

Why does Low-field Side Gas Fueling Delay H-mode transition?

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Transport and Turbulence Group Session

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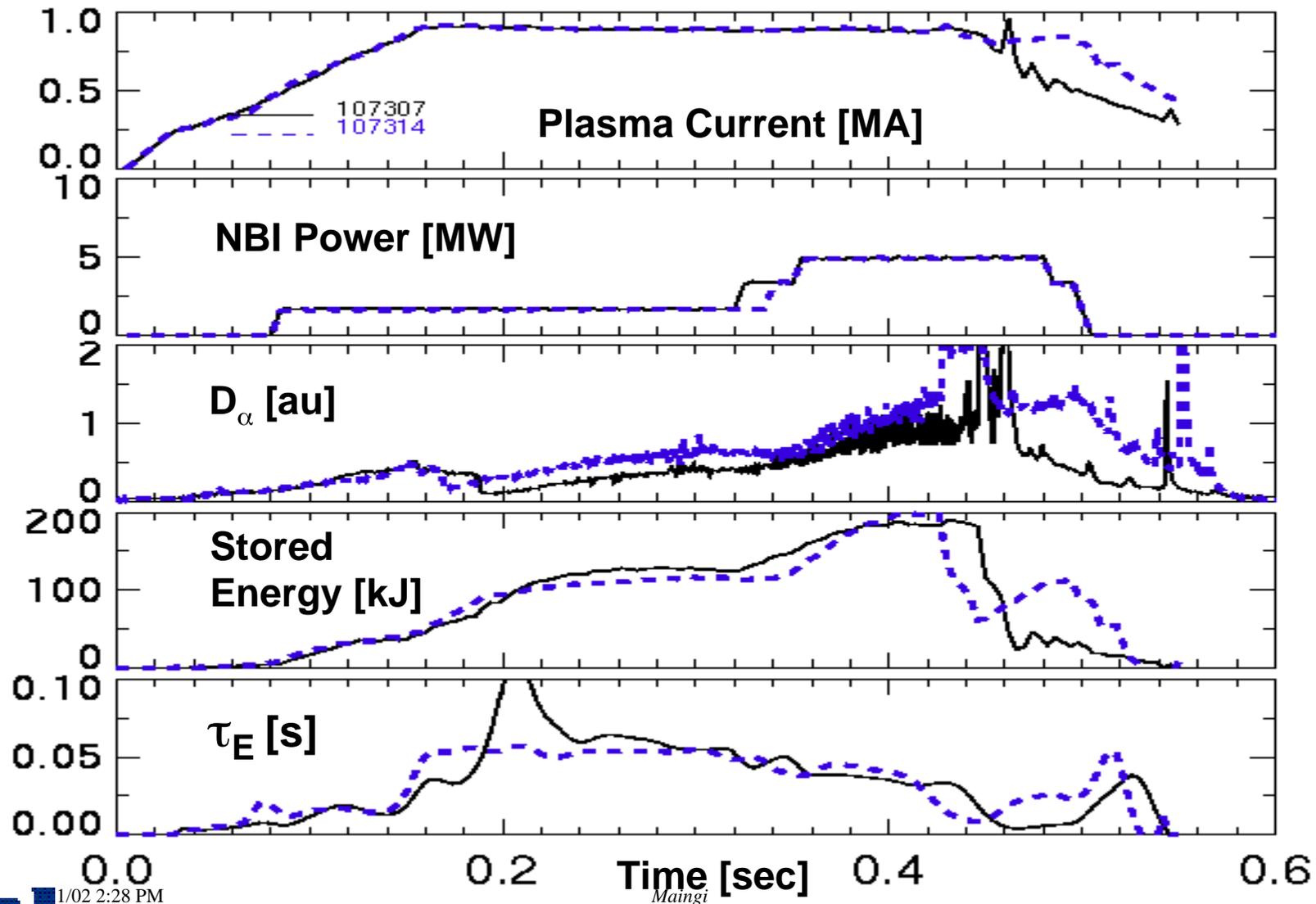
Princeton, NJ

