

# H1 Status



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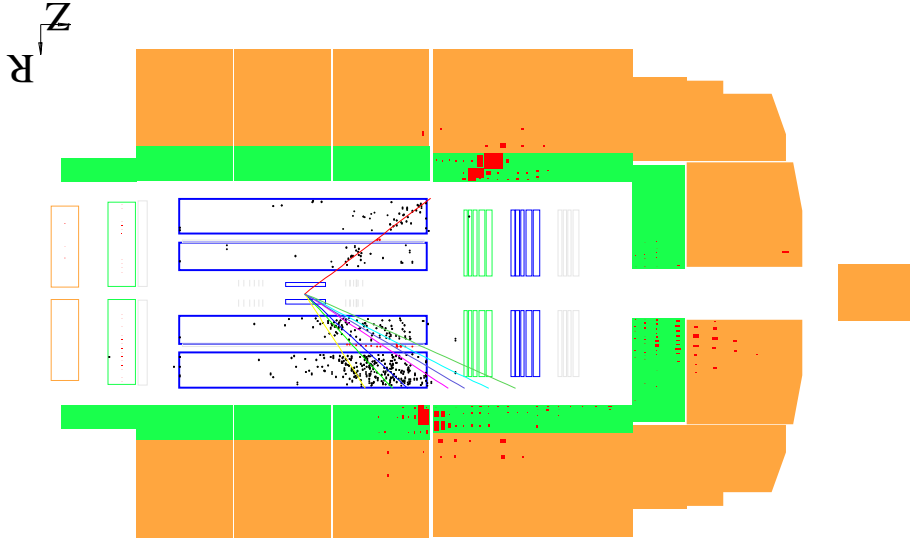
HERA coordination meeting, 11.1.2005

- Backgrounds
- Proton spikes
- FST/BST repair
- Planning

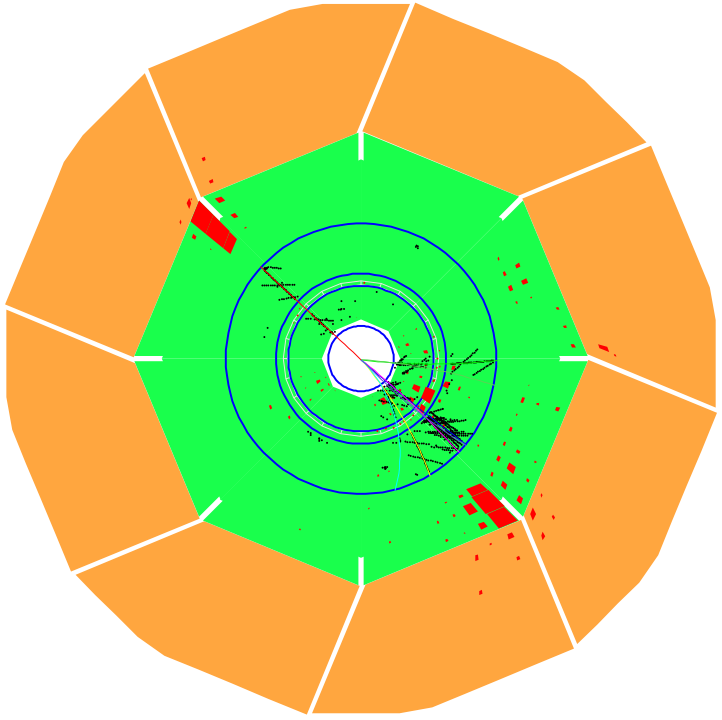
# H1 Status

H1 is ready for data taking with all systems operational:

E = -27.6 x 920.0 GeV    B = 0.0 KG  
 DSN=/h1wgs/h1raid08/x05/h1/marseille/diaconu/hotline/HOTSCAN/HOTLIN  
 RUN 398557 Event 552    Run date 2004/12/20 01:53  
 BTOF Global, BG, IA = 000    AST = 788D    400    0  
 RST = 788D 42500400    0



