Summary of XP822

Field scaling of electron transport change with heating power

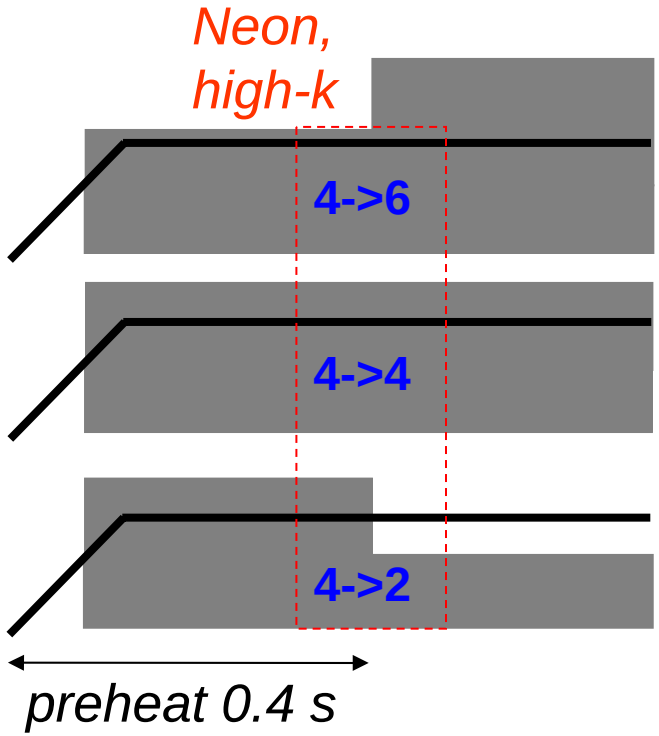
D. Stutman, L. Delgado, K. Tritz, M. Finkenthal

