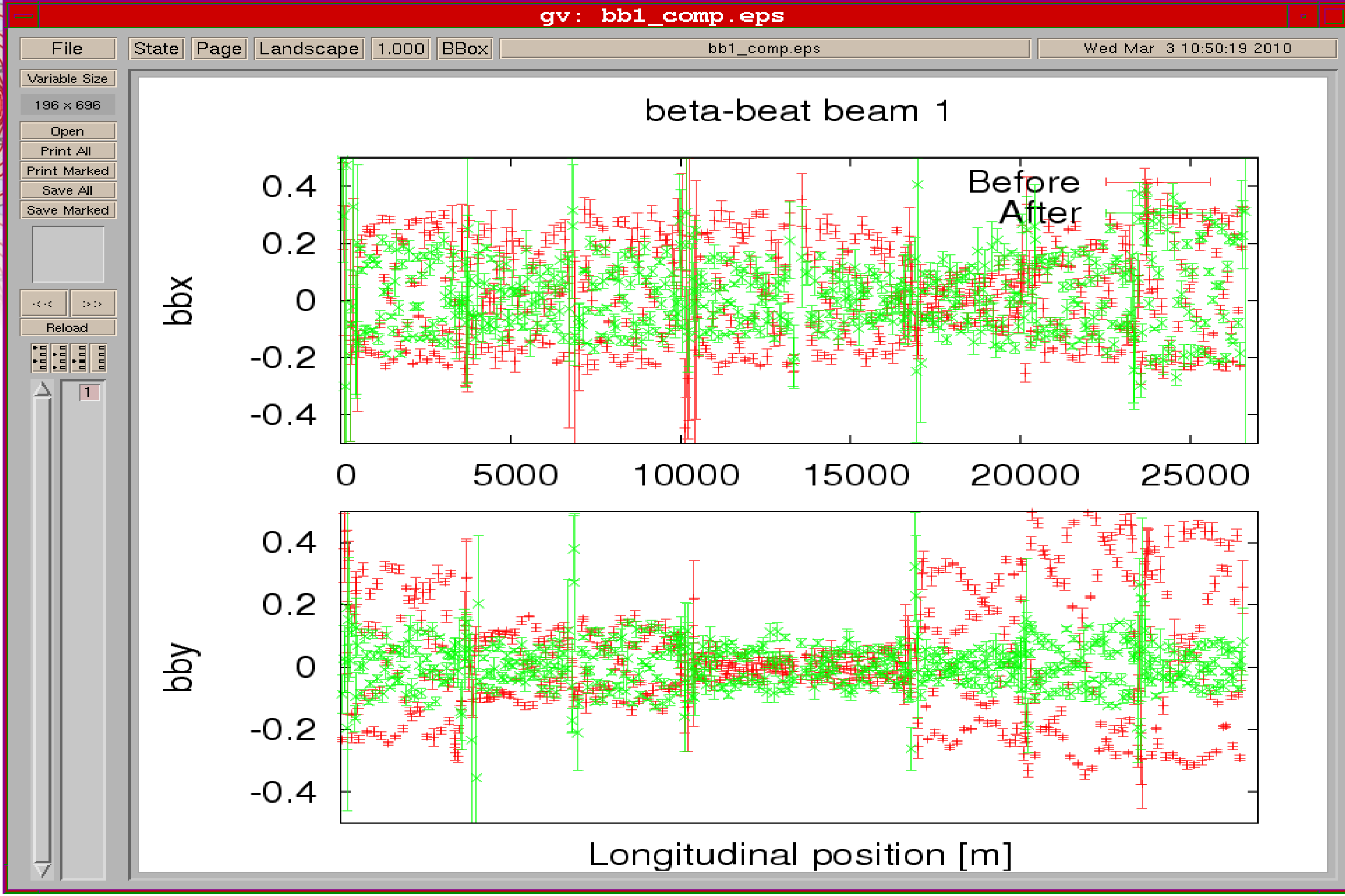
During the day until 17:00

03/03/2010

- Until 09:00: Beta beat continued - Rogelio and team

Results of first attempt to correct beta-beat simultaneous on both beams.
Beam1: Horizontal beta-beat peak ~30% - Vertical beta-beat peak ~15%
Beam2: Horizontal beta-beat peak ~30% - Vertical beta-beat peak ~30%



