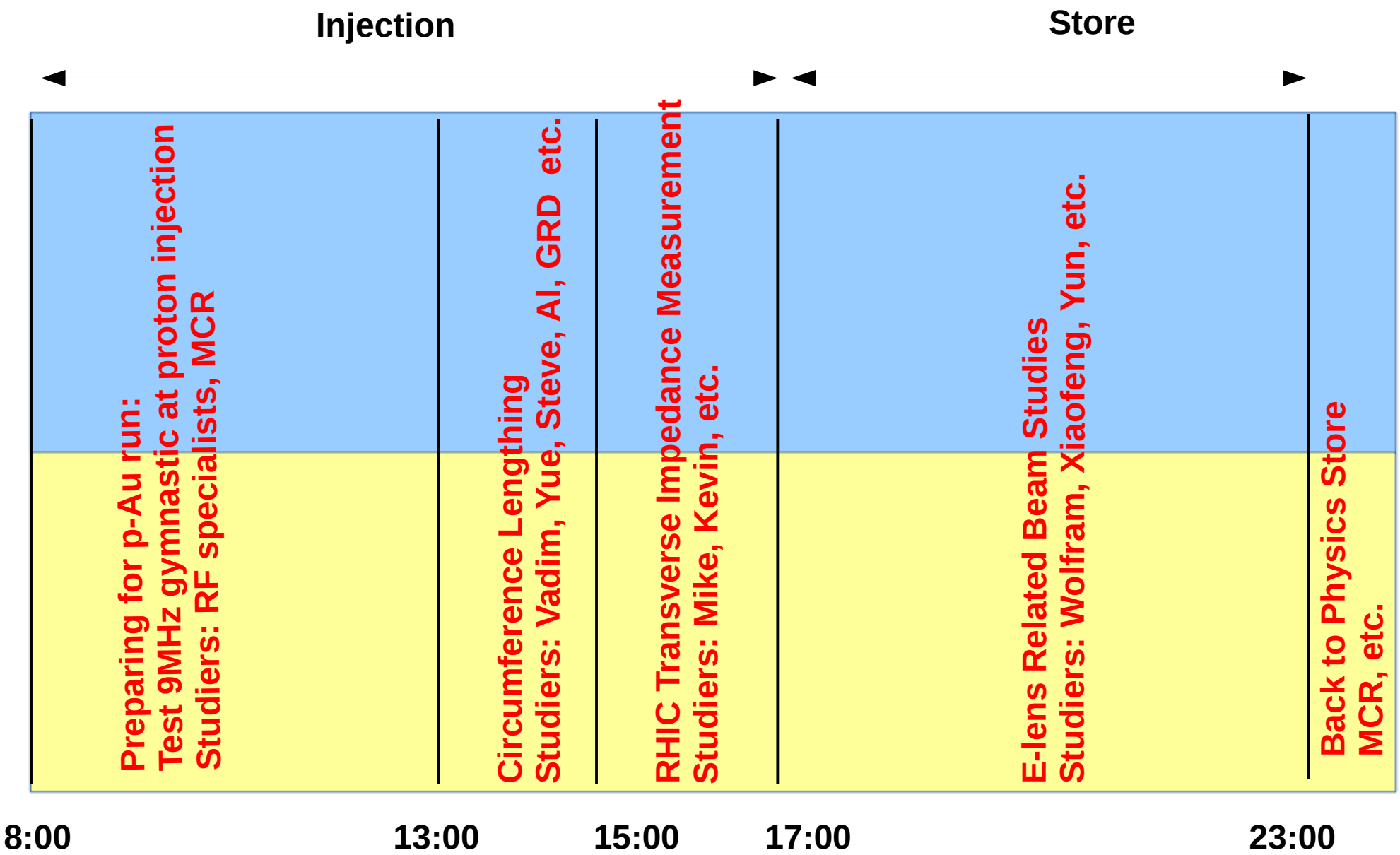
APEX Schedule for March 25, 2015



Summary of the LLRF APEX Effort from Wed 03/25/15

One of the RF configuration changes for the upcoming P-Au run required figuring out how best to bring on the 9MHz Common Cavity for PP injection on the intermediate injection porch.

