

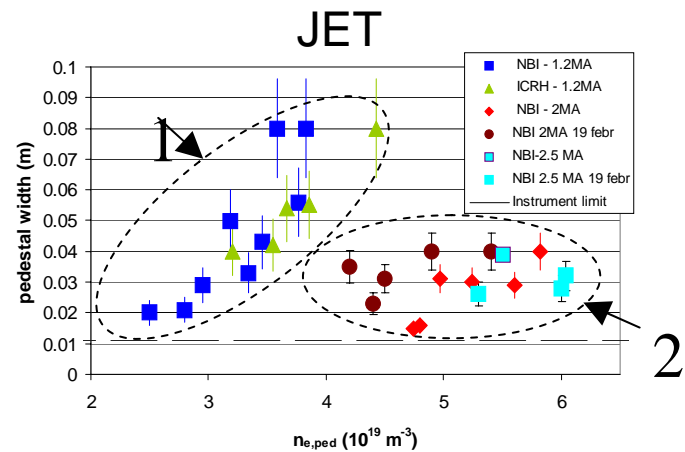
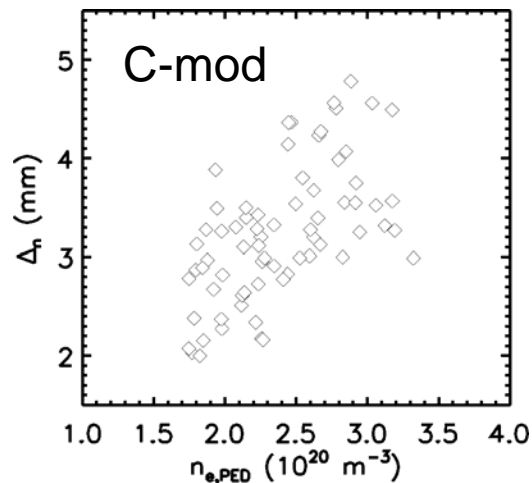
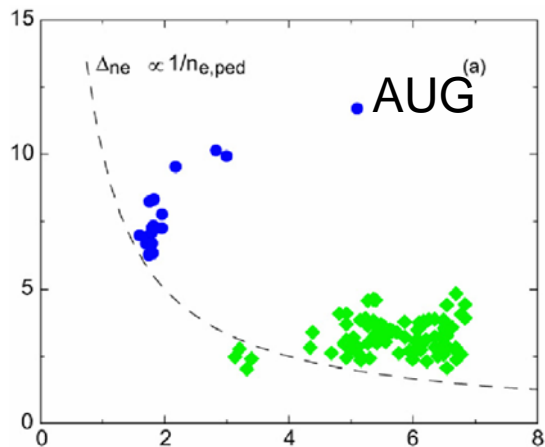
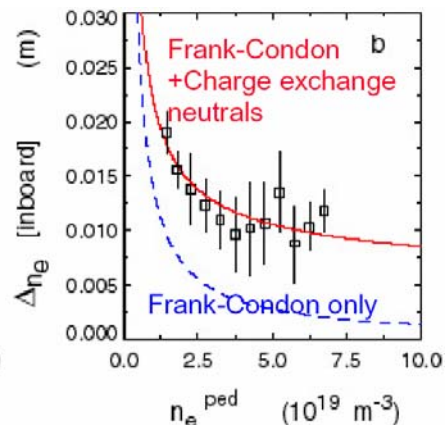
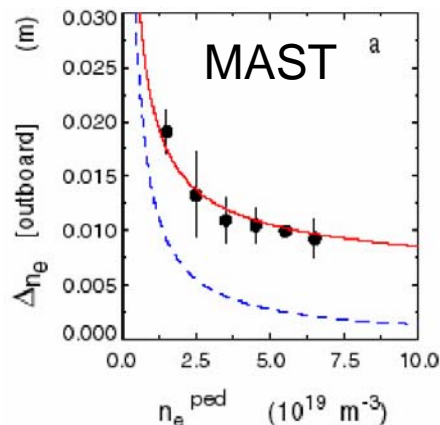
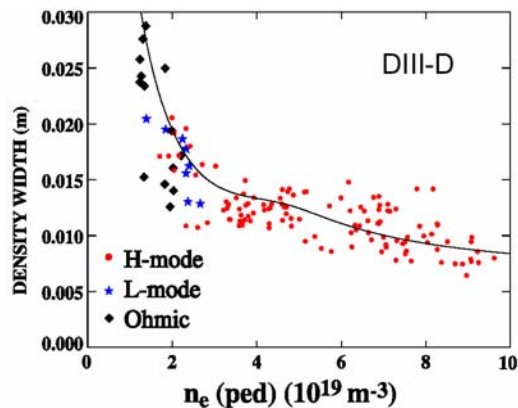
# Discussion on Diagnostics