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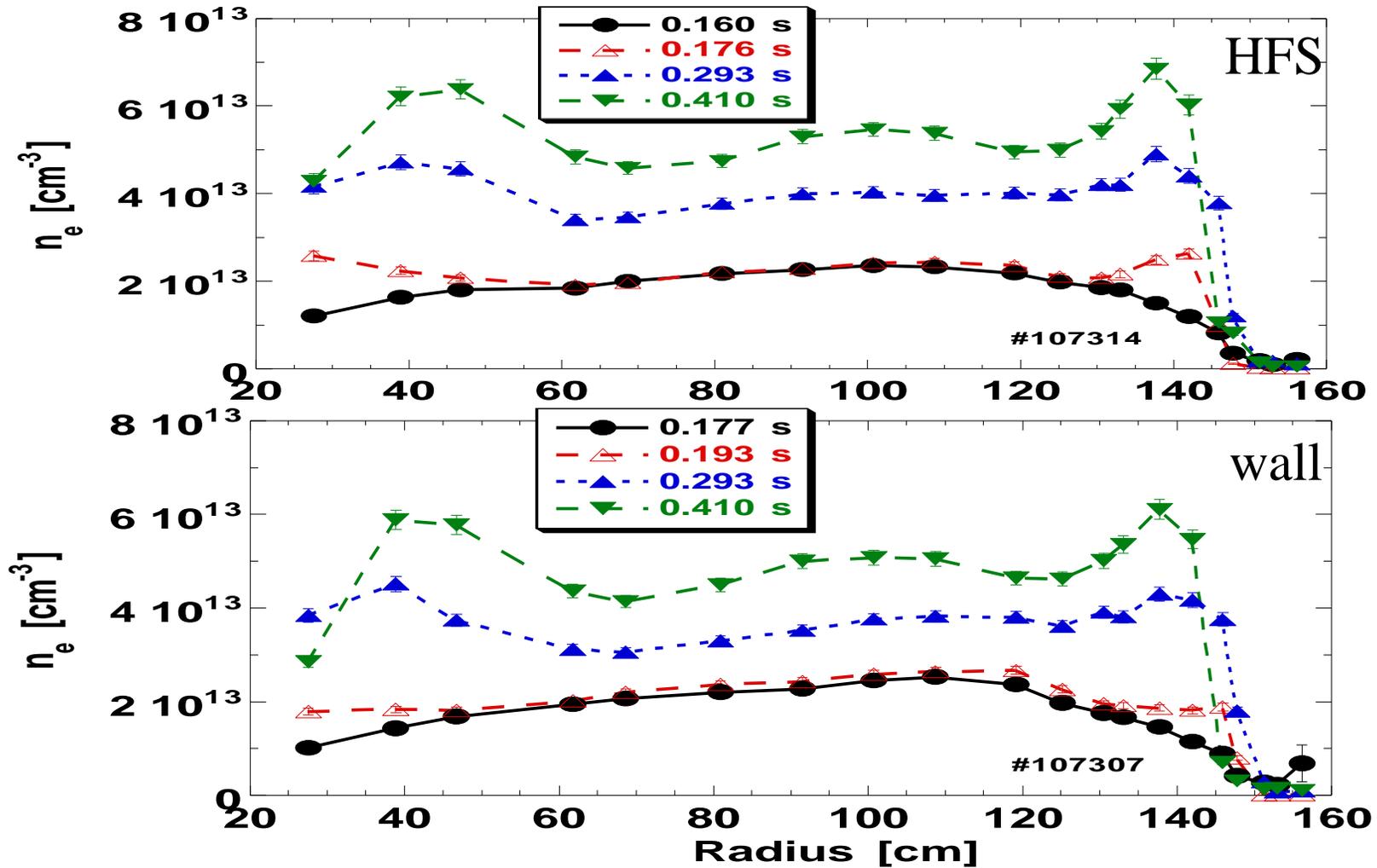
HFS fueling has been a useful tool, but continued progress requires better gas input control

- HFS fueling has provided a reasonably reliable means to long-pulse, H-mode access
- LFS fueling of comparable level has produced poorer, less reproducible H-modes
- Wall pre-loading has produced similar quality H-modes to HFS fueling, with ostensibly poorer reproducibility
- Proposal (1 day):
 - Compare long-pulse, HFS fueled H-mode discharge with LFS fueled and wall pre-loaded
 - measure rotation and E_r changes to test Helander's theory that poloidal distribution of neutrals affects E_r
 - reduce fueling rate and compare HFS/LFS
 - Measure and compare P_{LH} for HFS/LFS/pre-loaded

