XP 305: Effect of Fueling Location on H-mode Access and Quality

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XP Review
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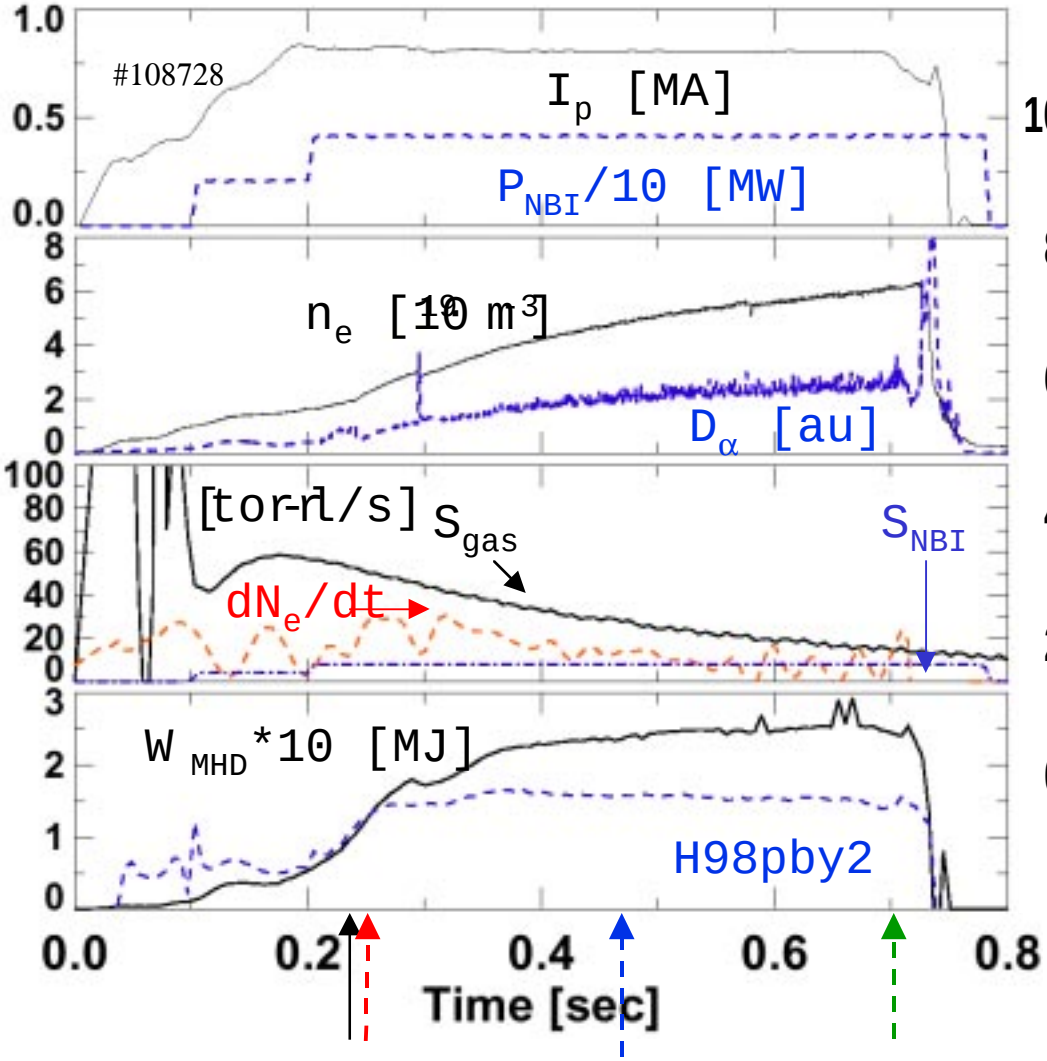
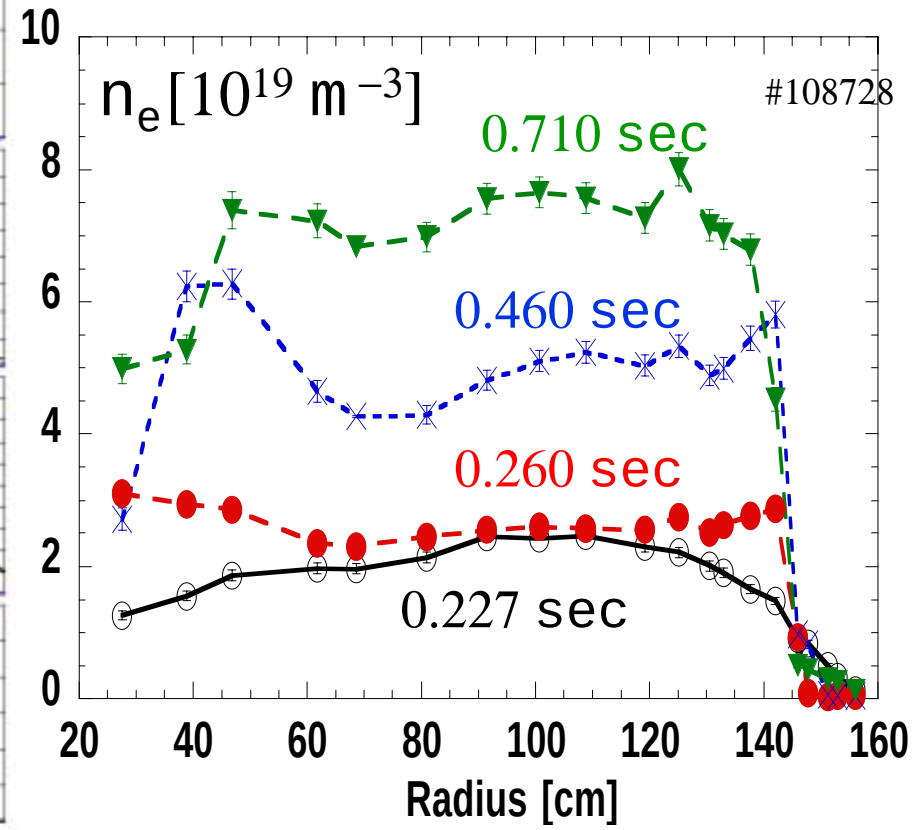
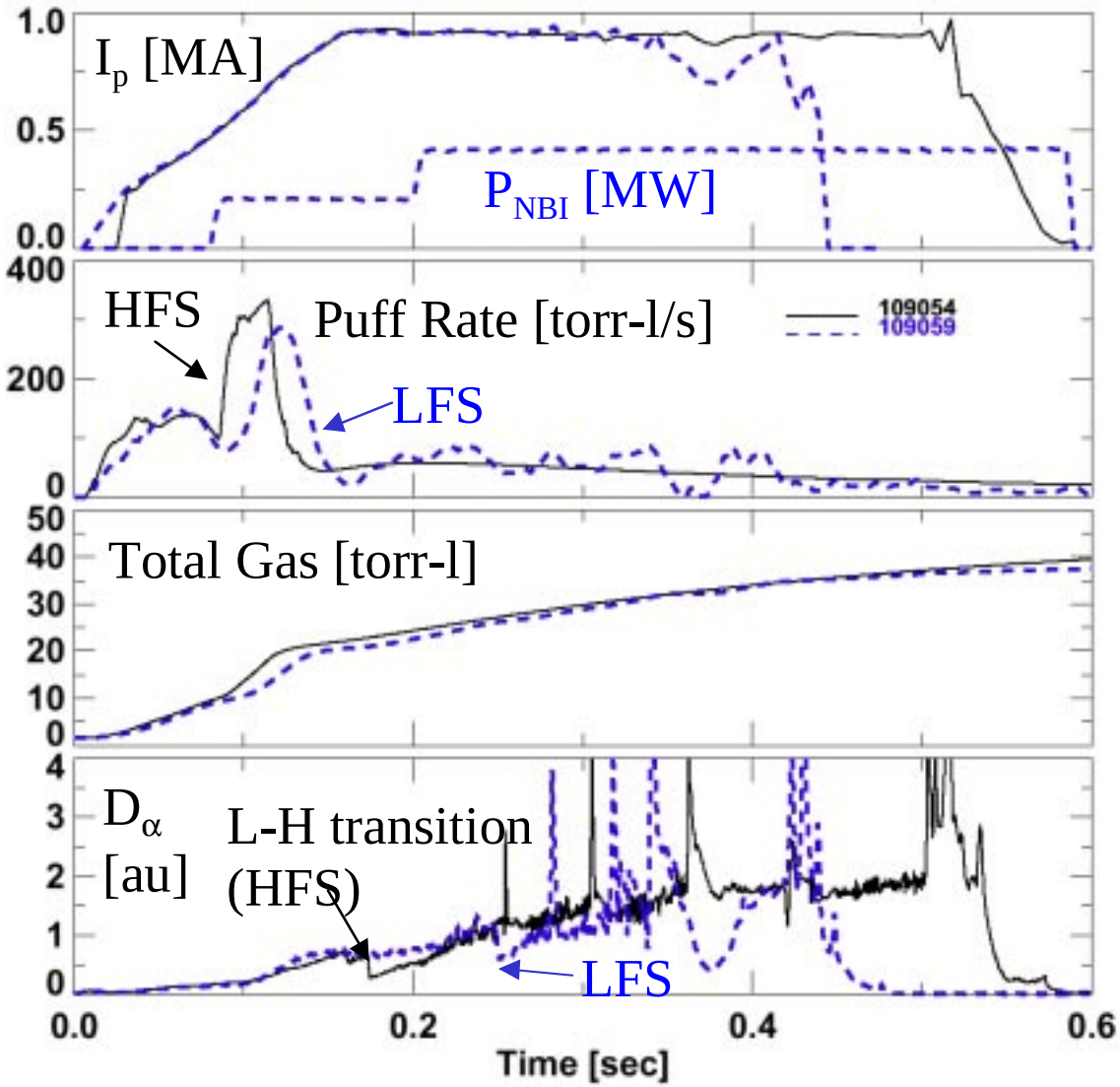
