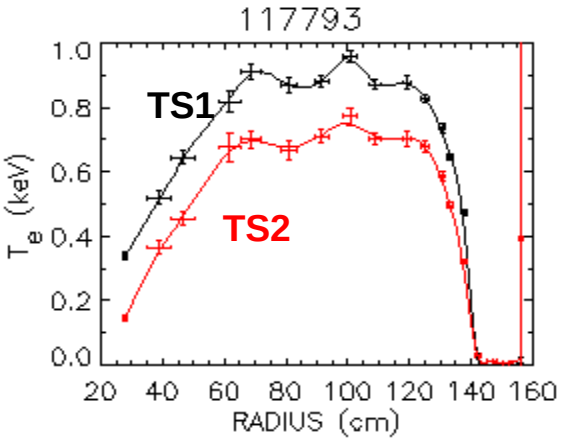
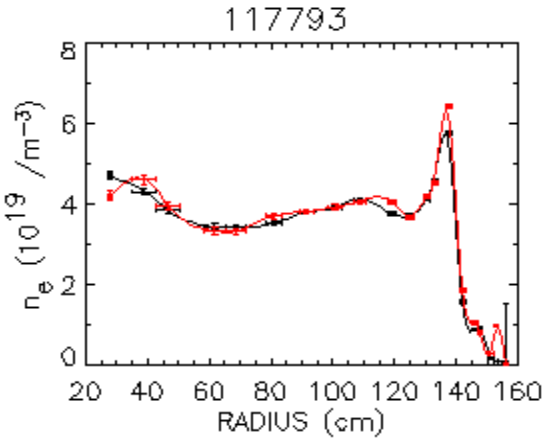
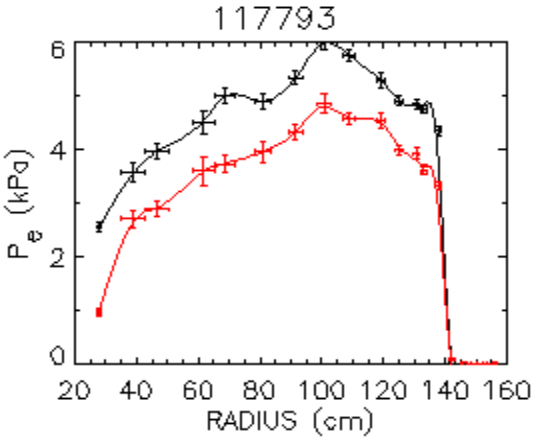
XP534 – Perturbative electron transport using low-Z pellets

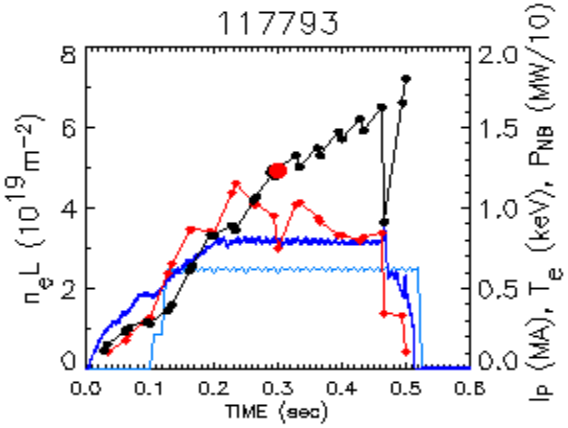
- **Half day XMP: *optimization of Li pellet injection in low n_e/reversed shear L-mode and high n_e H-mode, for peripheral 'cold pulses'***
- **0.5 mg Li injected at 150 ms quenched low n_e, single beam L-mode**
- **Attempts to increase n_e + beam power in L-mode seem promising**
- **Switched to H-mode to 'map' experimental space**
- **0.5 mg Li at 150 m/s produced desired T_e perturbation (MPTS)**
- **Also tried 1 mg vitreous C (pellet penetrated through the plasma ?) and graphite (large perturbation)**
- **C pellet injection probably not best for enhanced CHERS signals**
- **Second half day (low n_e L-mode at 75 m/s + heat flux scan in H-mode) abandoned after a few shots (high-Z impurities following HHFW, CHI)**
- **Nevertheless interesting initial results for both L-mode and H-mode**

