



ZEUS last week



HERA weekly meeting

A. Geiser

27.4. 2004

- ZEUS performance
- correlation with HERA performance
- understanding the spikes



ZEUS last week typical fill

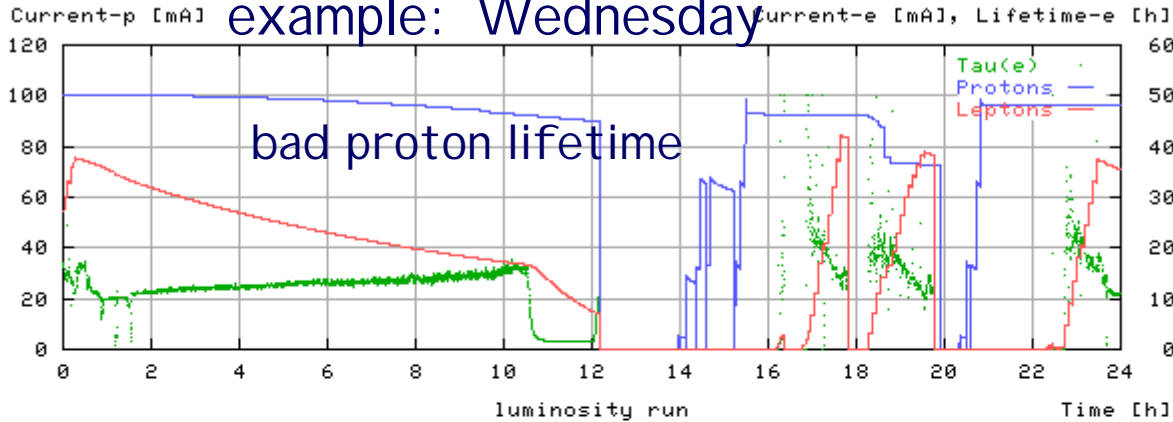


HERA

on Wednesday April 21 2004

p:96.0[mA] 503.5[h] 920[GeV] e+:35.5[mA] 11.0[h] 27.6[GeV]

example: Wednesday



typical HERA currents:

now regularly

80-100 mA protons

35-42 mA positrons

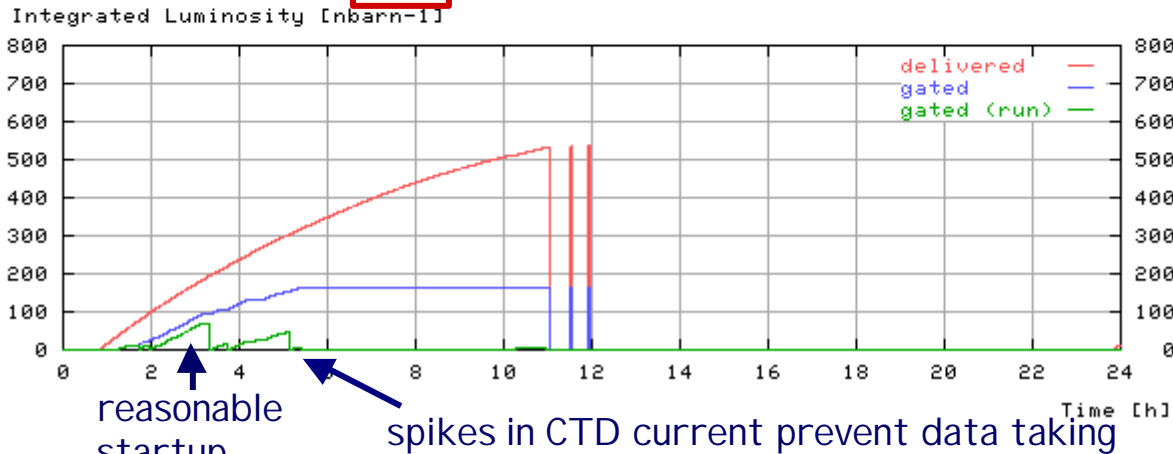
but

proton lifetimes degrading fast
development of coasting beam
(unbunched protons)

many short spikes in C5 and
scintillator rates -> **trip CTD**

ZEUS

on Wednesday April 21 2004



Data taking performance

usually OK at start of fill,
then degrading fast (trips),
often not possible to take data
despite low base background
-> need to ask for early
termination of fill



