

# XP803 SXR Tomography in Neon-Seeded RWM Stabilized Plasmas

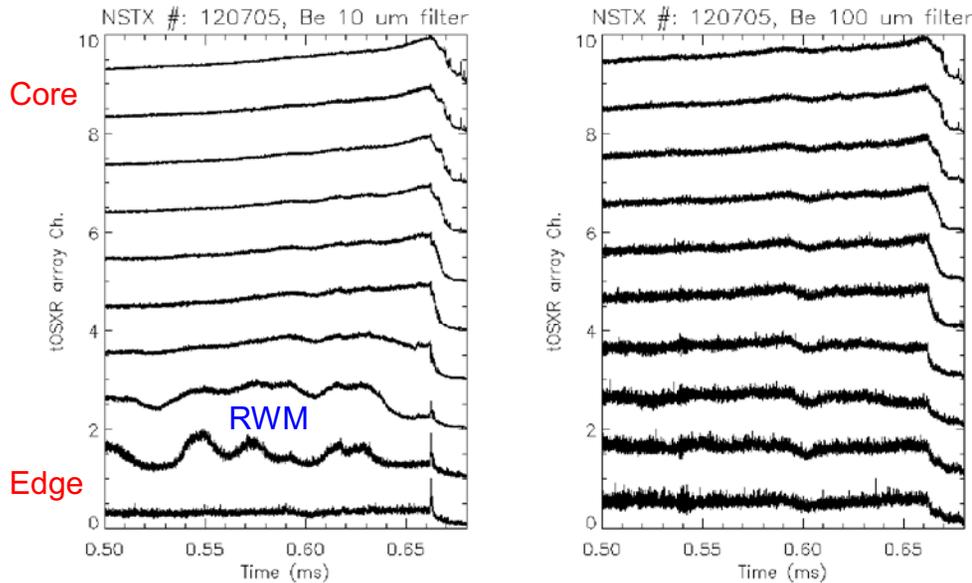
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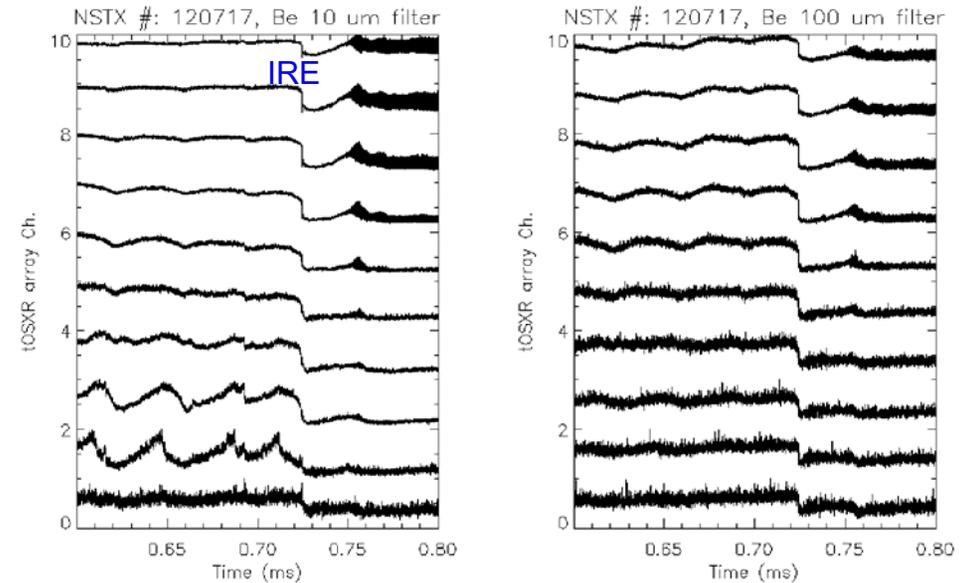
# Does RWM stabilization modify the internal magnetic structure?

