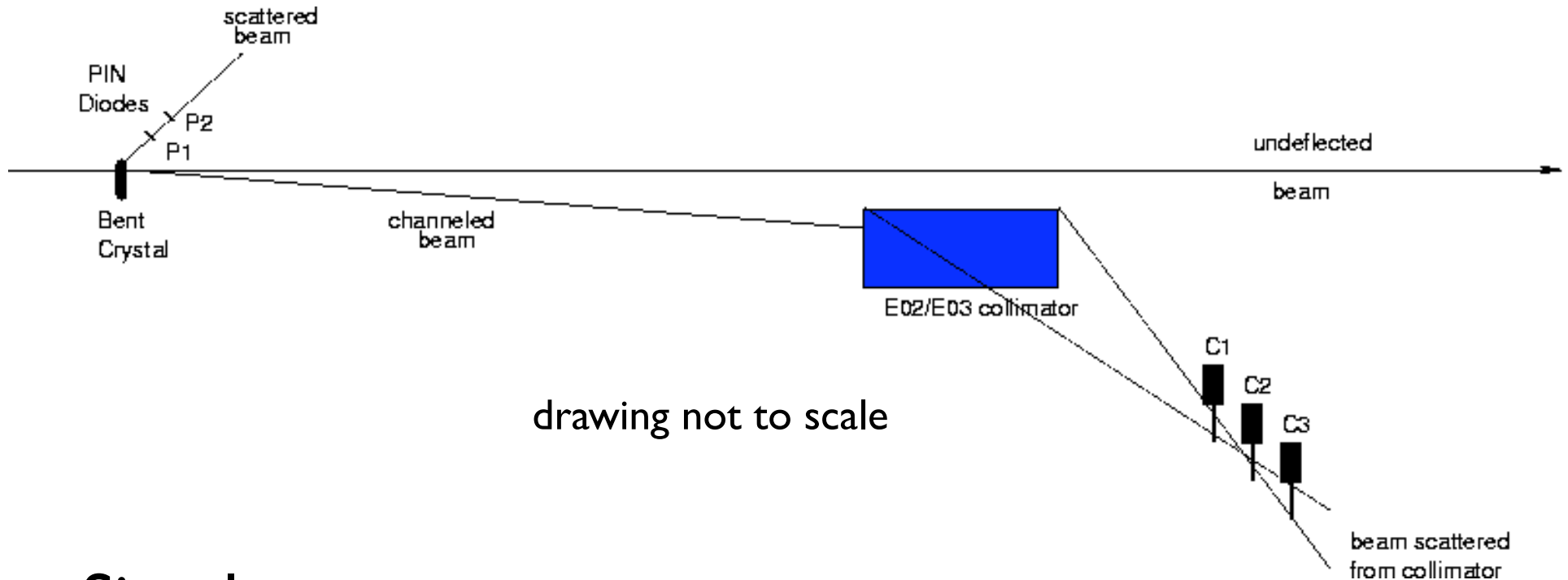


Instrumentation to Detect Crystal Channelling: Status & Plans

R.J. Tesarek
Fermilab
8/7/08

Detecting Crystal Collimation



Signal:

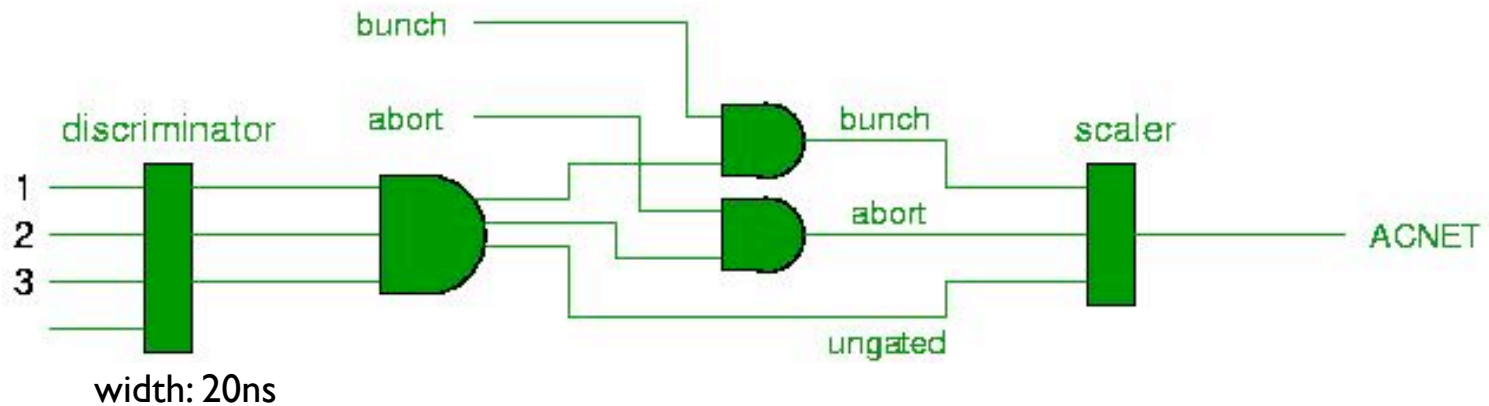
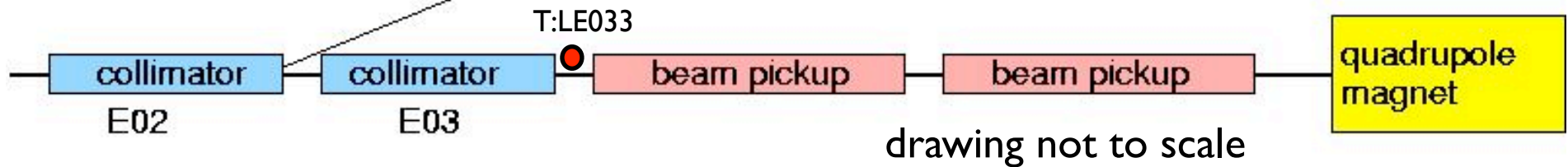
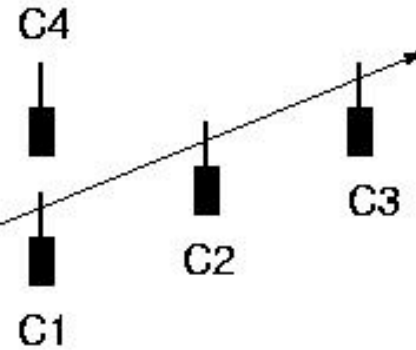
- increased rates in counters
- decreased rates in PIN diodes

