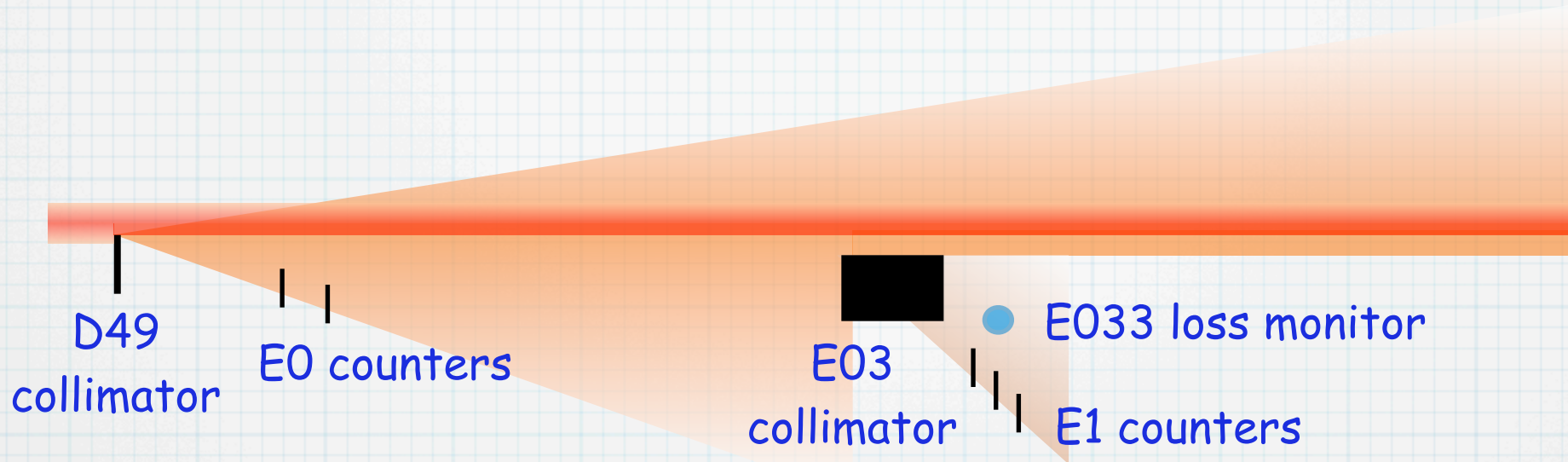


10/3 EOS Studies

What did I learn?

R.J. Tesarek
10/17/08

D-E Sector Geometry



My Understanding:

- D49 collimator (target) disrupts beam halo
- E03 collimator (absorber) absorbs disrupted beam
- E0/E1 counters "observe" D49 and E03 collimators
- ➔ E03 should "shadow" D49 (farther from beam core)
- ➔ Crystal "replaces" D49 for our tests