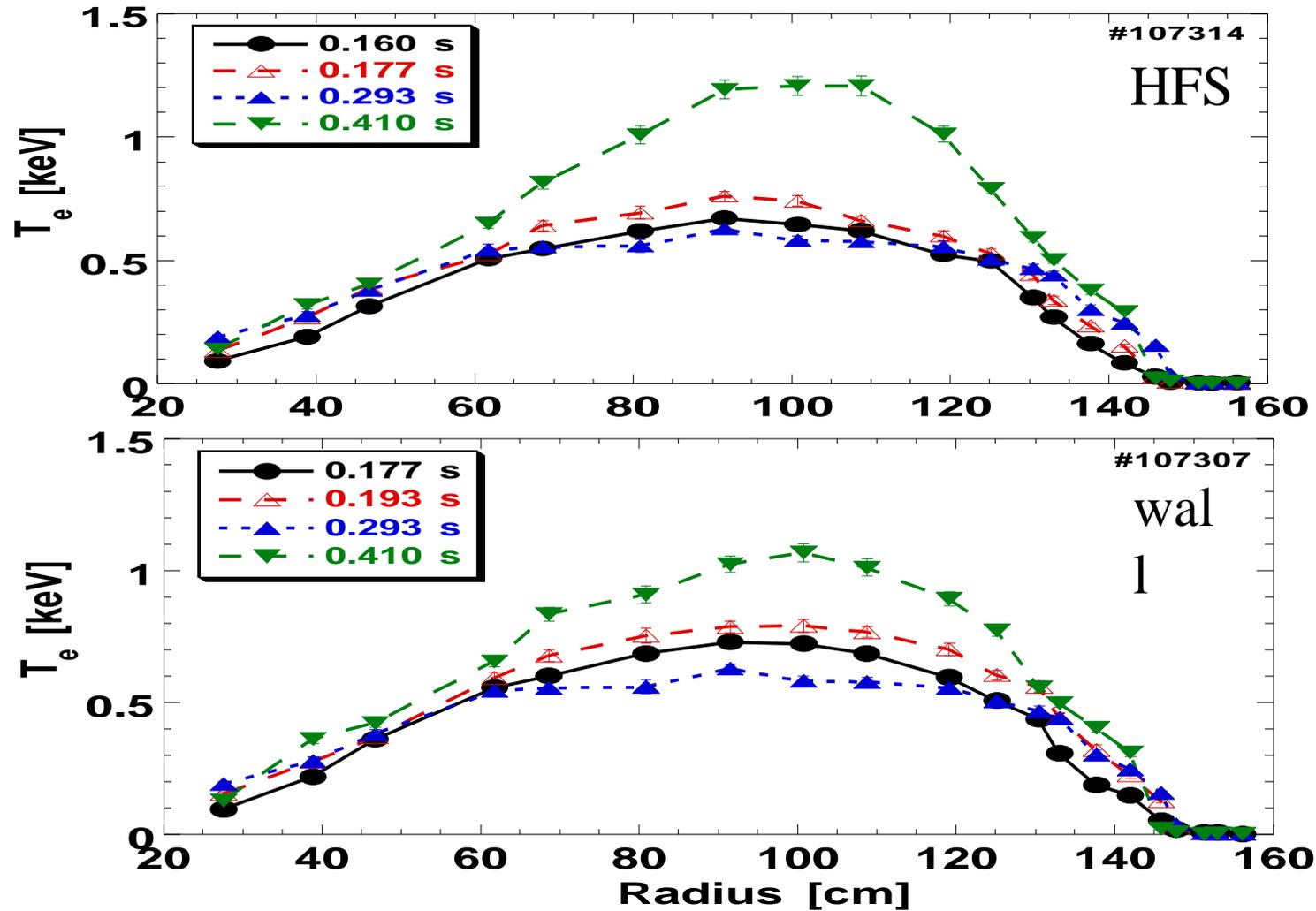
Comparable performance and improved reproducibility
w/high-field side fueled H-mode over low-field side fueled