ZEUS last week: CTD trips



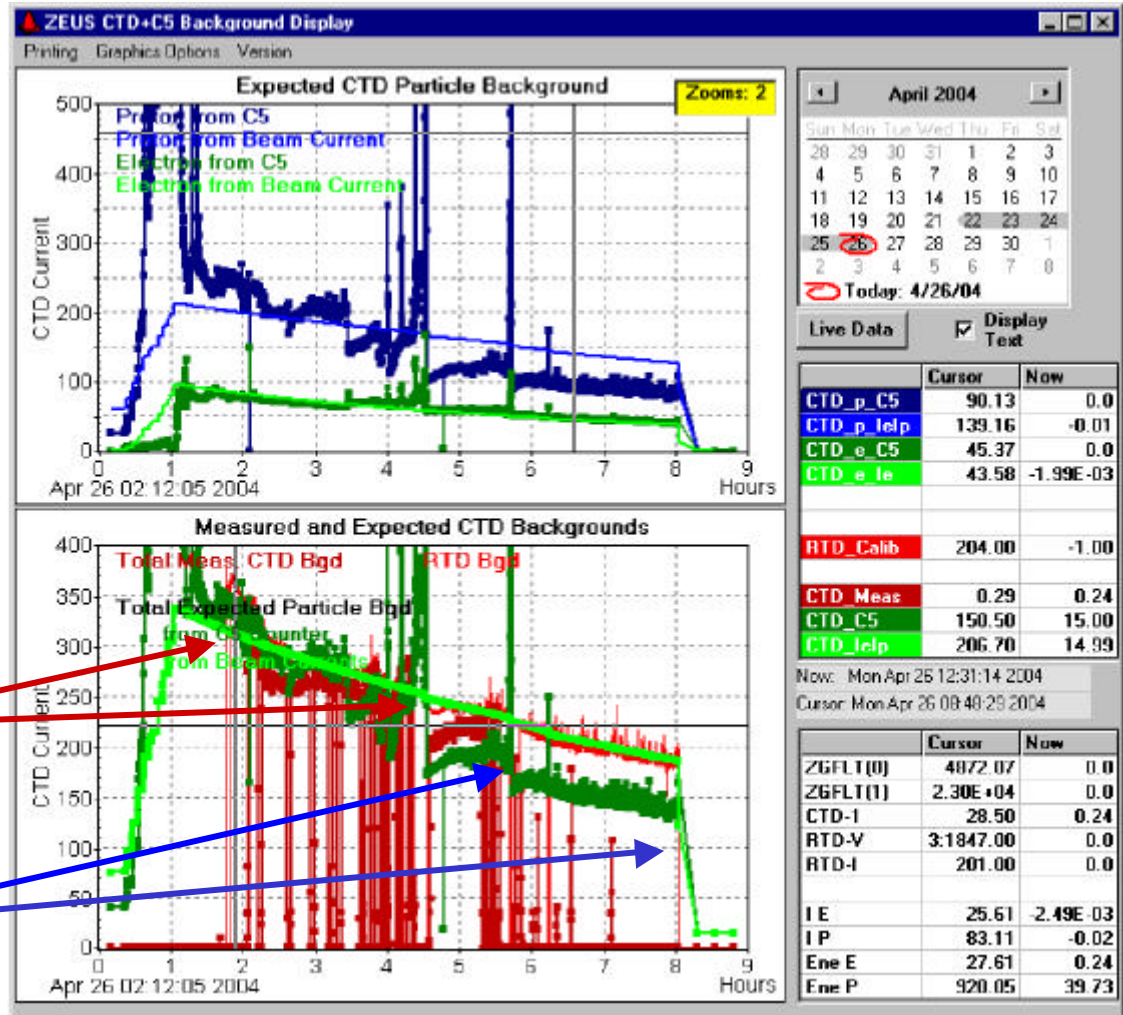
Major problem:
CTD trips

ZEUS
background display

night sunday/monday

HERA improves

HERA tries to
improve, no success