Goal: re-establish long pulse H-modes and compare effects of fueling on H-mode quality/access



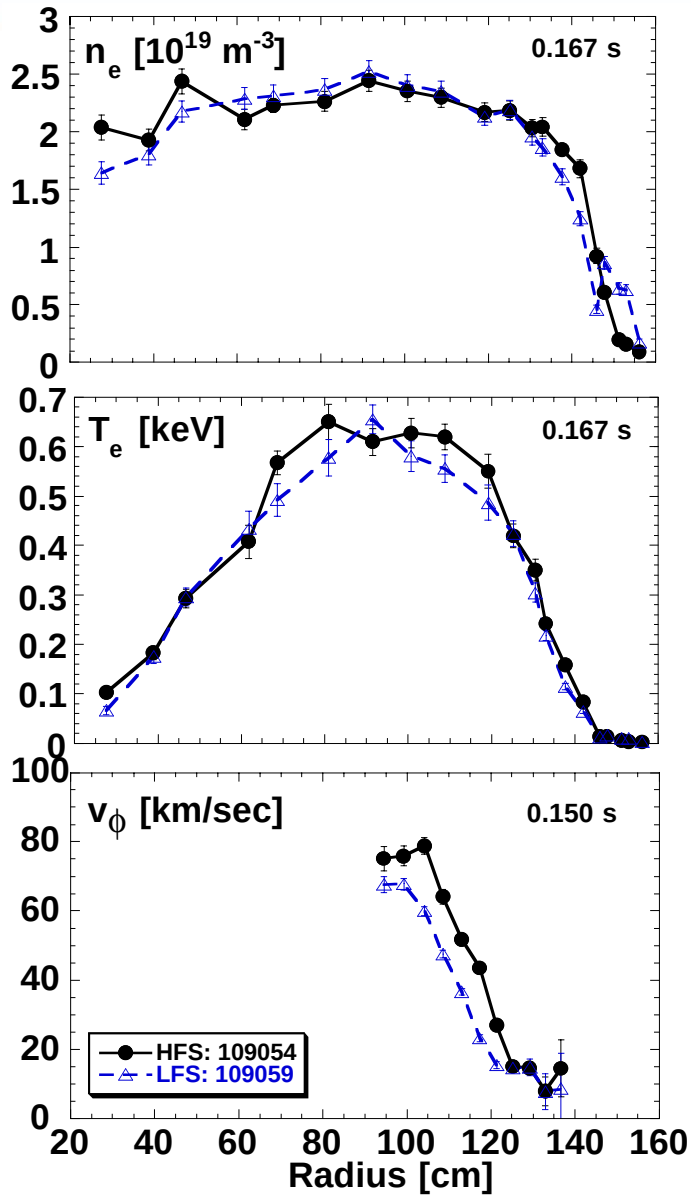


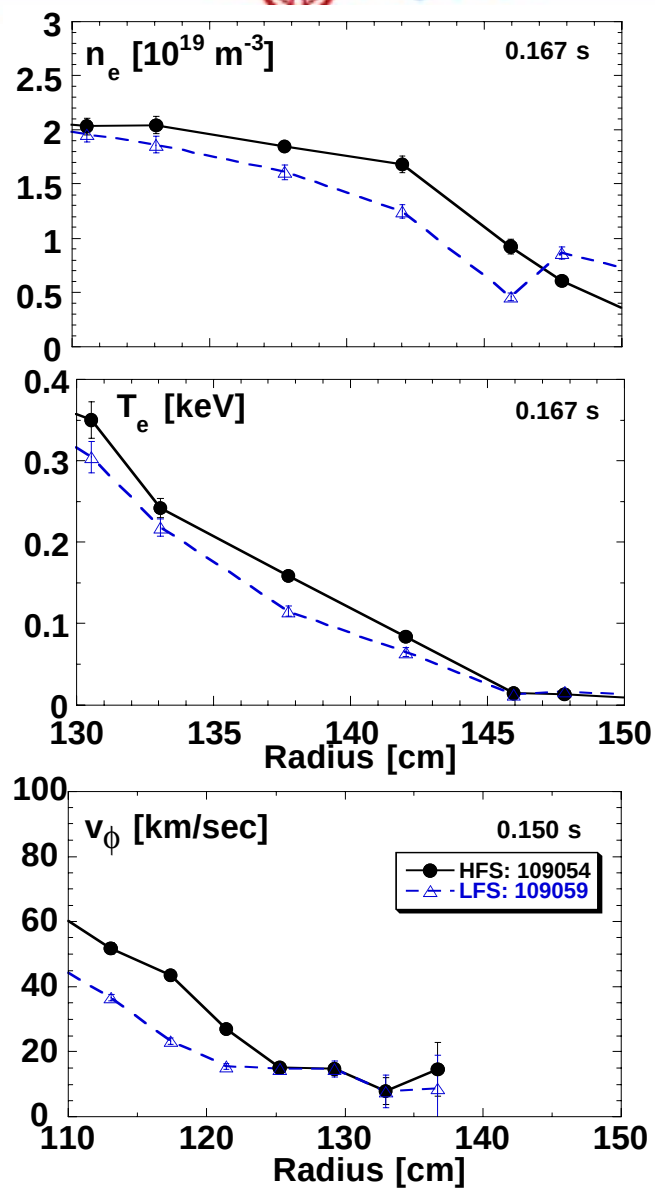
High-Field Side Gas Injector Fueling Allowed Early L-H Transition and Longer H-mode Duration



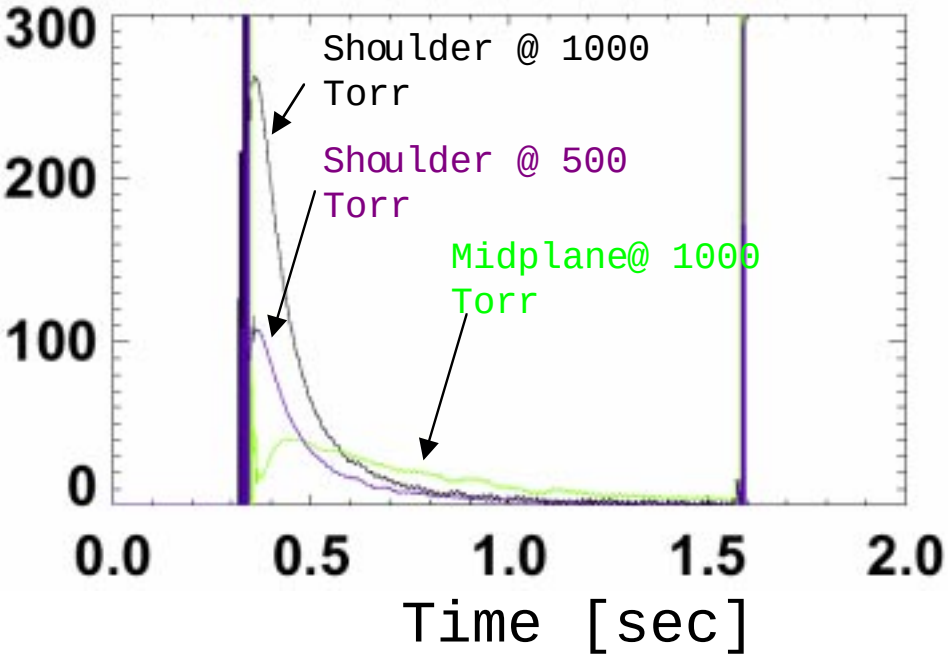