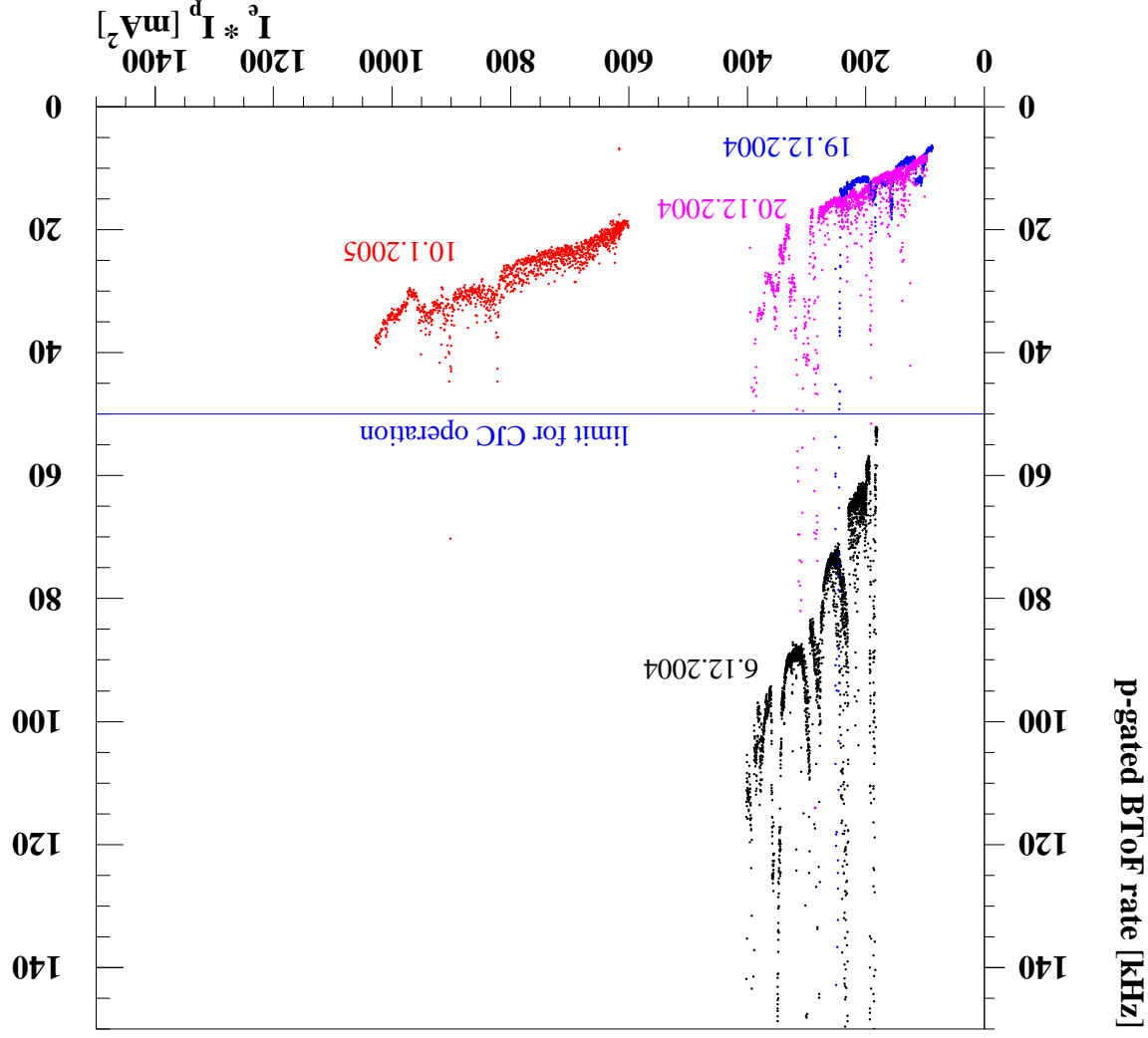
$Q^2 = 12000 \text{ GeV}^2$



x  
y

## Background is