It turns out (many details) that a rebucket type gymnastic is required in order to bring the 9MHz Common cavity “on frequency” just prior to PP injection.

The purpose of this APEX was twofold:

1) Develop and flesh out the necessary LLRF configuration changes required to implement the rebucket gymnastic with the 9MHz Common Cavity.
2) Test the gymnastic and its impact on both the 9MHz Common Cavity and the circulating “Au” beam held by the Yellow 28MHz system.
   a) This APEX used “rf equivalent” PP beam in place of Au beam.

Overall summary: The test was very successful.

1) The 9MHz Common Cavity was very robust against the transients experienced during the gymnastic.
2) The circulating “Au” beam was not adversely impacted by the 9MHz Common Cavity voltage.

We are evaluating the results and the overall P-Au RF plan, and may ask for further development time if deemed necessary.

Circumference Lengthening

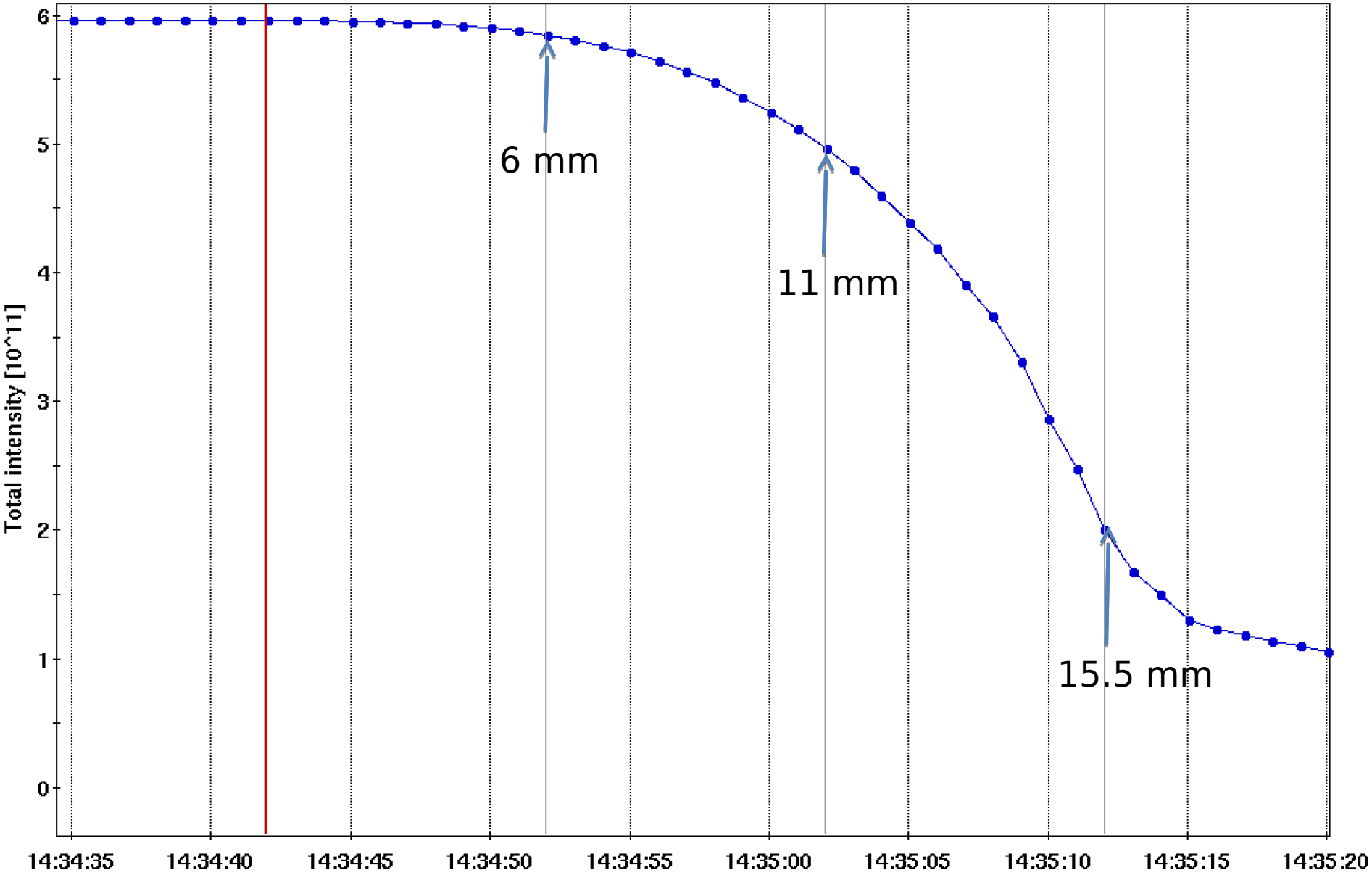
03/27/15 measurements

V. Ptitsyn, Y. Hao,
A. Marusic, G. Robert-Demolaize,
T. Roser, D. Trbojevic

Summary

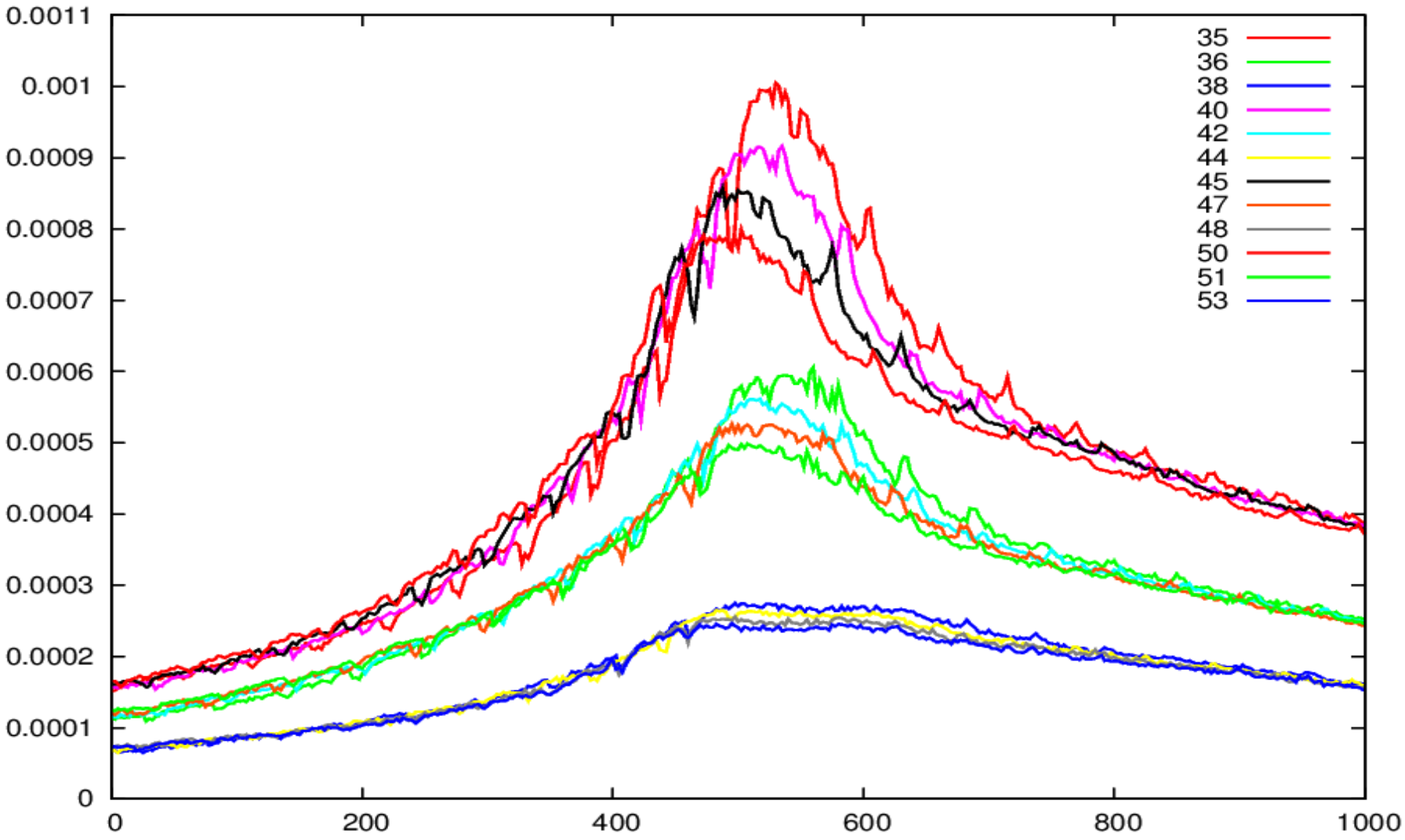
- Measurements were done at the injection
- Guillaume and Al were doing ramp tuning using tune feedback.
- Sextupoles settings had to be re-typed by hand (they were changed when tune changes were applied)
- Used momentum change dp/p up to 0.01 (radial shift more than 15 mm in arcs)
- Measured chromaticity was quite different from expected.

