Status of High Priority T&T XPs (non-high-k)

- M. Bell: Aspect ratio scaling - to be run in next 3 week period

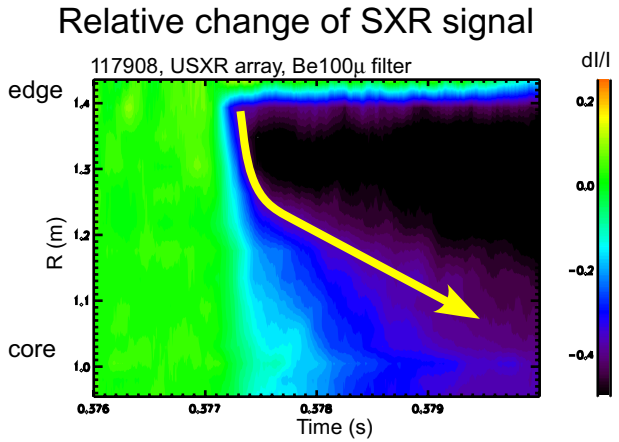
- S. Kaye: XP713 Beta scaling in weakly shaped plasmas
  - poor machine conditions due to nitrogen leak prevented successful completion of XP
  - low-κ basis shot developed in Maingi XP, extend β scan to higher power
  - β scaling shape dependence in weakly shaped plasmas still ITPA priority

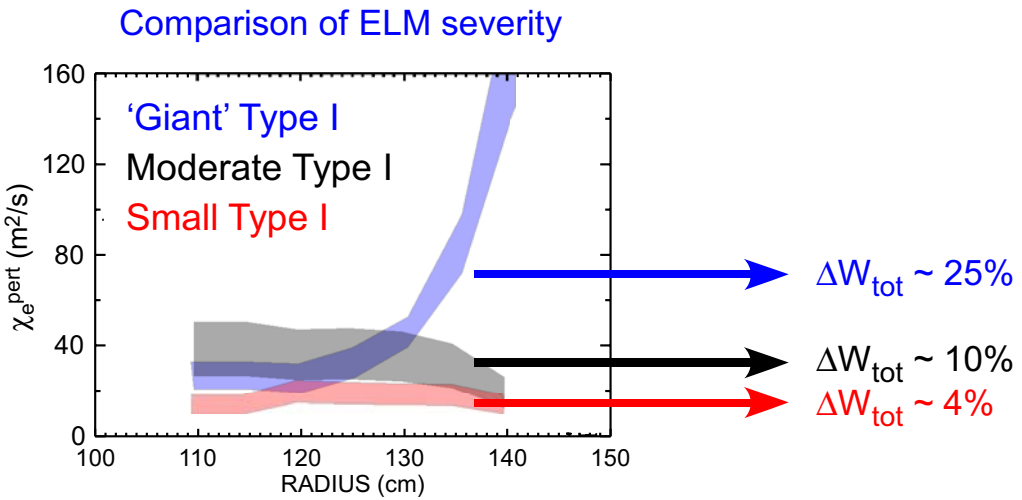
- L. Delgado: XP716 Scaling of impurity transport
  - reference 3 NB source discharge unavailable due to lack of source B
  - 2 source discharges contained significant amounts of MHD and edge activity, interfered with neoclassical transport measurements
  - extra 0.5-1 day requested to probe Bt/Ip scaling of impurity transport

- D. Stutman: Role of integer q-surfaces in electron transport
  - XP still desired ~1 day, addresses ITPA TP-8.2
  - Li pellets may be required
  - initially exchanged with priority 2 XP - Tritz: ELMs/electron transport

