Chromaticity Tracker Status

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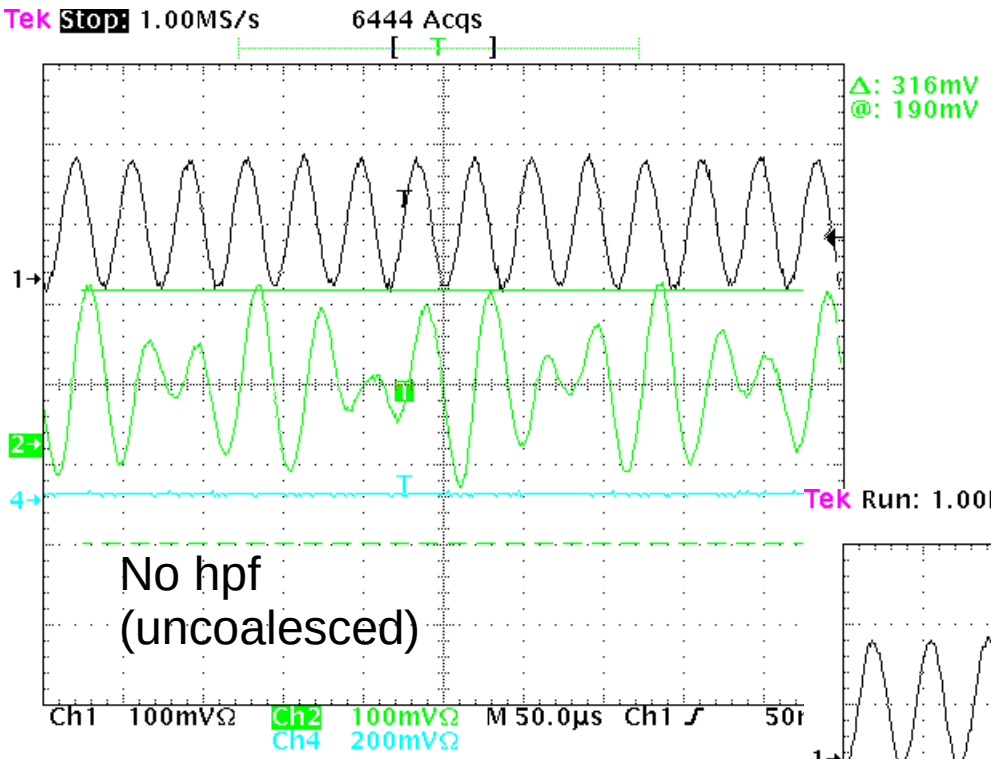
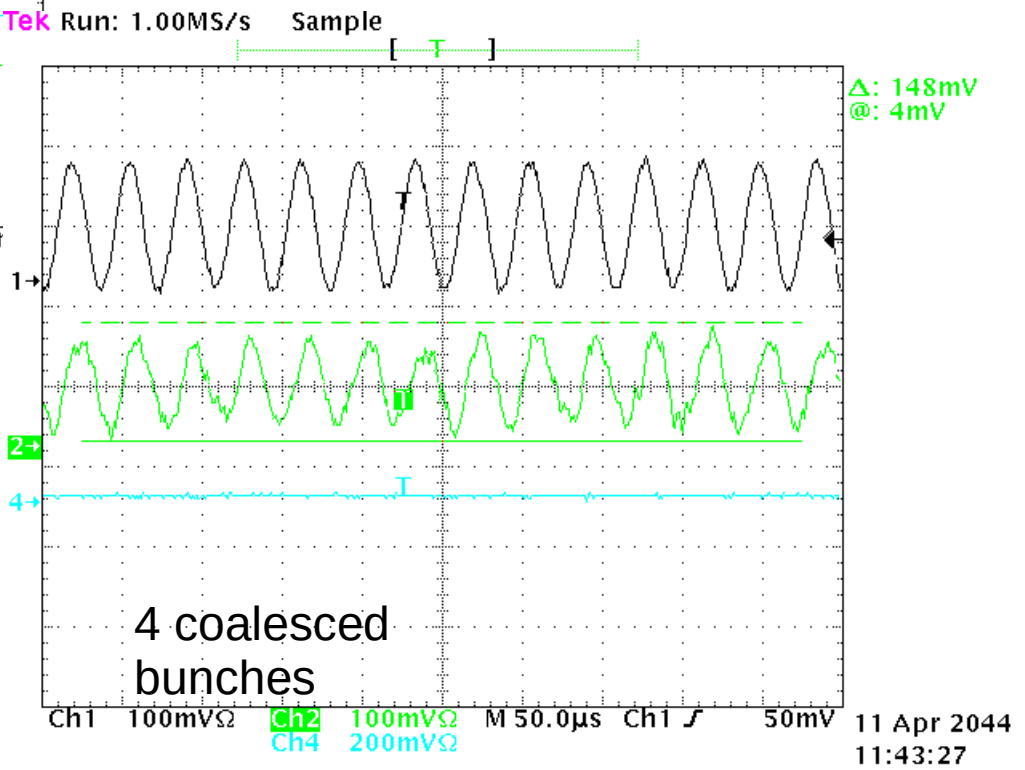
Goal