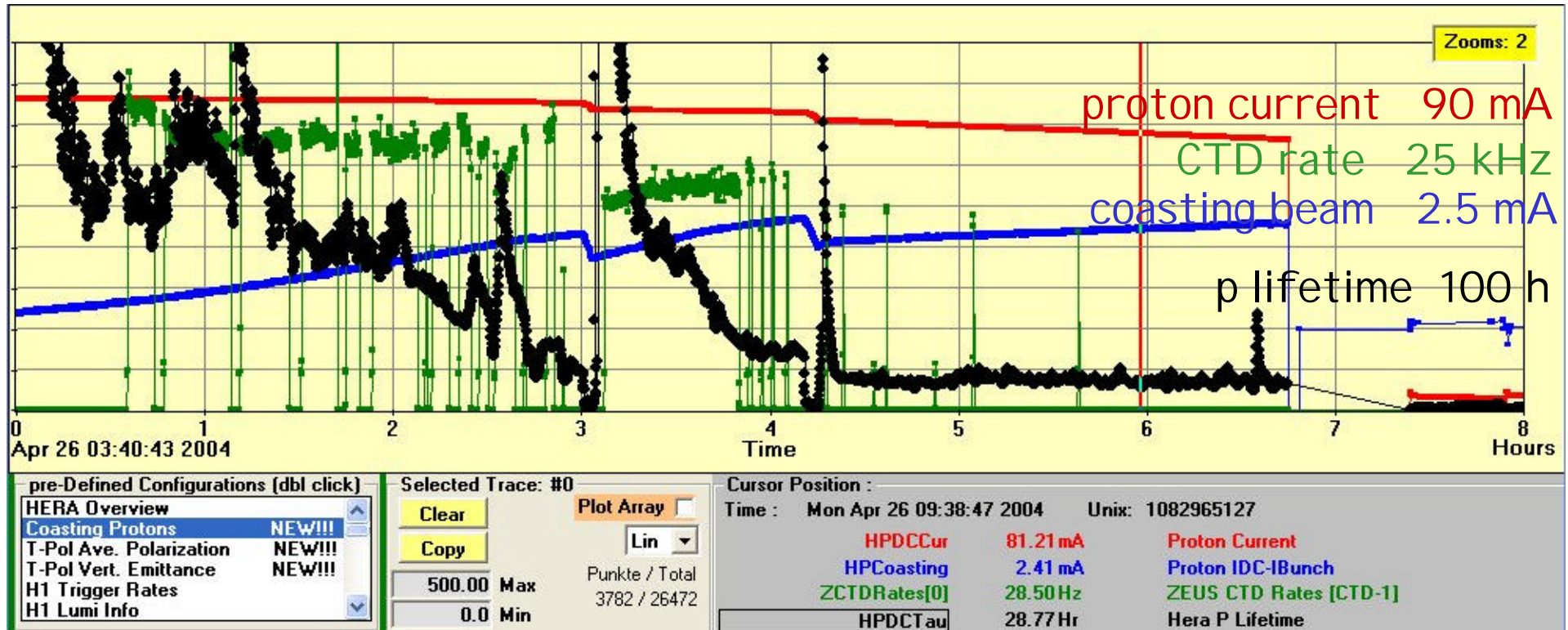




ZEUS last week: CTD trips vs. beam



same fill, information from HERA archive (R. Carlin)



in this fill: data taking impossible when p lifetime < 50 h (spikes!)

