

# *Direct Launch of CAE/GAE with RF antenna*

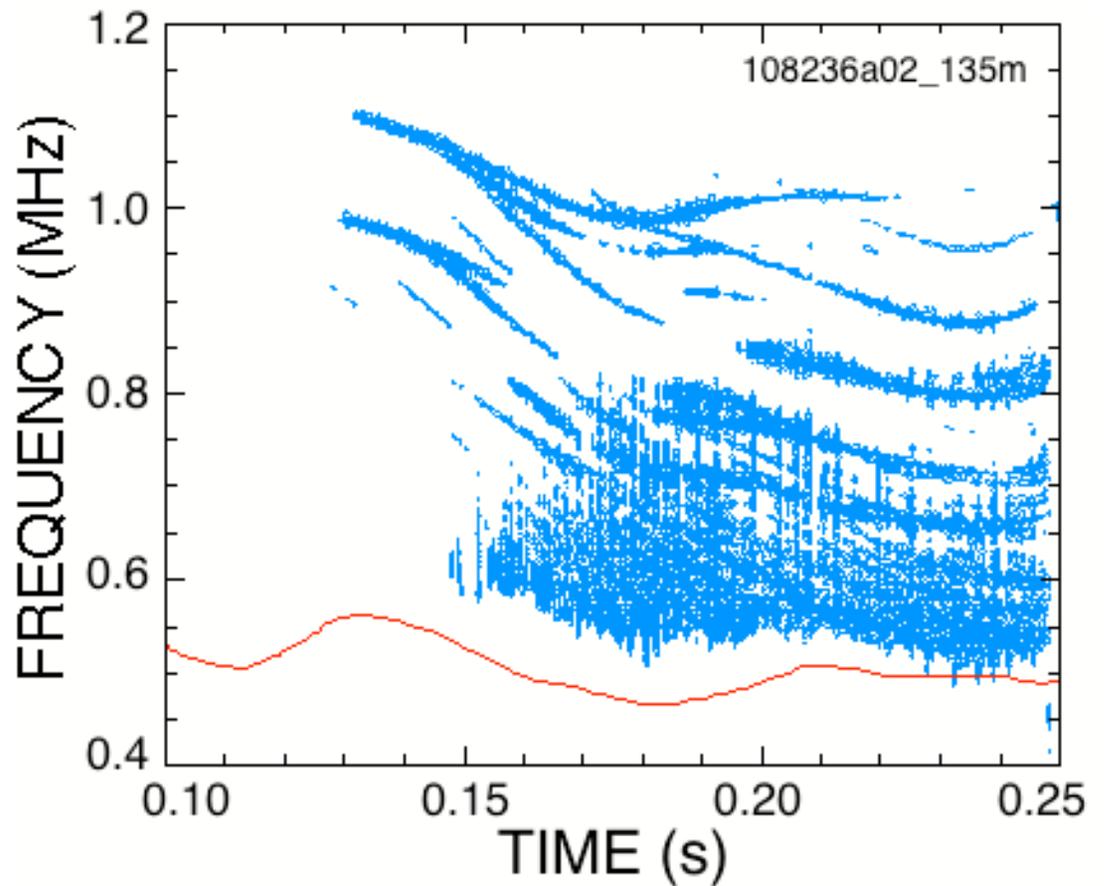
---

1. Direct measure of CAE/GAE linear damping rates (maybe TAE, too).
  - RF antenna already launches compressional waves
  - Measure spectrum of waves launched by RF antenna
2. First step in feasibility study of direct sub-cyclotron ion heating with RF.
  - Direct RF heating of thermal ions with sub-cyclotron frequencies would be a breakthrough for fusion

*Typically, it will be possible to couple to a nice, broad, spectrum of eigenmodes*

