

ELM Physics in NSTX

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- (1) ELM behavior on NSTX
- (2) Diagnostics improved and faster
 - Better for stability and other MHD studies

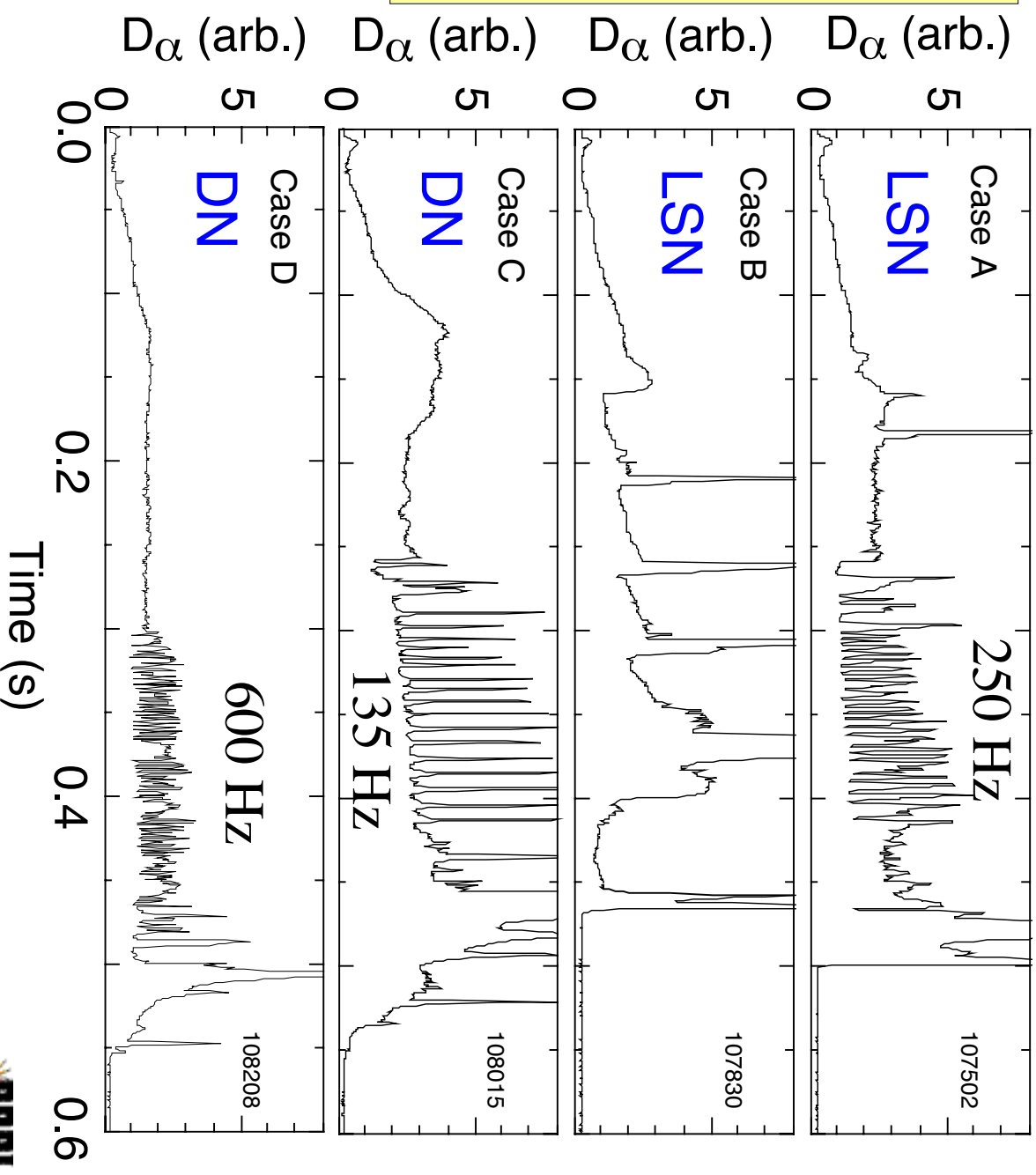
NSTX Research Forum

Princeton Plasma Physics Laboratory

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Is the MHD stability and character the same for all ELM types in NSTX?