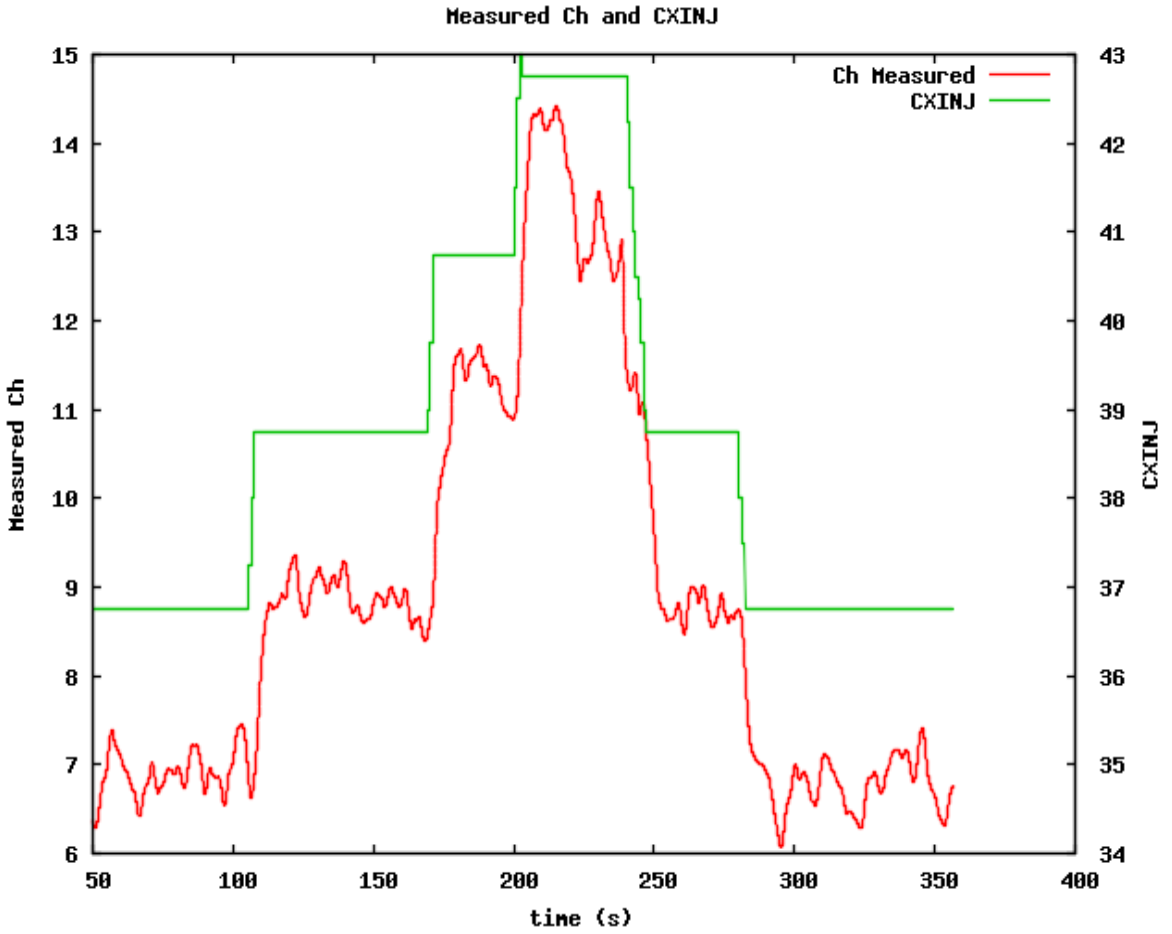
- See if addition of HPF which kills the “(1-Qh)” line will improve S/N.
  - Reason for doing this are the shoulders. See next slide.
- See if noise levels are lower at the input.
- See if tracking works for uncoalesced and coalesced beam.