- Recent PRL indicated that charge exchange losses higher on low-field side than high-field side for same n_o/n_e and n_e, T_e profiles in ohmic (Fulop,PRL 11/25/02)
- Theory being extended to NBI
- NSTX data in qualitative agreement with predictions

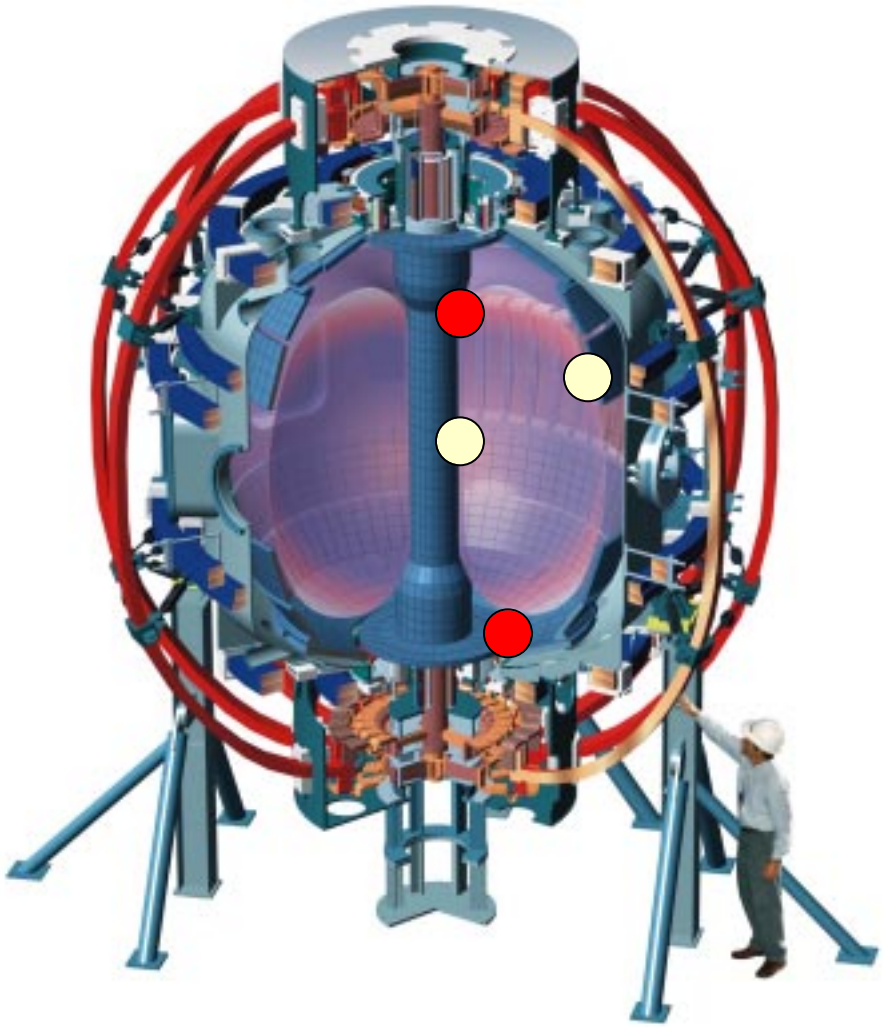
High-Field Side Gas Injector Fueling Allows Higher Toroidal Rotation and Edge T_e