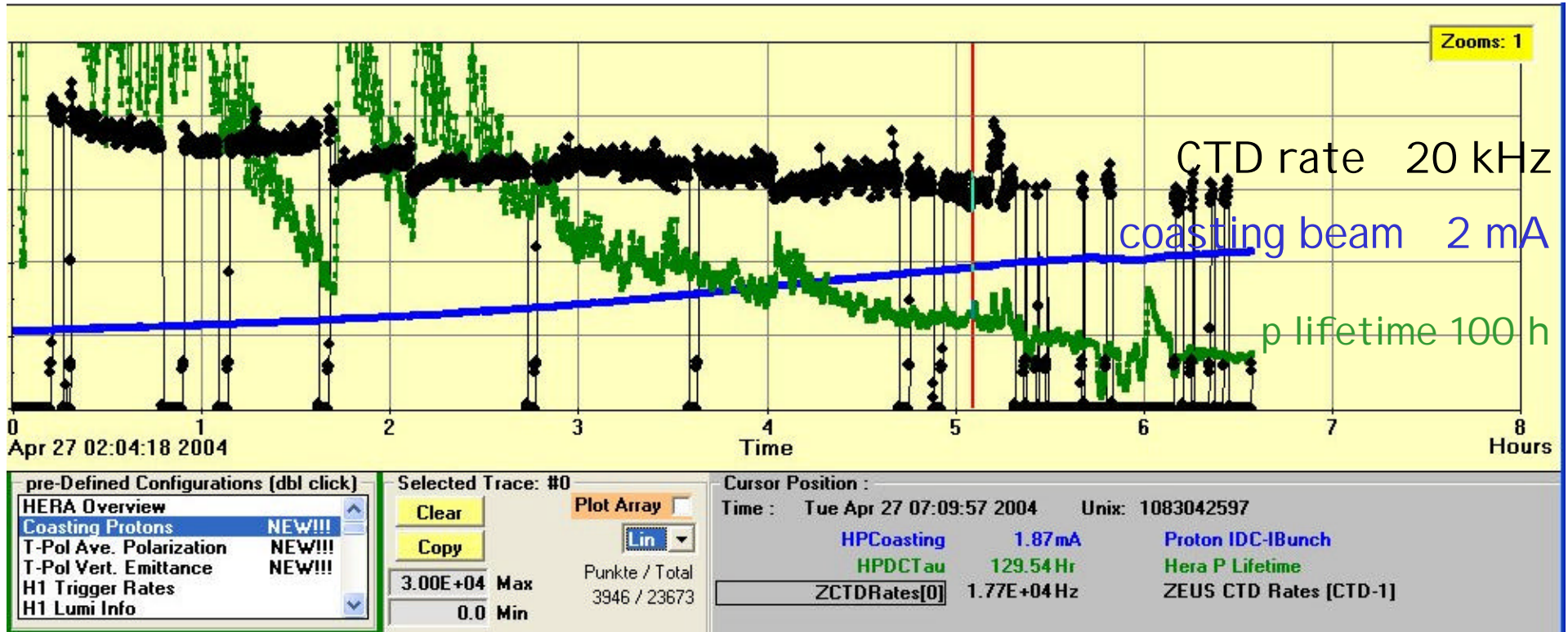


ZEUS last week: CTD trips vs. beam



fill of last night/this morning

(R. Carlin)



in this fill: data taking impossible when p lifetime < 100 h (spikes!)

