

# Validation of M3D-K code for beam-driven TAE modes

## XP -1015

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*et al.***

Goal: *obtain detailed measurements  
of structure and dynamics of TAE  
modes to validate the M3D-K code*

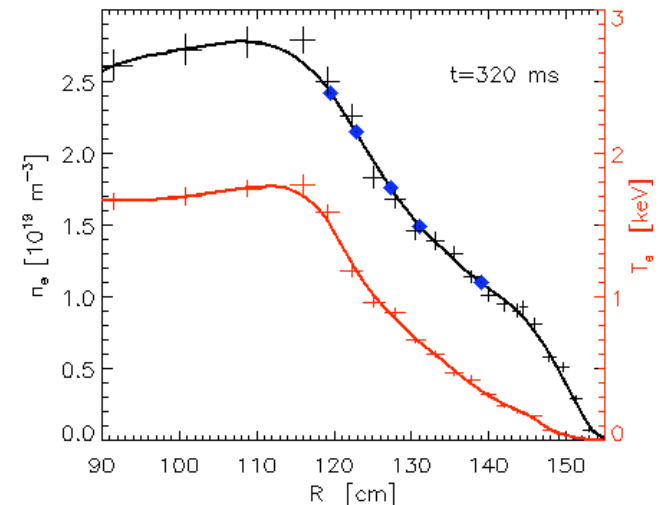
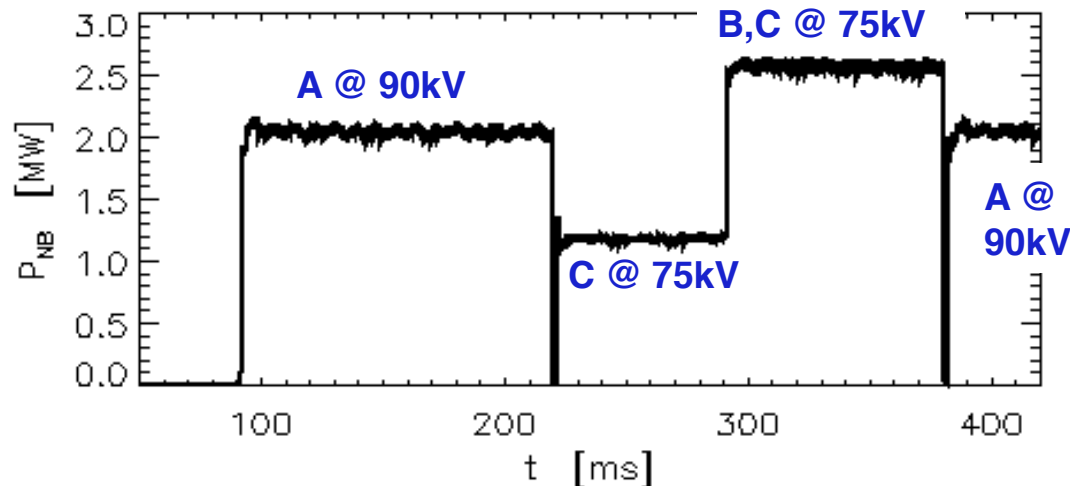
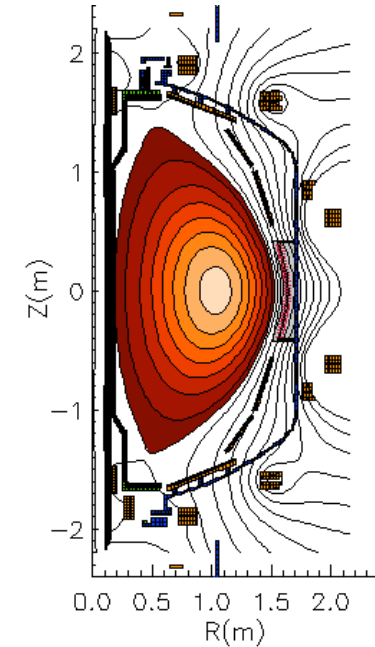
**Assigned run time:  
0.5 day**

College W&M  
Colorado Sch Mines  
Columbia U  
CompX  
General Atomics  
INL  
Johns Hopkins U  
LANL  
LLNL  
Lodestar  
MIT  
Nova Photonics  
New York U  
Old Dominion U  
ORNL  
PPPL  
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Culham Sci Ctr  
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Hyogo U  
Kyoto U  
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NIFS  
Niigata U  
U Tokyo  
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Hebrew U  
Ioffe Inst  
RRC Kurchatov Inst  
TRINITI  
KBSI  
KAIST  
POSTECH  
ASIPP  
ENEA, Frascati  
CEA, Cadarache  
IPP, Jülich  
IPP, Garching  
ASCR, Czech Rep  
U Quebec

