

Fast-Ion Driven Instabilities

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ST attractiveness:

- Thresholds for alpha-driven instabilities.
- Consequent alpha transport.

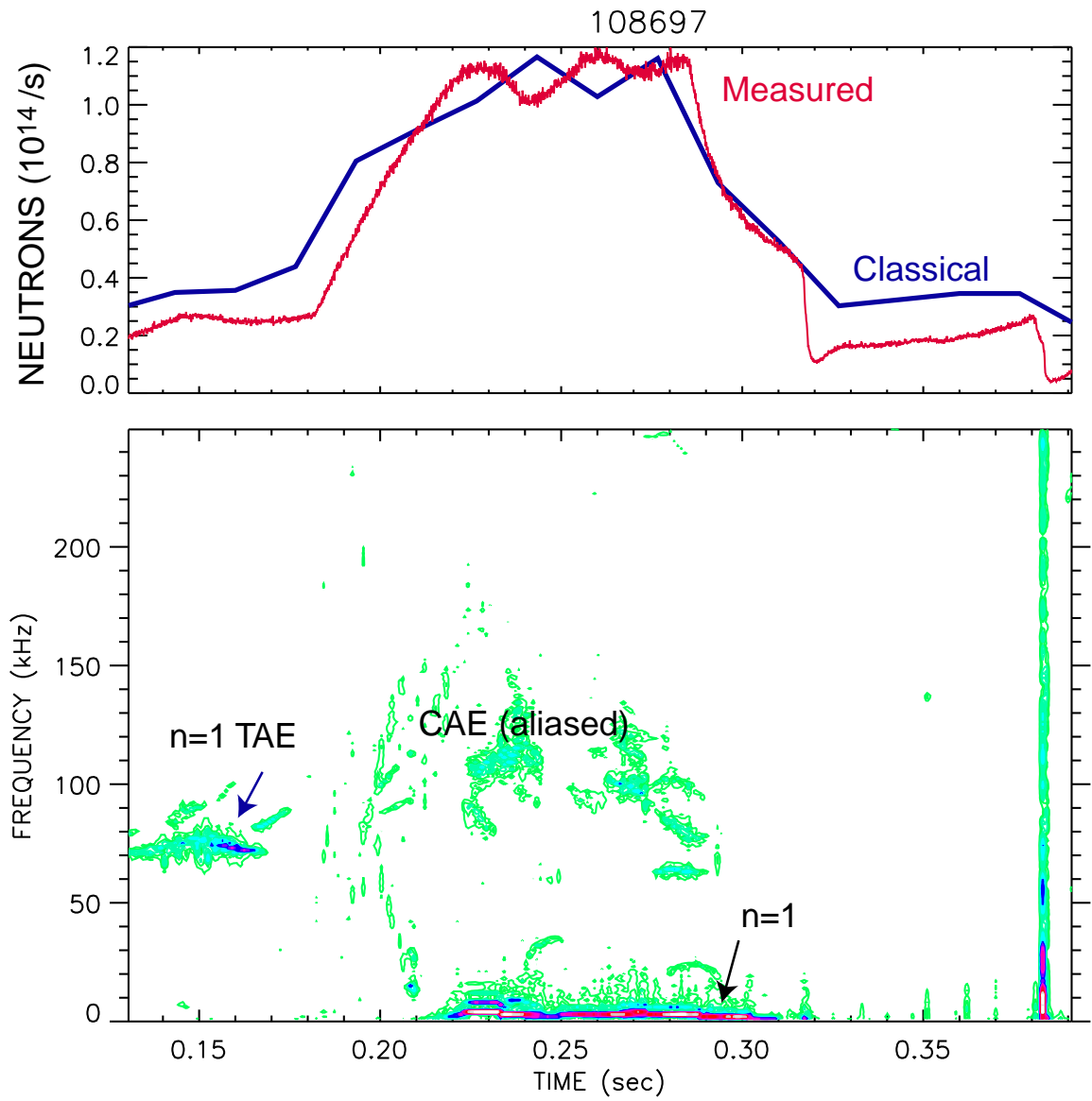
Toroidal physics:

- Impact of open gap structure.
- Large kinetic effects.

Center stack upgrade:

- Bigger range of B helpful in sorting out stability thresholds.
- Higher I_p could make beam-ion transport studies more relevant to a reactor.

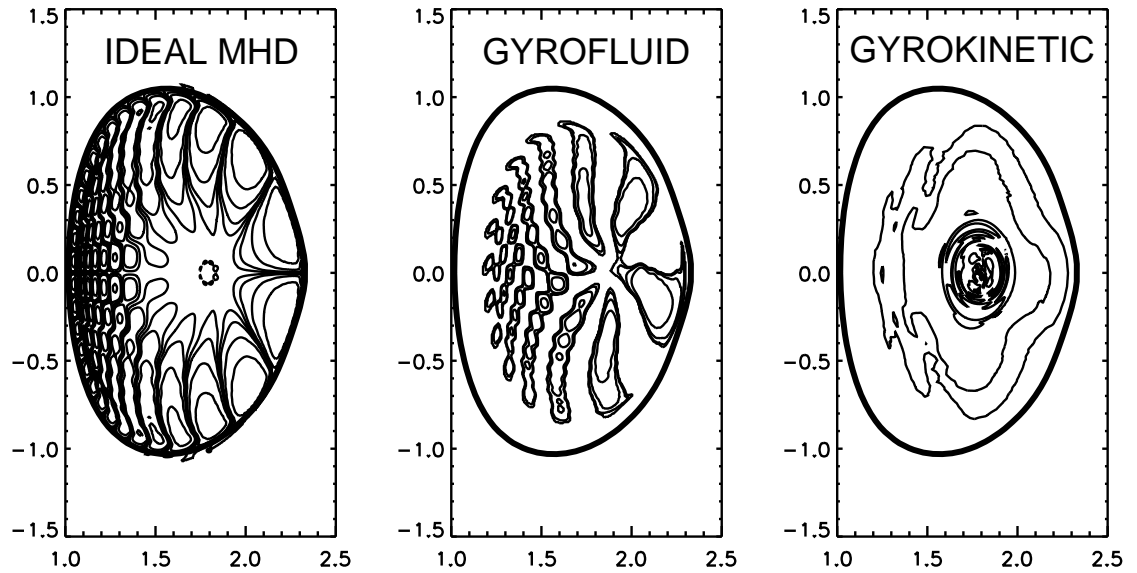
Current Diagnostics are Relatively Crude



Diagnostics:

- Spatial eigenfunction.
- Beam spatial profile.

DIII-D Beam-Driven TAE Eigenfunctions



Carolipio et al., Phys. Plasmas **8** (2001) 3391

Theory:

- Mode identification (e.g., bounce-resonance fishbone).
- Stability thresholds
- Fast-ion transport
- Nonlinear saturation

Next few years:

- Figure out spectra (mode identification).
- Similarity comparisons.
- Experiments to determine thresholds.