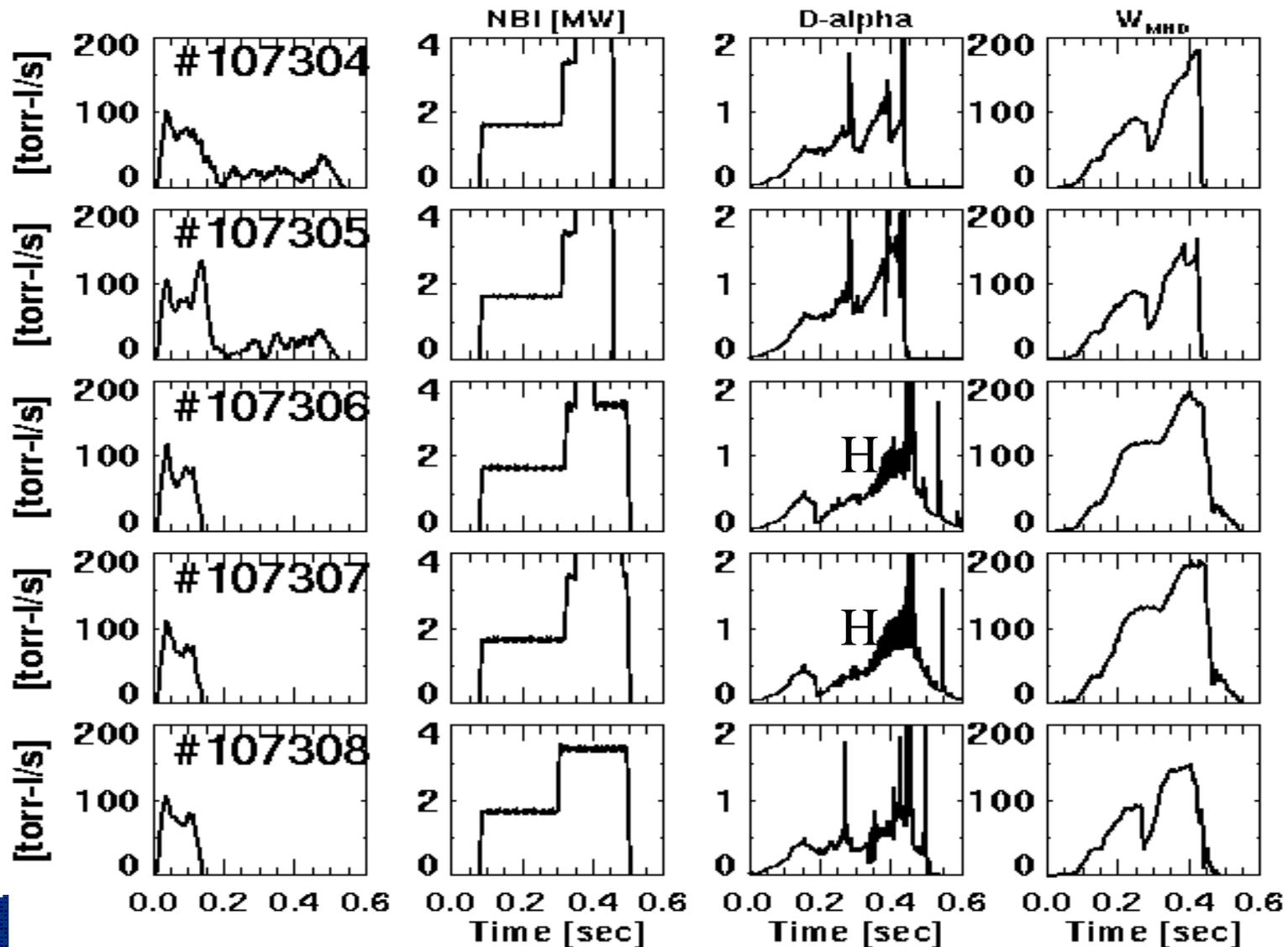
Both edge and core electron density rise continuously during long H-mode phase (HFS or wall fueling)