Good ramp


Total intensity [10^11]
6
5
4
3
2
1
0
6 mm
11 mm
15.5 mm
14:34:35
14:34:40
14:34:45
14:34:50
14:34:55
14:35:00
14:35:05
14:35:10
14:35:15
14:35:20

Transverse Impedance Measurement

M. Blaskiewicz, K. Mernick



E-lens related beam-beam experiment

03/25/2015

Kevin Mernick, Vladimir Shiltsev, Claudia Tambasco, Al Marusic, Peter Thieberger, Michiko Minty, W. Fischer, Y. Luo, X. Gu

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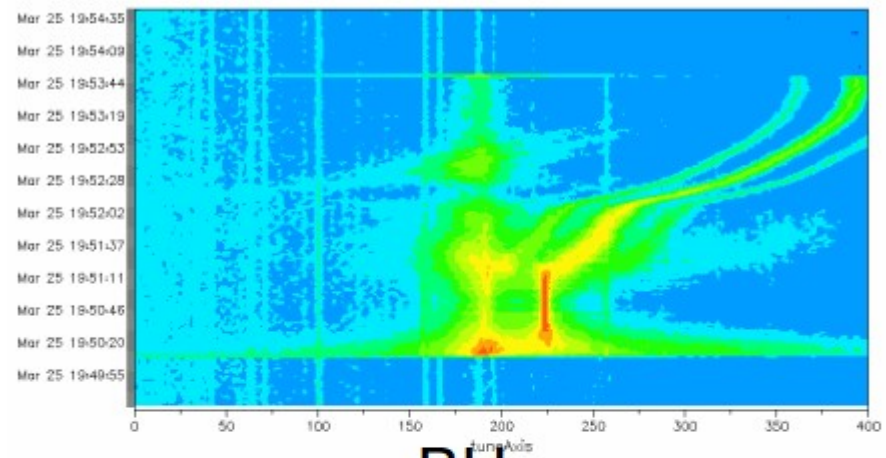
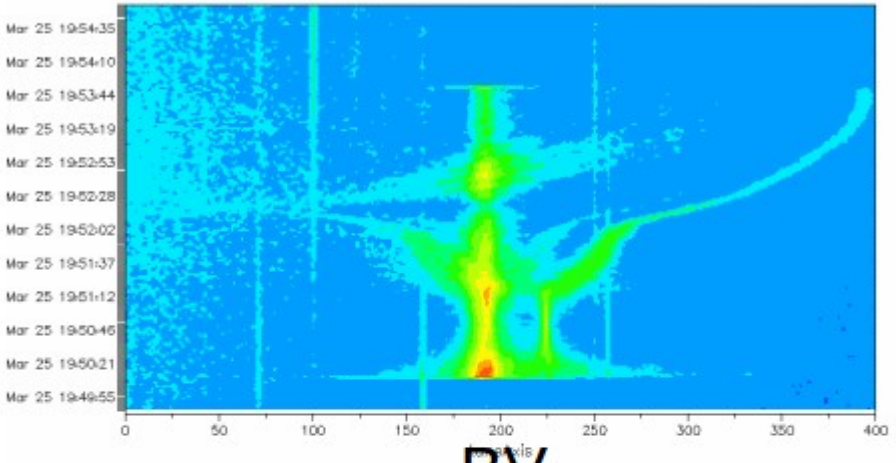
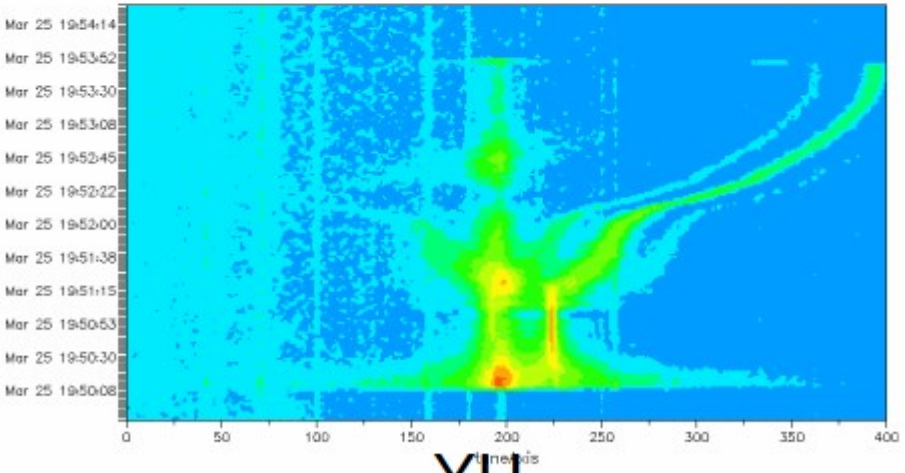
BBQ DSA spectrum (DSA y-axis is in dB)