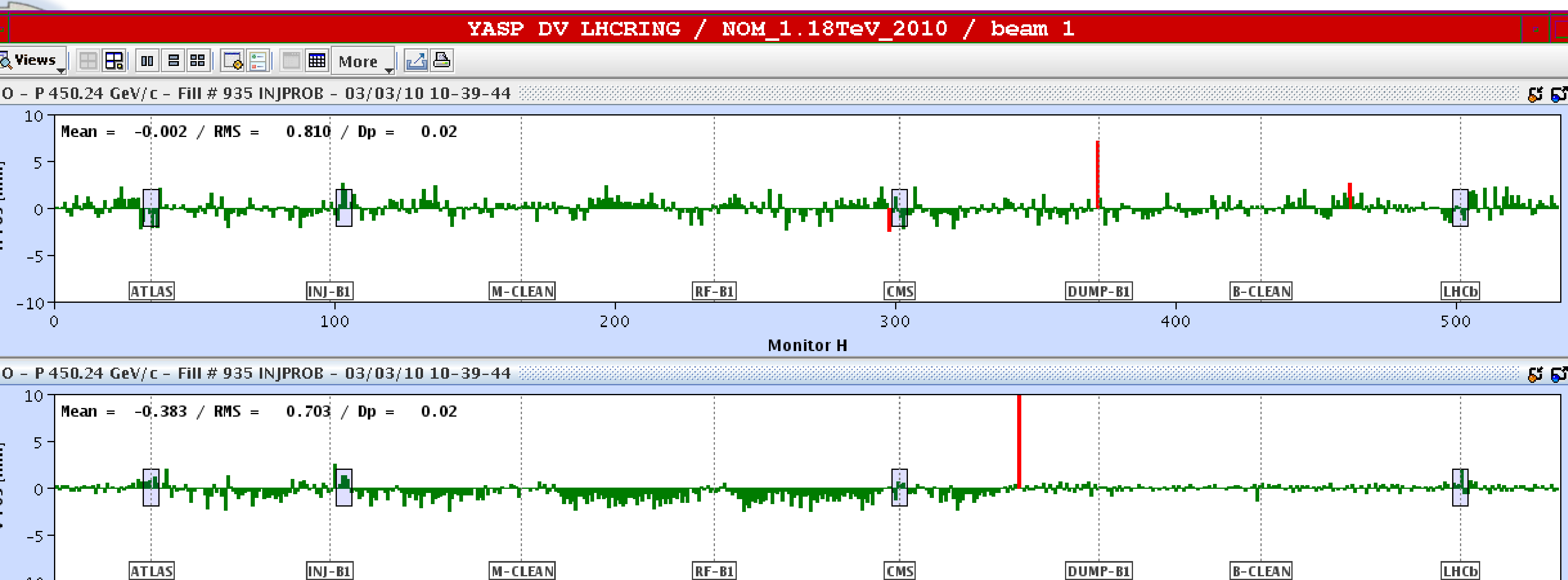
Very promising. Rogelio and team are continuing the data analysis. More beam time for them on Thursday night. Meanwhile, removed the global correction, left the corrections in IR7