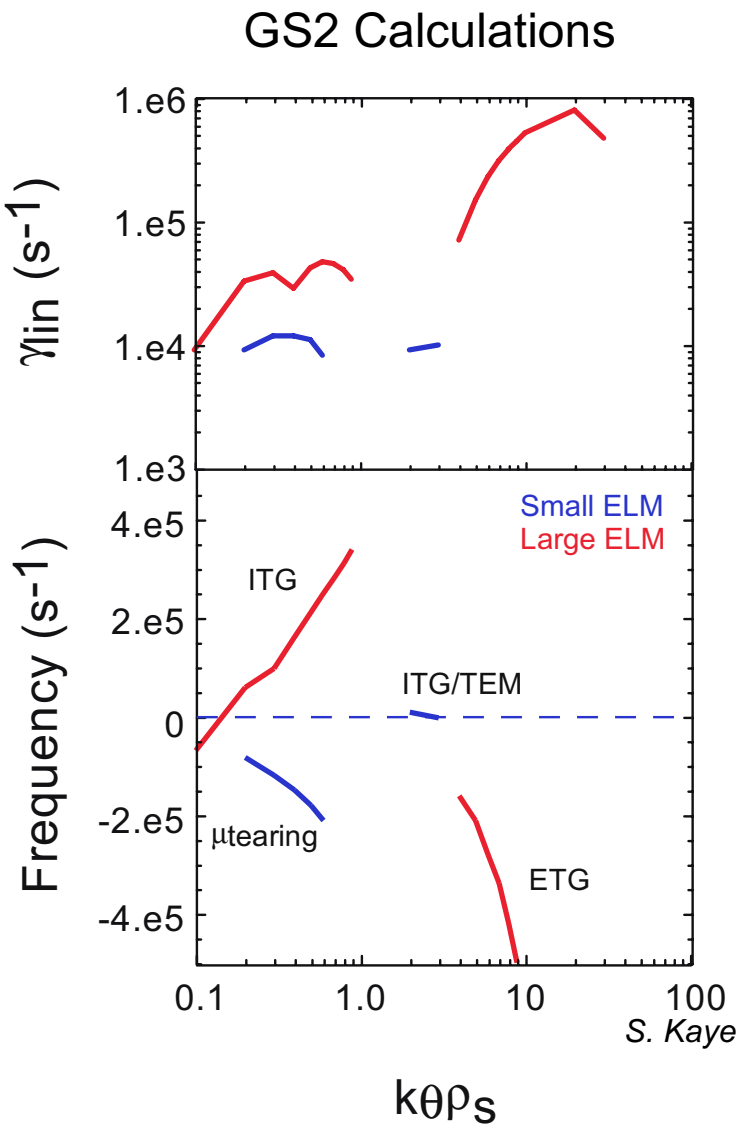
Severity of Type I ELMs Appears Related to Perturbed Electron Thermal Transport

- NSTX observes wide range of ELM types, related to collisionality, input power, etc...
- Within the Type I regime, ELM severity (ΔW_{tot}) varies under different plasma conditions (LSN, DND high-δ, j(r) differences, etc...)
- Initial ELM MHD signature appears similar, resultant electron temperature perturbation propagates with varying speed and penetration depths