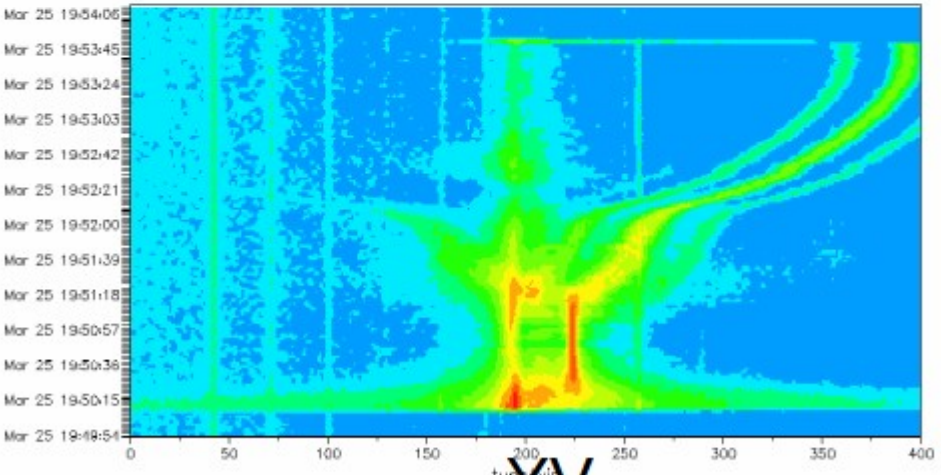
BH



BV



YH



YV

Store without and with e-lens

1. The first Store Without e-lens: tune change for better working point;