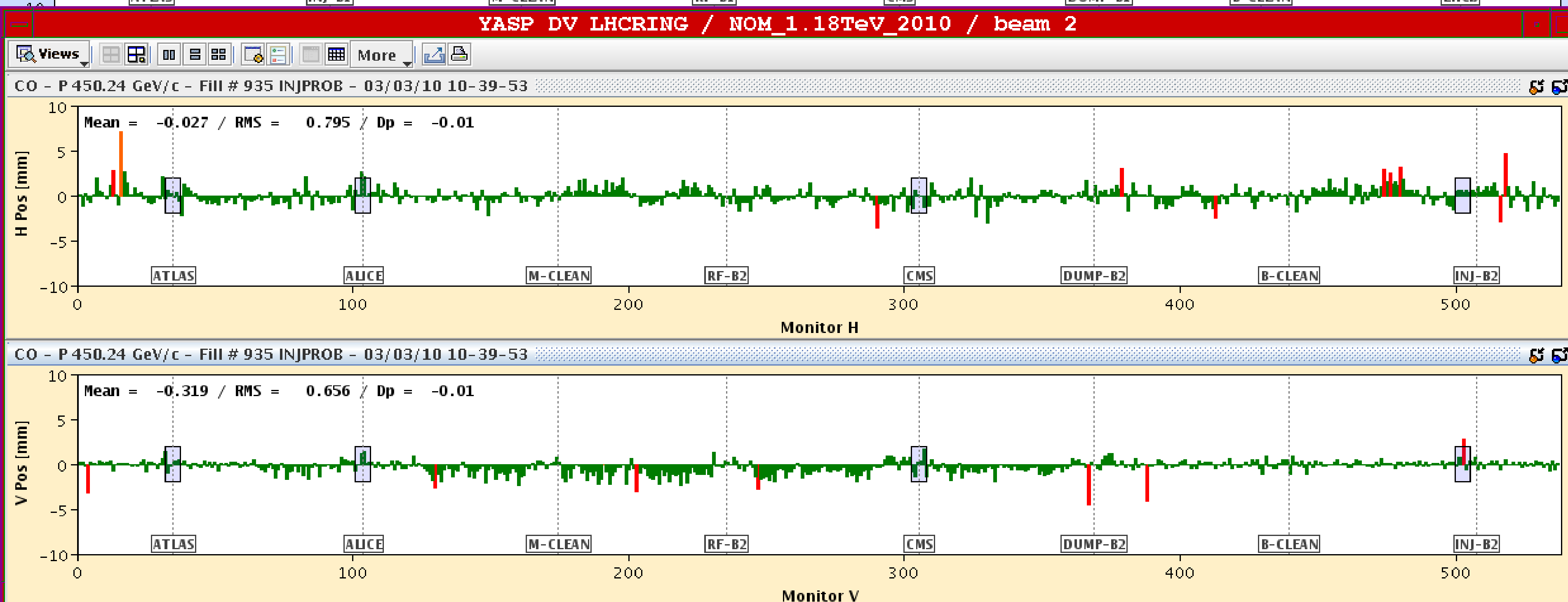
03/03/2010

- 09:00 - 10:30: Orbit studies with two beams – Jorg Wenninger

Improved orbit (“silver plated iron”).

Much better in IRs, CMS offsets collision point offsets down from ~2 mm to <= 0.6 mm


YASP DV LHCRING / NOM_1.18TeV_2010 / beam 1
Views
More
O – P 450.24 GeV/c – Fill # 935 INJPROB – 03/03/10 10-39-44
Mean = -0.002 / RMS = 0.810 / Dp = 0.02
ATLAS
INJ-B1
M-CLEAN
RF-B1
CMS
DUMP-B1
B-CLEAN
LHCb
Monitor H
O – P 450.24 GeV/c – Fill # 935 INJPROB – 03/03/10 10-39-44
Mean = -0.383 / RMS = 0.703 / Dp = 0.02
ATLAS
INJ-B1
M-CLEAN
RF-B1
CMS
DUMP-B1
B-CLEAN
LHCb


YASP DV LHCRING / NOM_1.18TeV_2010 / beam 2
Views
More
CO – P 450.24 GeV/c – Fill # 935 INJPROB – 03/03/10 10-39-53
Mean = -0.027 / RMS = 0.795 / Dp = -0.01
H Pos [mm]
ATLAS
ALICE
M-CLEAN
RF-B2
CMS
DUMP-B2
B-CLEAN
INJ-B2
Monitor H
CO – P 450.24 GeV/c – Fill # 935 INJPROB – 03/03/10 10-39-53
Mean = -0.319 / RMS = 0.656 / Dp = -0.01
V Pos [mm]
ATLAS
ALICE
M-CLEAN
RF-B2
CMS
DUMP-B2
B-CLEAN
INJ-B2
Monitor V

03/03/2010

- 10:45 : Beams dumped
- Machine mode changed to "machine development" – **RBAC activated**
- BLM intervention : Added two optical fibre splitters in crates SR6.C and SR7.L.
- Preparation for pre-cycling started
- To note: Reset of the QPS to be added in the sequence after putting all magnets to IDLE
  - Reset of S45 600A failed
  - Linked to RQTL11.L5 B1/B2 and RQTL12.L5 B1/B2 QPS problems
  - Re-setting them -> fixed the problems
- 11:45 : Cycling of all sectors launched
- 13:00 : Cycling completed – Preparing for beam