EI Counters

Timing signals derived from TeV
RF (53 MHz) and \$AA marker

- bunch
- abort gap

Scintillation Counters



S. Shiraishi, R.J. Tesarek

EI Counters

“EI” counters

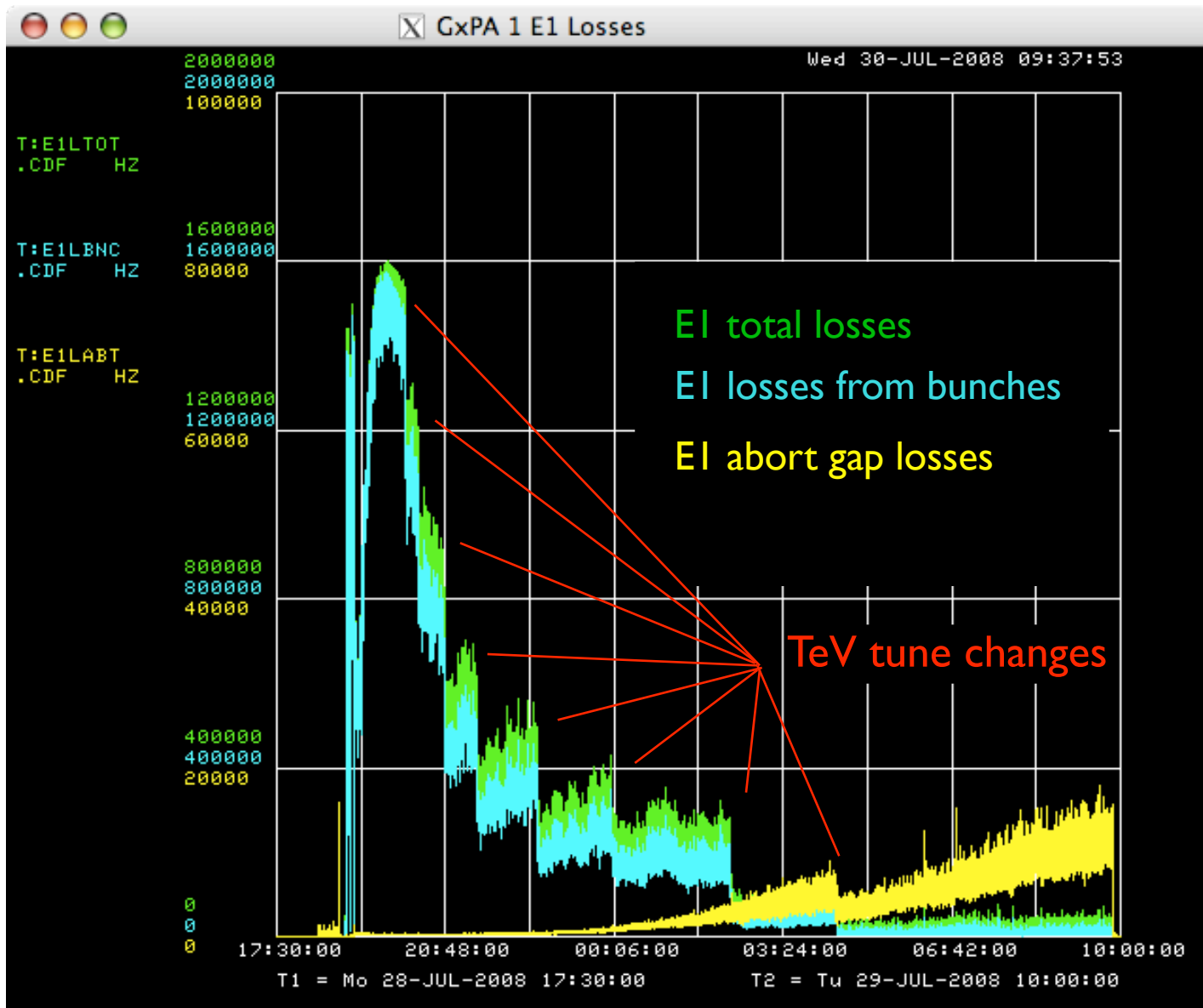


“EI” counters



EI Counter Performance

typical store 6323