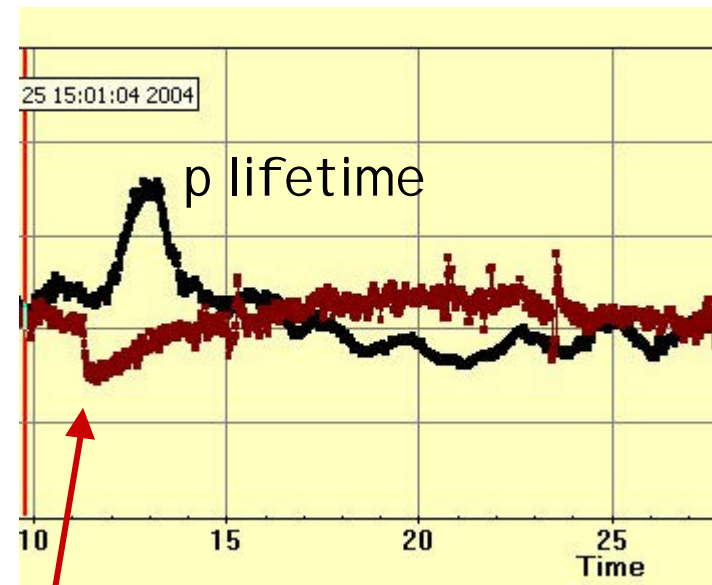
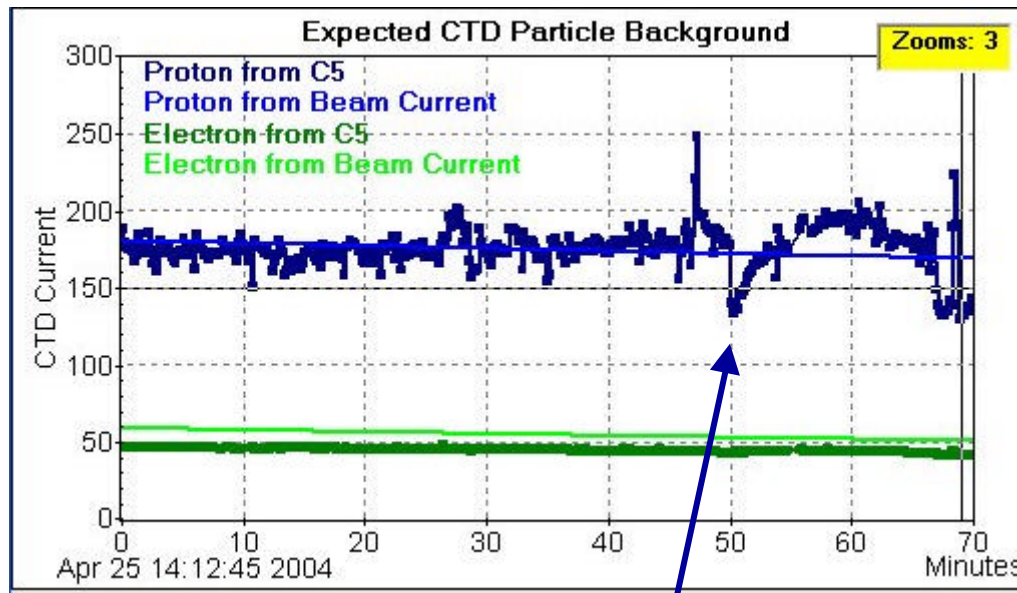


ZEUS last week: bg from beam scraping?



fill on saturday

(R. Carlin)



Fast drop indicates:
part of background probably not vacuum related (beam scraping?)