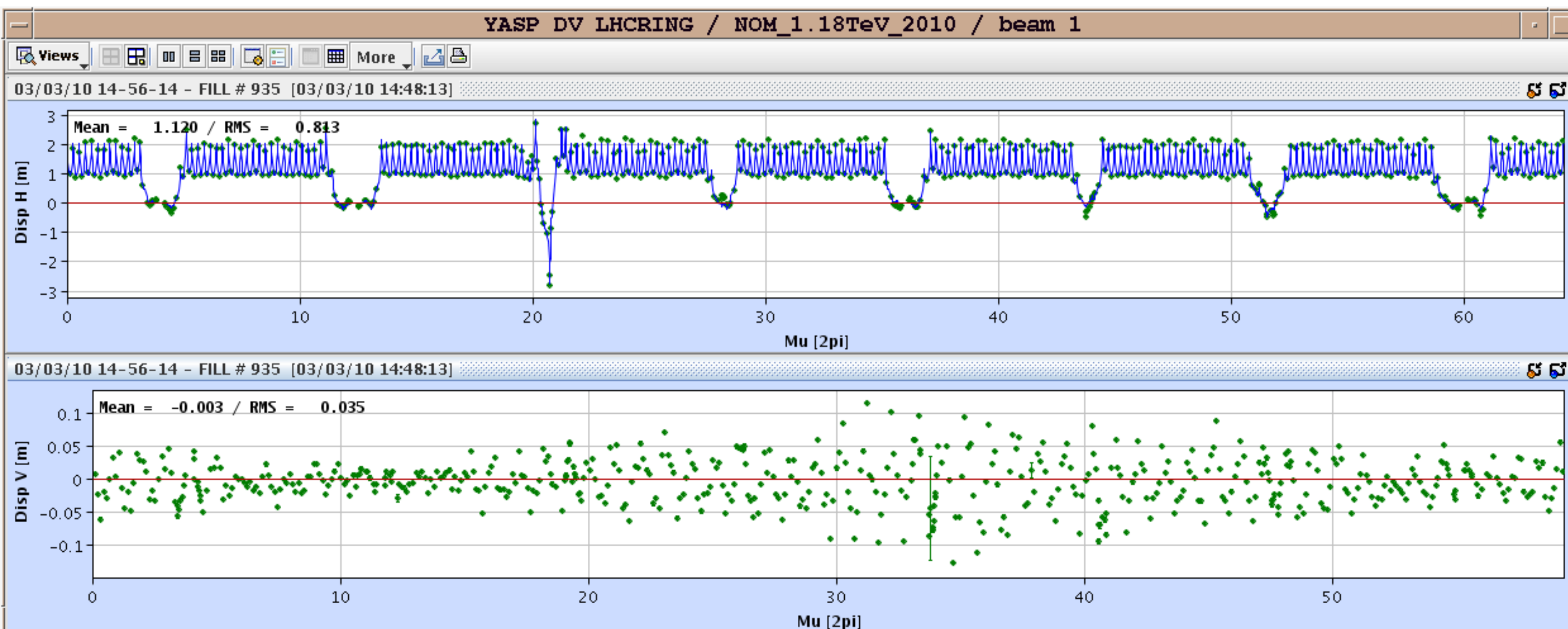
Beam 2

- Beam 2 injected
  - Tunes found at 0.20 – 0.28
  - Tunes corrected to 0.28 – 0.31 (trimmed by 0.07 0.04)
  - Chromaticities found at 1.2 and 4 (resolution of 1-2-units)
  - Chromaticities corrected to ~ 1 and 2
  - Coupling C- 0.002
  - Dispersion measurements done
  - Hump reference spectrum saved – one beam – damper off

