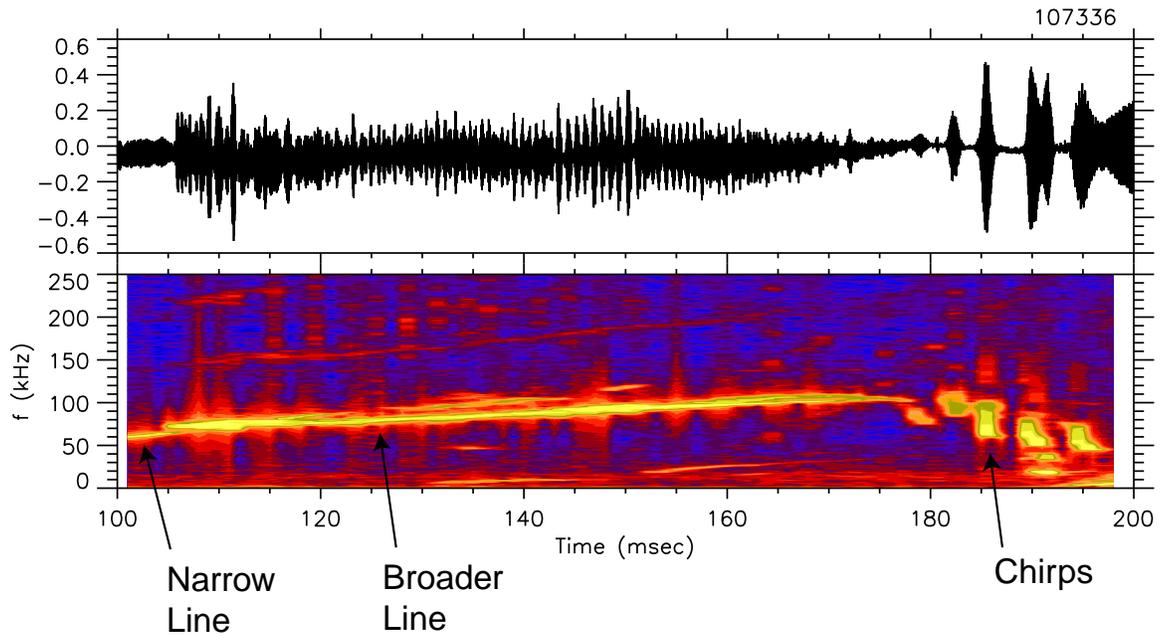


# Chirping Beam-Ion Driven Instabilities

W.W. Heidbrink

- Beam-driven modes with rapidly changing frequency are very common in NSTX. They are rare in DIII-D but fairly common during NNBI on JT-60U.
- Rich variety of linewidths in NSTX → better understanding?
- Theoretical explanation for chirping incomplete.
- One hypothesis: variation in bounce and/or precession frequency.
- Another hypothesis: different nonlinear saturation mechanisms operate.

## Three Linewidths in this Shot (~2, 10, and 30 kHz)



- Step 1. Complete analysis of NSTX/DIII-D similarity data.
- Step 2. NSTX data mining. Test preliminary hypotheses.
- Step 3. Dedicated experiment. e.g., vary shear in bounce frequency.