Johns Hopkins University

S. Kaye, M. Bell, R. Bell, B. LeBlanc, E. Mazzucato

PPPL

Goals: study χ_e change with P_b as a function of B_t

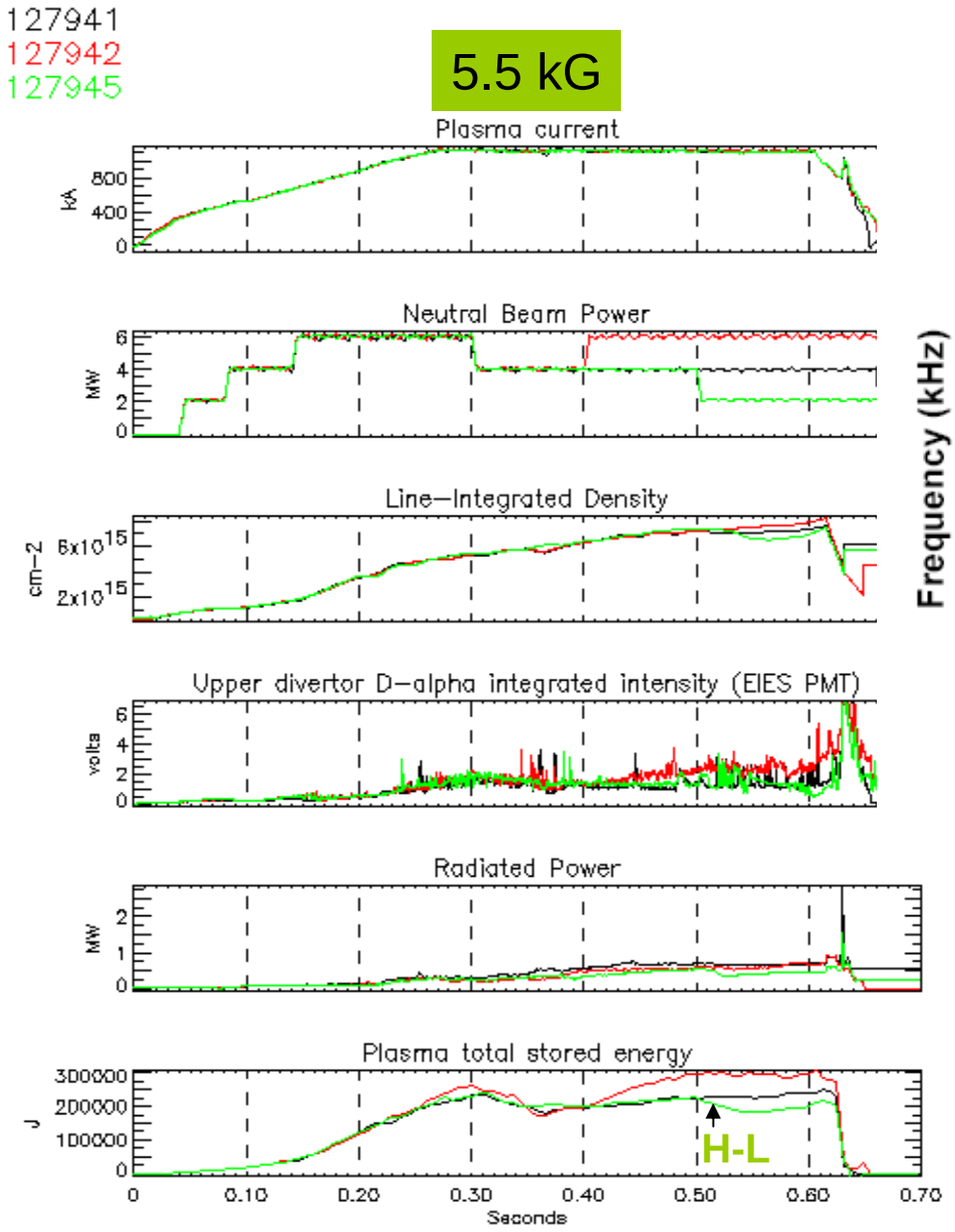


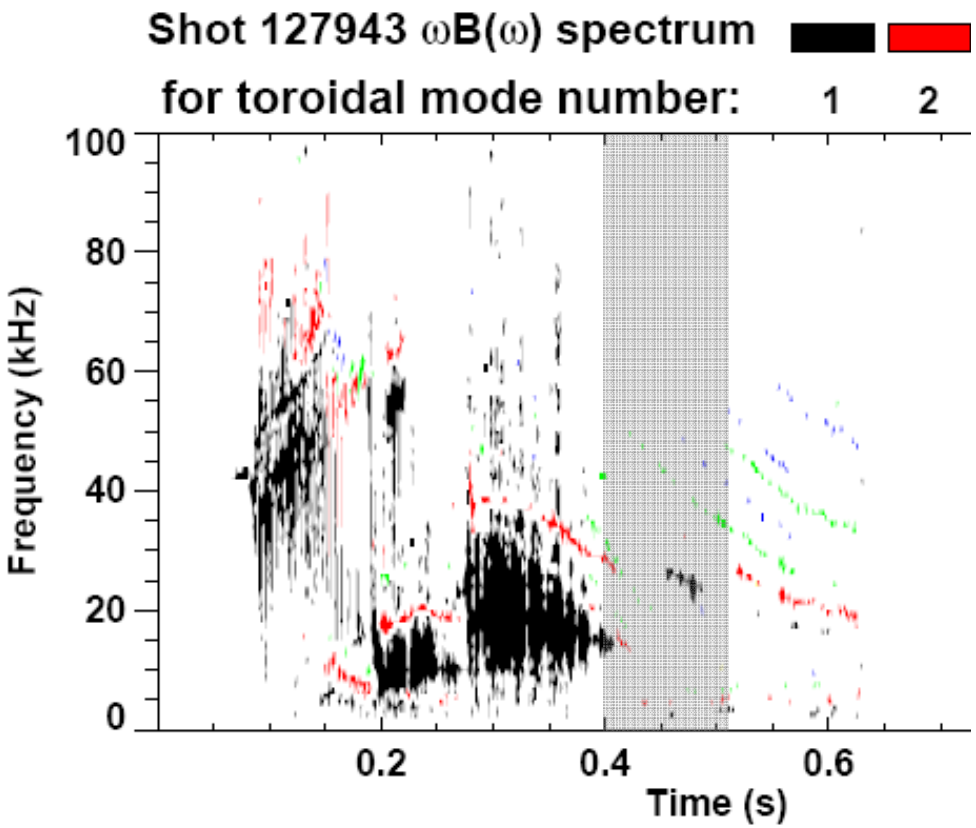
		P_{NB}	
B_t / I_p			
4.5/0.9	4->4	4->6	4->2 ← H-L
3.6/0.7	4->4	4->6	4->2
5.5/1.1	4->4	4->6	4->2
		Neon	
5.5/1.1	4->4	4->6	4->2

