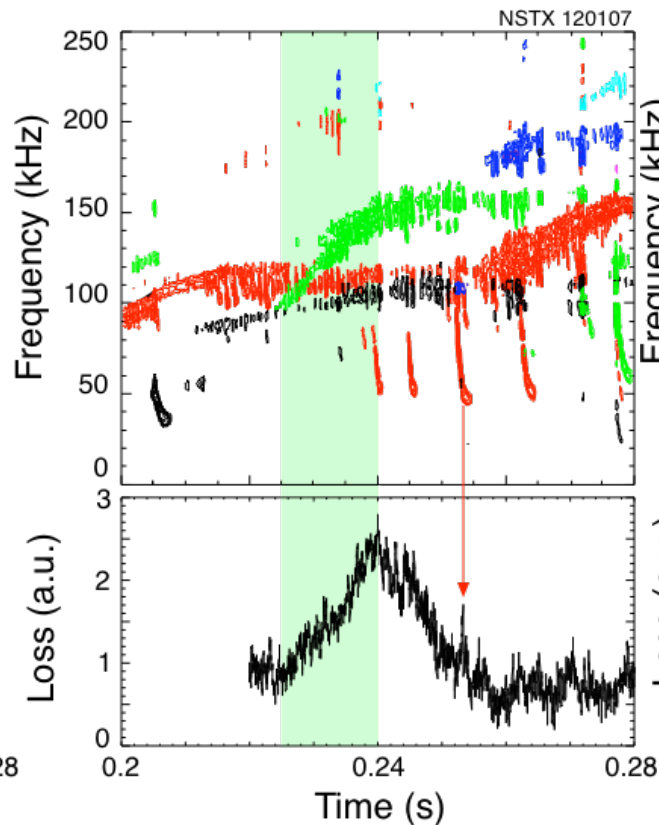# Proposal: Investigate recently observed AC mode-induced fast-ion loss mechanism
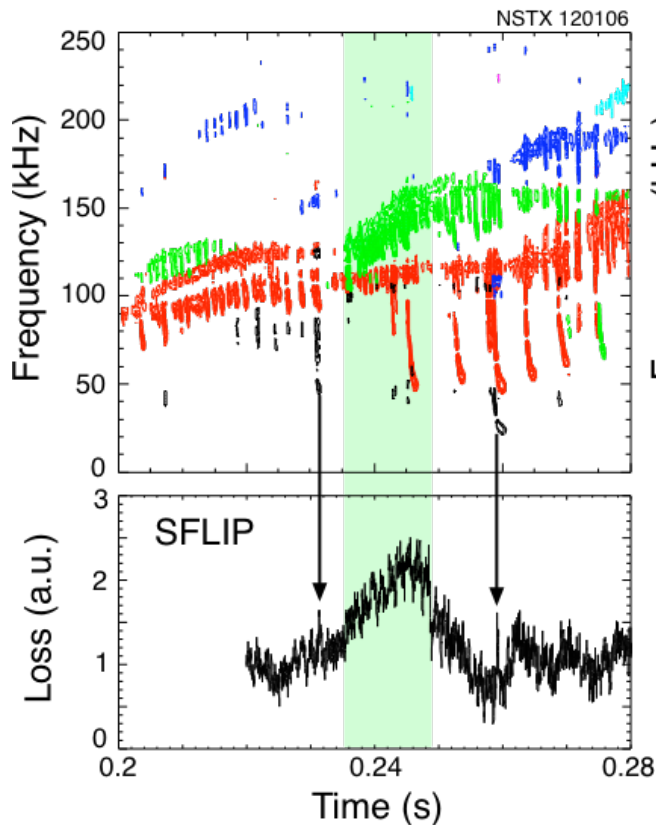
- *n* = 3 AC mode correlates with increasing fast-ion loss at "high *β*"

- further study necessary:

  - Why *n* = 3? Do other modes induce loss under other conditions?
  - How is the fast-ion population changed? What part of phase space is "lost"?
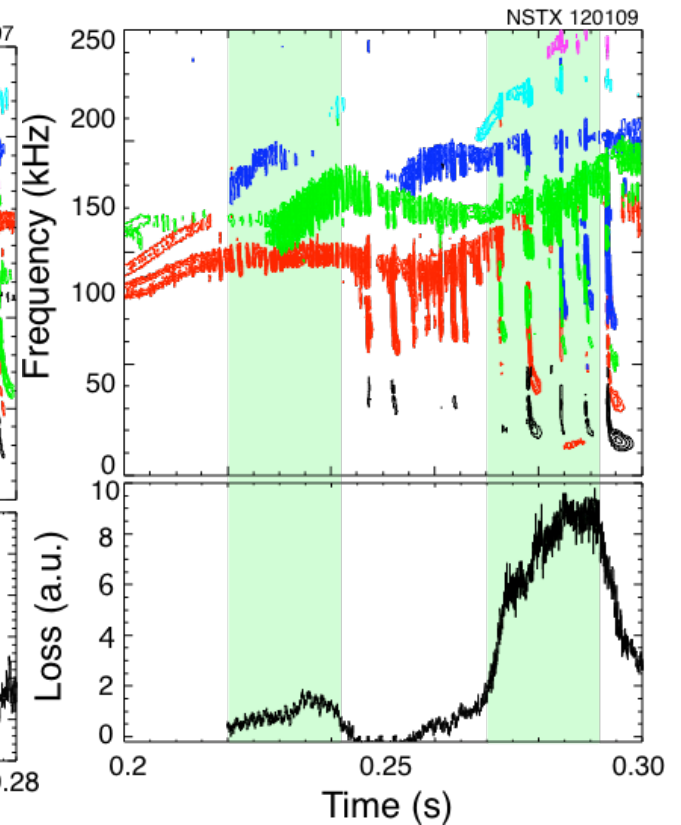
Proposal: Investigate $\nabla\beta$ effects on AC modes