October 3rd Studies

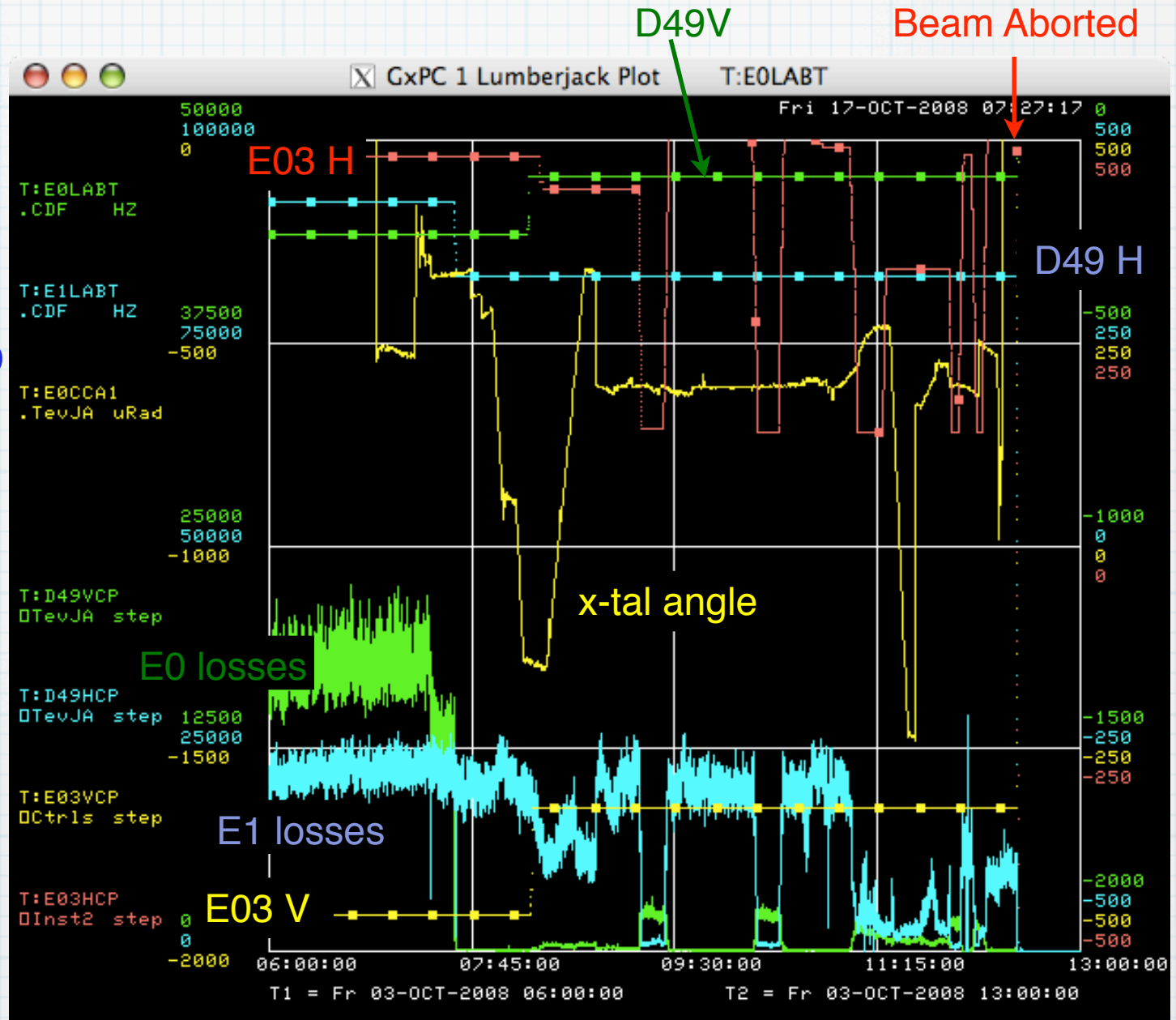
Entire study period

- ▶ x-tal angle scan
- ▶ collimator study

Use abort gap rates

- ▶ stable rates
- ▶ quantitative info

Dotted lines are