high-k r/a=0.25 r/a=0.65

- Central T_e flattening, electron transport increase with P_b at 4.5 kG
- See how effect changes with B_t
- Check particle transport and high-k fluctuations at r/a=0.25 and r/a=0.65
- Technique: 'freeze-in' q-profile -> power steps -> B_t scan at fixed I_p/B_t
- Partly completed (1/2 effective run day, re-develop MHD free 4.5 kG shots)

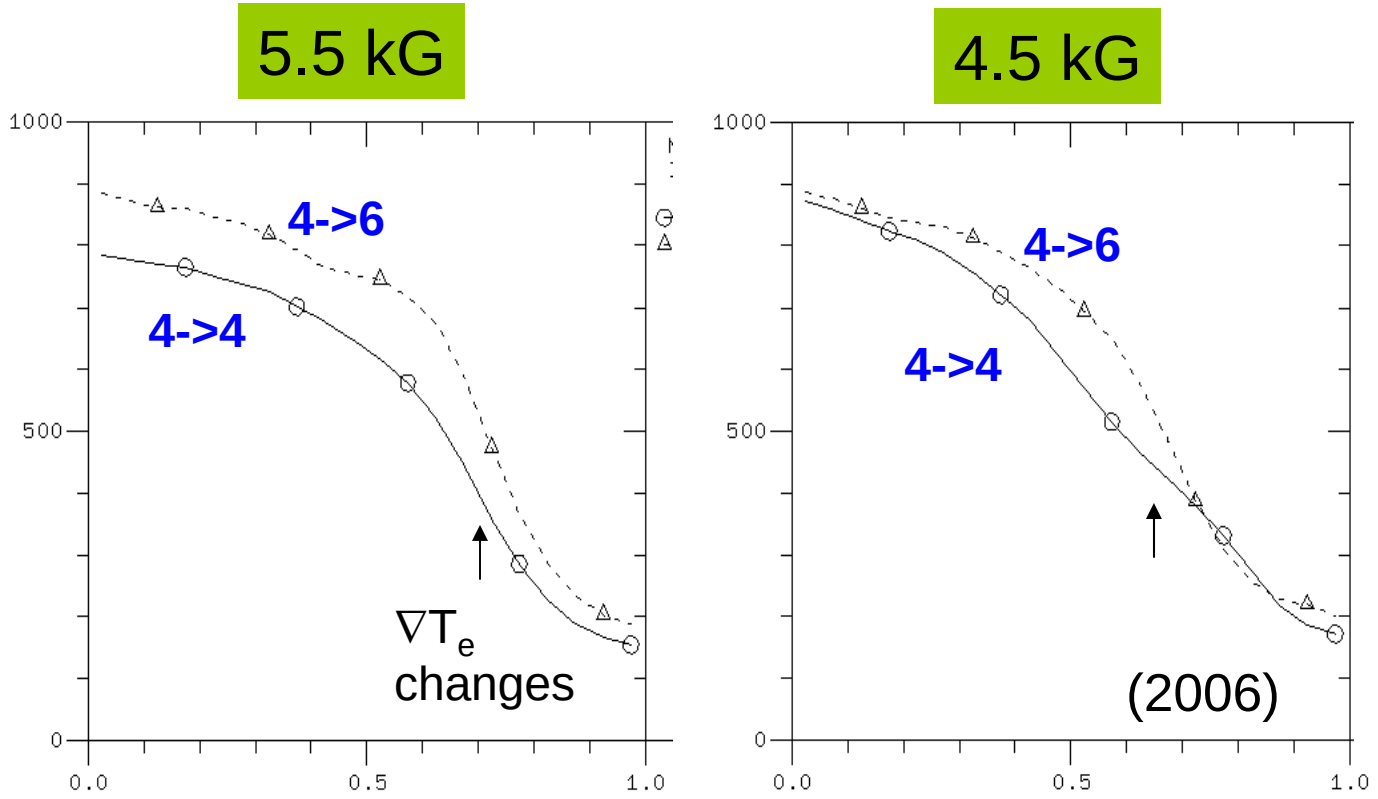
MHD quiescent window around times of interest