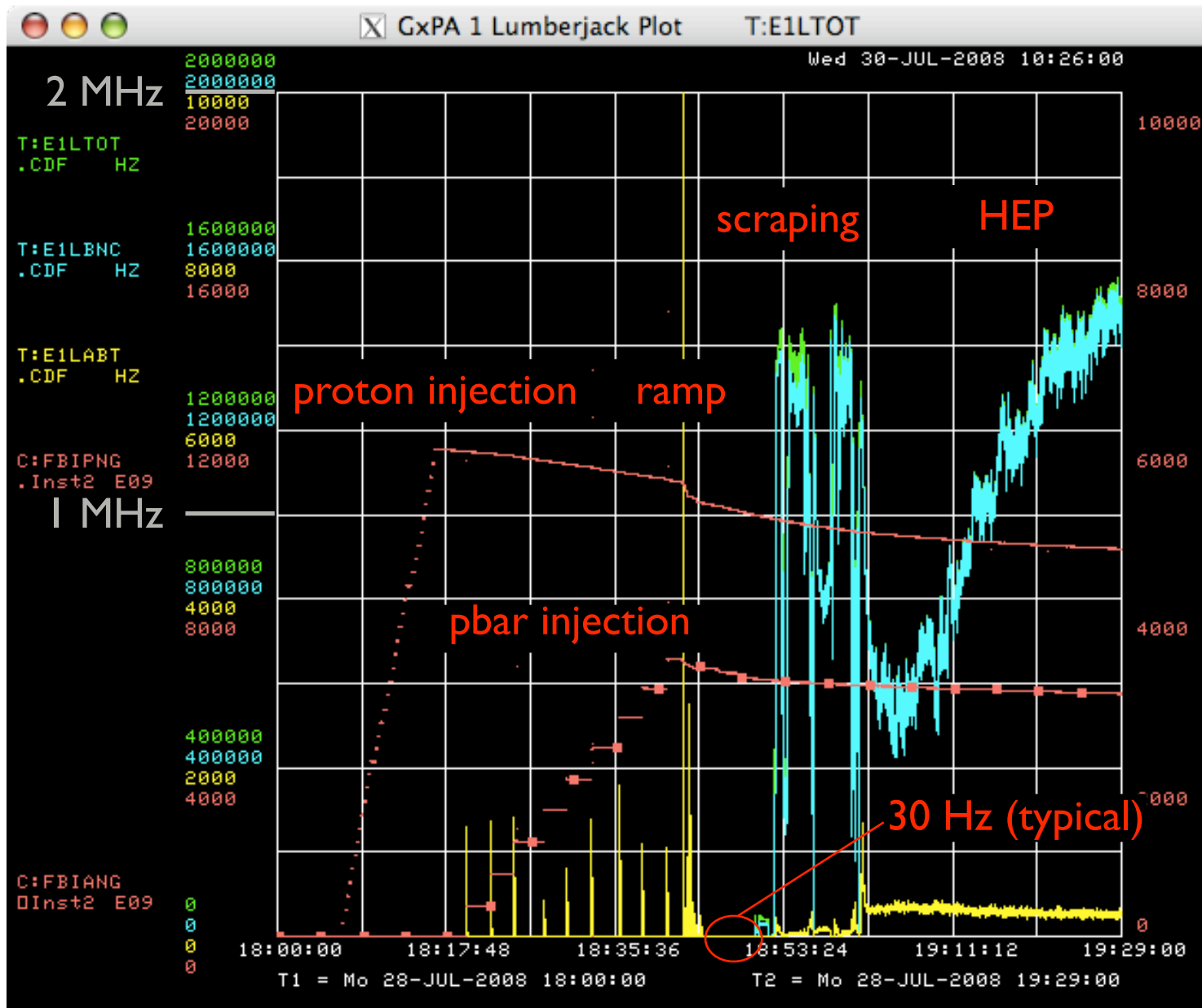


Regions of Interest

- no beam
- collimator out

EI Counter Performance

Injection



proton current

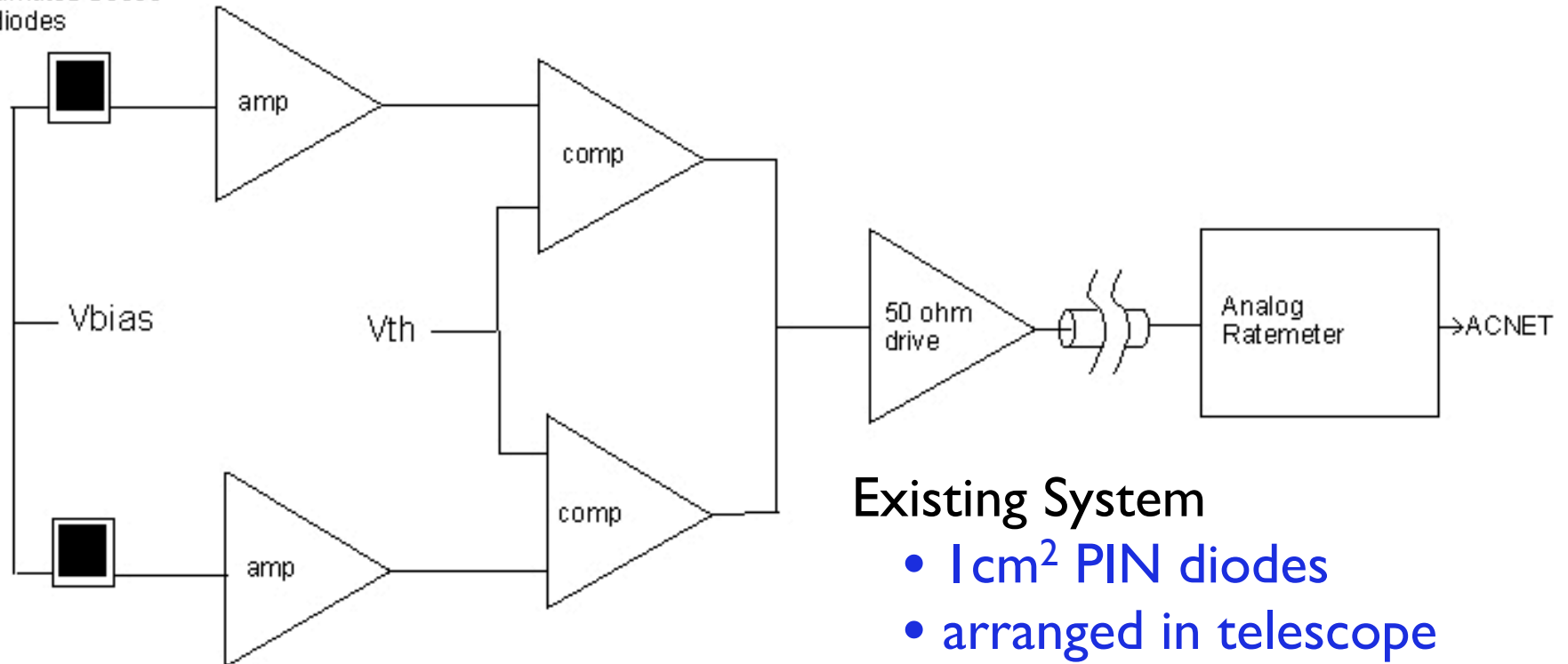
pbar current

Study rates w/
D49 (target)
retracted, all
other collimators
in nominal pos.