Shoulders


Tek Stop: 1.00MS/s 6444 Acqs
Δ: 316mV
@: 190mV
No hpf
(uncoalesced)
Ch1 100mVΩ Ch2 100mVΩ M 50.0µs Ch1 ƒ
Ch4 200mVΩ

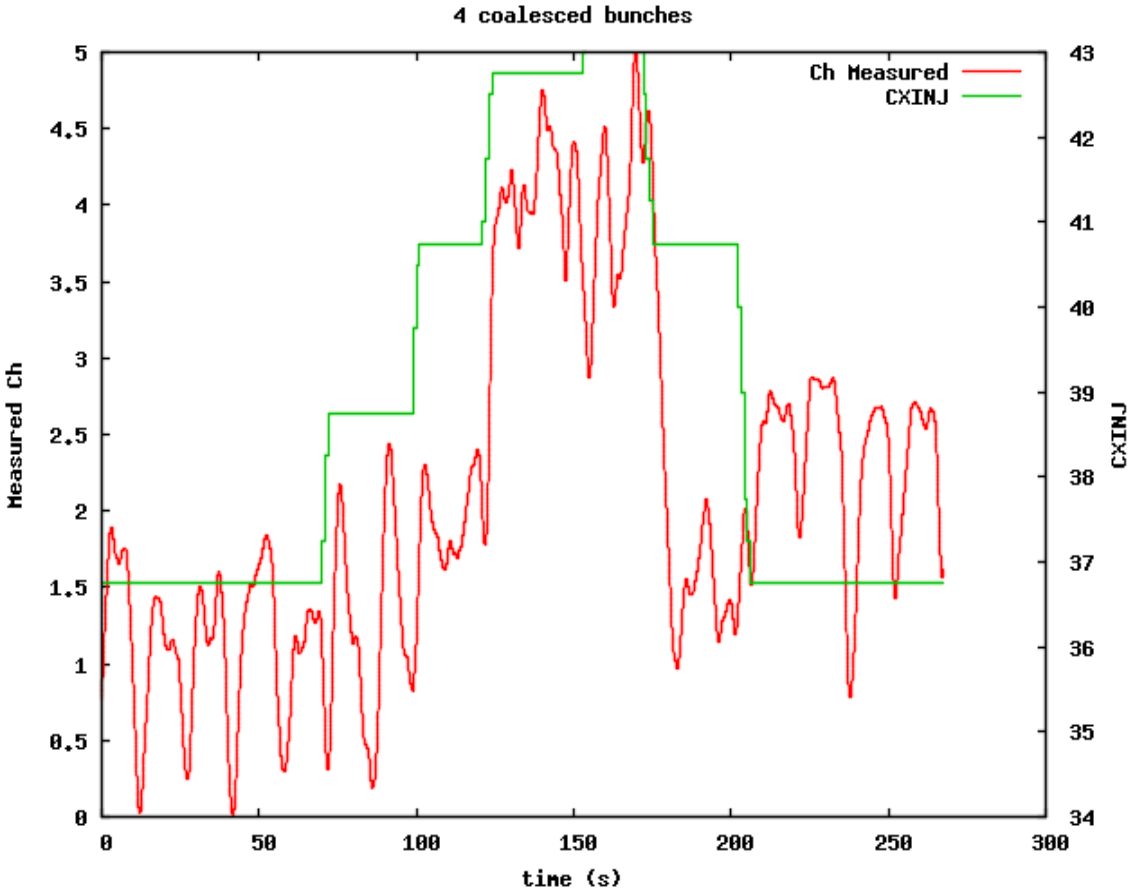

Tek Run: 1.00MS/s Sample
Δ: 148mV
@: 4mV
4 coalesced
bunches
Ch1 100mVΩ Ch2 100mVΩ M 50.0µs Ch1 ƒ 50mV
Ch4 200mVΩ
11 Apr 2044
11:43:27

Measured Ch with Uncoalesced Beam



Note Calibration not done yet. Tracks but at best +/- 1 unit of chromaticity. Can I do better?