improving

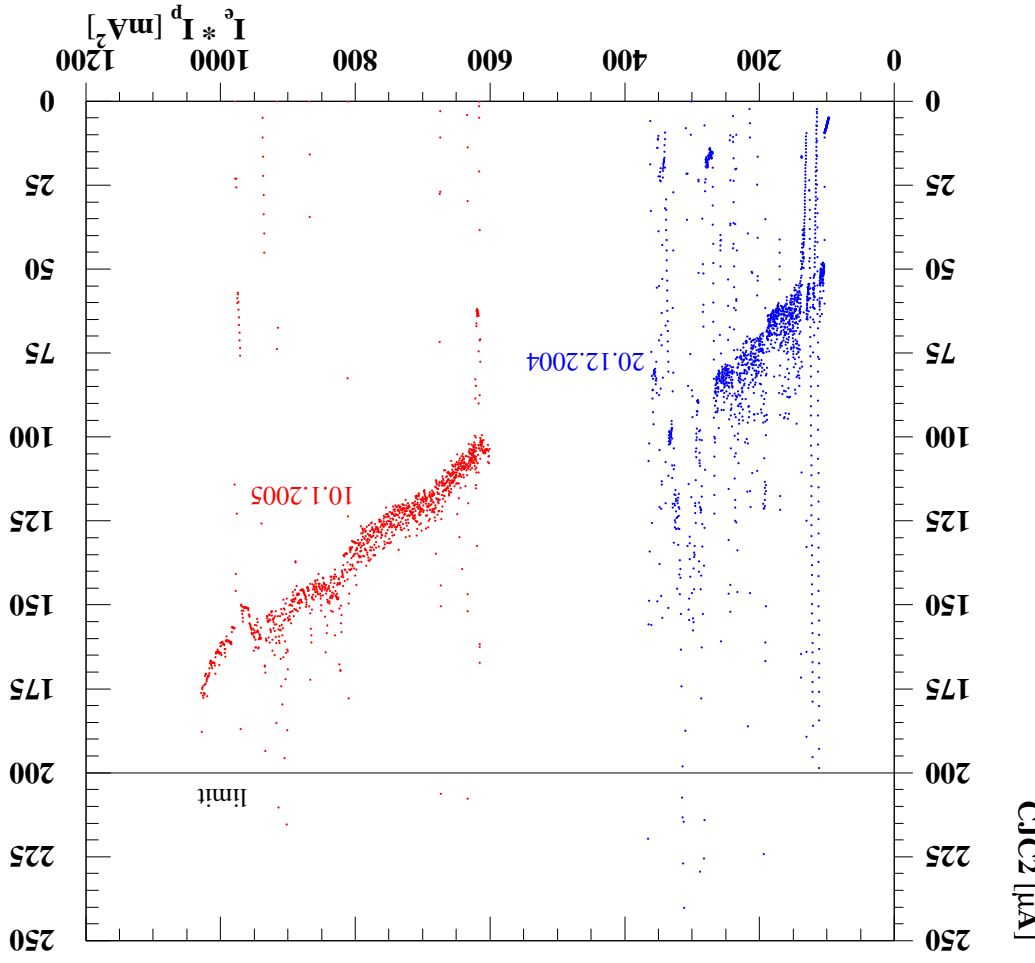
Proton background from the H1 BToF counter:

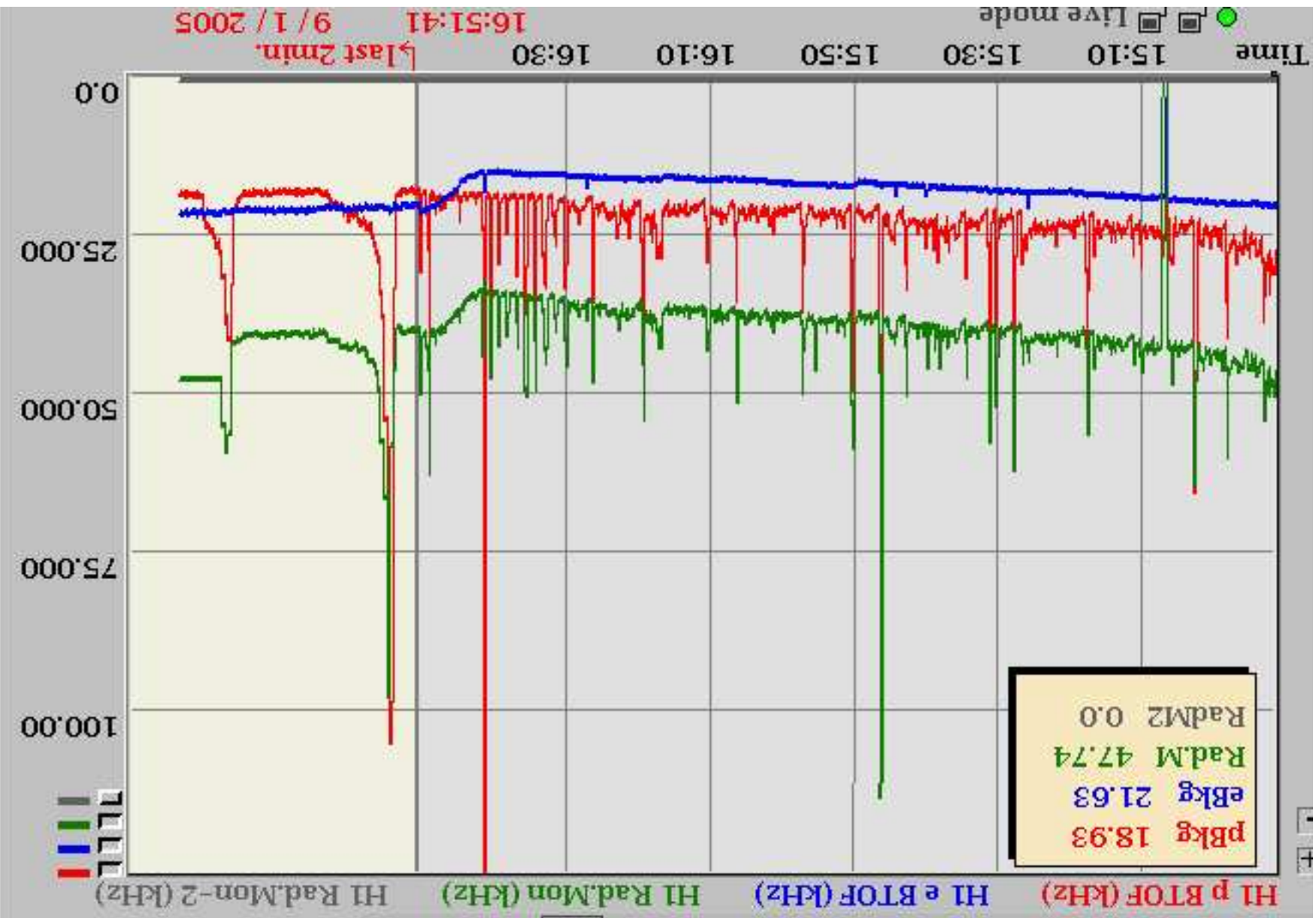


- $p$ -gas background was reduced by factor 4.5 after closing the vacuum leaks NR6 m and NL14 m on 9.12.2004 and NEG pump activation on 15.12.2004.
- Another factor 1.5 was gained after NEG regeneration on 5.1.2005.
- We thank ZEUS and Hermes for supporting our requests for vacuum conditioning.

# Drift chamber operation

- CJC current scales with  $I_e \cdot I_p$
- ⇒ Dominated by  $p$ -gas background.
- Safe operation possible at  $20 \cdot 60 \text{ mA}^2$  under quiet beam conditions.
- ⇒ Need further reduction by factor 4 for safe operation at design beam currents.
- Background spikes cause overcurrents and trips.
  - The inner CJC is hardly ever at full HV.
- ⇒ Track trigger not efficient.
- ⇒ Data unusable for many physics analyses.