E0 PIN Diodes

PIN Diode Loss Monitor for Crystal Collimator

Hamamatsu S3590
PIN diodes

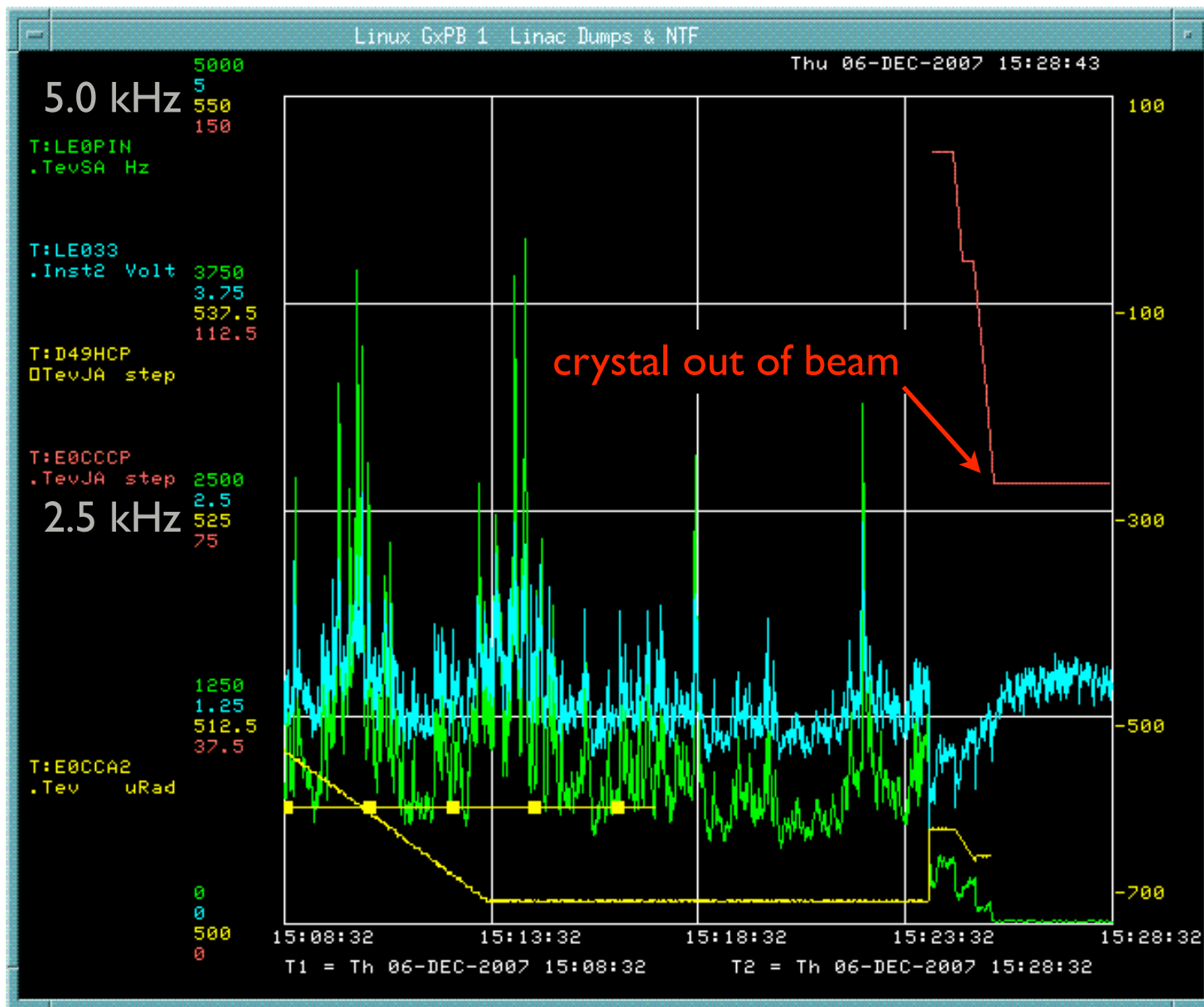


Existing System

- 1cm^2 PIN diodes
- arranged in telescope

T. Johnson

PIN Diode Performance



Confirm working
on re-installation

crystal position

PIN Diode Rate

Instrumentation Summary

El counters

- Running since 6/13/08
- Low rates with no beam/collimators out (~ 30 Hz)
- High rates with beam/collimators in (kHz - MHz)
- Behavior with beam as expected
- Supplemental Tevatron monitors
- ➔ Measure rates with D49 target out (all other collimators in)
End of store study ~ 10 min.

PIN diodes

- PIN diode system used in 2005, 2007
- ➔ Existing system needs confirmation once re-installed
Parasitic beam studies