- No large internal modes or ELMS
- H-L drop, τ_E increase at 4->2 step

T_e responds better at 5.5 kG, but central T_e still flat



- Less χ_e degradation at high field, but central electron transport still rapid

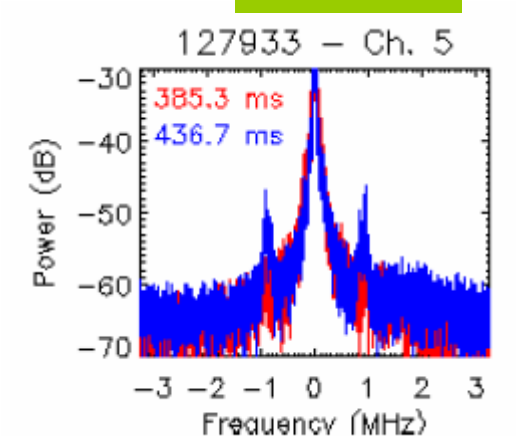
(S. Kaye, preliminary)

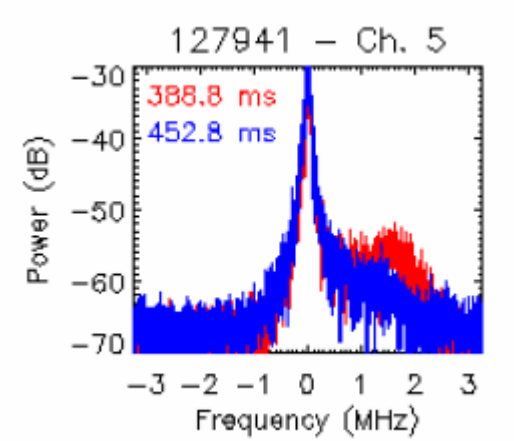
At r/a=0.25 high-k changes little with P_b, B_t ?