## Stabilization OFF



- RWM affects edge channels
- causes disruption

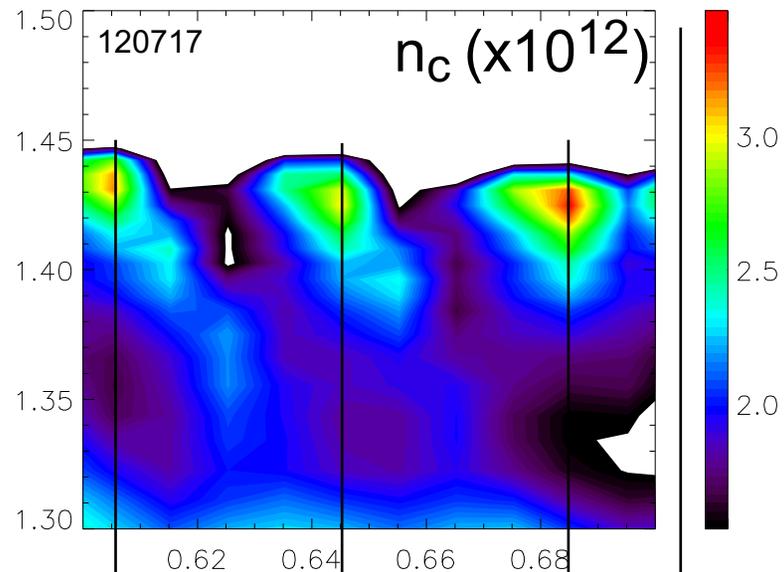
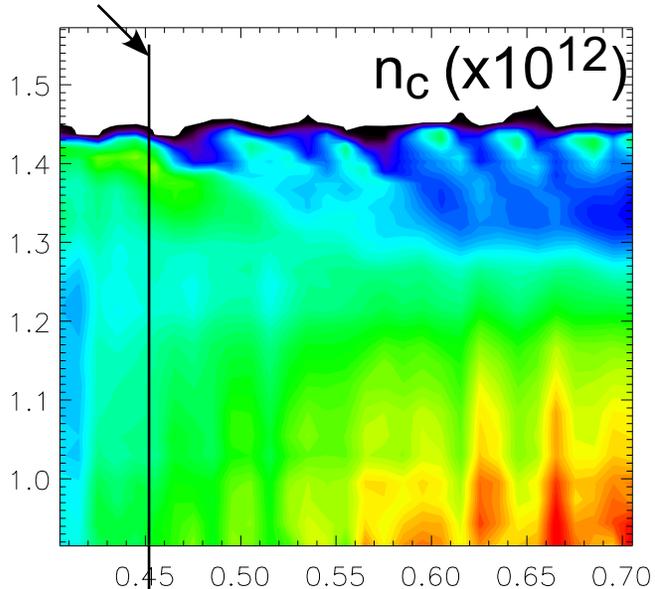
## Stabilization ON



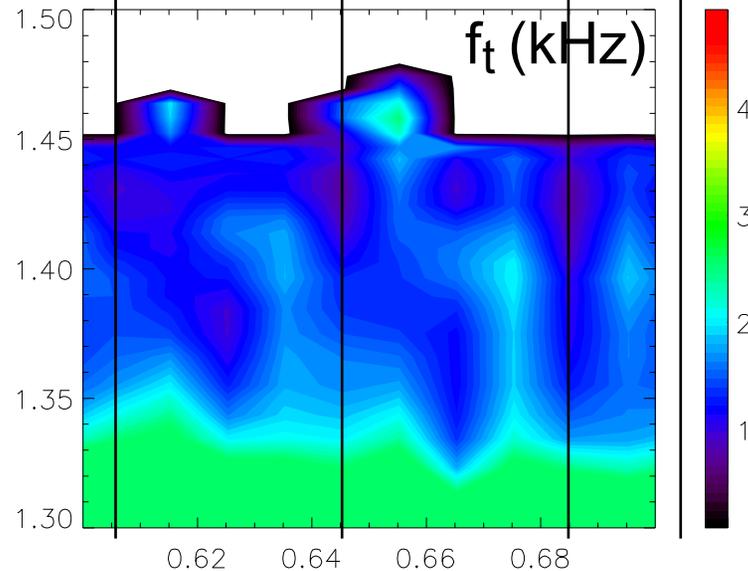
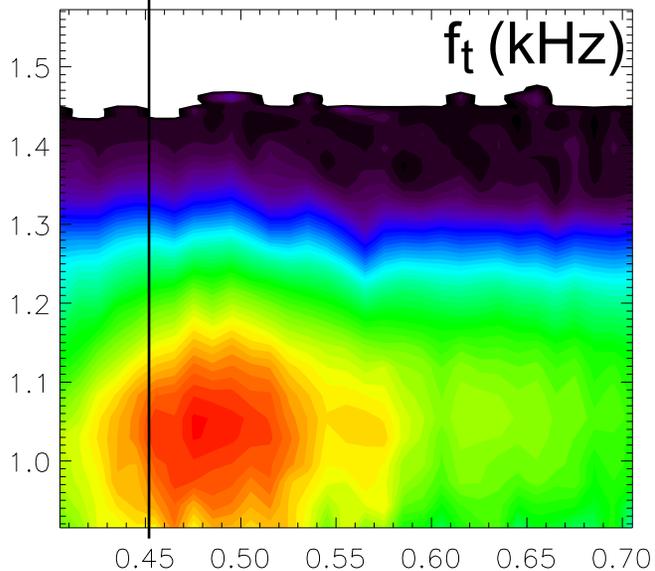
- mode appears in edge and core plasma channels
- eventual IRE