- **Is "suppression" of AC modes a $\nabla\beta$ effect?**
  - $\nabla\beta$ suppresses AC partway through sweep and AC $\rightarrow$ TAE transition (above)

- **Document and compare minimum $\nabla\beta$ effect on AC frequency at high β**
  - At high β, observed AC frequency sensitive to n (right) – theory predicts this to be $\nabla\beta$ effec; test theory at high β

- **Control $\nabla\beta$ by comparing L-mode with H-mode**

- **Can HHFW be used to manipulate $\nabla\beta$?**
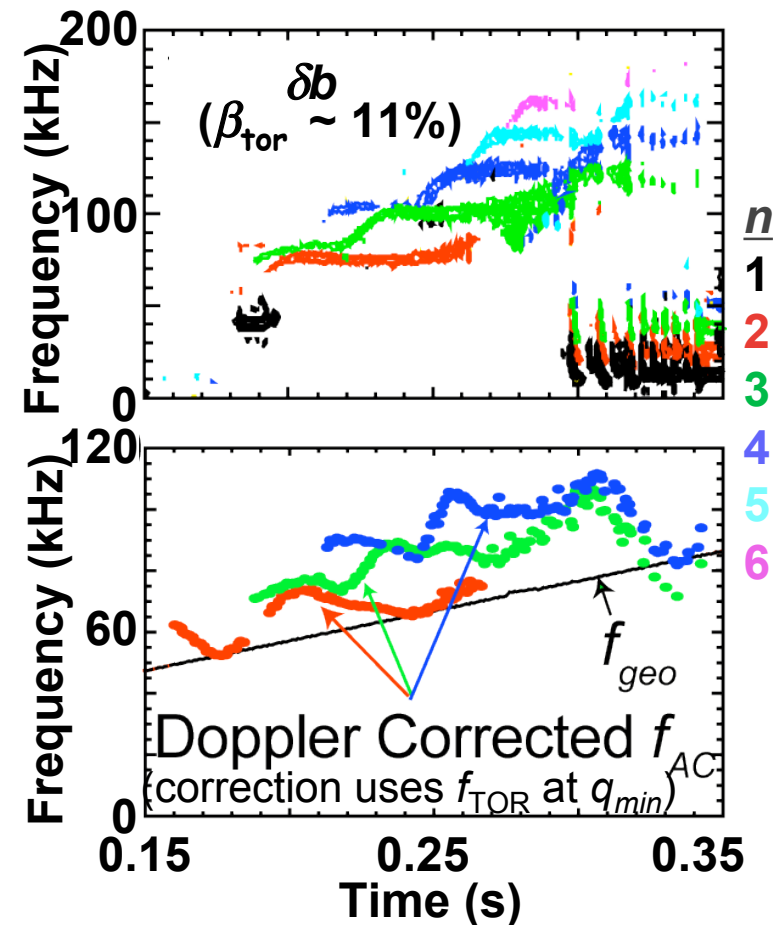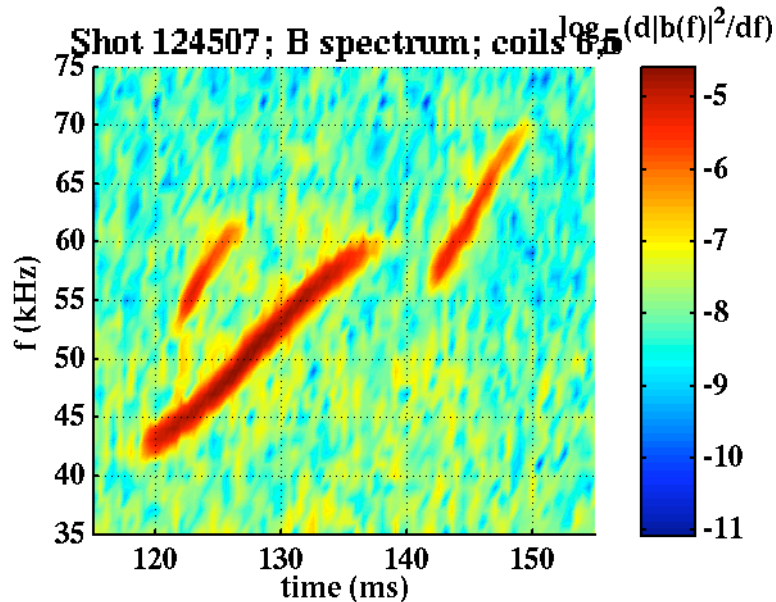
Other possibilities for fast-ion mode experiments

- Use HHFW to modify T_e independently of T_i – study of species dependence of specific heat, γ (contributes to f_{geo})

- Characterize effect of AC mode participation in multi-mode avalanches