4.5 kG

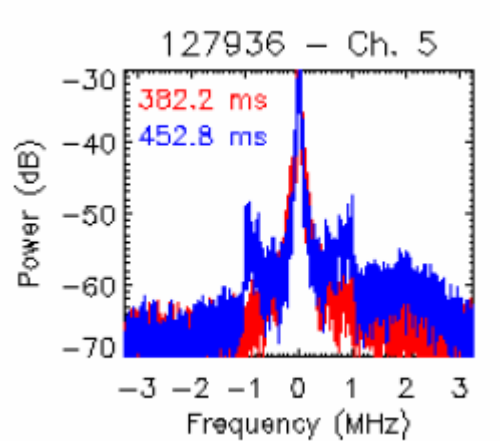
5.5 kG

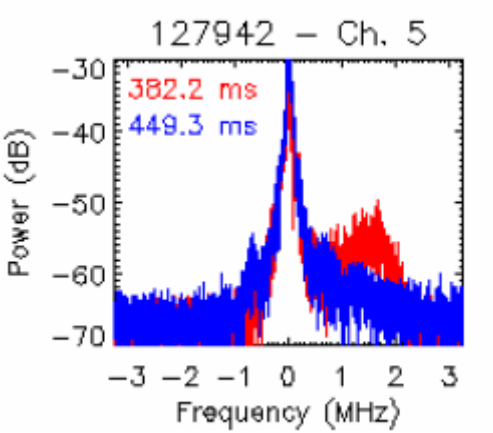
4->4



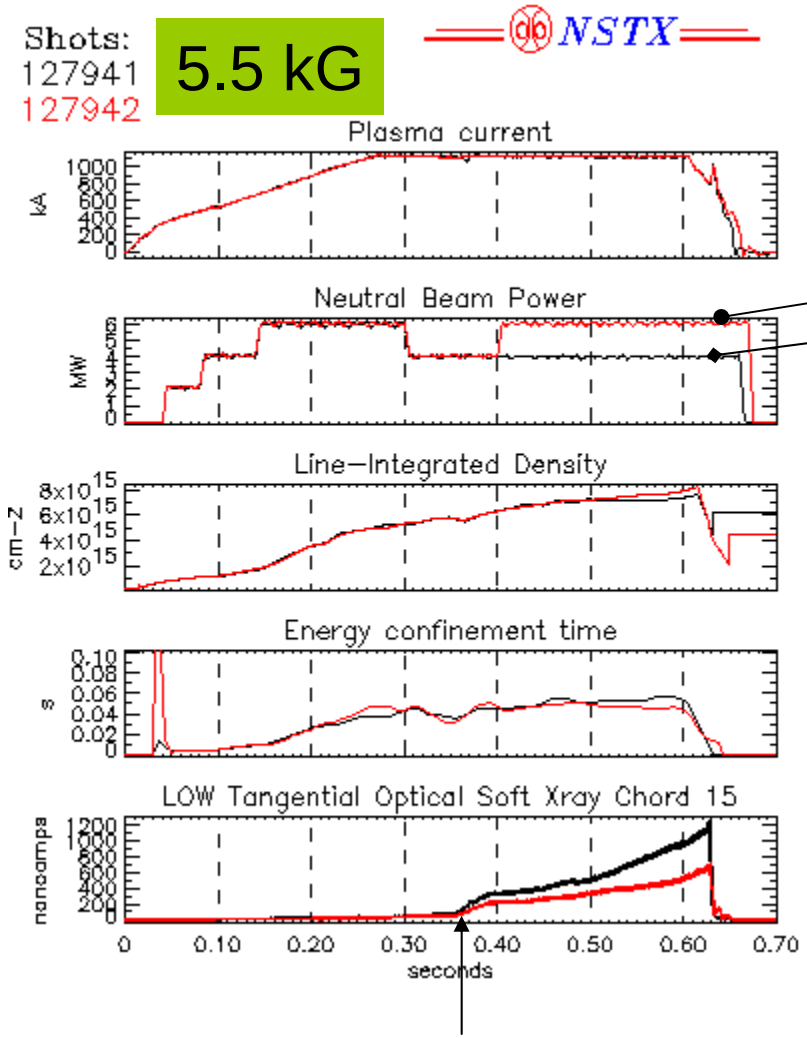


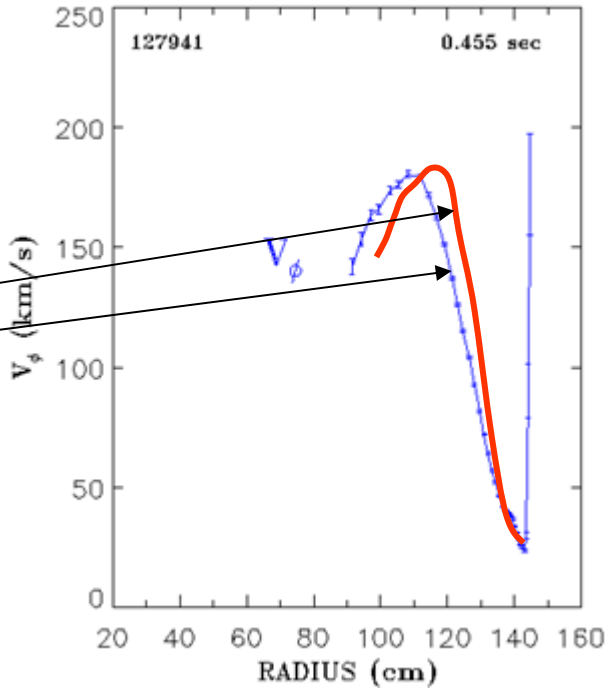