4 Coalesced Bunches



Really Poor!!!

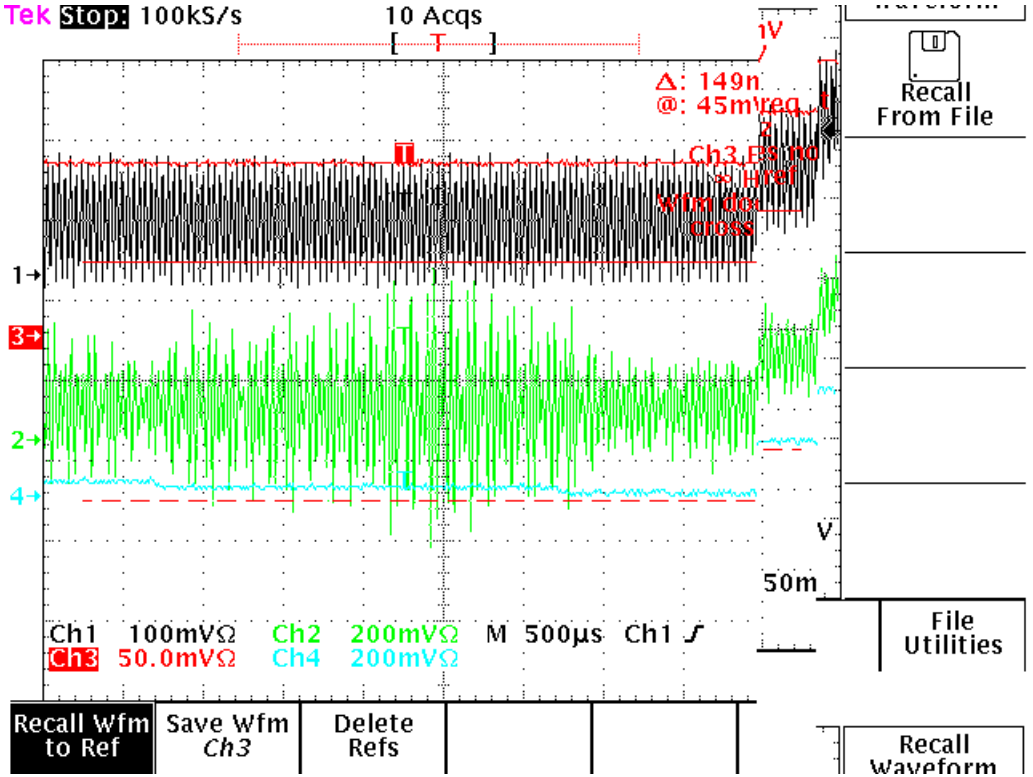
Why??????????

- Is it me or is the universe against me?
  - Does the McGinnis method really work?
  - Works on the bench.
  - Am I stupid or what?
- This really sucks ...
  - But all is not lost yet
  - Switch tactics