Beam 1

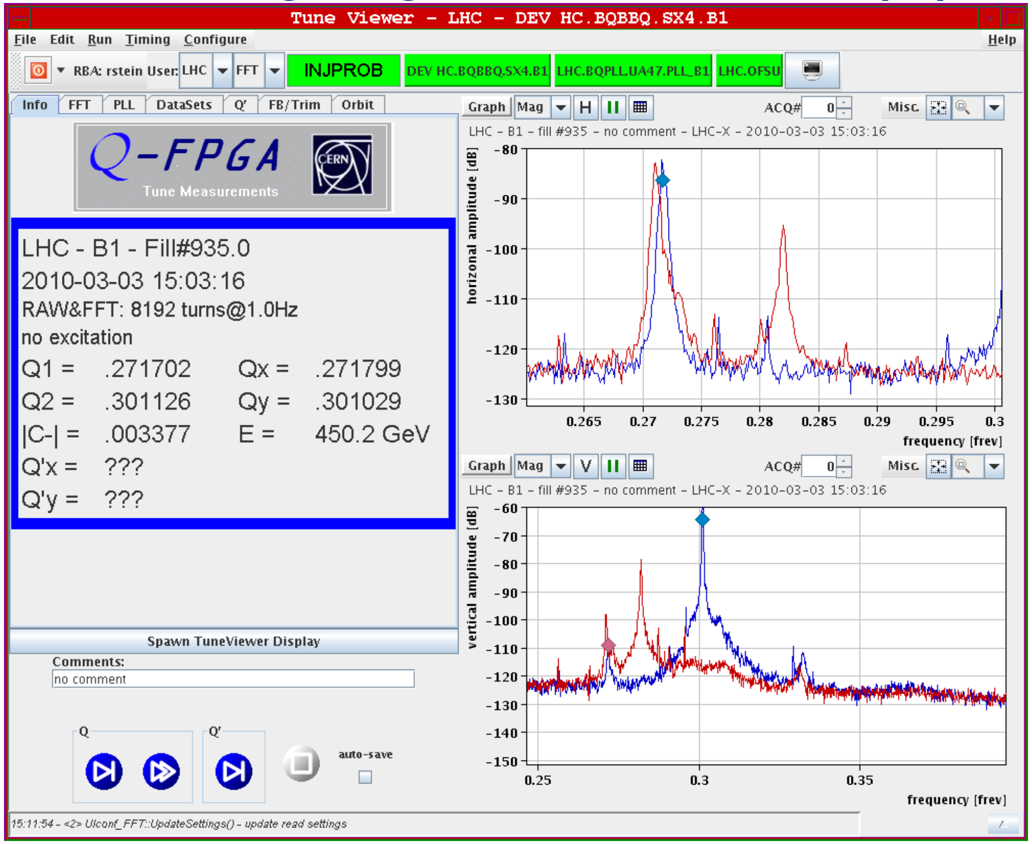
- Beam 1 injected
  - Tunes found at 0.20 – 0.28
  - Tunes corrected to 0.28 – 0.31 (trimmed in V by 0.04)
  - Chromaticities found ~ 2 and 3.5
  - Coupling C- 0.002
  - Dispersion measurements done
  - Hump reference spectrum saved – one beam – damper off


YASP DV LHCRING / NOM_1.18TeV_2010 / beam 2
Views
More
03/03/10 14-37-40 - FILL # 935 [03/03/10 14:35:08]
Mean = 1.123 / RMS = 0.811
Disp H [m]
Mu [2pi]
03/03/10 14-37-40 - FILL # 935 [03/03/10 14:35:08]
Mean = 0.001 / RMS = 0.056
Disp V [m]
Mu [2pi]


YASP DV LHCRING / NOM_1.18TeV_2010 / beam 1
Views
More
03/03/10 14-56-14 - FILL # 935 [03/03/10 14:48:13]
Mean = 1.120 / RMS = 0.813
Disp H [m]
Mu [2pi]
03/03/10 14-56-14 - FILL # 935 [03/03/10 14:48:13]
Mean = -0.003 / RMS = 0.035
Disp V [m]
Mu [2pi]

Hump search...