4->6





In contrast to electrons, Ne transport improves with P_b

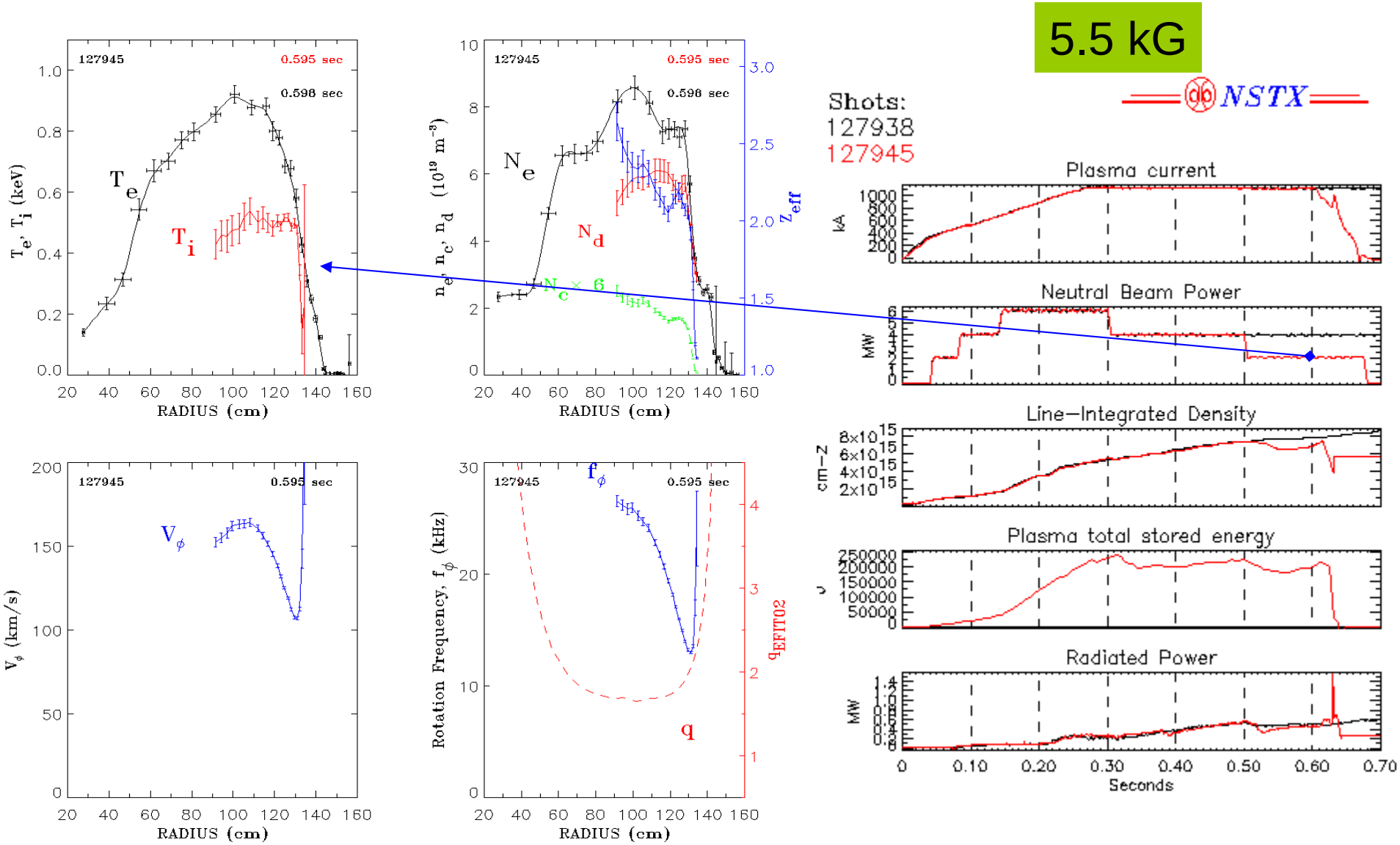




- Less Ne penetrates at 4-6 than at 4-4
- Possibly due to higher ω_{ExB}