# CHERS observes periodic carbon signature

Stabilization ON

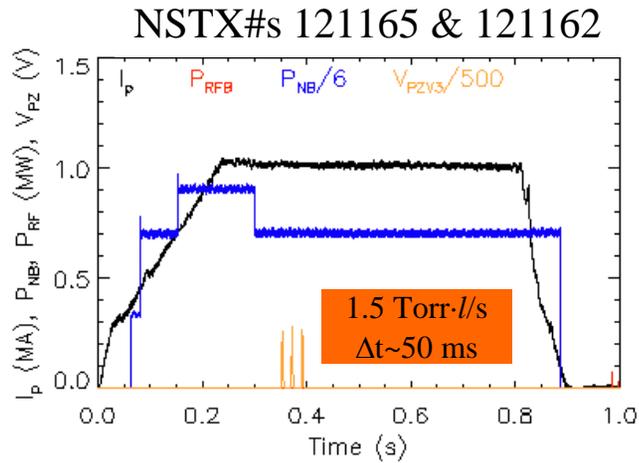


Impurity influx or slowly rotating island?

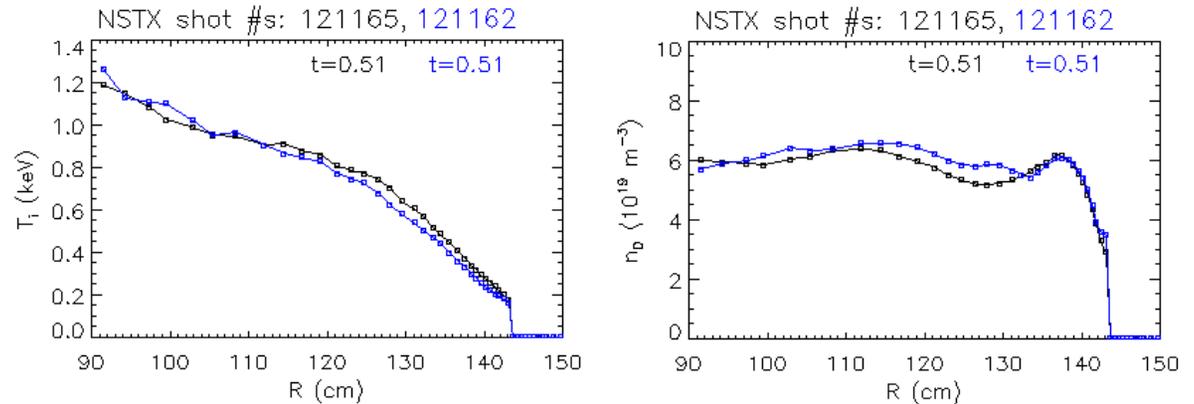


Velocity perturbation correlates with blob  $\Rightarrow$  island "drag"?