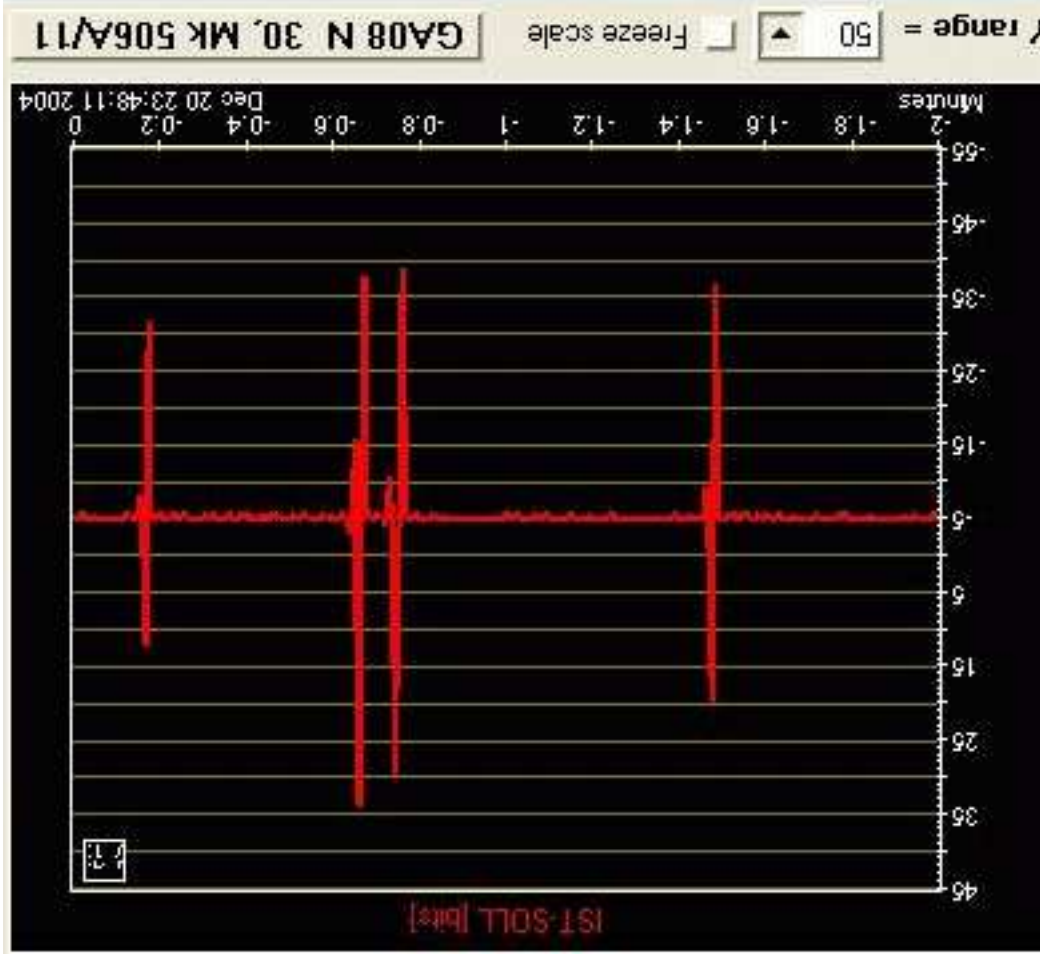
Regular proton spikes



7 spikes in 7 minutes

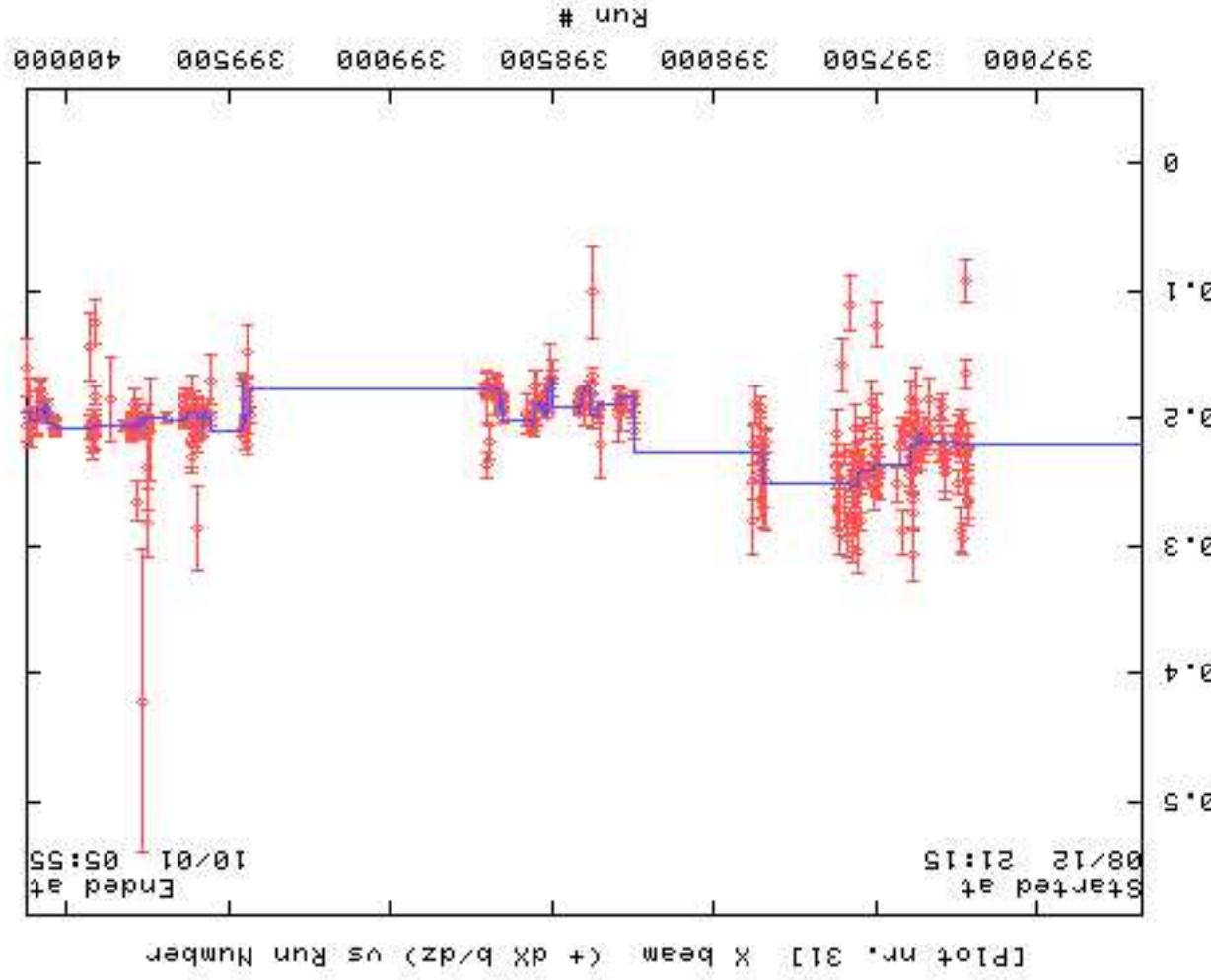
## One culprit identified

- Tracer on a power supply for a strong proton focussing quadrupole close to H1: GA08 N.
- Excursions correlate with large  $d$  spikes.
- The filtering and regulation of this power supply was improved on Tue 21.12.04 and again on 10.1.2005.
- Exchange power supply? May take 1 – 2 days (MKK).
- Further suspect: QQ24 in the East.
- Other sources?