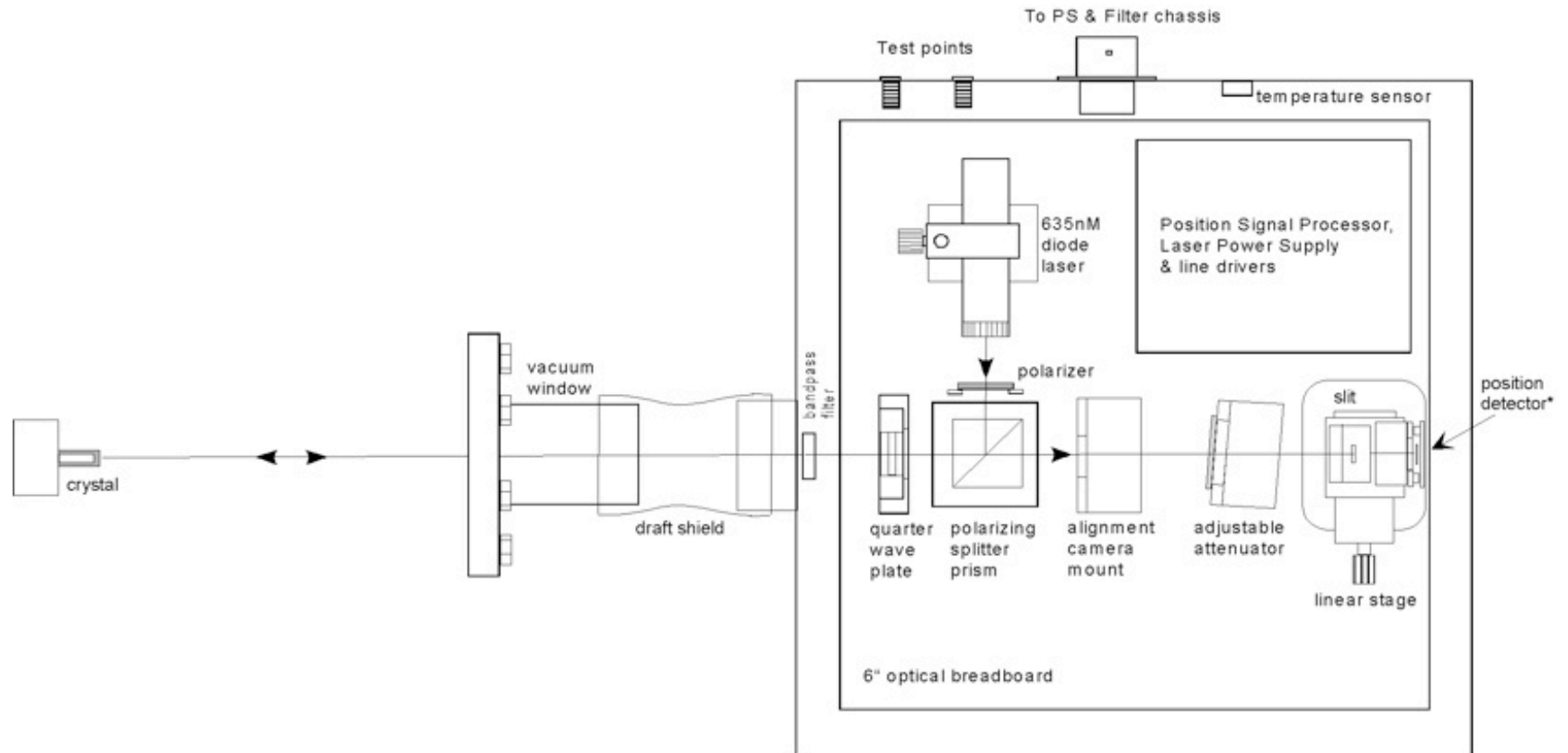
Backup Slides

LASER Angle Gauge

Crystal Collimator Laser Angle Gauge

Todd Johnson