EPPW

# What is needed in general?

- Ne: top/width/gradient/time resolution
- Te: top/width/gradient/time
- Ti: top/width/gradient/time
- Ni: profiles of impurities?
- Er:
- J(R):
- Rotation pol./tor:
- For all plasma parameters/shapes/conditions

# Experimental evidence $\Delta n_e$



is  $1/n_e$  model valid for larger tokamaks? Are JET and AUG data instrument limited?

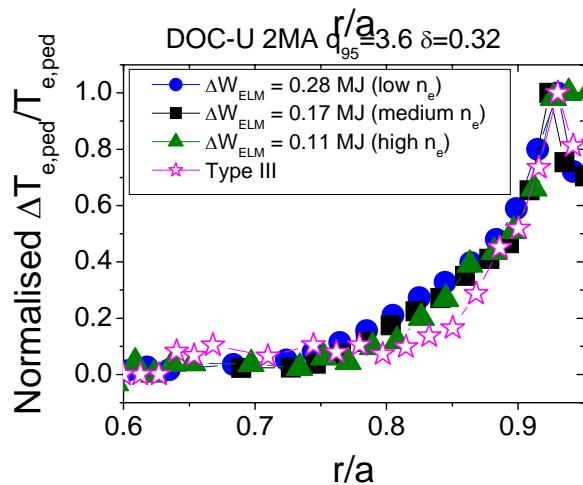
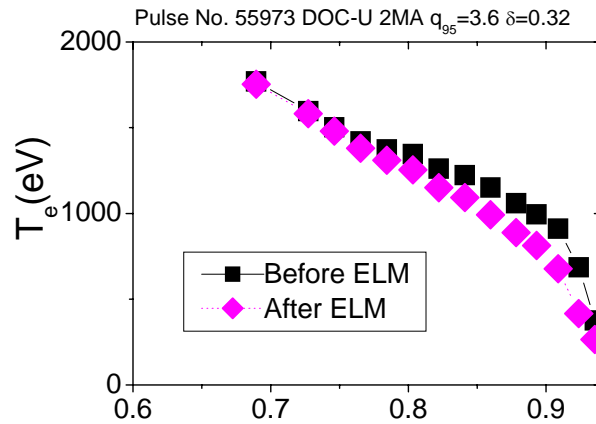
Graphs from G Maddison/Kempnaars

# Similar studies for

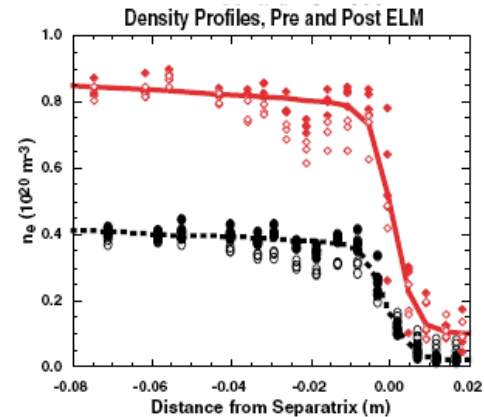
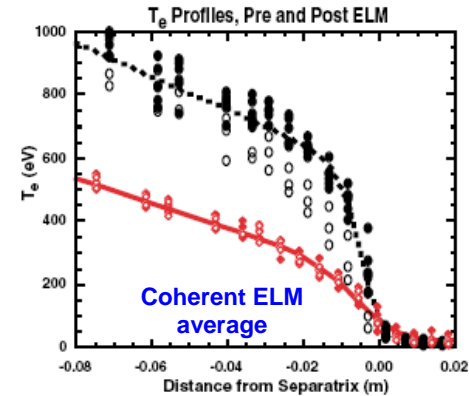
- Te
- Ti
- Etc...