- V_{pinch} change also likely

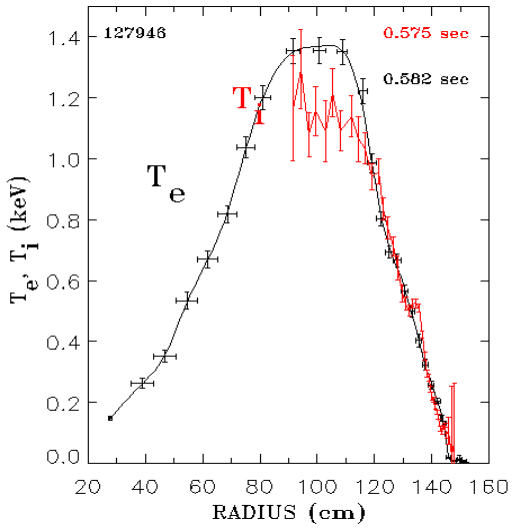
Neon injection (L. Delgado)

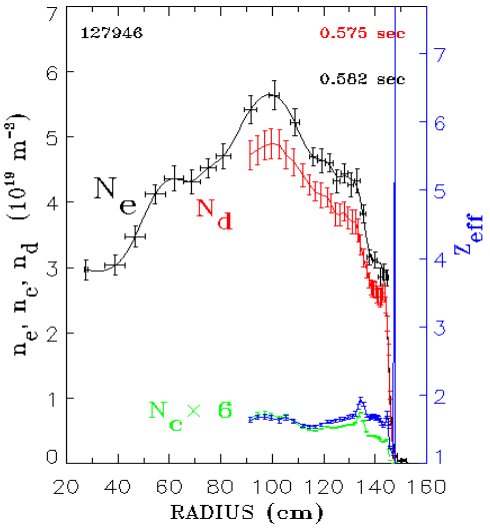
Strong ion ITB after P_b drop?