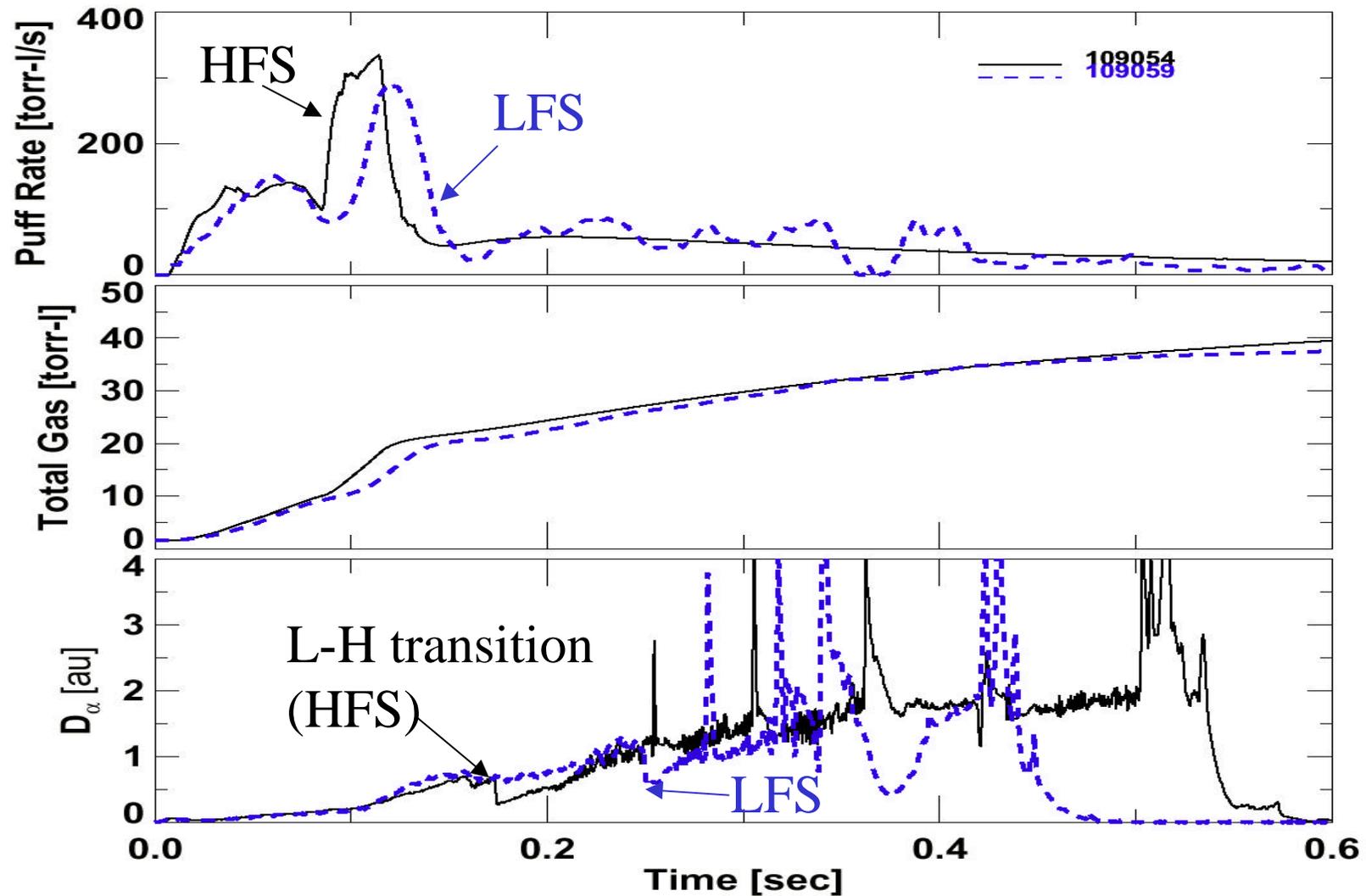
Core and Edge T_e rise after L-H transition, but core T_e falls as n_e increases with time (until more NBI power added)