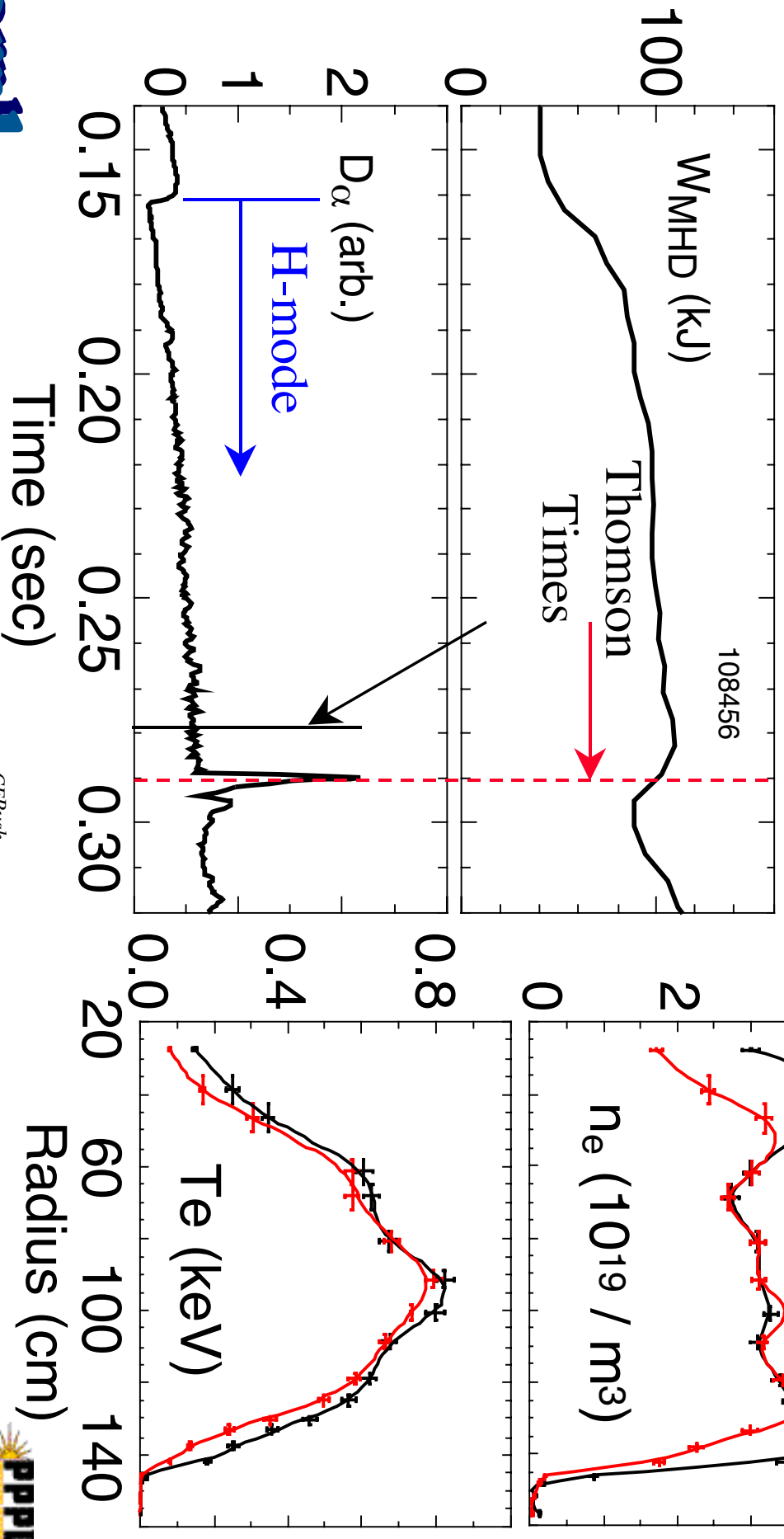
- From Grassy to Giant ELMs to ELM-Free
- ELMs w/DN and LSN
- ELMs w/NBI and RF
- Precursors? -Possibly seen by GPI
- Frequency: from < 135 Hz to > 600 Hz



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Stability and Large ELMs: Is there also a variety of large ELMs?

- Effect to $r/a \sim 0.4$, edge $\Delta n_e/n_e > 50\%$ observed. Can return to sustained L-mode.



Studies and Measurements

ELM Stability:

- Test theory for ELM trigger - Combined ∇p and J (edge) / n-number
 - MSE or calculate bootstrap from edge n_e , T_e , T_i profs.
 - Mode number of any precursors - Magnetics, USXR, other?
- New - possible precursor detection using GPI

ELM MHD characteristics:

- Fast n_e , T_e , T_i measurements \Rightarrow across ELM (Thomson, CHERS, and edge scanning reflectometer)
- Fast magnetics \Rightarrow Reconstruct equilibrium