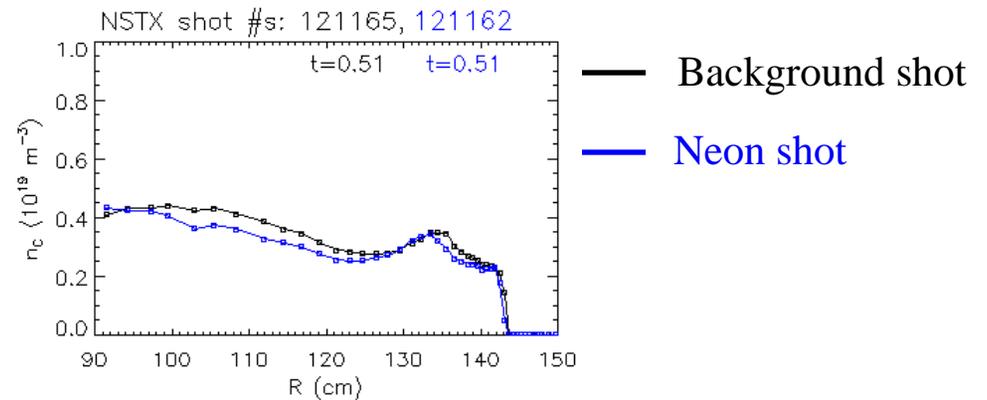
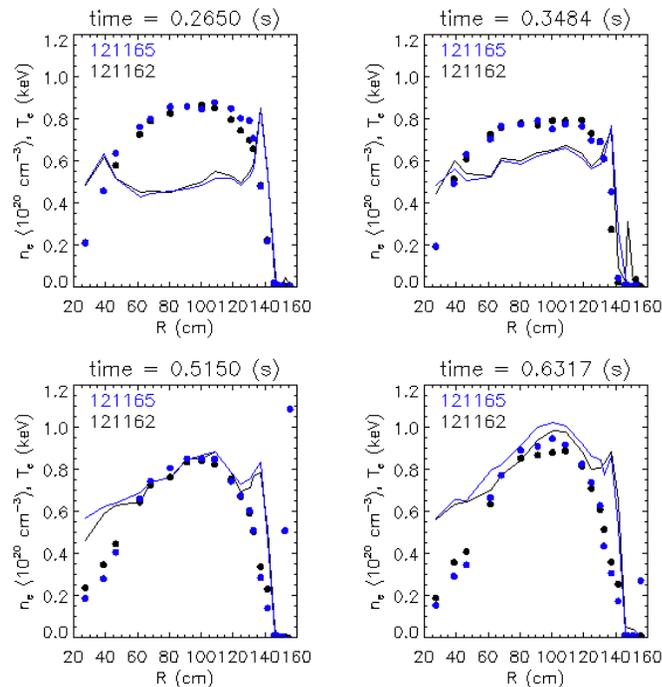
# Neon injection didn't modify background shot



## CHERS DATA (R. Bell, PPPL)

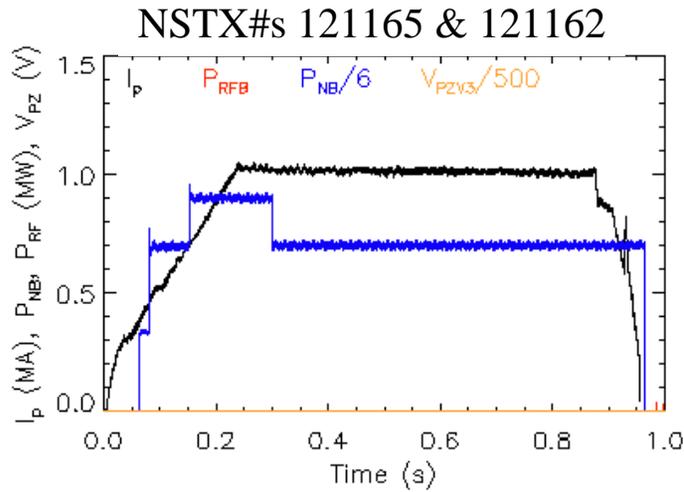


## MPTS DATA (B. LeBlanc, PPPL)

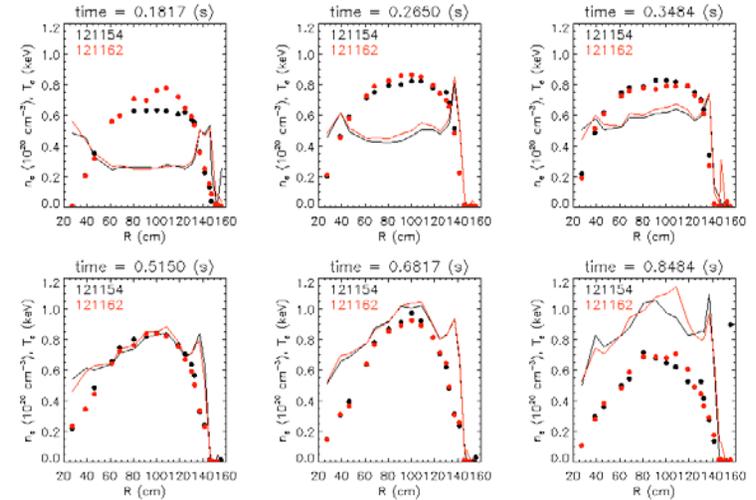


- We used one Neon and one background shot.
- At late times MHD kicks in due to impurity accumulation.