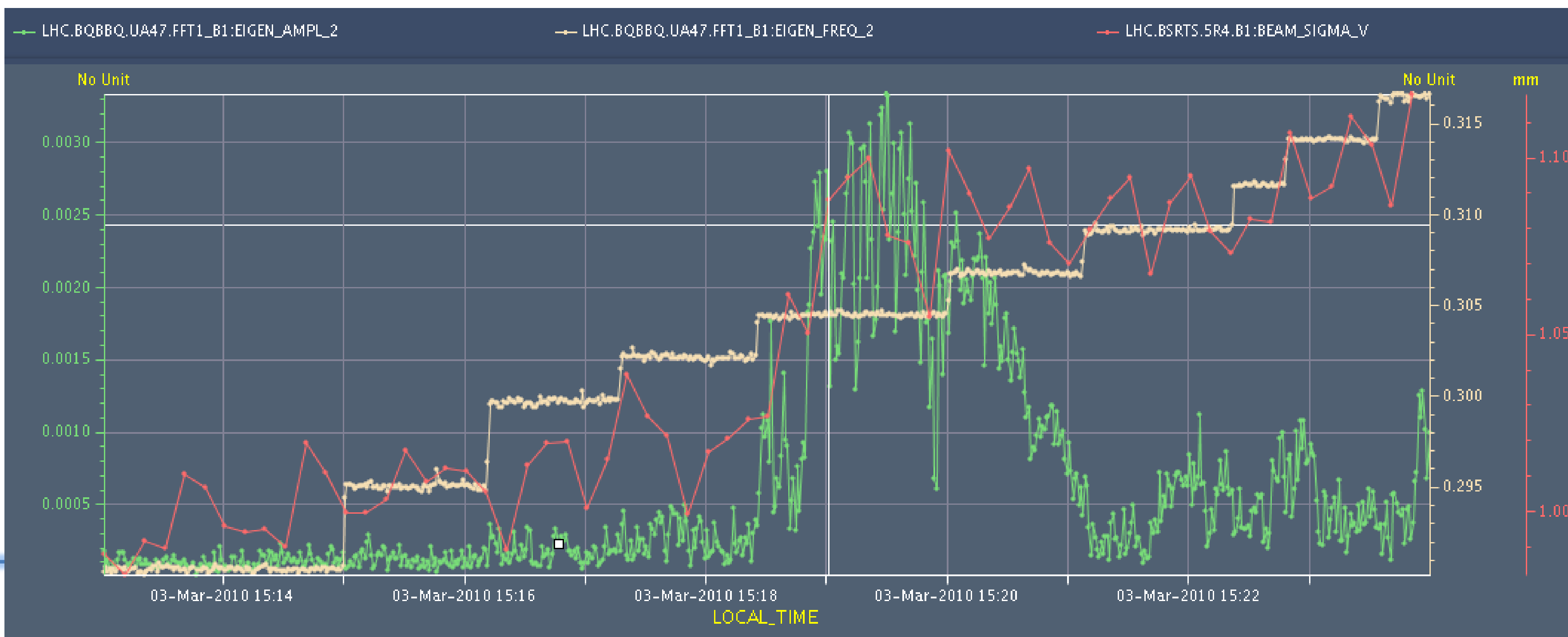
- Beam 1 injected
  - Starting the vertical tune scan while observing the lifetime while going across the hump position – Ralph Steinhagen



Record amplitude of the tune spectra and beam lifetime FBCT

Hump search...