# Time resolution required: ELM losses

JET

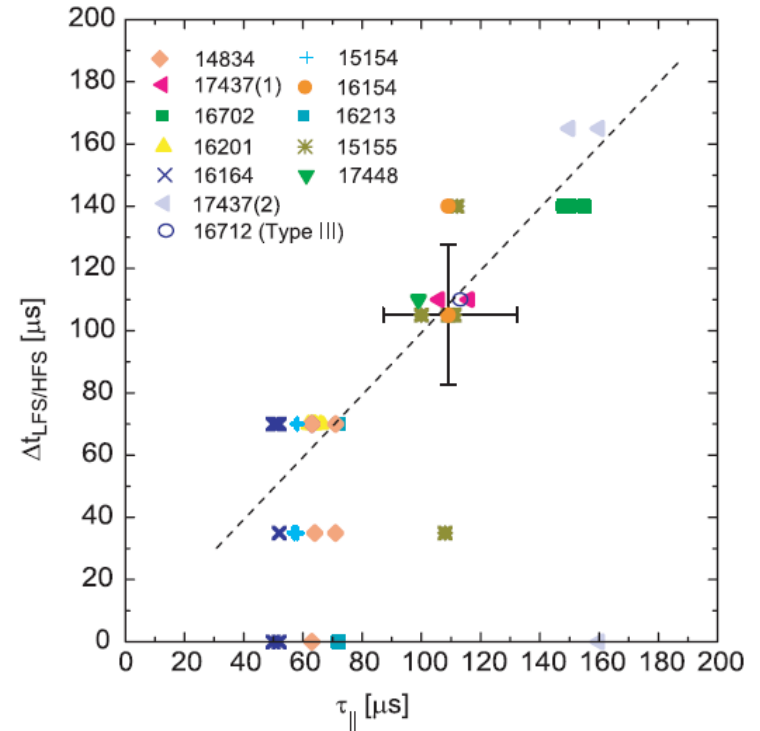
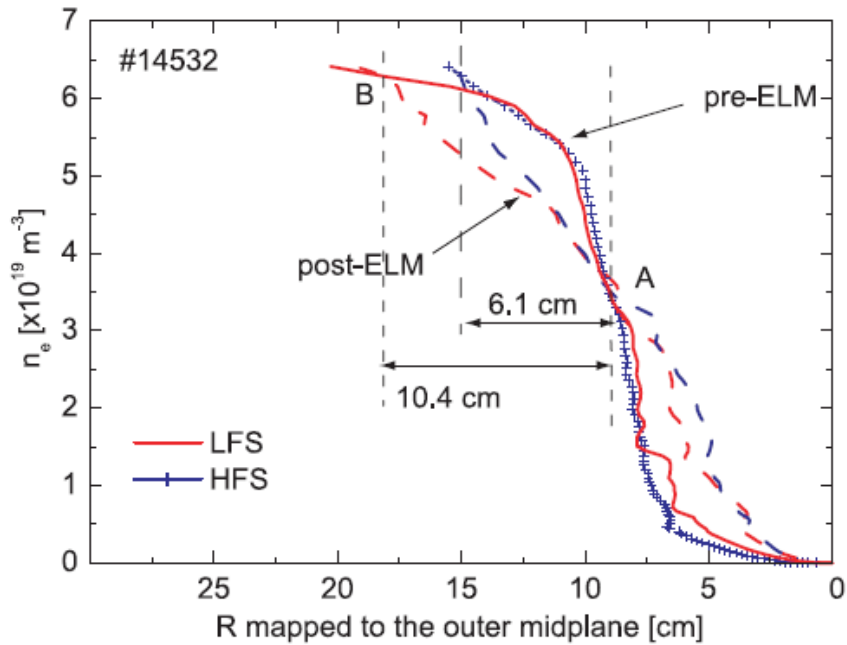


DIII-D



# ELM temperature/density changes (II)

## AUG: Reflectometry



ELM collapse most likely not in/out symmetric in space nor simultaneous in time (possibility of inner/outer pedestal parameters measurements in JET ??)

# What is missing at ASD EX?

## Short Term

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## Long Term

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# What is missing at JET?

Short Term

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Long Term

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# What is missing at JET?

