NSTX Boundary Physics TSG
Small Group Meeting

NSTX

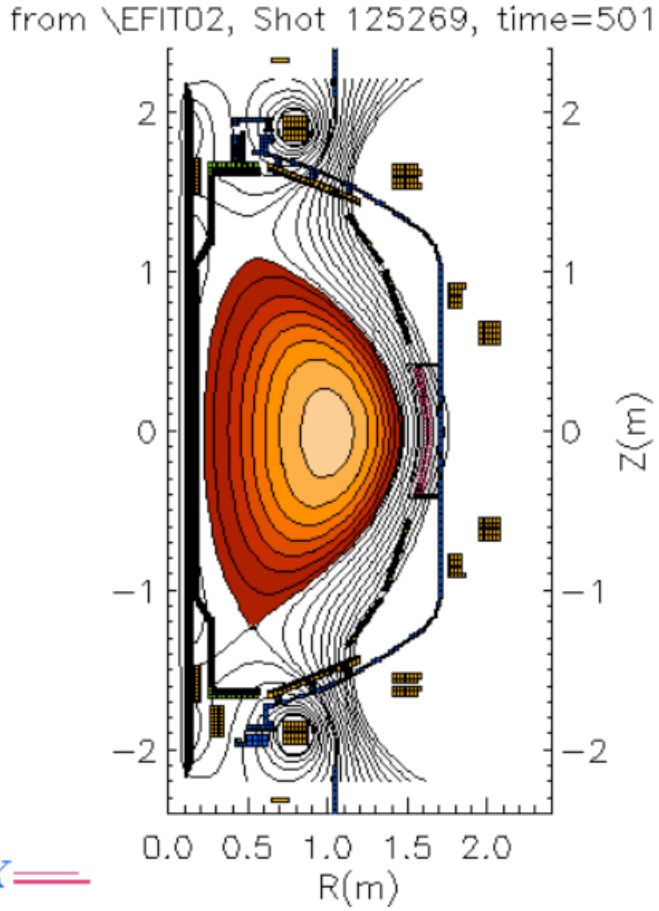
Discussion of

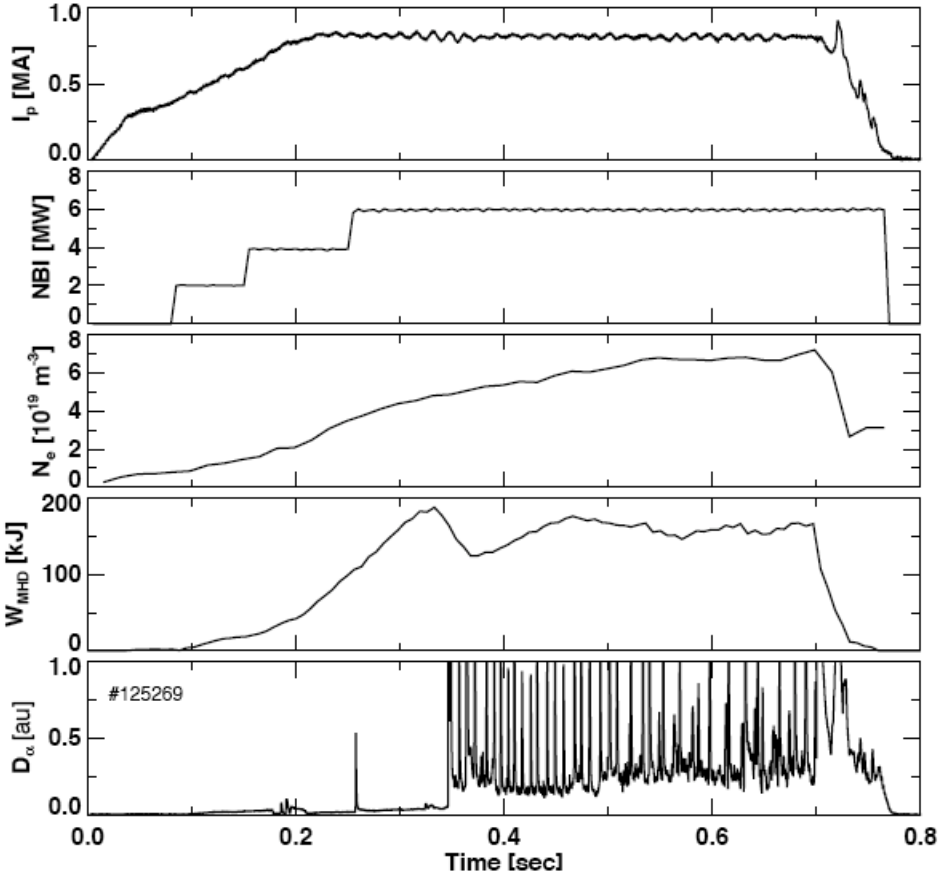
XP826: LITER Characterization (H. W. Kugel) and ELM Mitigation (D. K. Mansfield)