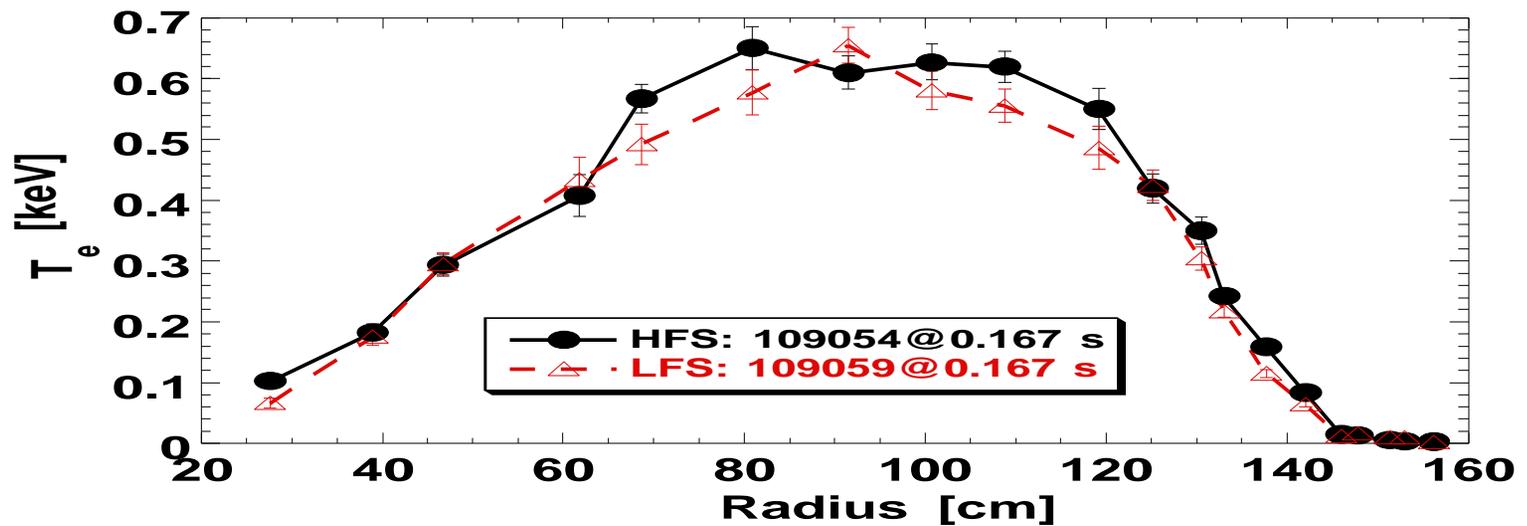
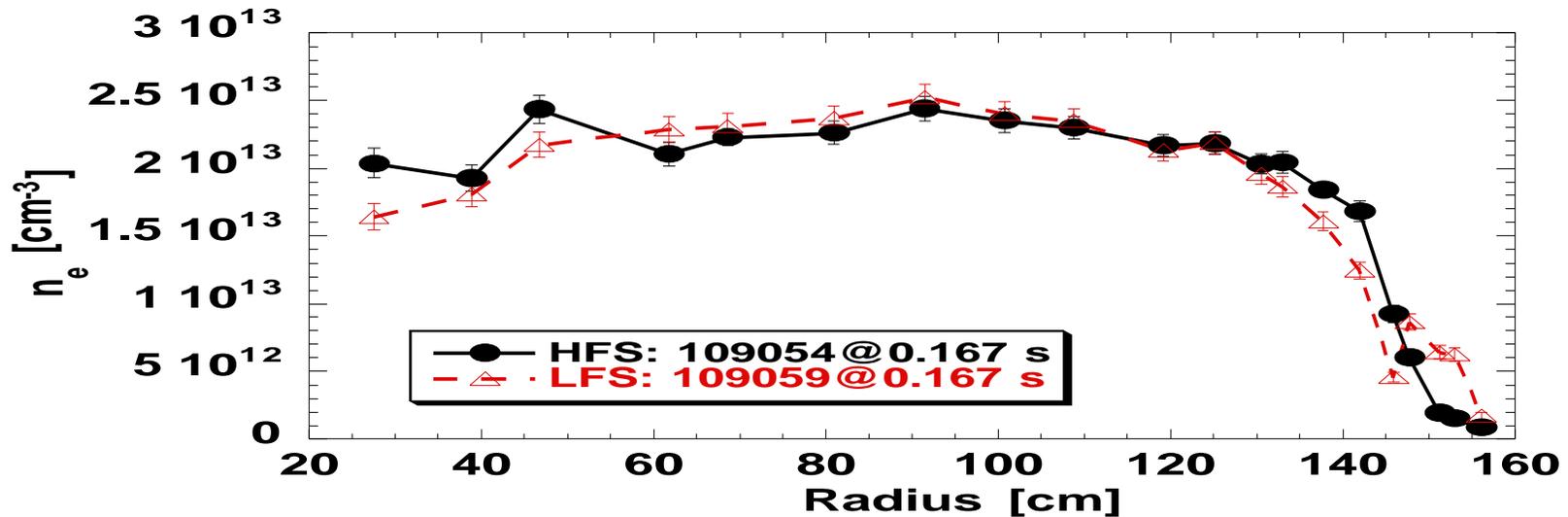
Long (Irreproducible) H-modes Observed After Discharges with Heavy Gas Puffing from Low Field Side



Low-field Side Fueling Delayed H-mode Transition at Comparable Fueling Rates to HFS Fueling



LFS puffing has higher outboard edge density and lower temperature in L-mode phase before transition



Backup Slides

Long ELM-free H-mode with high ρ , rising q_0 , obtained with high-field side fueling