collimator positions



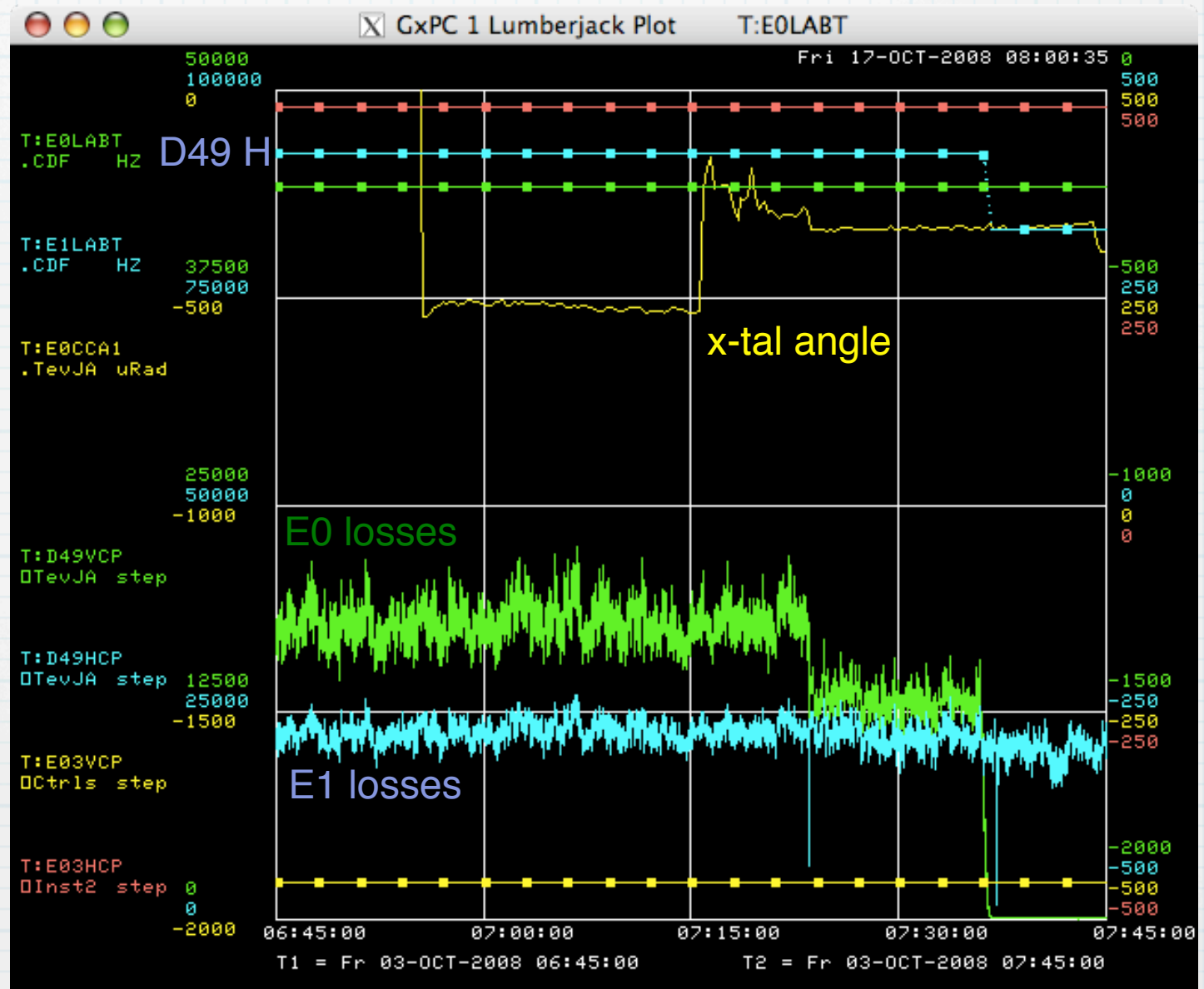
D49 Collimator Study

Extract D49 (H)

- ▶ E0-lower rate
- ▶ E1-no change

Scattered beam from D49 collimator has little effect on E1 loss rate.

