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XMP proposal: Commissioning of RTV diagnostic for fast toroidal rotation measurements

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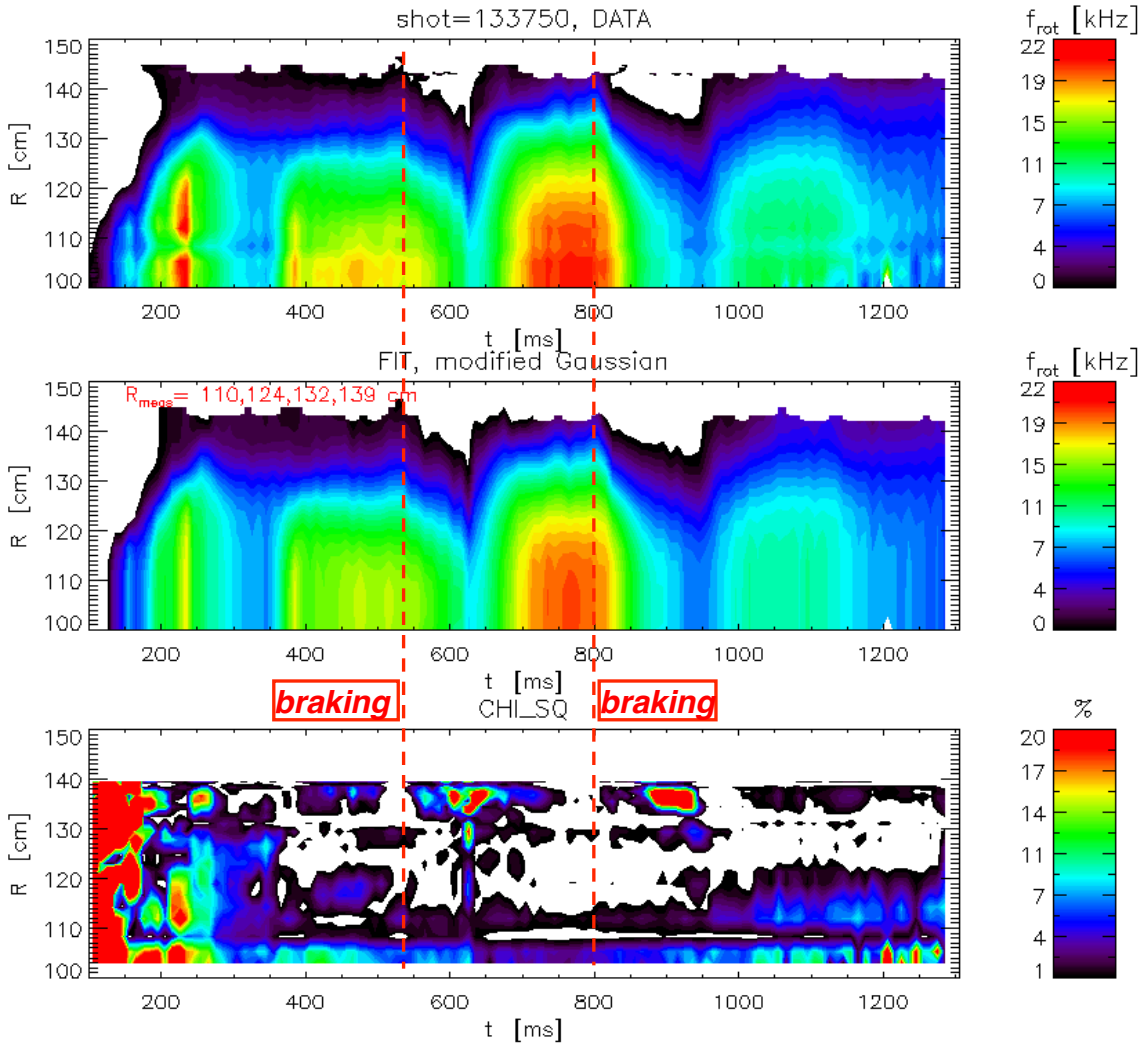
Requested Run time:
½ day

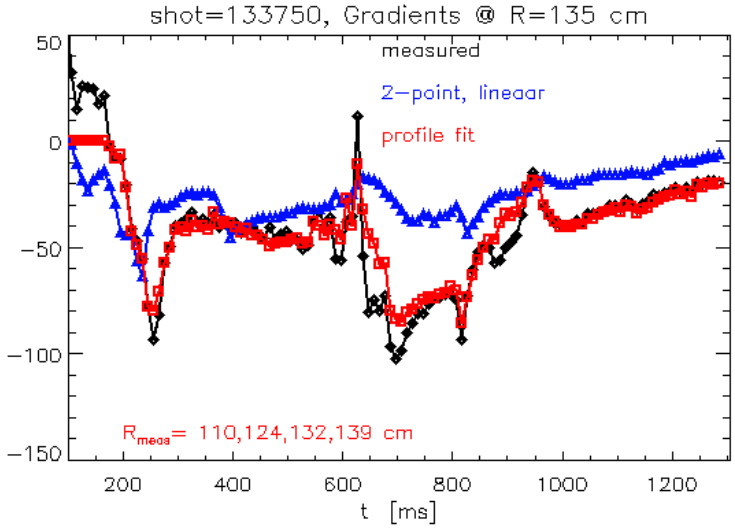
Is RTV working 'as expected'? Will RTV provide accurate, fast information on profile & gradient evolution?

Example of v_{tor} profile reconstruction (data from CHERS)



RTV:

- V_{tor} measurements based on active charge-exchange recombination spectroscopy
- 4 radial positions
  R=110,124,132,139cm
- Up to 5kHz sampling rate (nominal)



Proposed experiment: RTV checkout and (accuracy of) measurements for various plasma scenario

- RTV checkout:
  - Single NB source, 10/10ms ON/OFF modulation to evaluate background subtraction
  - 2 NB sources, A+B, A+C, B+C (can be combined in same shot)
  - Insert 10ms notches @300, 600ms for direct background measurement

- Explore 'extreme conditions' for RTV:
  - Scan outer gap: 5, 10, 15, 20cm
    - Compare quality of profile reconstruction vs. CHERS
  - Scan of n=3 braking (coils' current) for 'standard' H-mode plasmas
    - Compare accuracy of v_{tor} measurements vs. CHERS
  - Explore 'fast' response to n=3 pulses
    - Braking: 5ms ON, 25ms OFF; optimize pulse amplitude
    - Repeat for both L-mode and H-mode plasmas