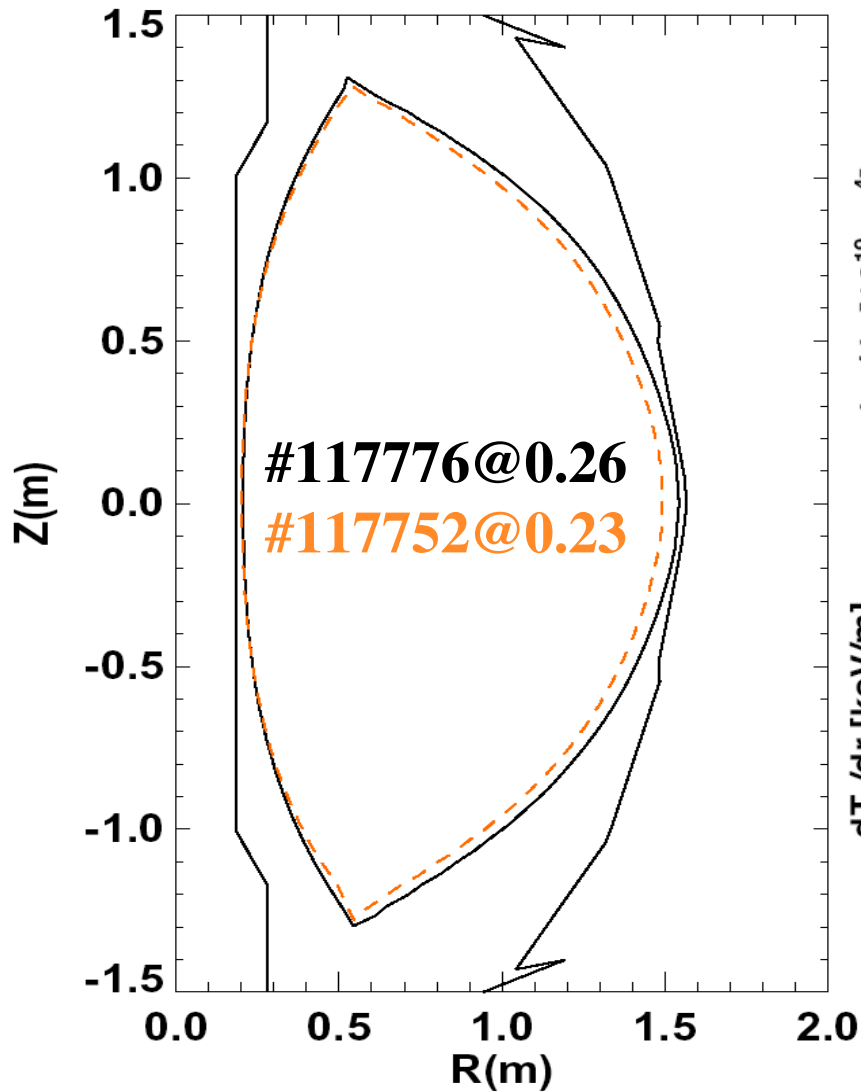


**Error bar
analysis
needed to
confirm**

P_{LH} increased with decreasing δr_{sep} with RF heating



Similar shapes and edge gradients achieved for RF and NBI discharges just before time of L-H dithers



Summary



- Lowest P_{LH} observed near balanced DN
 - with either NBI or RF heating
 - Local minimum?
- P_{LH} comparable with NBI and RF heating in balanced DN configuration
- Subtle differences in edge profiles just before L-H transition
 - Need error analysis and more statistics to confirm
- H-mode characteristics different
 - DN transitions to dithery H-mode with perhaps Type III ELMs
 - LSN and USN go toward ELM-free H-mode