## Short Term

- HRTS/Reflectometer/ECE *inboard/outboard*
- Rotation profile: edge CXRS
- Plasma sweeps: 1.5 cm needed (all shapes/heating?)
- B-sweep for ECE: 1-2% needed
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## Long Term

- $E_r$
- $J(r)$
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# What is missing at DIII-D?

Short term

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Long term

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# What is missing at TCV?

Short term

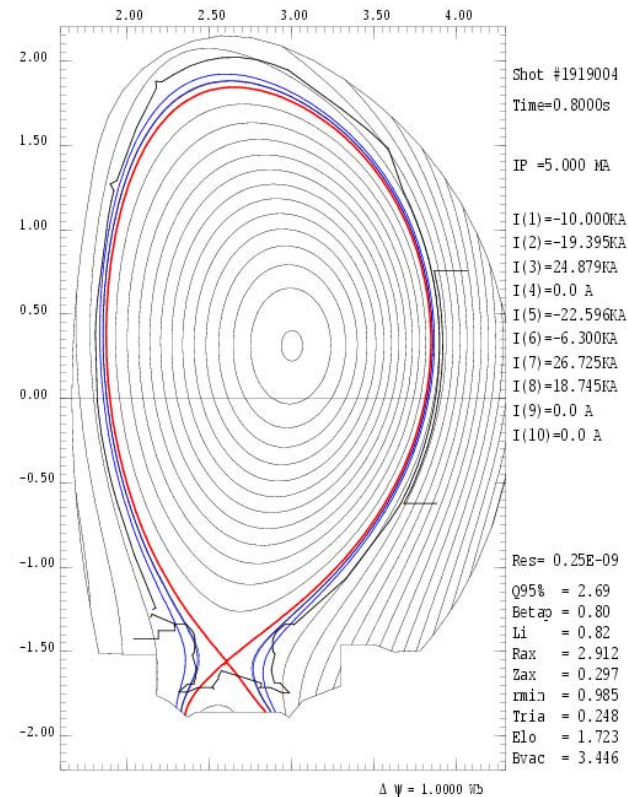
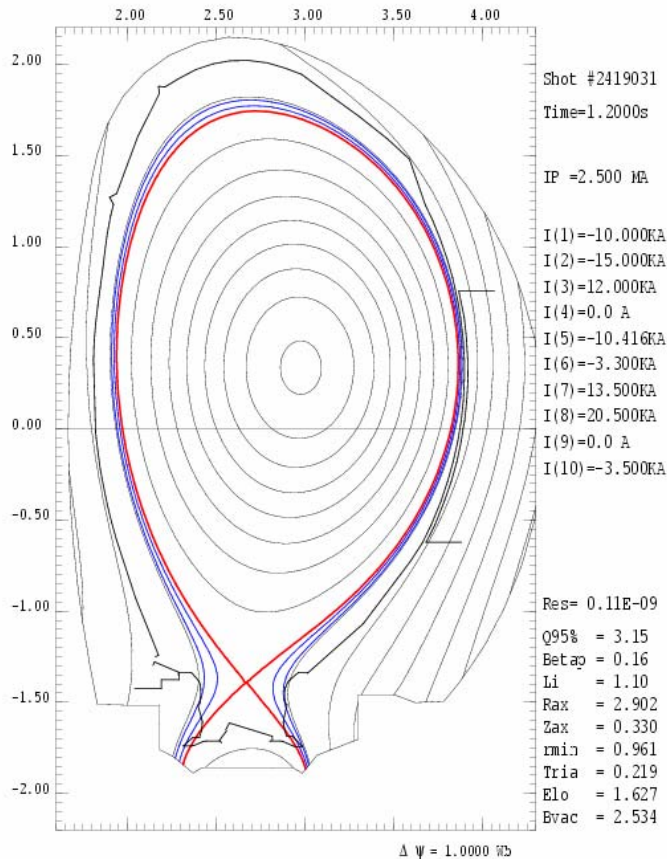
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Long term

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# Expected plasma configurations – Low $\delta$