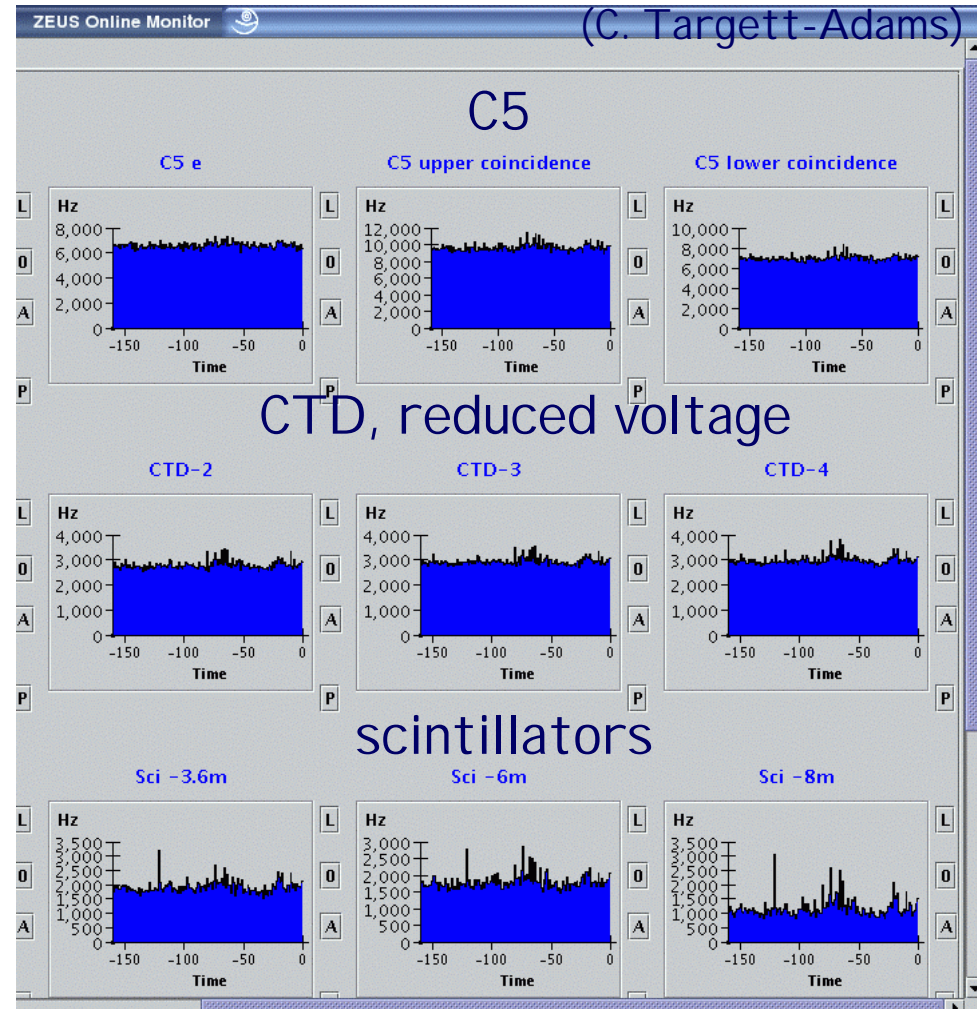


ZEUS last week: CTD trips vs. spikes



Spikes in CTD
correlated with
spikes in scintillators
and C5
on fast ZEUS online
monitor

typical trip:
one 0.2 s bin
in 6m and/or 8m
scintillator
(incoming proton side)