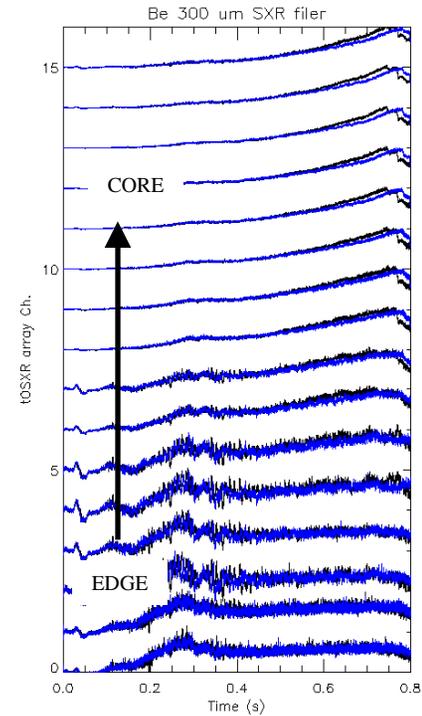
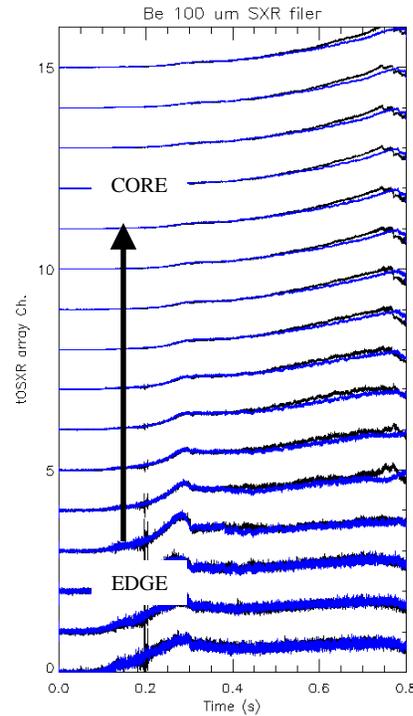
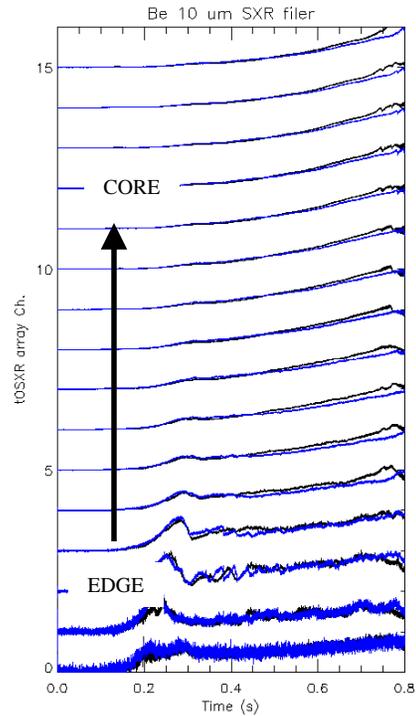
# The background shots are reproducible



MPTS  
(B. LeBlanc, PPPL)