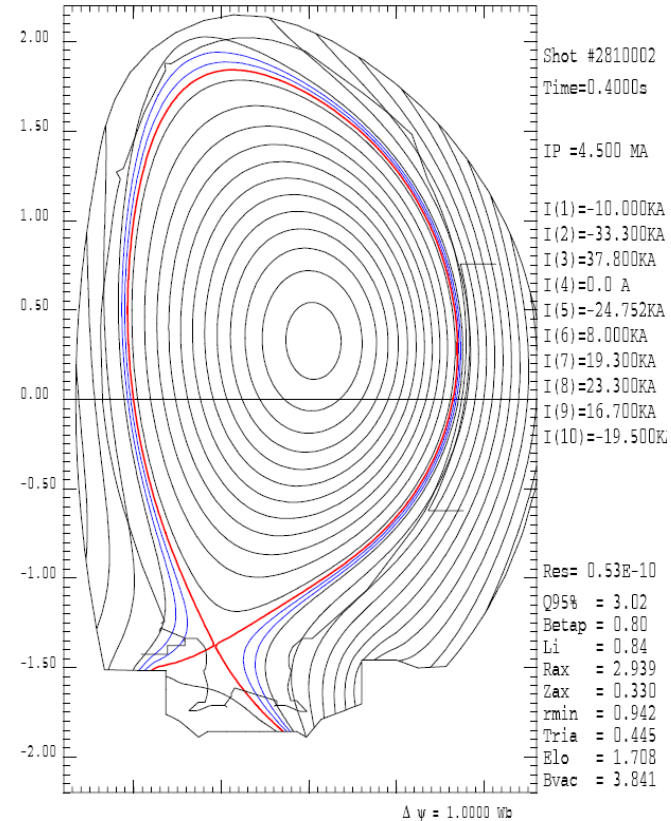
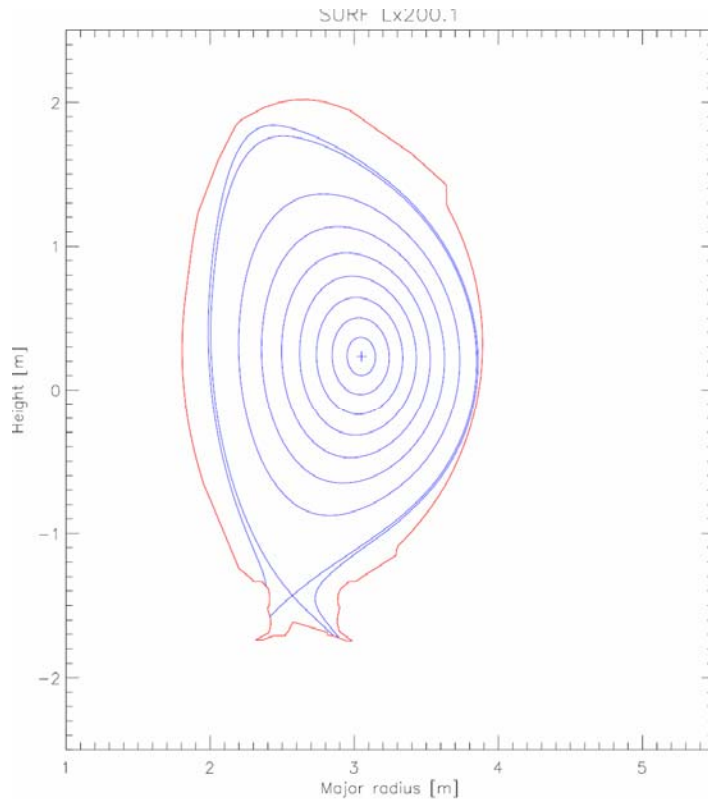
Two configurations being considered “new” V-SFE-LT & H\_4M5\_LT



Choice depends on re-start assessment + clearance and RCP accessibility (better V) + IR divertor view (V or H better ?) + L.P. sweeps for divertor (V or H better ?) + opinion of DIII-D team ...  $\rightarrow$  slow midplane sweeps (1-2 cm) for V possible but IR ?