8/1/04

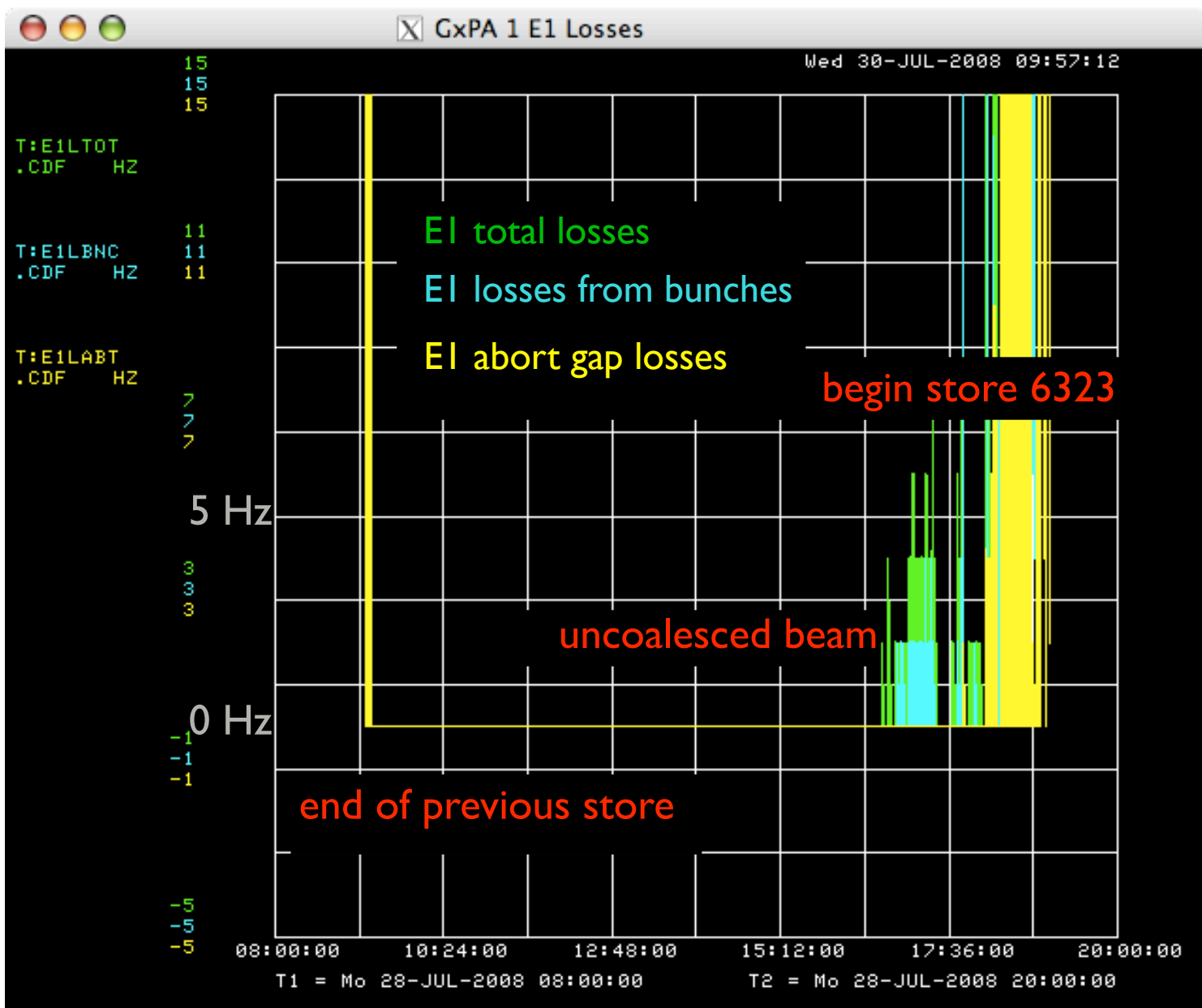
Resolution: < 1 microradian
Scaling: 5mV/uRad nominal
Range: 4 milliradians total



