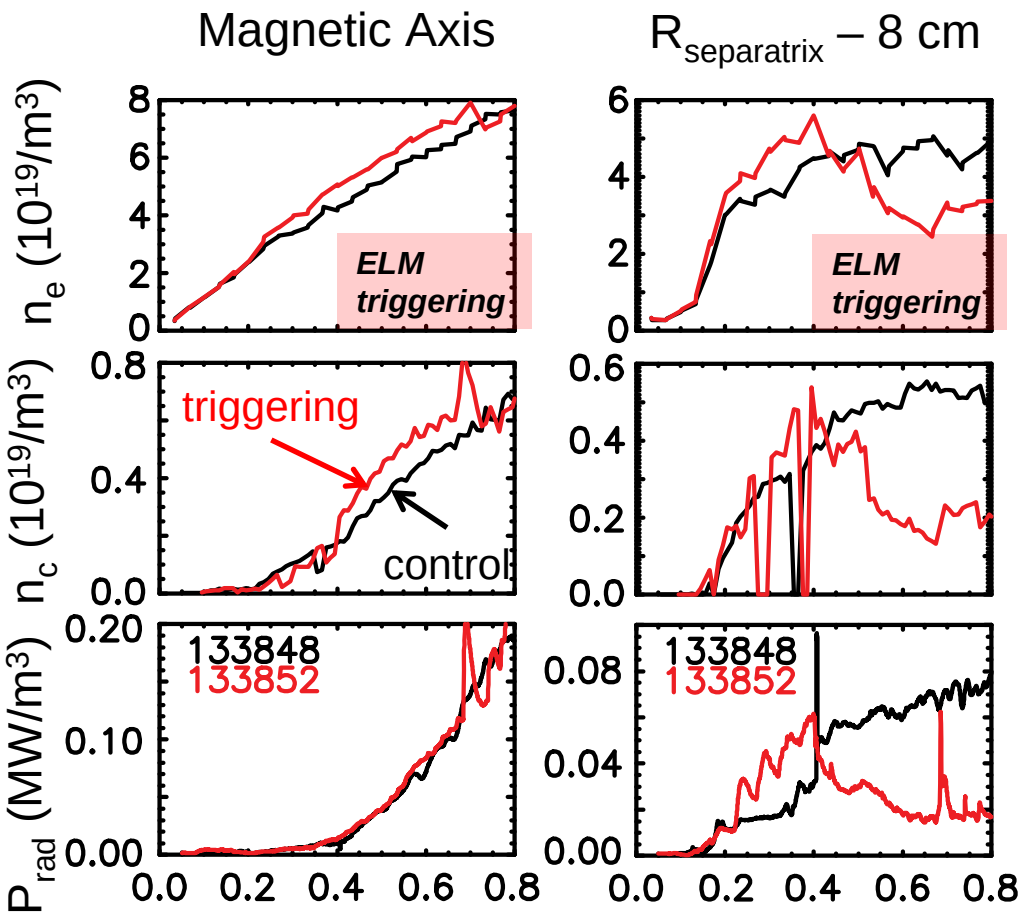
Using 3D fields to control edge, RF to control core impurity accumulation



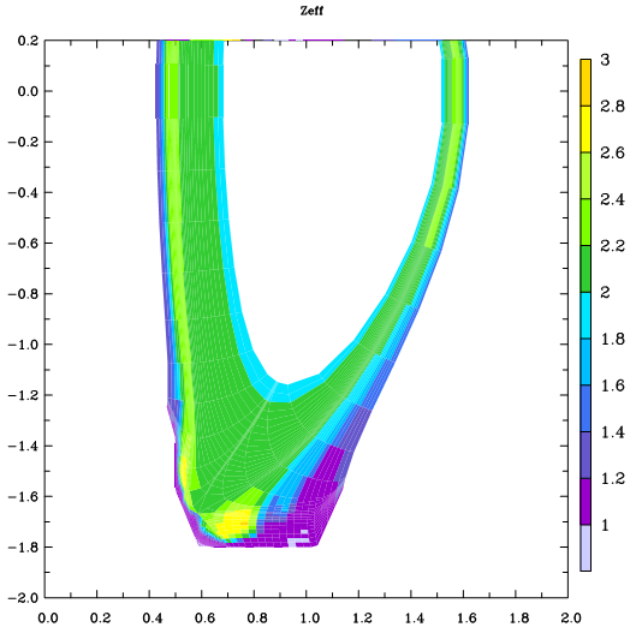
- ELM triggering works to reduce edge impurities, but core accumulation still strong
- AUG successful using ECRH to mitigate W accumulation
  - Enhanced outward turbulent convection of impurities*
  - Requires very central deposition (ρ<0.2)**
- Possible solution for NSTX: add HHFW to beat core accumulation
  - Requires successful heating of H-mode using RF
  - Can alternate blips of n=3 field and HHFW if ELMs trip RF

* Angioni, PPCF **49** (2007) 2027

** Gruber, NF **49** (2009) 115014

Evaporating Li into the SOL to reduce heat flux

- What happens if the heat flux is too high on a liquid lithium target?
  - Li heats up, evaporation becomes strong -> lots of Li into the SOL -> SOL density and Li radiation increase -> heat flux to target is reduced
  - Vapor shielding during disruptions
- Is there a self-consistent, steady state solution where Li is allowed to evaporate into the SOL and produce a radiative/detached divertor that prevents further evaporation?
  - Will density control be a disaster?
  - Will the core contamination be too much?
- Can test by running LLD hotter
  - End of year XP
  - Might be interesting to test this effect during ELMs



- SOLPS simulation of NHTX with Li evaporation
  - With no Li evaporation, q_{pk} = 18 MW/m2
  - With 20% of the heat on targets dissipated by evaporation, peak heat flux < 6 MW/m2