Same effect seen from previous collimator studies



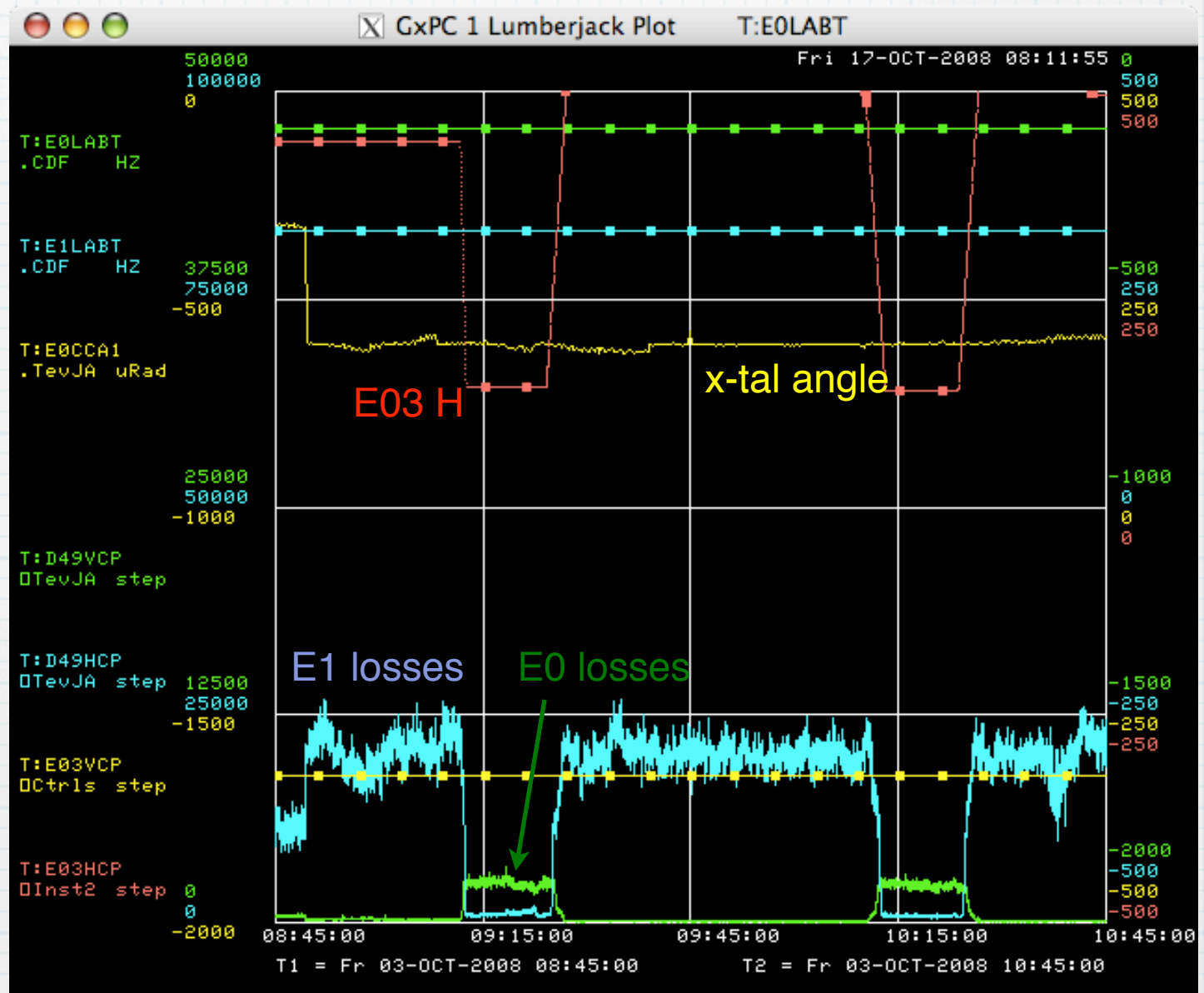
E03 Collimator Study

Extract E03 (H)

- ▶ E0-higher rate
- ▶ E1-lower rate

Extracting E03 leaves D49 as aperture restriction.

Expect higher loss rates at CDF (BOPAGC)