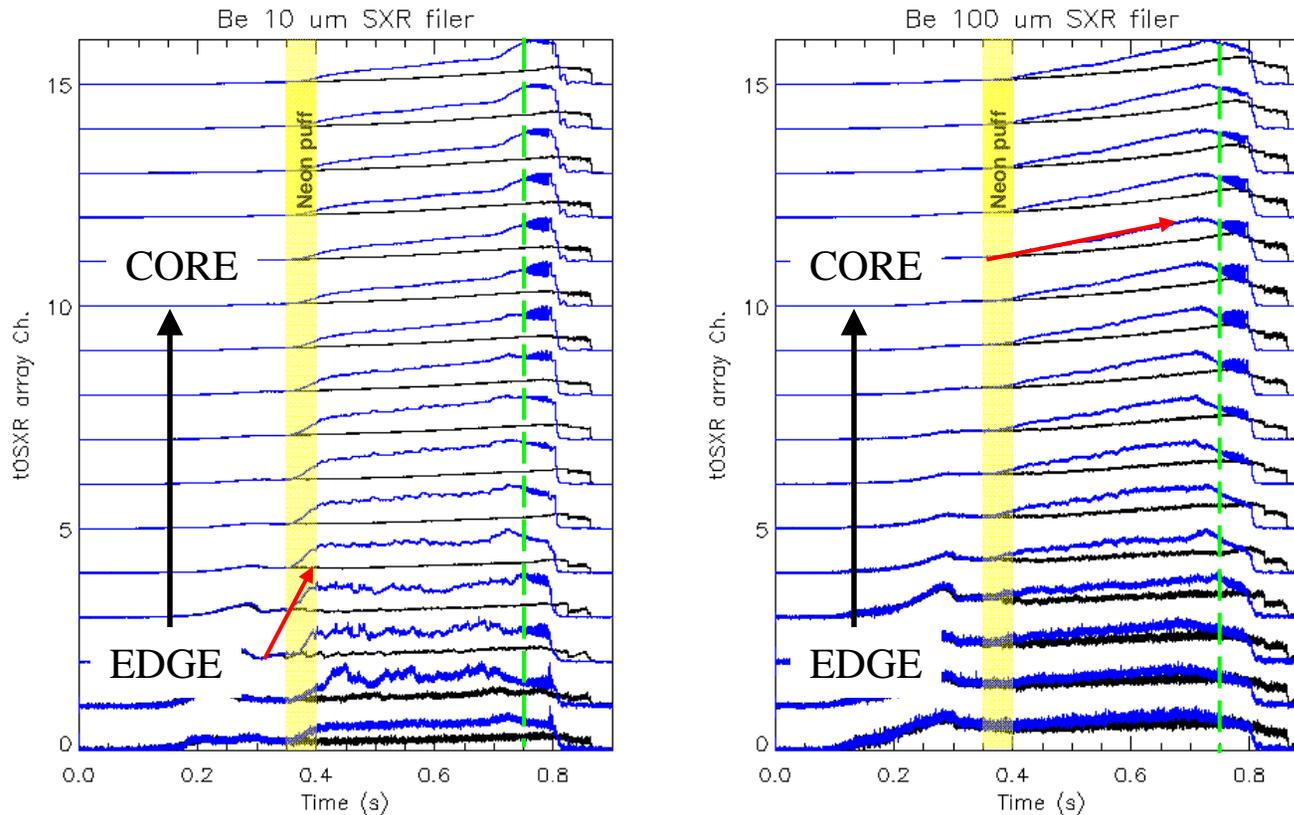


tOSXR signals  
(121162 & 121154)



# The edge Neon builds up fast, core builds up slow

121165 (neon) vs. 121162 (background)



- Good SNR of tOSXR signals when Neon was injected.
- Fast edge vs slow core Neon build up.
- Strong peaking of impurities ( $\sim 0.7$  s) and flattening of  $T_e$  (consistent with MPTS)
- Late  $(1,1)$  MHD mode triggered by impurity accumulation ( $\sim 0.75$  s).

# XP Proposal: Illuminate magnetic structure with Ne puff

- Controlled impurity injection will boost signal and discriminate influx vs. island accumulation
- Interchange SXR tomography with two-color mode for discrimination of  $T_e/n_z$  and characterization of “blob”

Part I - two-color/tomographic characterization of RWM and stabilized plasma  
- piggyback w. XP802 S. Sabbagh, test neon+background if possible

Part II - if successful use discharge from Part I with Neon+background shots  
repeat with filters in tomographic and two-color configuration

baseline discharge - no stabilization (background + neon)      2 shots  
change filter configuration      2 shots

baseline discharge - with stabilization (background + neon)      2 shots  
change filter configuration      2 shots

baseline discharge - with different n=3 current      2 shots  
change filter configuration      2 shots

Total:      12 shots (0.5 day)

Part III - does magnetic structure change with phase of  $n=3$ ?

baseline discharge - optimal phase (background + neon) 2 shots  
change filter configuration 2 shots

baseline discharge - phase +45? (background + neon) 2 shots  
change filter configuration 2 shots

baseline discharge - phase -45? (background + neon) 2 shots  
change filter configuration 2 shots

Total: 12 shots (0.5 day)

Diagnostics:

SXR, CHERS, MPTS, FireTIP, MSE, Fast Cameras (filtered?)