Monday, 07 April 2008,
3:00 PM, B252

XP826: LITER Characterization and ELM Mitigation

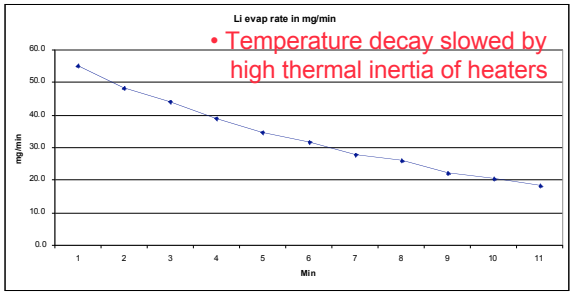
- Procedure: for reference shot use 125269, LSND, δ=0.5 a high recycling, ELMing, H-mode, (4.5KG, 800KA, 700ms, 3 NBI)
  - increases sensitivity to Li pumping effect on recycling
  - good sensitivity to possible ELM-to-no ELM transition

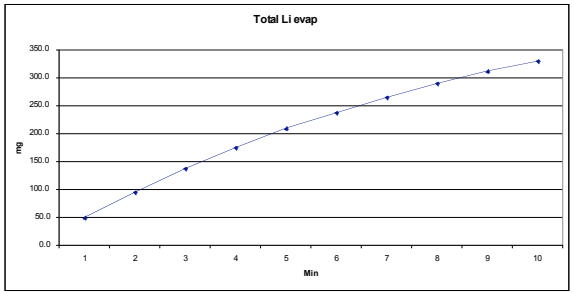


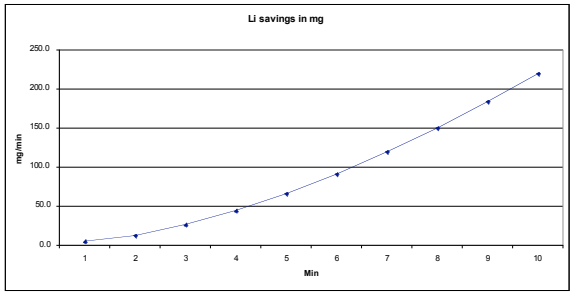


XP826: Initially Use 5 Min HeGDC and Then Decrease Duration as Higher Deposition Rates are Accessed

- Sequence:
  - at -30s turn off power, start LITER withdrawal to Park position
  - after LITER at Park position, close Shutter, open diagnostic shutters
  - start discharge
  - after discharge, close diagnostic shutters
  - start 5 min HeGDC
  - stop HeGDC, open LITER Shutter, turn on LITER power





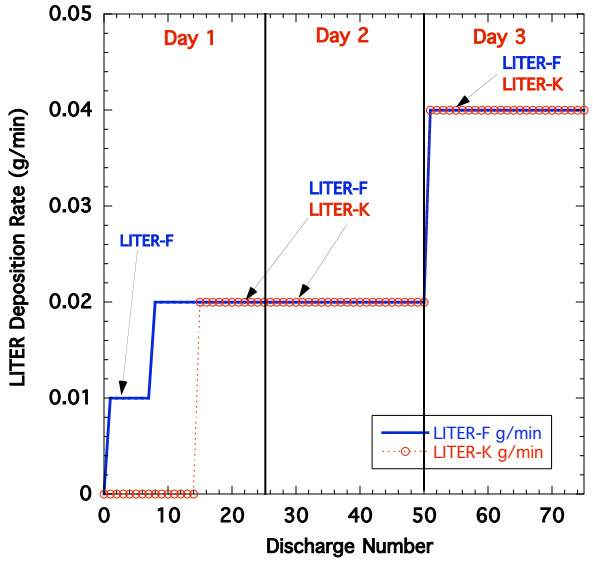


From L245: With 17 g of Li in the reservoir. ΔT over the interval was 49.6˚C, starting at 660.4 ˚C.

- NSTX Example: warm-up from 675˚C to 689˚C at full heating power. This starting temperature is based on 5 minutes of cool down during GDC. The whole process took approx 7 minutes and 548.02 mg evaporated, compared to 633.08 mg with the heaters on the whole time, for a ΔLi of 85.78 mg. If we add on the 5 minutes of savings during GDC, the net Li savings per shot at this evaporation rate is ~100 mg.

XP826: LITER FY08 Evaporation Profile

- **Start with 1 LITER operation, & increase deposition rate slowly**
  - -to make contact with FY07 database and seek possible transition from ELMs to no-ELMs
- **Measure effect of increased coverage for increased pumping**



Region of Possible ELM to no-ELM Transition