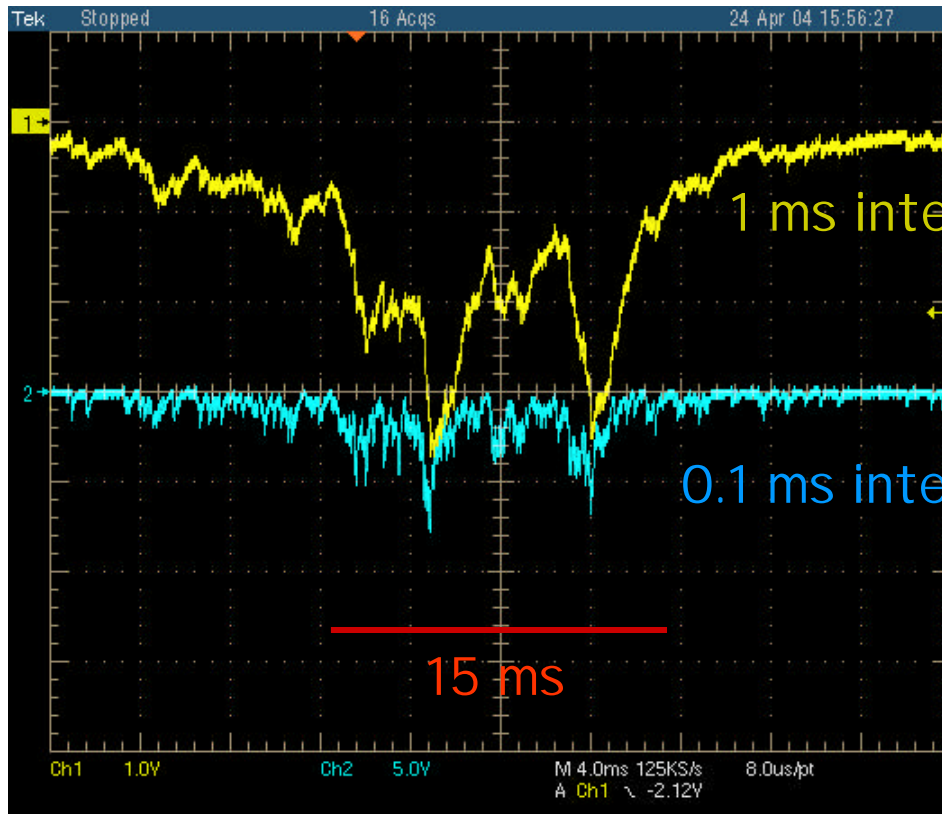




ZEUS last week understanding the spikes



oscilloscope/integrator setup by **U. Koetz, R. Carlin**
pictures by A.Ge, Y. Yamazaki, 24.4.04
use **8m scintillator signal** (mainly sensitive to protons)



clear correlation to
CTD spikes/trips in
ZEUS online monitor

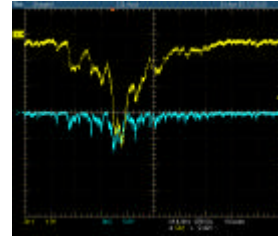
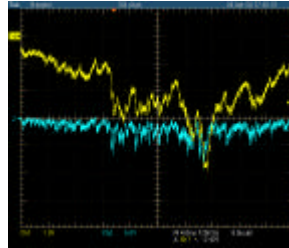
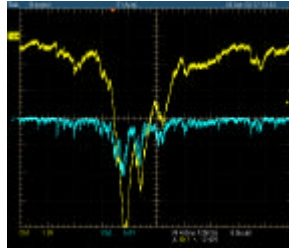
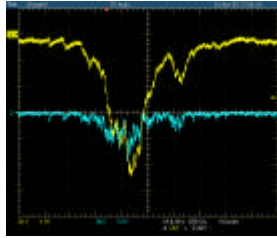
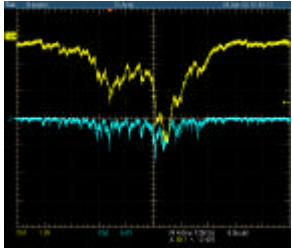
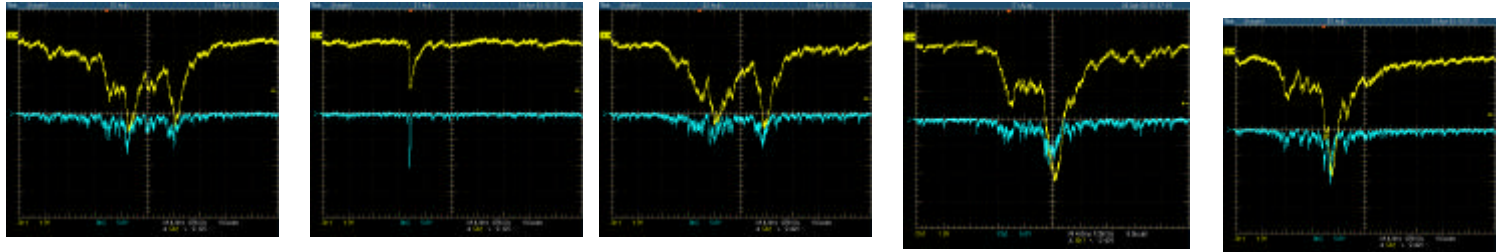
typical spike which
tripped CTD in
„semi-bad“ conditions
(full voltage,
trip every few
minutes)