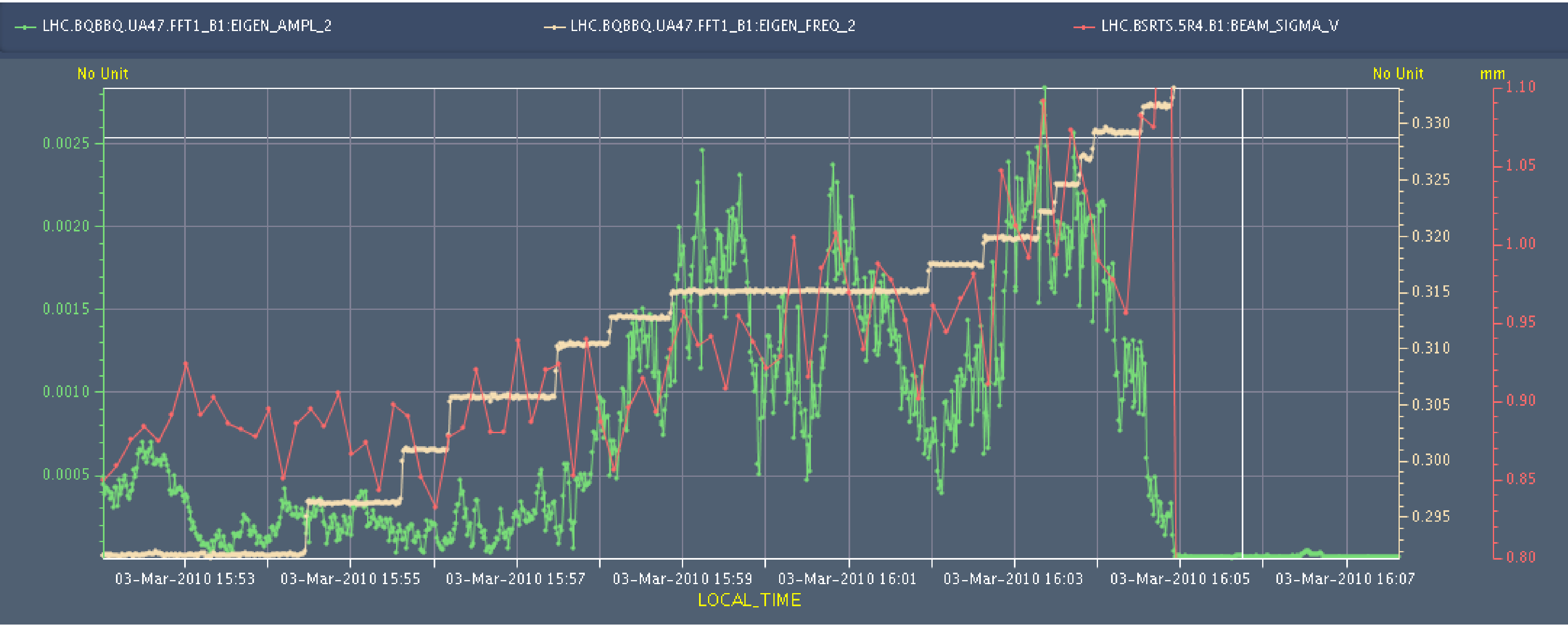
- Beam 1 injected
  - Starting the vertical tune scan while observing amplitude of the tune signal and the vertical beam size from the BSRT, while going across the hump position
  - The increase in amplitude and vertical beam size is visible as soon as the tune hits the hump



Hump search...

- Beam 1 injected

  Another tune scan, this time starting with the vertical beam tune spectra less wide -> moving frequency!



Plan - 03/03/2010

- Until 9:00 : beta beating
- 09:00 - 10:00 : Orbit study with 2 beams
- 10:00 – 12:00 : Dump and Pre cycle –BLM intervention IR6 – RBAC activation
- 12:00 - 15:00 : Re-establish beams and checks of parameters
- 15:00 - 21:00 : Systematic hump investigation
- 21:00 – 02:00 : Injection studies
- 02:00 – 03: 00 : ALICE : beam on the TDI – 5e9
- 03:00 – 07:00 : Systematic hump investigation

<u>Thursday 04/03/2010 Tentative </u>:

- 07:00 – 15:00 : HWC tests
- 15:00 – 23:00 : Hump investigation continued – cryogenics tests for hump
- Overnight : beta beating measurements and correction

Hump measurements

- List of elements ON/OFF for hump checks: PC OFF not only 0 current – one beam at a time.
  - TL magnets incl. MSI
  - Damper OFF (power-wise) – O.K.
  - Orbit correctors after establishing an orbit with minimum number of correctors
  - Spool pieces RCO – RCD – RCS – RSS
  - AC dipole
  - Spectrum of BLM data at the primary collimator with RF ON and RF OFF (get value of the emittances, and all longitudinal parameters)

- Measurements with experts:
  - Spectral analysis of the radial pick-up and damper pick-up data
  - Vary He flow of the beam screens – block all the valves regulating the flow on the beam screens – saved actual settings first
  - Make the measurements with different sets of RF modules ON while keeping the RF voltage constants

Hump measurements

- Inject both beams: B1&B2
  - Take reference for the hump (save spectrum)
  - Measure correlation e.g. After disconnection of Beam1/Beam2 frequencies, change B1 frequency and observe effect on hump on both beams

- With single beam:
  - Measure lifetime as a function of tune w.r.t. hump position (tune scan)