H-mode

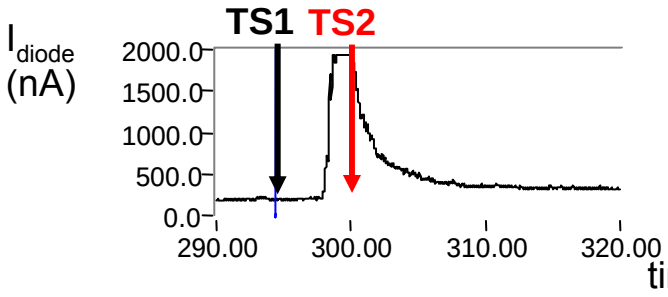




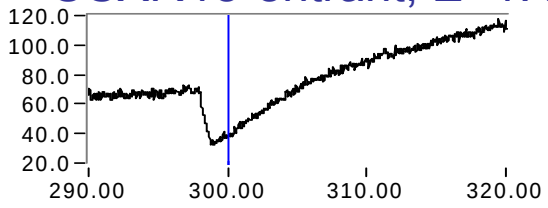




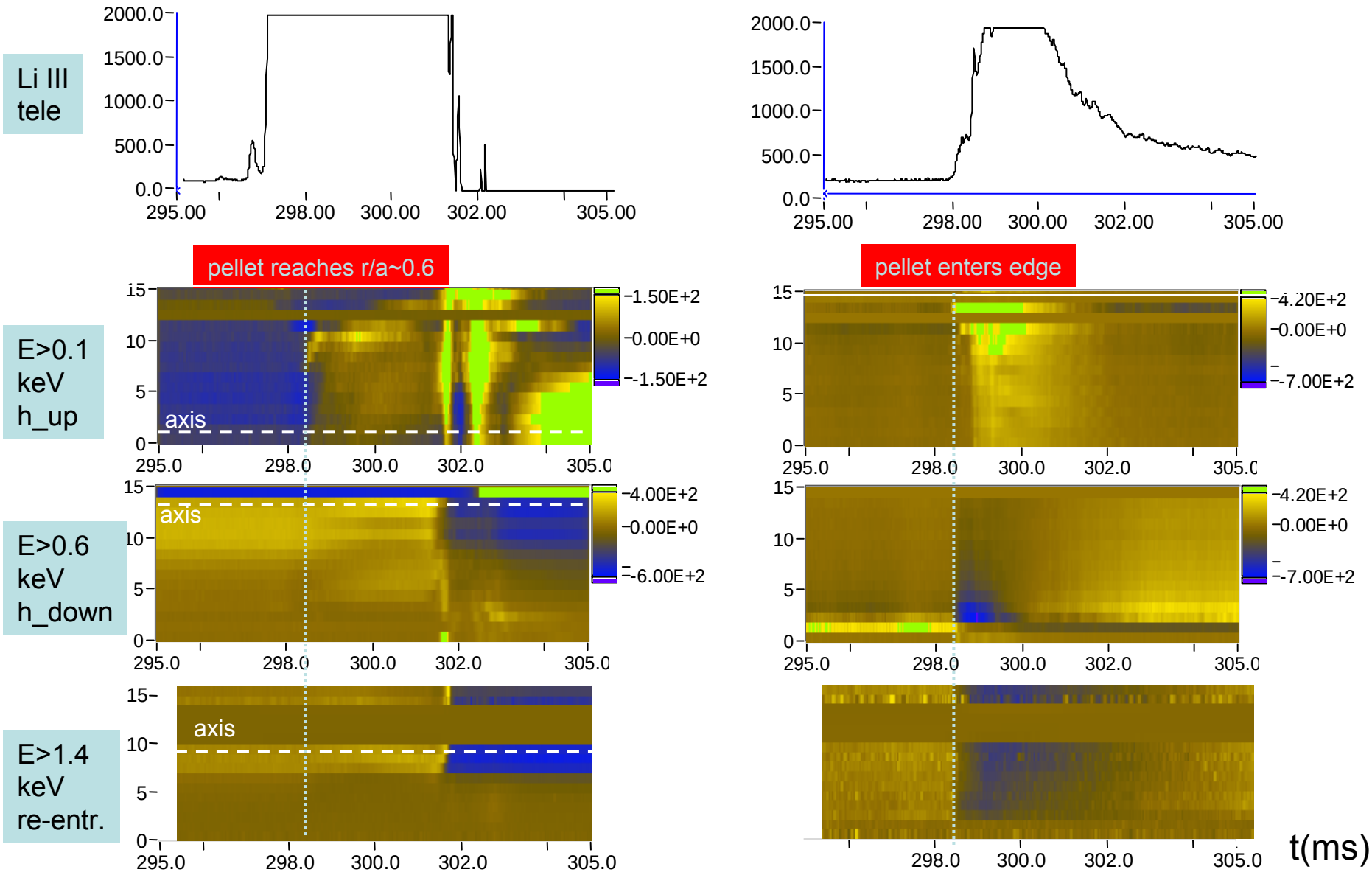
Li III JHU Telescope



USXR re-entrant, E>1.4 keV



- Good T_e perturbation achieved in H-mode, with minimal n_e perturbation
- T_e crashes in ≤ 1ms keeping the gradient unchanged (clear ‘critical-gradient’ behavior)
- Li III JHU telescope also works well (‘impurity seeded BES’ for low-k core turbulence)



- In low n_e/high T_e L-mode pellet penetrates to r/a ~ 0.6 and quenches plasma
- However, enough time before quench to see that cold pulse affects much less the core plasma (q<1) than in H-mode; strong eITB ?