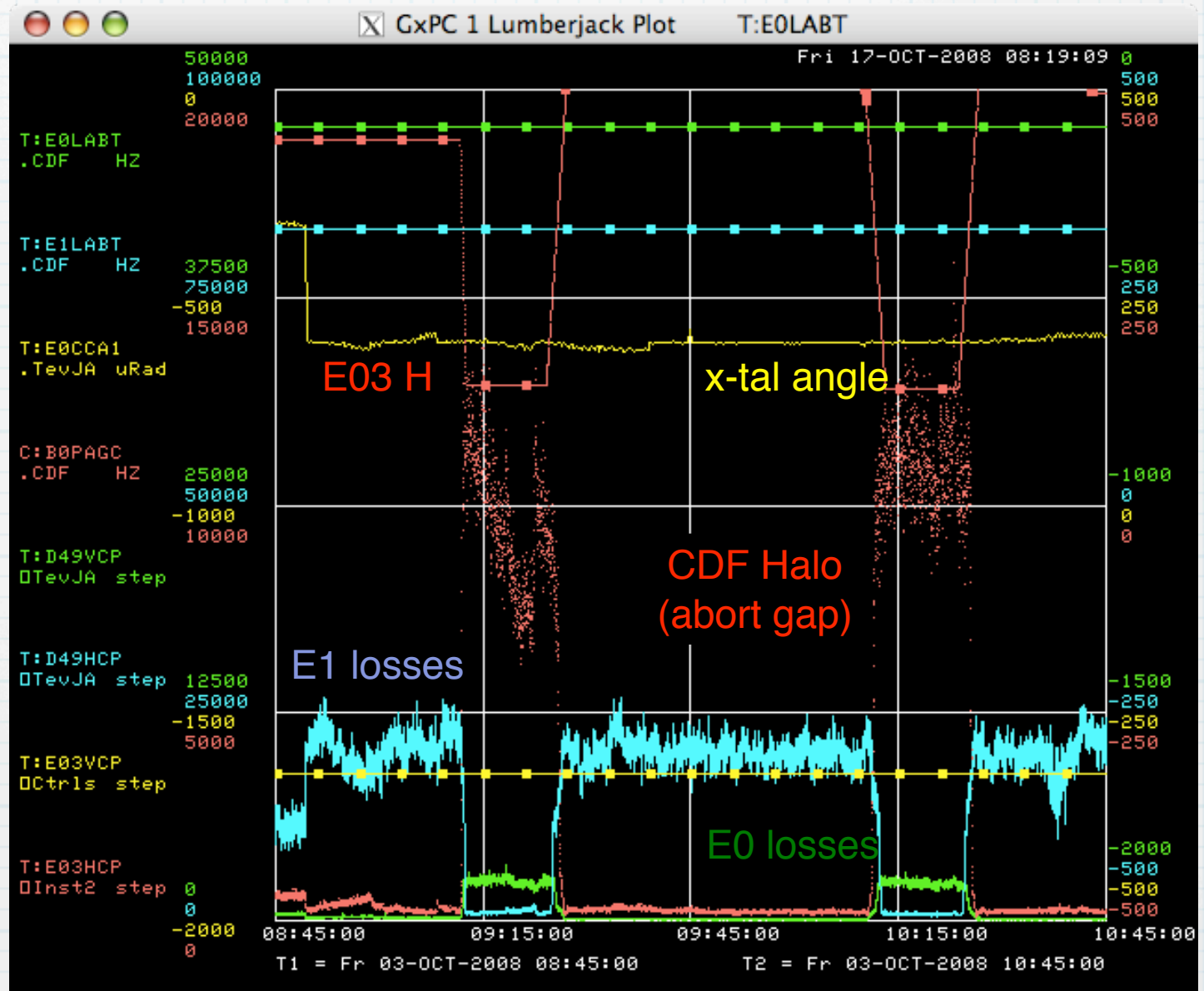


E03 Study: Loss Rates at CDF

Extract E03 (H)

- ▶ E0-higher rate
- ▶ E1-lower rate
- ▶ CDF-higher rate

Extracting E03 leaves CDF/D49 as aperture restriction.



Losses from Bunches

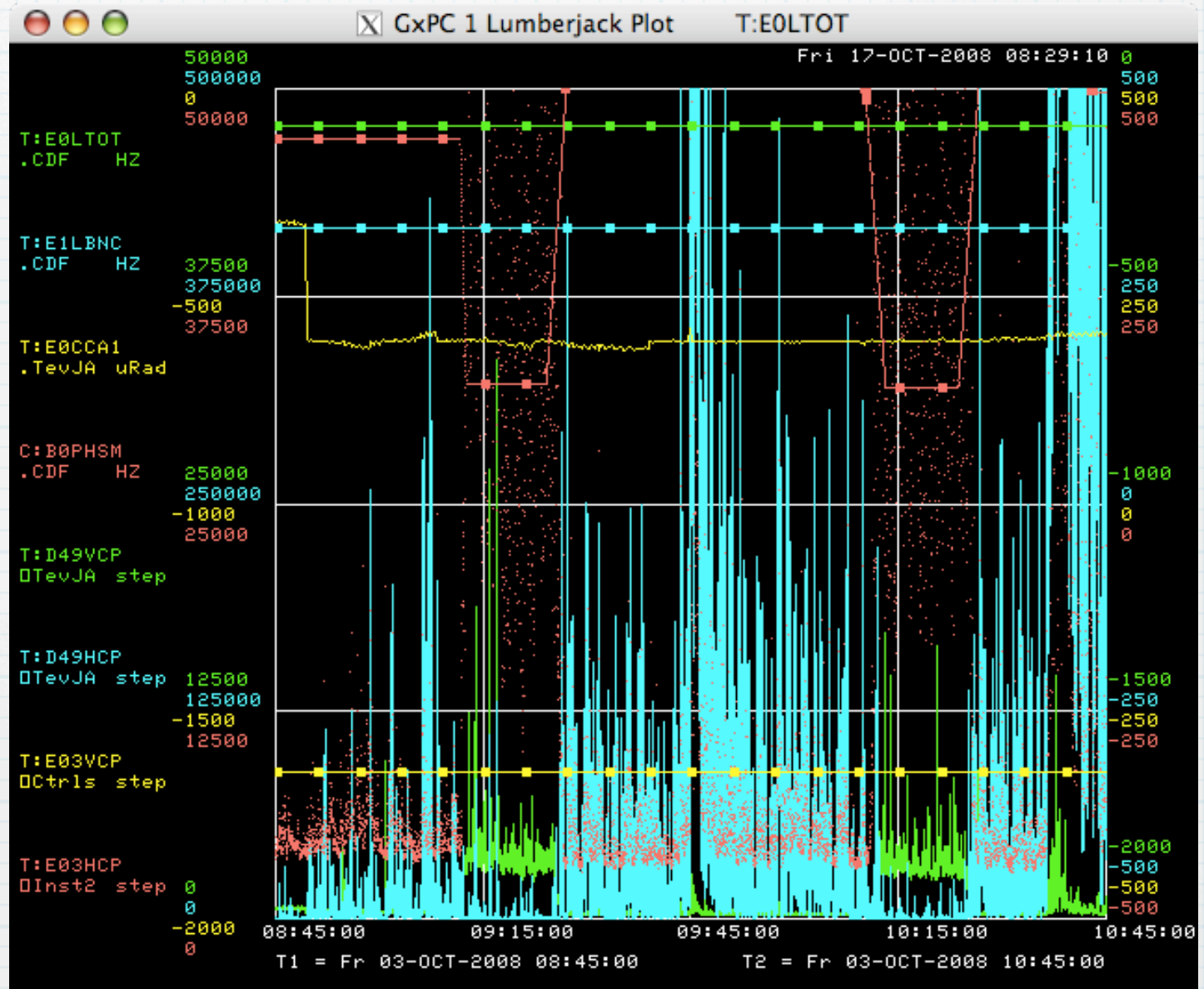
Colors represent
SAME detectors but
gated on bunches

