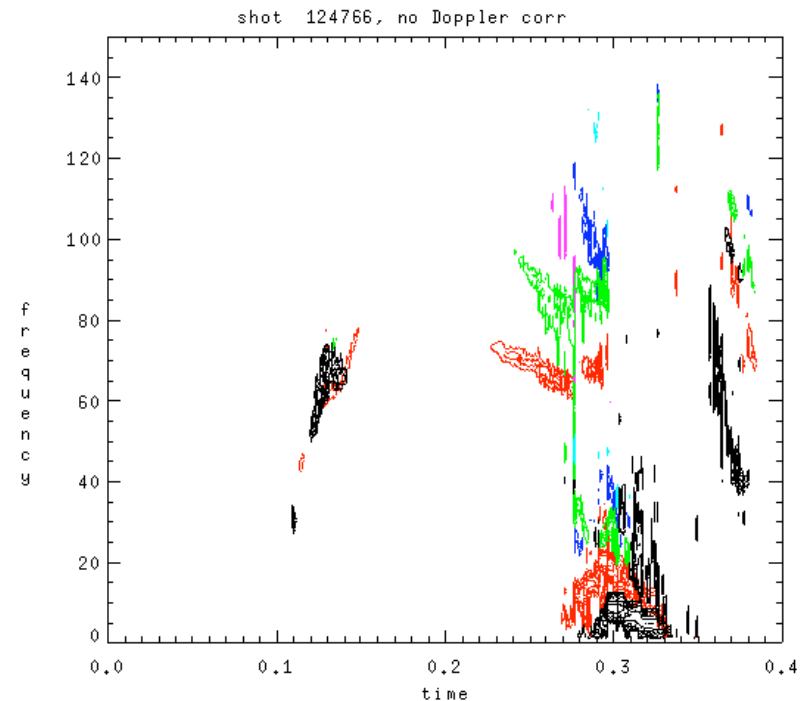


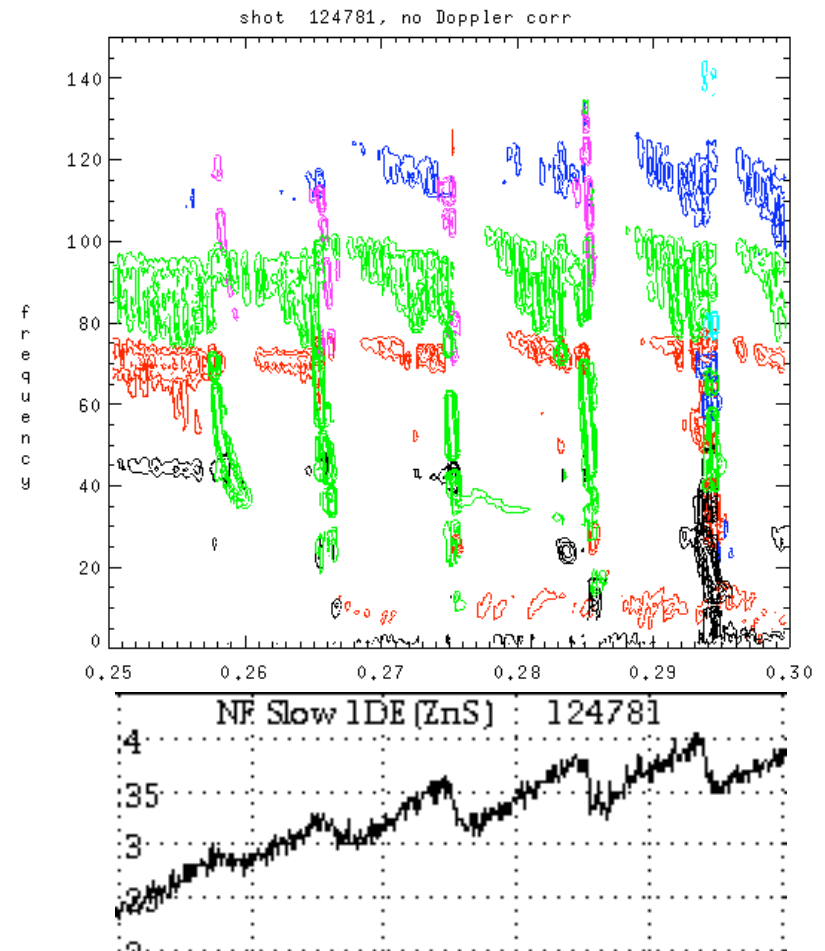
# XP705: Beam Power scan from quiescent plasma to TAE avalanches

- Second day: reproduced quiescent plasma with source C at 65 kV; start power scan.
- Add source B at 60 kV, multiple TAE appear
- Higher power triggers MHD.
- Try several variations of beam timing.
- Simultaneously increase source B voltage to 65 kV and then 70 kV for power scan.
- Measured q profile during avalanches, started NPA scan.
- Should have 5 refl. channels.



# MHD avoided by delaying source B to 240 ms.

- Sequence of avalanches produced demonstrating multi-mode fast ion transport.
- Strong drops in neutron rate were seen, correlated with avalanche events.
- Many avalanches did not have  $n=1$  "fishbone" modes.
- Avalanches typically involved strong frequency chirping - maybe as important as multi-mode.
- $q$ -profile documented with Source A timing scan.



# Started NPA scan, avalanches replaced by fishbones

- Density scans, beam timing scans don't bring avalanches back.
- Change found to be correlated with declining deuterium content of plasma
- After one shot in deuterium, avalanches reappear.
- Lighter mass of thermal deuterium will change resonant interactions between thermal ions and mode.
- Higher ion-Landau damping in Helium, or thermal deuterium drive?