If you can't find it fake it

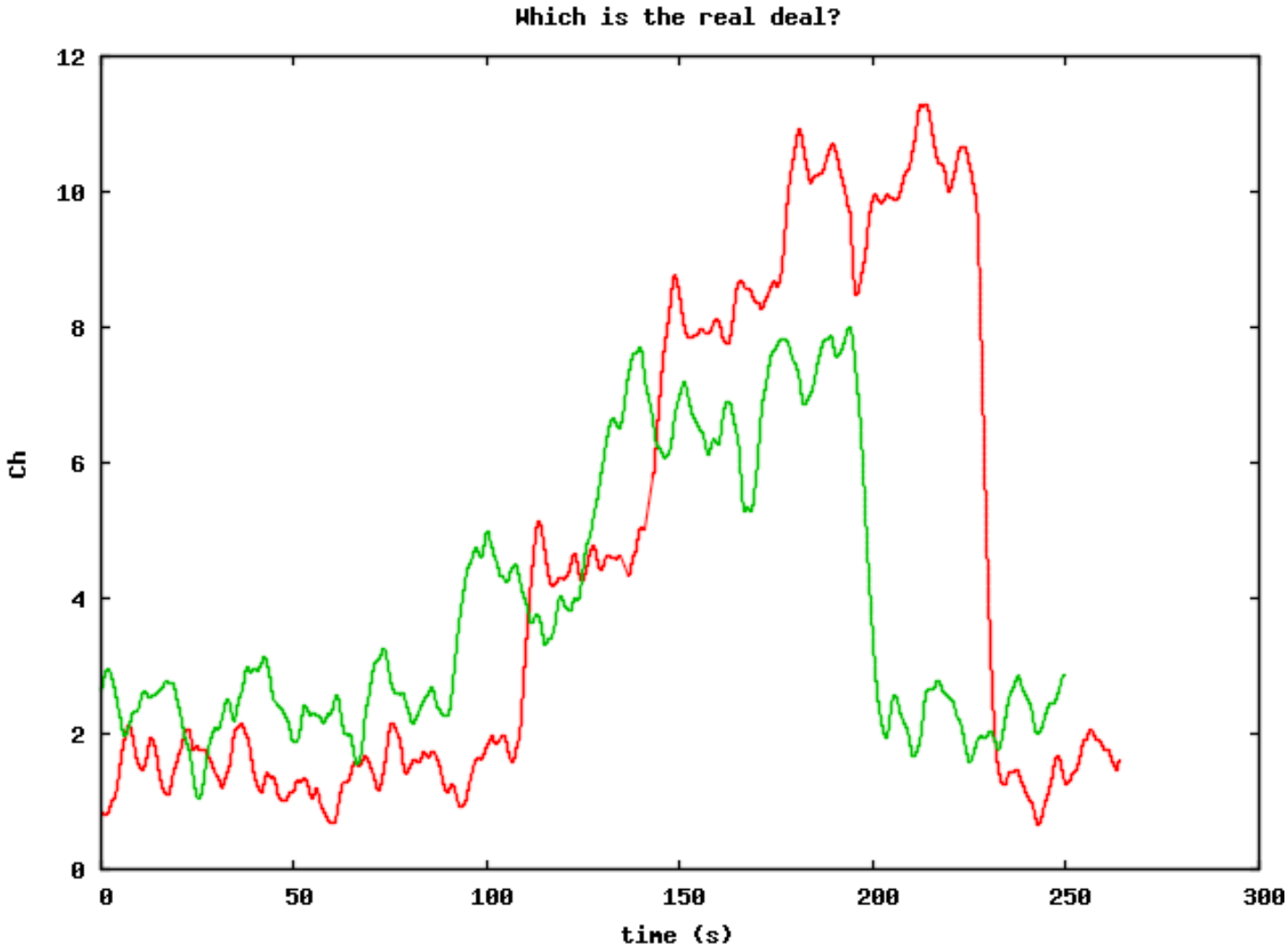
- With about 6 hrs of staring at the Schottky signal, I can see that the problem comes down to Schottky signal although excited by TT still has
  - Large synchrotron motion even when I **DO NOT** phase modulate the beam!!!! Sorry no movie.
  - Large Qv component. See next page.
  - Large (1-Qh) component. Shown before.
- I can electrically simulate this!
  - By using up all my signal generators in the lab.
    - 8 channels (4 sig gens)

Qv beating with Qh



Beats!!!! This really make this bad.