- ▶ bunch loss rates
not well
controlled/
understood

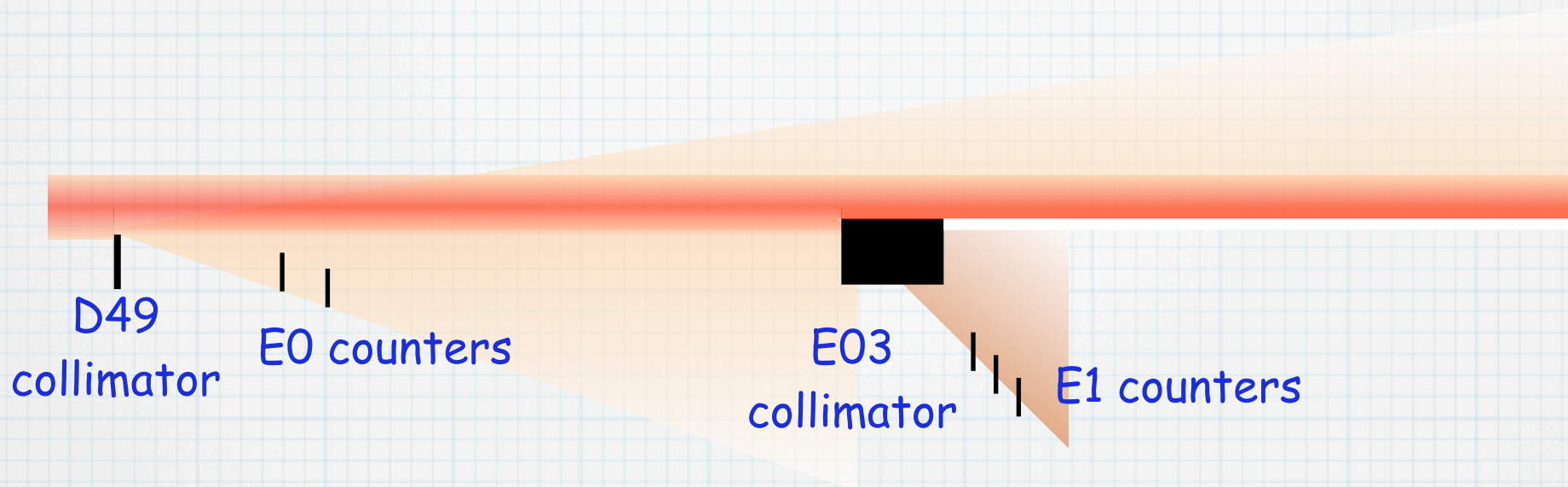
Extract E03 (H)

- ▶ E0-higher rate
- ▶ E1-lower rate
- ▶ CDF-higher rate

Extracting E03 leaves
CDF/D49 as aperture
restriction.



What's Happening?