# Configurations to be used – High $\delta$

Two configurations being considered “old” HT3 & “new” 4M5\_HD or “new” ITER-like

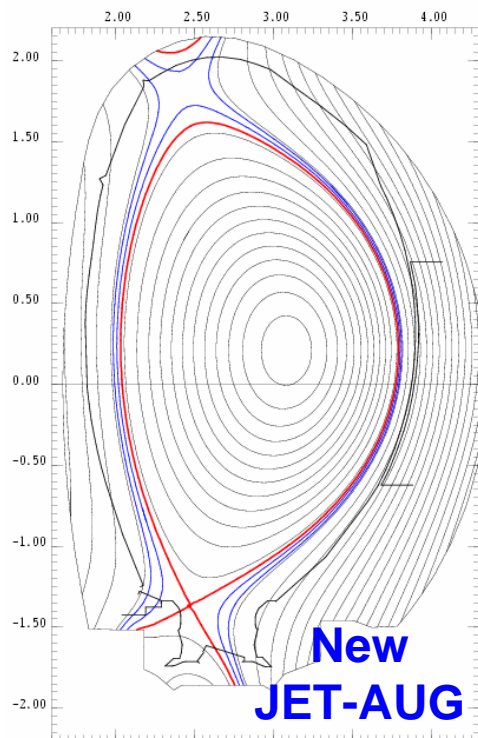


Choice of high  $\delta$  configuration for high  $I_p$  studies requires re-start assessment (NTMs, disruption forces ,...) to get comparable shots at low and high  $I_p$

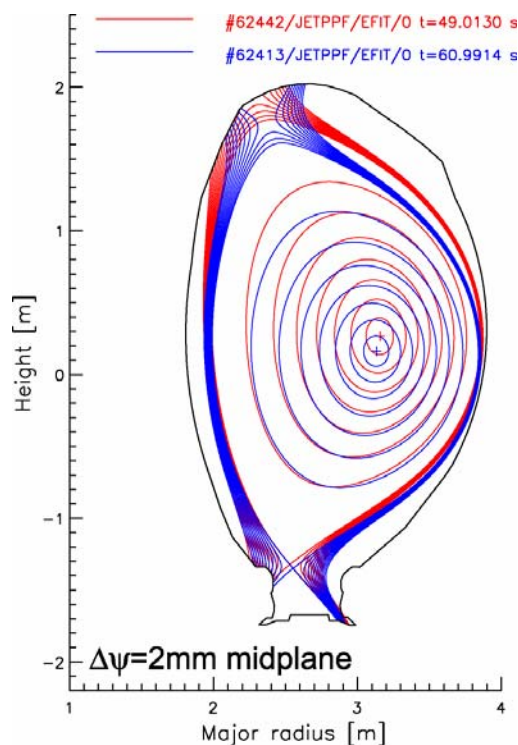
Choice depends on re-start assessment + IR divertor view + L.P. sweeps for divertor + clearance and RCP accessibility  $\rightarrow$  slow midplane sweeps (1-2 cm) unlikely

# Configurations to be used – High $\delta$ /QDN

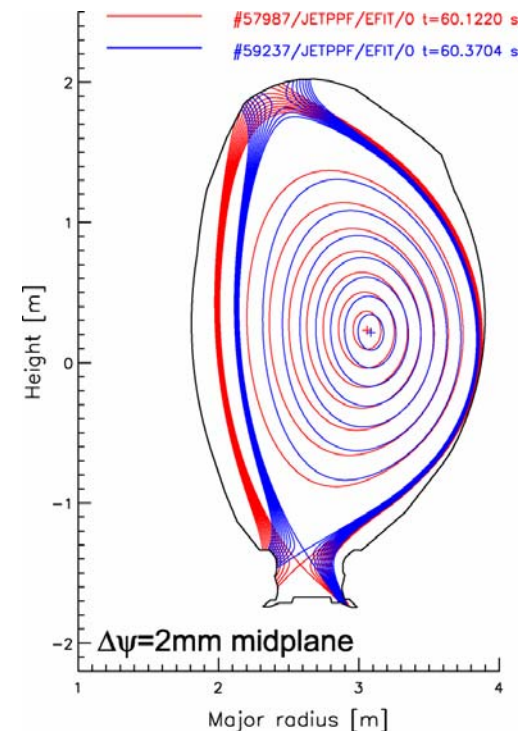
A range of configurations in QDN have been/will be used to explore : JET/AUG  
similarity Type II ELM experiments, high  $\beta_p$  JT-60U-like grassy ELMs + SN/QDN  
Type II ELM access in JET



## JET- high $\beta_p$



## JET- SN - QDN



Choice of configuration depends on re-start assessment + previous results  
→ slow midplane sweeps (1-2 cm) unlikely except for new JET-AUG

# What is missing in other machines?

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