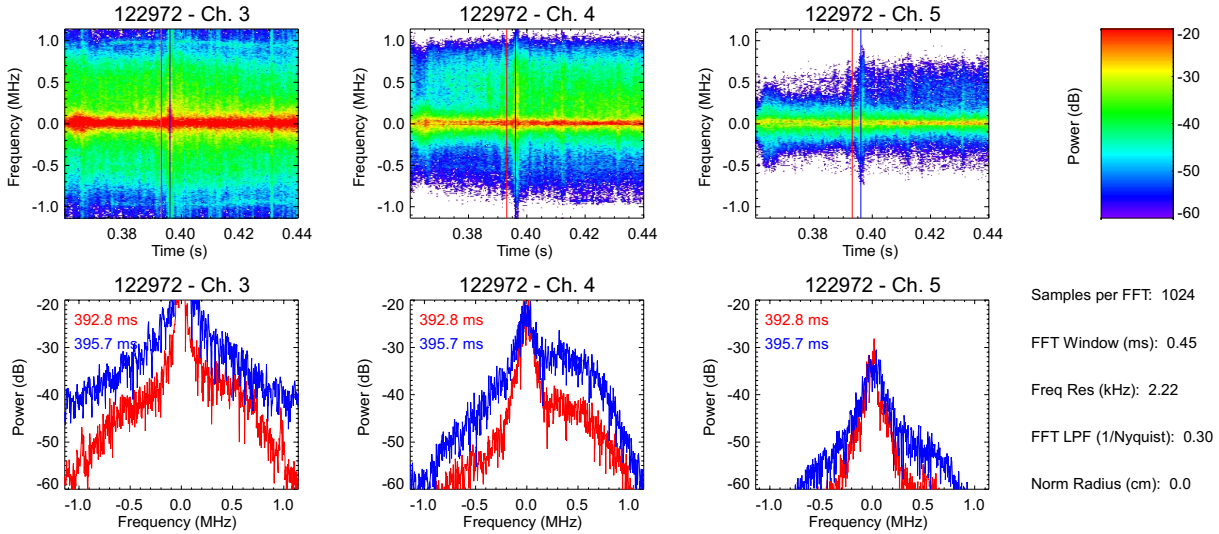




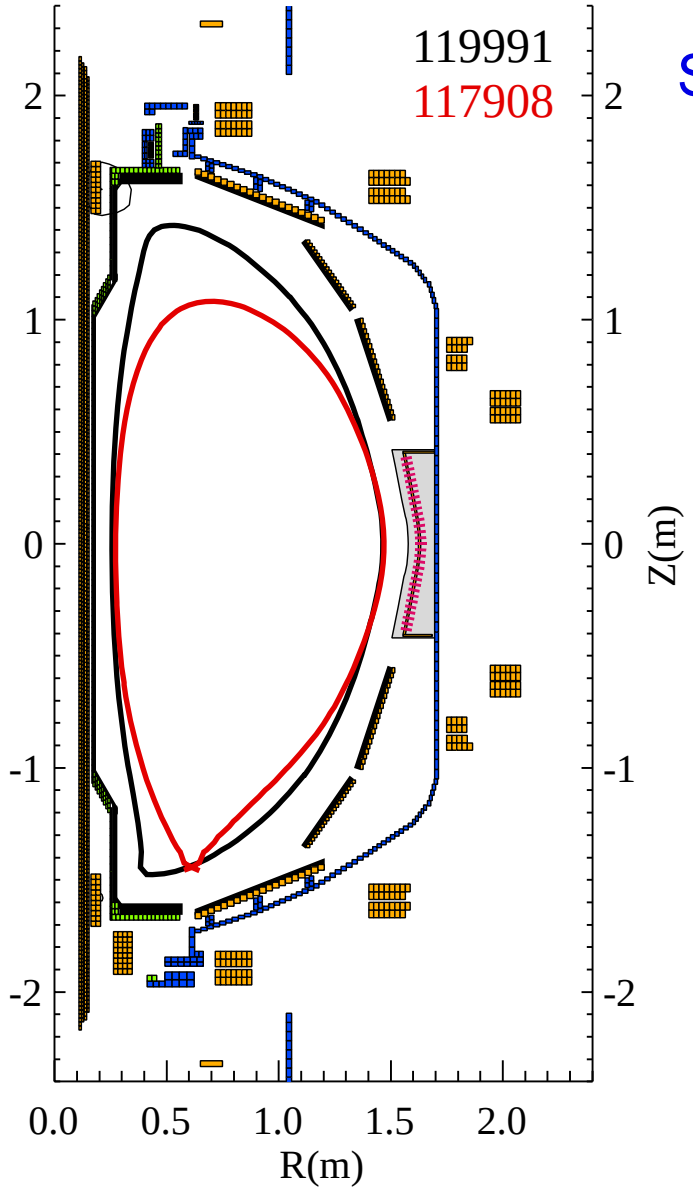
Initial Linear Stability Calculations Indicate Difference in Mode Growth Rates between Large/Small Type I ELMs



- Discharge with large ELM severity shows large ITG/ETG growth rates during perturbation
- 'Small' Type I ELMs have little μtearting, no ETG instability
- During ELM high-k measurements show increased fluctuations at short wavelengths k_r ~ 14-16 cm^{-1}



Experimental Plan: Shape Scan



Scan dr_{sep} at low and high-δ

shapes from XP609 (Rajesh)

low-δ reference shot #119136
restore shot + scan (6 shots)

high-δ reference shot #119085
restore shot + scan (6 shots)

repeat scan with second high-k position
(or repeat shots for better ELM statistics)

Total shots 24 (1 day)

Diagnostics :
30 ch. Thomson, USXR + multicolor, FireTIP, Fast camera, full magnetics, CHERS, MSE, high-k.

- ELM understanding necessary for confident ITER/NHTX/CTF projections
- Plasma configuration and scan is relevant to ITPA PEP-6/20