My Theory:

- D49 scraping diffuse halo
- E03 closer to beam core
- TEL kicks beam a lot

Oct. 3rd tests:

- Appears to confirm theory

Q: Is D49 effective?

Test:

- Need to nudge D49 in a little

Caveat: I don't know what "a little" means.

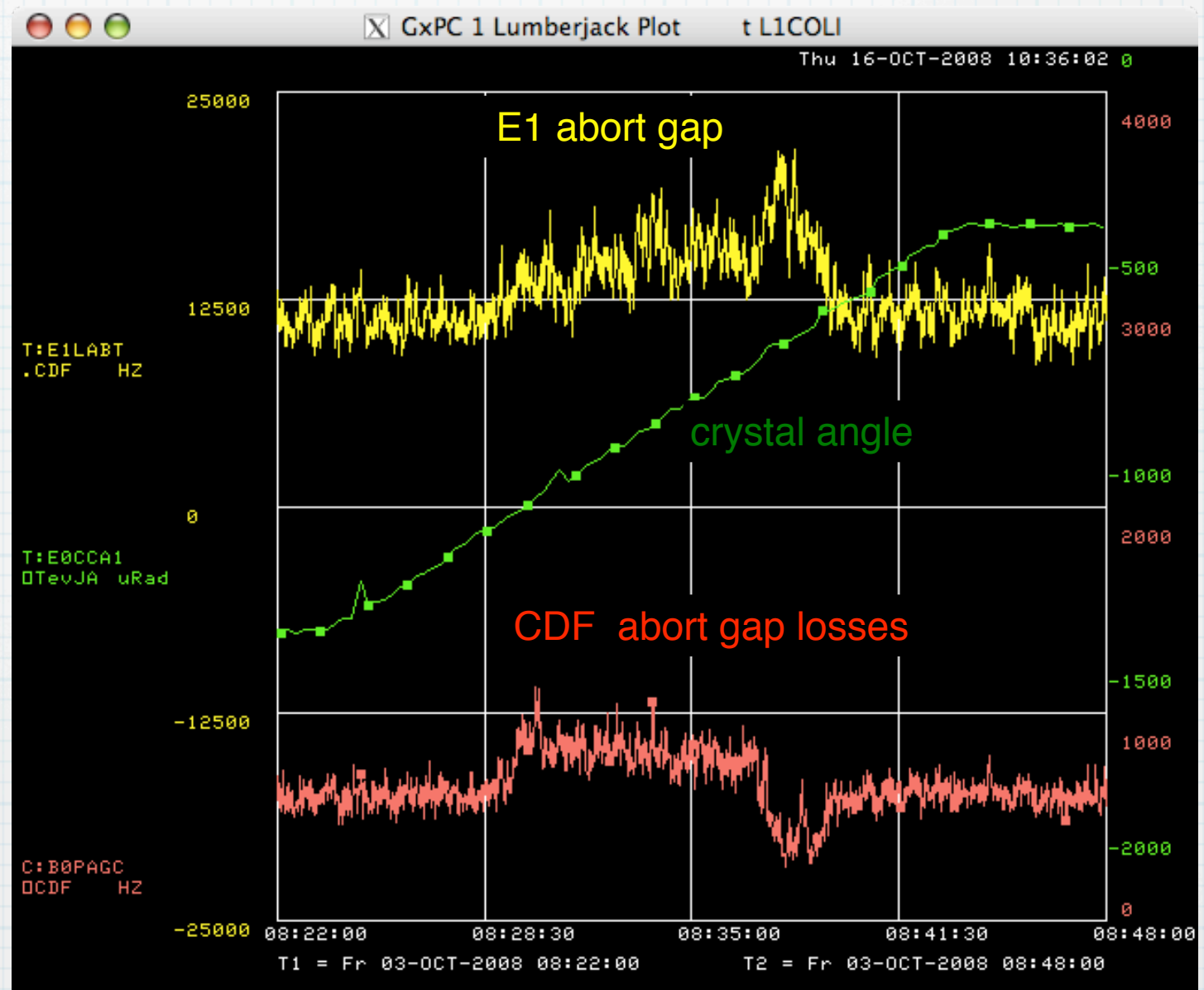
Crystal Angle Scan

Channeling?

- ▶ narrow feature
- ▶ width ~ 20 urad

Volume Reflection?