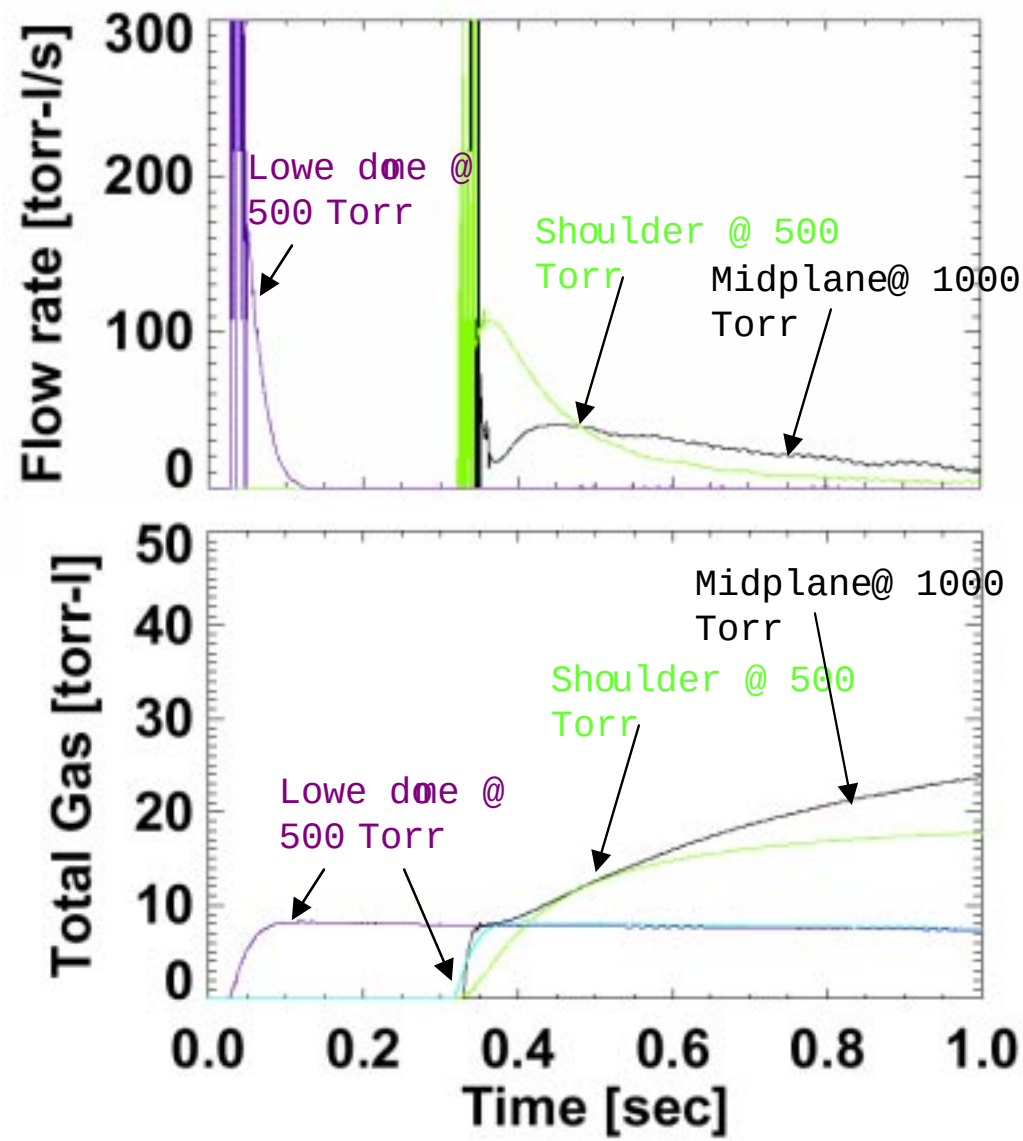


Gas Injectors at Four Poloidal Locations to be Used





Preliminary Chacterization of Valves Accomplished
Detailed Characterization Still Needed



XP305 Shot Plan

- Re-establish H-mode discharge with inboard puffing in LSN
  - Use 0.8 MA, B_t=0.45 T (reference was 0.5 T), 2 srcs, LSN shot like 108741 (*2-6 shots)*
  - repeat with lower fill pressures (2 shots)
  - repeat with single source (*2 shots*)
- Controlled access to change over to shoulder injector, $\leq$ 1 PM
- Reproduce with shoulder injector (similar line density), fill~300-600 torr *(4–10 shots)*
- Reproduce with low-field side injector (8-12 shots)
- Reproduce with lower dome gas injector @100-200 torr (3 shots)
- Establish H-mode discharge with shoulder puffing in DND
  - Use 1.0 MA, B_t=0.4 T , 2 srcs, LSN shot like 108450 (*2-4 shots)*
  - repeat with lower fill pressure (2 shots)
  - reproduce with LFS injector (2-3 shots)