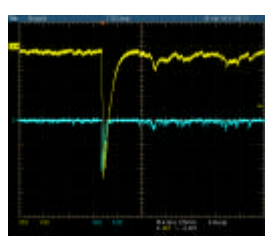
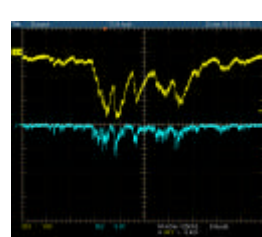
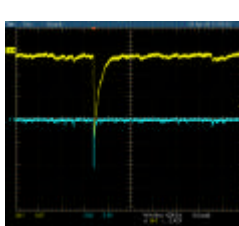
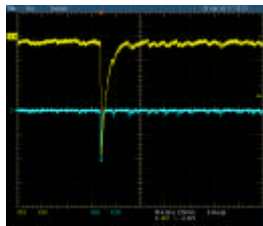
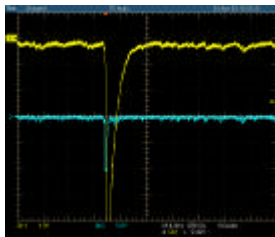
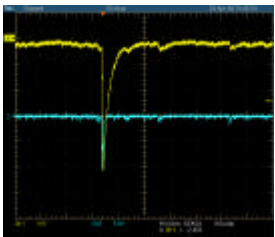
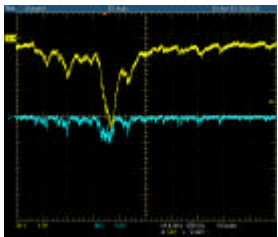
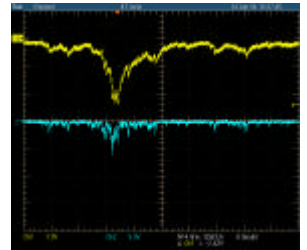
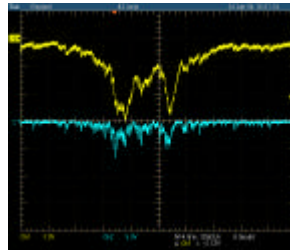
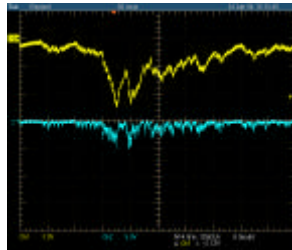
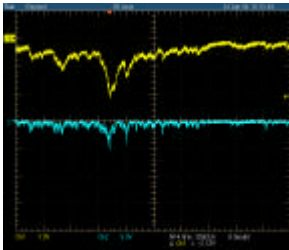
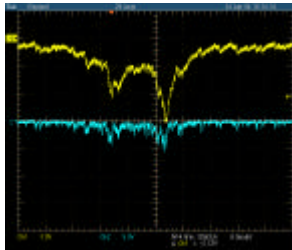
ZEUS last week understanding the spikes



tripped



not
tripped





Summary



- No significant hardware or DAQ problems,
but currently very low data taking efficiency due to frequent CTD trips
- Basic background conditions good, but spikes trip CTD
- Most spikes clearly visible as single 0.2 s bin in "fast" 3,6,8 m scintillator display (+C5)
- HERA investigations:
repair of intermediate frequency generator did not help
relation to ground faults in BU magnets? not excluded
relation to coasting p beam/low p lifetime? most likely
can HERA do something about this?
- ZEUS investigations: typical spikes probably last ~ 15 ms
size of same order as CTD trip threshold?
- Measures to reduce CTD sensitivity to spikes under study
CTD experts at DESY this week