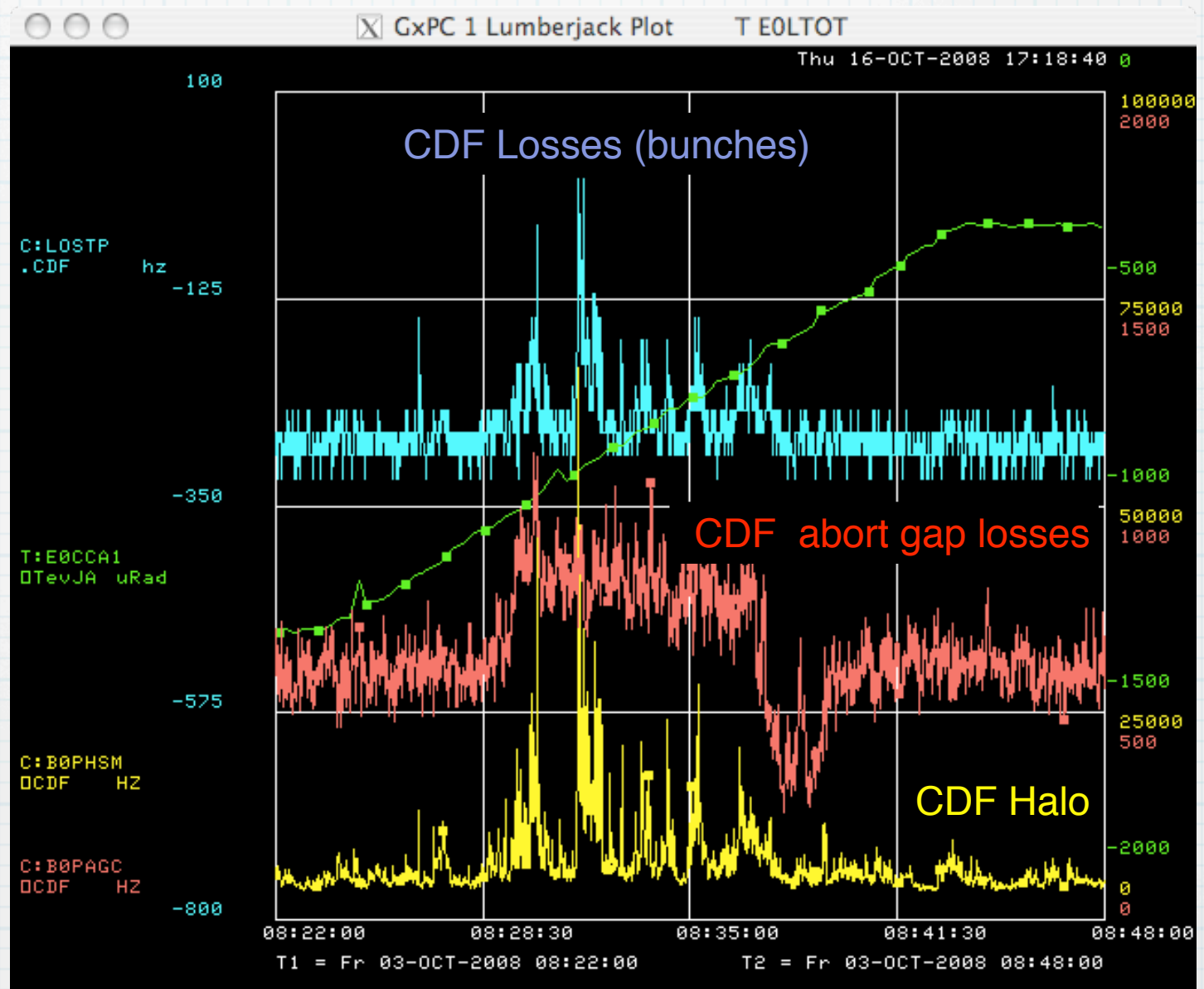
- ▶ "plateau"
- ▶ width ~ 500 urad



Bunch Losses at CDF

Bunch signal?

- ▶ losses increases at CDF
- ▶ $\sim 1/2$ least count
- ▶ halo increases at CDF
- ▶ increase in "noise"



Summary

Work in progress...

Collimator Studies:

- D49/E03 collimators set up incorrectly at end of store or D49 is not effective.
- ➔ Dedicated EOS study of D49 position (nudge in)

Crystal Studies:

- See evidence that the crystal does something for bunches
- Perhaps evidence for volume reflection (small angle)