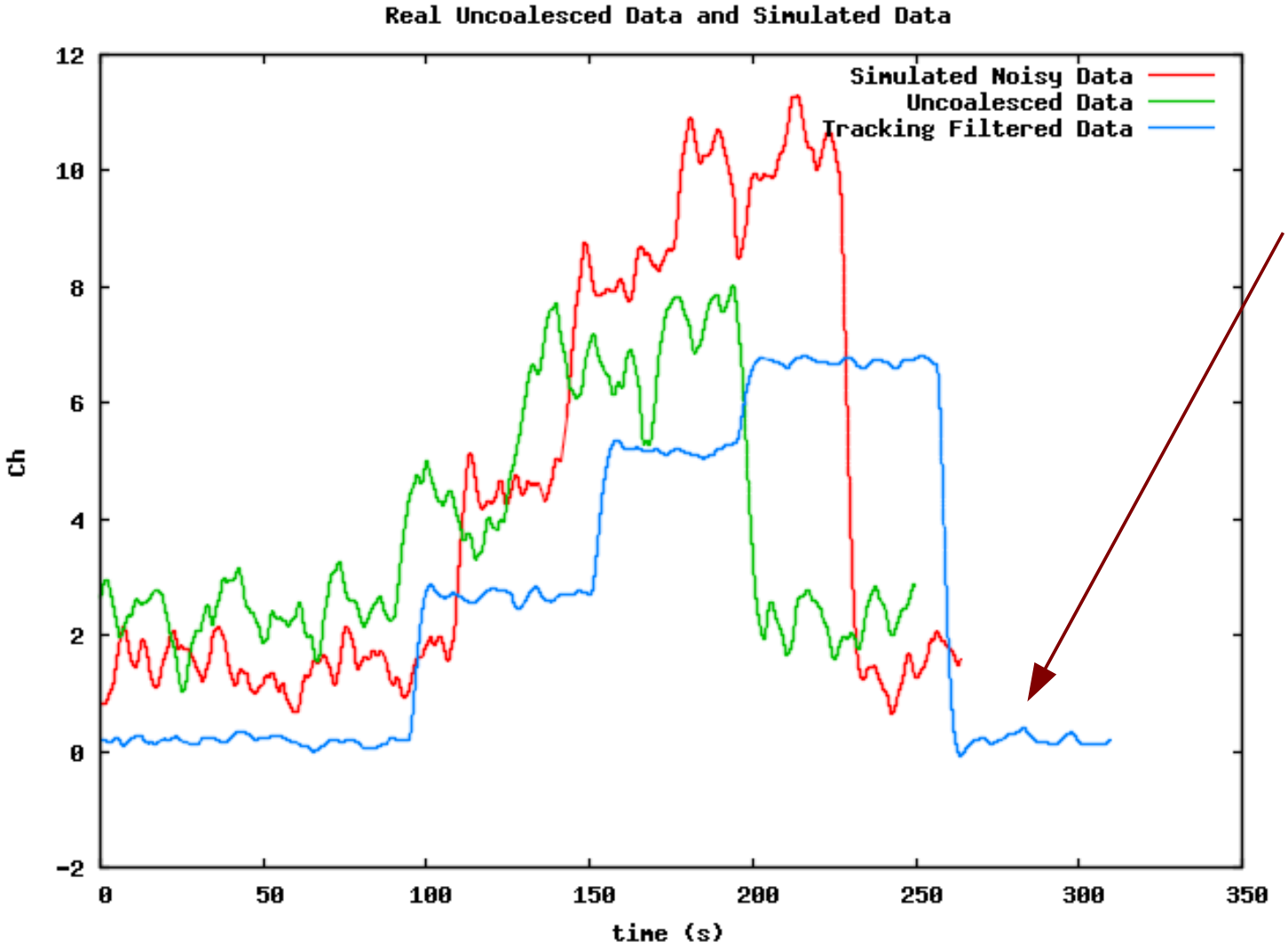
Which one is real?



I can fix this with ...

- Extremely narrow band tracking filter called a commutating filter on the bench.

Fix?



Add in magic narrow band tracking filter that kills of Qv, (1-Qh). CT takes care of large sync oscillations and voila!

This is requires ...

- Building of 8x Qh pll for the commutating filter.
  - Ken is building this. Priority unfortunately is with HINS and not me.
- Much less ambitious
  - Make 150 GeV with uncoalesced beam work first (shot setup?) then worry about tracking up the ramp and squeeze.
  - Then worry about coalesced beam.
  - Then up the ramp and squeeze.