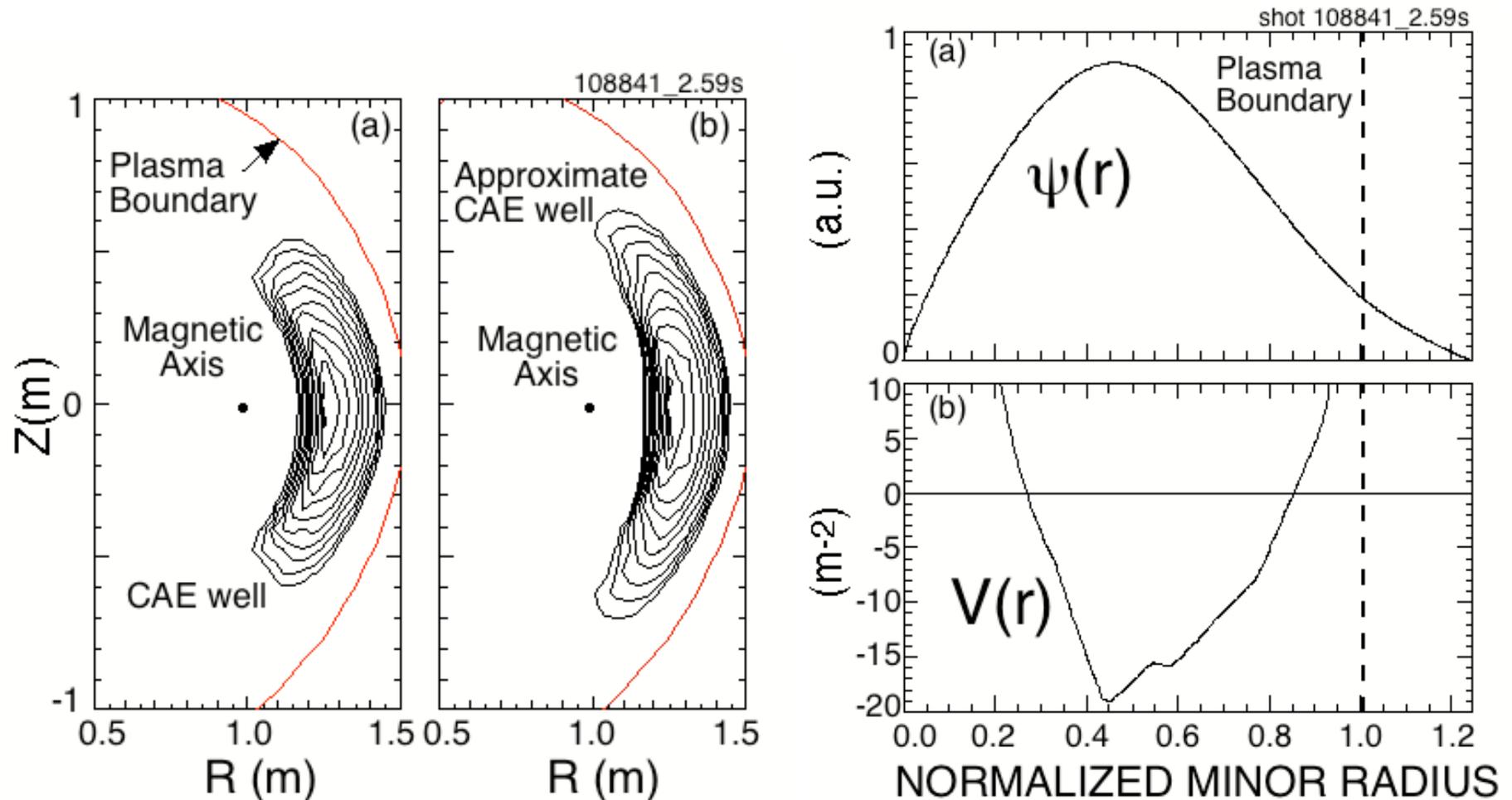
---

- Of course, only the unstable modes are seen here; likely many more stable modes are also present.



# *Eigenfunction extends to wall; coupling should be good*

- Eigenfunction has longish wavelength; fall-off is slow.



# XMP steps

1. Write procedure for reconfiguring antenna feeds to allow passage of frequencies down to  $\approx 200$  kHz.
2. Passively use antenna to detect CAE/GAE activity.
  1. Ideally, high-frequency digitizer on antenna feed.
3. Try launching Alfvén waves at "low" power.
  1. Scan frequency from 200 kHz to 2 MHz, looking for evidence of coupling.
4. Based on results, decide whether further steps are indicated.