NSTX

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Removal of Core Impurities by Neon Gas Puffing

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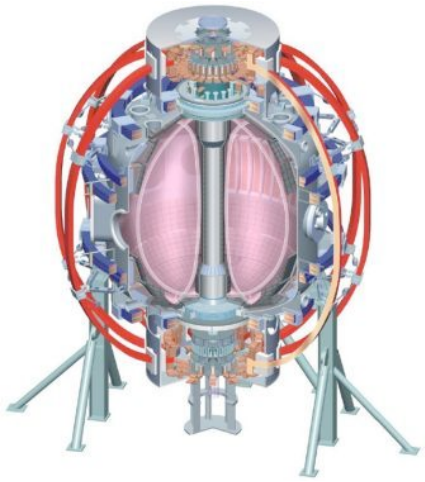
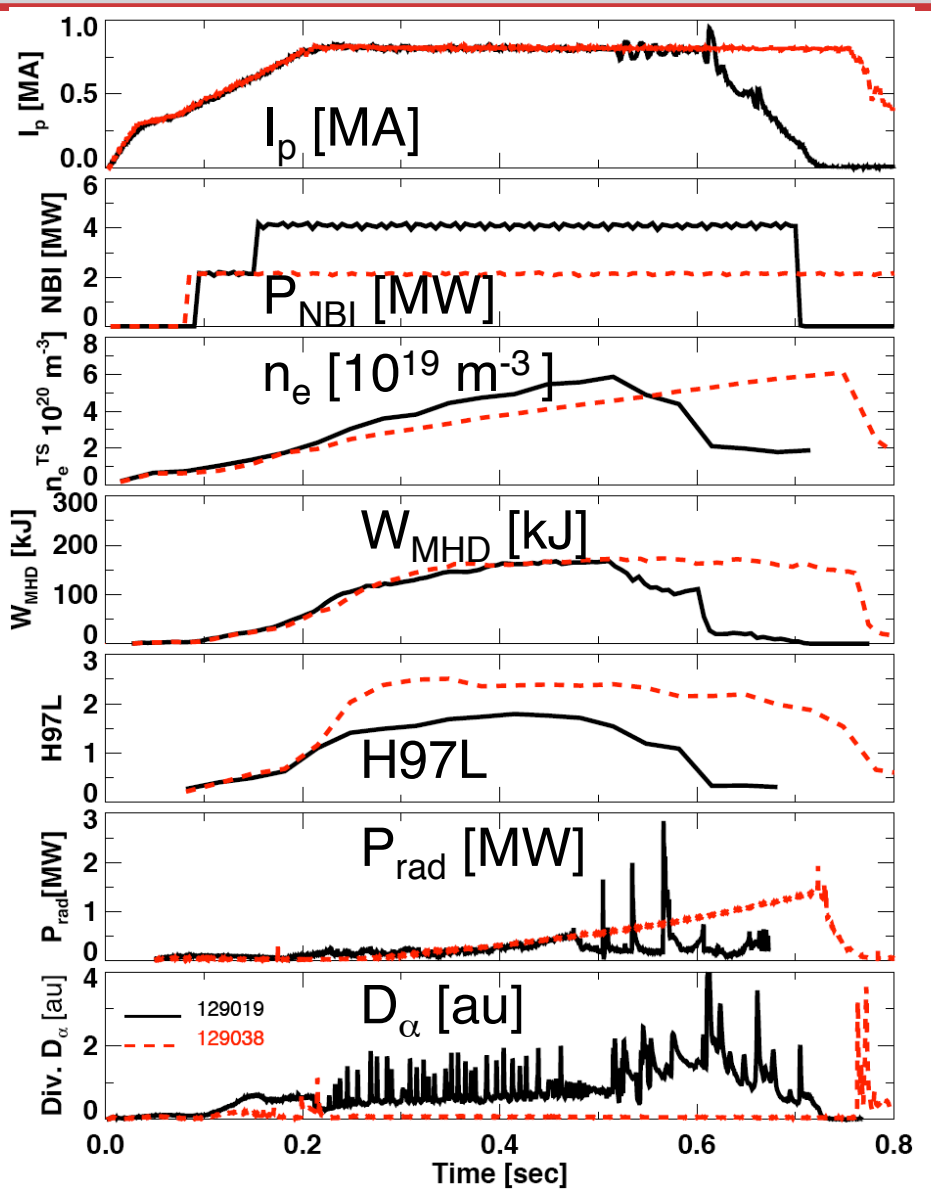


Understand the mechanism by which high Z impurities accumulate in NSTX discharges (R11-3)

- ELM-free NSTX lithium discharges show a large increase in impurity accumulation during the discharge
  - C, O and heavy metals (Fe)
- Multiple mechanisms by which impurities could be accumulating
  - C impurities flow, via neo-classical transport, to the core screening out Li impurities
- Puff in gas with high-Z (neon or argon) to test theory



Diagnostics required to determine impurity content

- Require ELM-free Li enhanced H-mode discharges
  - Propose scan of gas puff pressure, duration and timing
  - Similar work done in the past by JHU, but not in ELM-free discharges
    - L. Delgado-Aparicio, *et al.*, Nucl. Fusion **49** (2009) 085028
- Likely to require:
  - CHERS, Bolometer arrays
  - Monitor C and Li atomic/molecular spectroscopic emissions during gas puff
    - Possible significant increase in physical erosion as measured previously in DIII-D