*Hamamatsu S8361

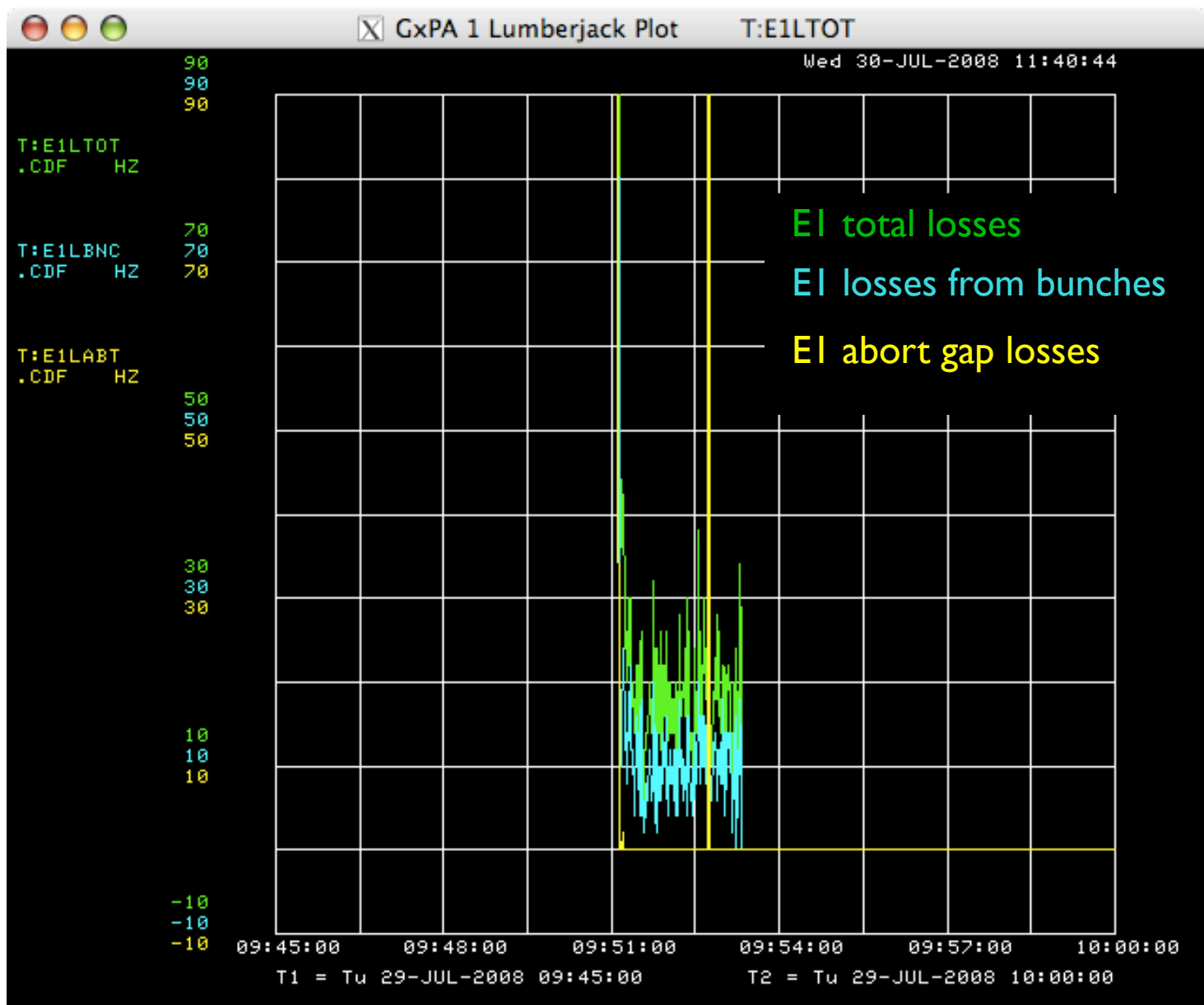
EI Counter Performance

Rates without beam



EI Counter Performance

Rates after termination of store



Rates after dump:

- steel activation
- abrupt turn of not understood ($\sim 10^{-4}$ effect)