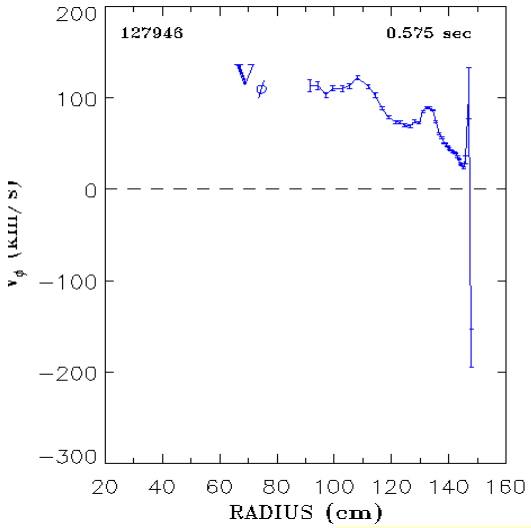


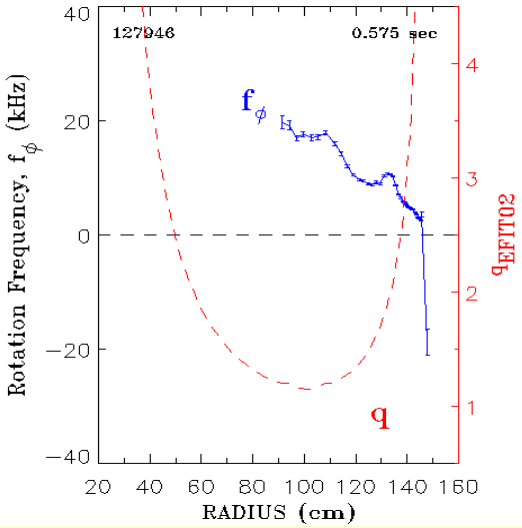
- Stored energy slightly decreases but then recovers

High T_e and τ_E in H-mode with only 2 MW (eITB ?)



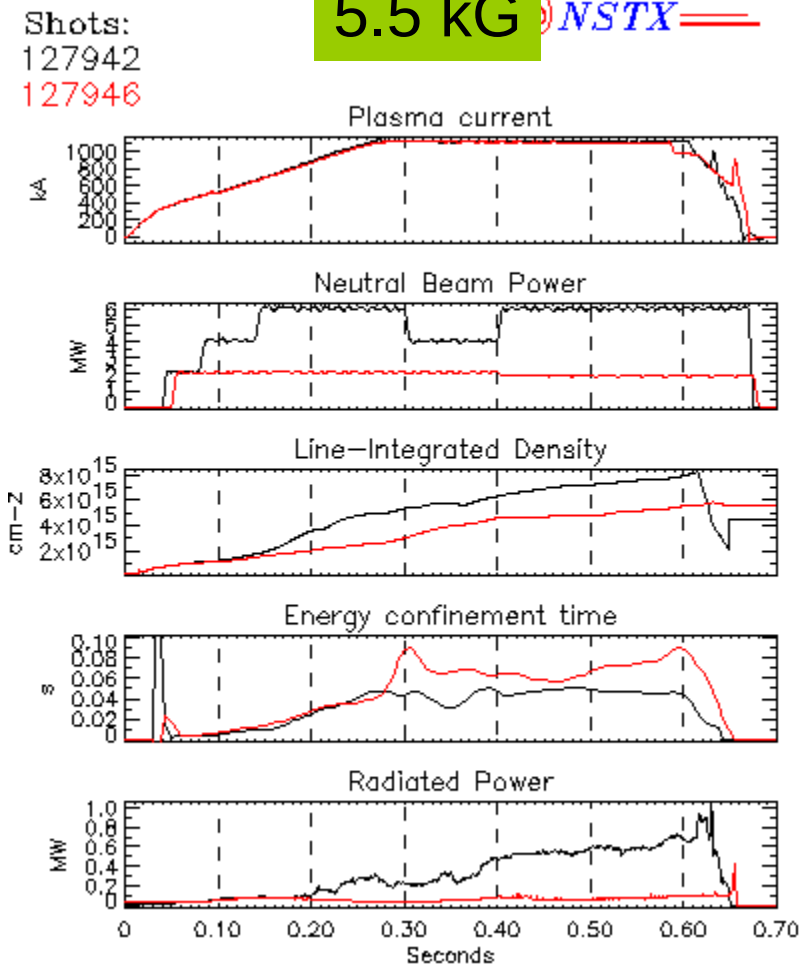






5.5 kG

NSTX



- Not enough time to try and further increase T_e