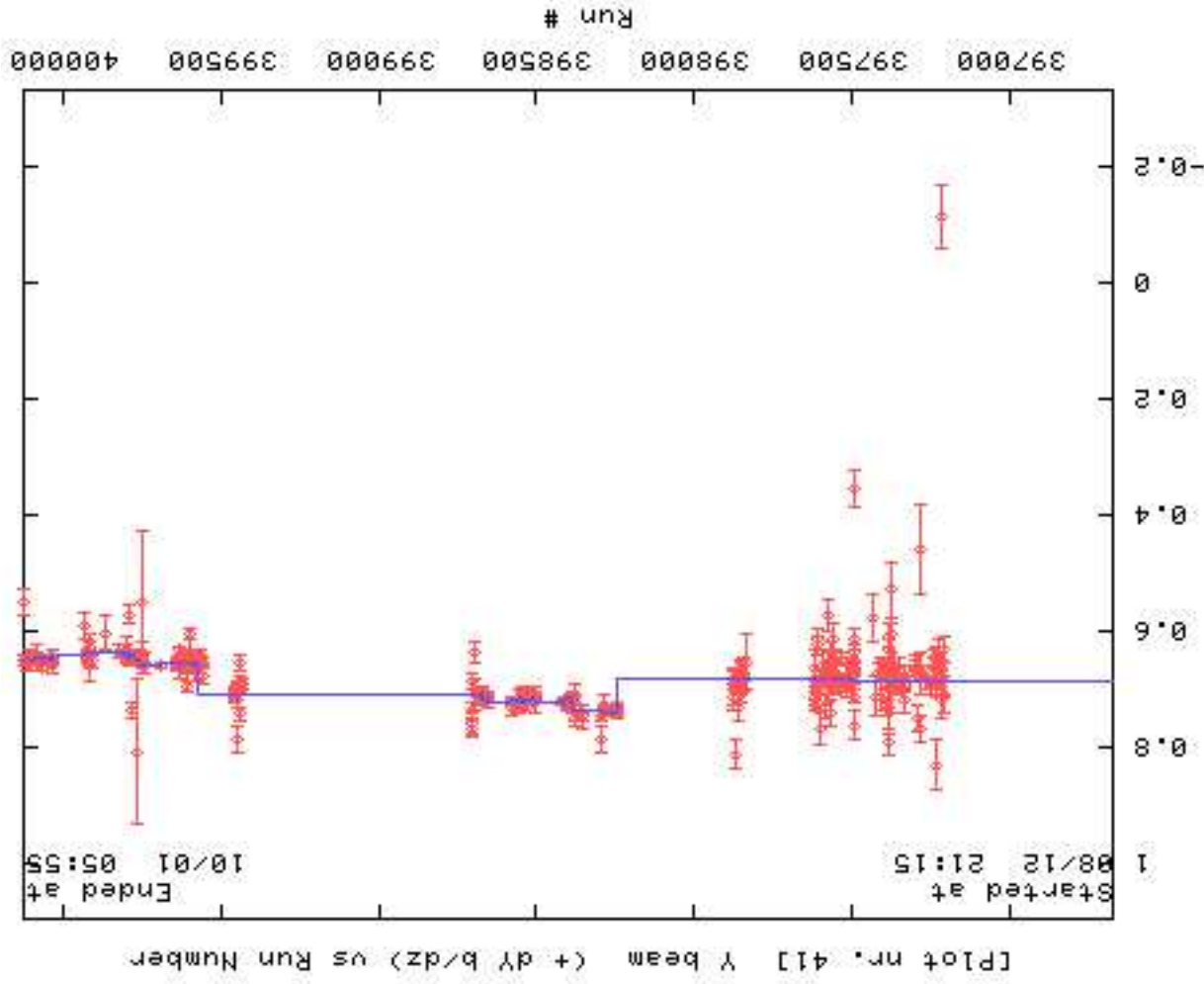
## Vertex position in horizontal plane

- The interaction point is 0.2 cm ring inwards from the center of H1.
- For  $e^+p$  it was at the same relative position.
- The  $e^-$  and  $p$  beams were moved 0.75 cm ring outwards.
- H1 was moved 0.7 cm ring outwards on 2.12.2004.
- ⇒ Cancellation.
- ⇒ C5a and C5b are at the same position relative to the beams as with  $e^+$ .





## Vertical beam position



- The interaction point is 0.7 cm high in H1.
- The same offset was observed for  $e^+p$ .
- ⇒ H1 is too low.
- The 'keyhole' collimator has this asymmetry built-in.
- ⇒ don't change this.
- The IP end of the GO magnet was raised to compensate.

## FST repair



- 120 + 30 silicon sensors from CIS Erfurt: 3 batches in Feb, Mar, early Apr.
- 150 Hybrids from Straschu Leiterplatten: 2nd prototype next week, if OK: series by mid Feb.
- Radiation hard APC and Decoder chips from UMC, Taiwan, by mid Feb.
- Test and assemble in Zeuthen and Hamburg in several steps: Mar-May.
- Repeater boards from Prague, with rad hard components: Mar-May.
- Goal: ready by Jun 2005.

## BST modification

- Re-use Si sensors and hybrids, but equip with rad hard chips.
- Old chips and bonds were removed cleanly by DESY-ZE.
- Repeater boards already have rad hard components since 2003.
- Assemble and test in Zeuthen and Hamburg: May-Jul.
- New cooling water manifolds being made.
- Goal: ready for installation by Aug 2005.



# H1 Planning

- The large proton spikes must be cured. Otherwise, H1 cannot take physics data.
- The overall background level allows safe chamber operation at  $20 \cdot 60 \text{ mA}^2$ , with gradual improvement from vacuum conditioning.
- ⇒ H1 would like to stay with 120 bunches.
- GO/GG warmup and NEG pump regeneration is always beneficial. Next opportunity: 2.2.2005.
- For FST and BST repair all components have been ordered.
- Milestone: test of the rad hard APC chip end Feb 2005.
- The FST and BST repair plan aims for installation in early September 2005. The shutdown should start 1 week earlier and last 6 weeks based on this year's experience, with no further repair work on other components.