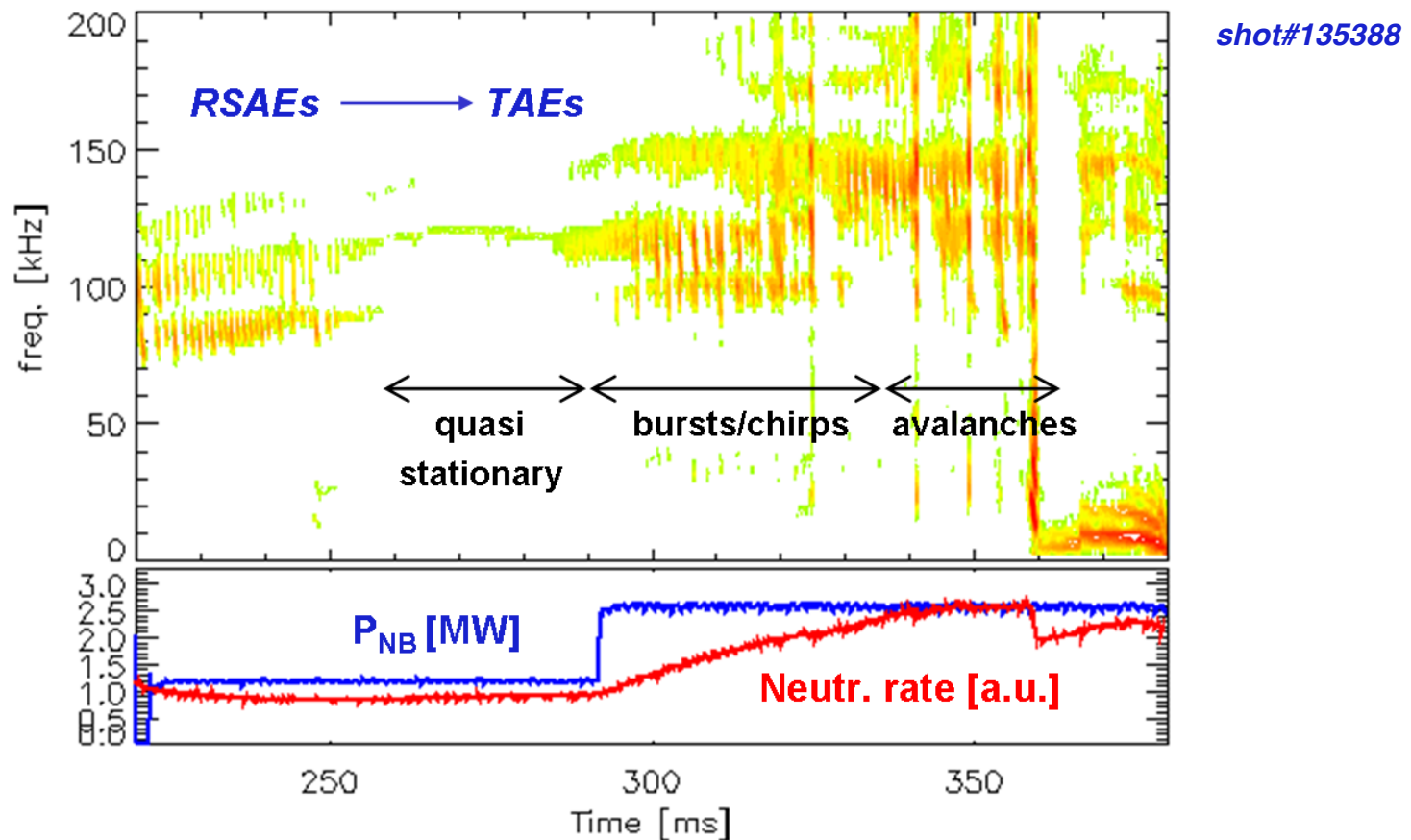
# Focus on L-mode, center-stack limited deuterium plasmas (similar to XP-916)

- Starting conditions:
  - Reproduce baseline discharge from 2009 (e.g. sh#135388)
    - L-mode, D plasma, center-stack limited
  - Make sure that plasma remains *limited* from 200 ms up to ~450 ms
  - Need good shot reproducibility
    - Optimize Liter/LLD (based on experience from LLD commissioning, previous XPs, etc.)



# Optimize scenario to have “long” ( $\gg 50$ ms) phase with weakly turbulent TAEs

- Scan NB voltage to identify “marginally stable” conditions
- Maximize duration of quasi-stationary TAE activity by adjusting NB timing (example: delay source B)



# Run plan for 1/2 day XP

- Establish baseline scenario 2 shots
- Optimize density and NB timing/voltage 3 shots
- Document mode structure and TAE dynamics 3 shots (*repeat*)
- Document  $q$ -profile evolution (anticipate source B) 4 shots
- Repeat for high density,  $n \sim 8 \times 10^{19} \text{m}^{-3}$  @  $t \sim 300$  ms as time permits



- *Required diagnostics:*
  - *BES (at least 8 radial channels), reflectometer*
  - *All fast ion diagnostics (FIDA, NPA, ssNPA, sFLIP)*
  - *Plasma profiles (MPTS, CHERS, MSE) & magnetics*