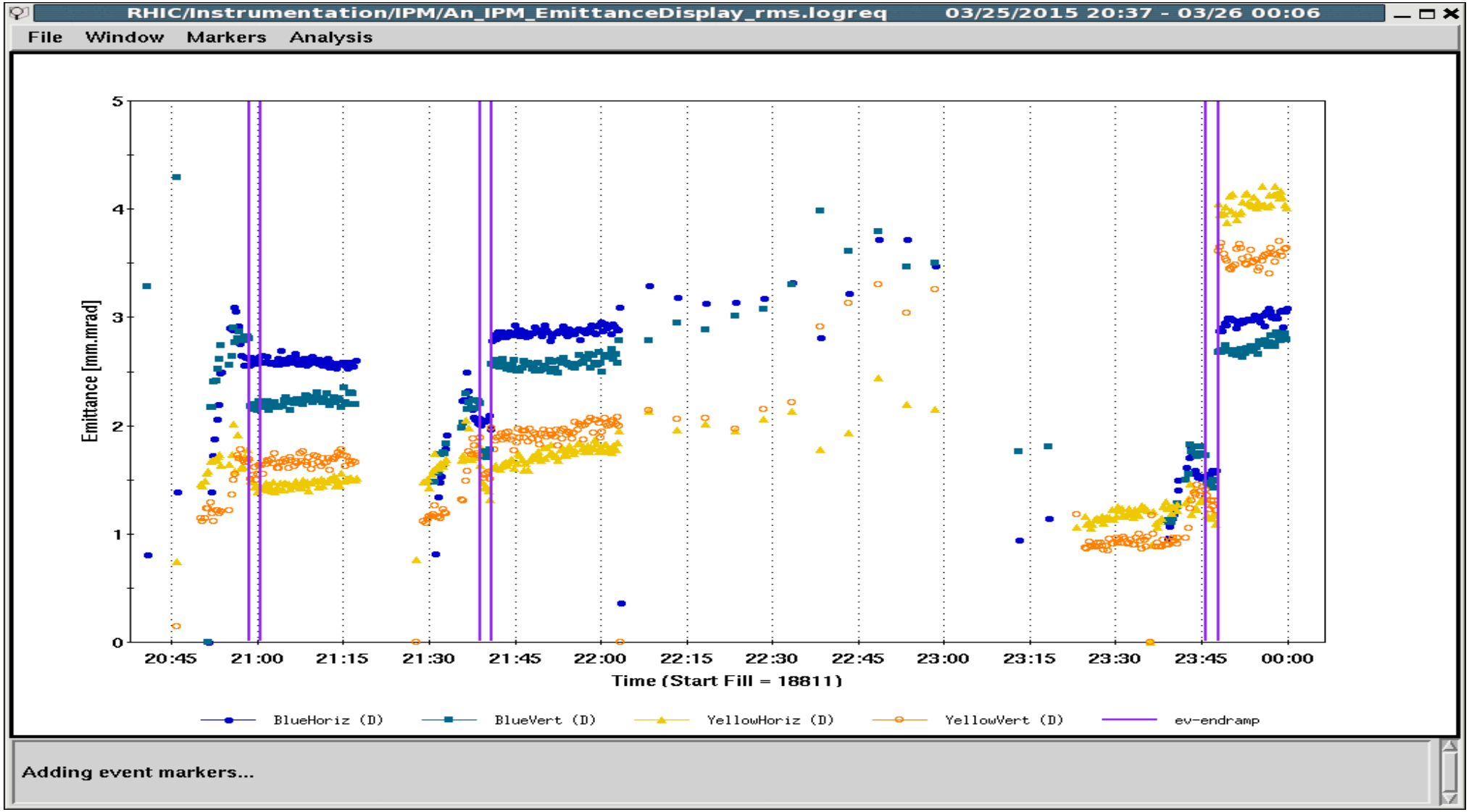
2. The second store with e-lens: nominal store tune;

3. The third store with e-lens: nominal ture;

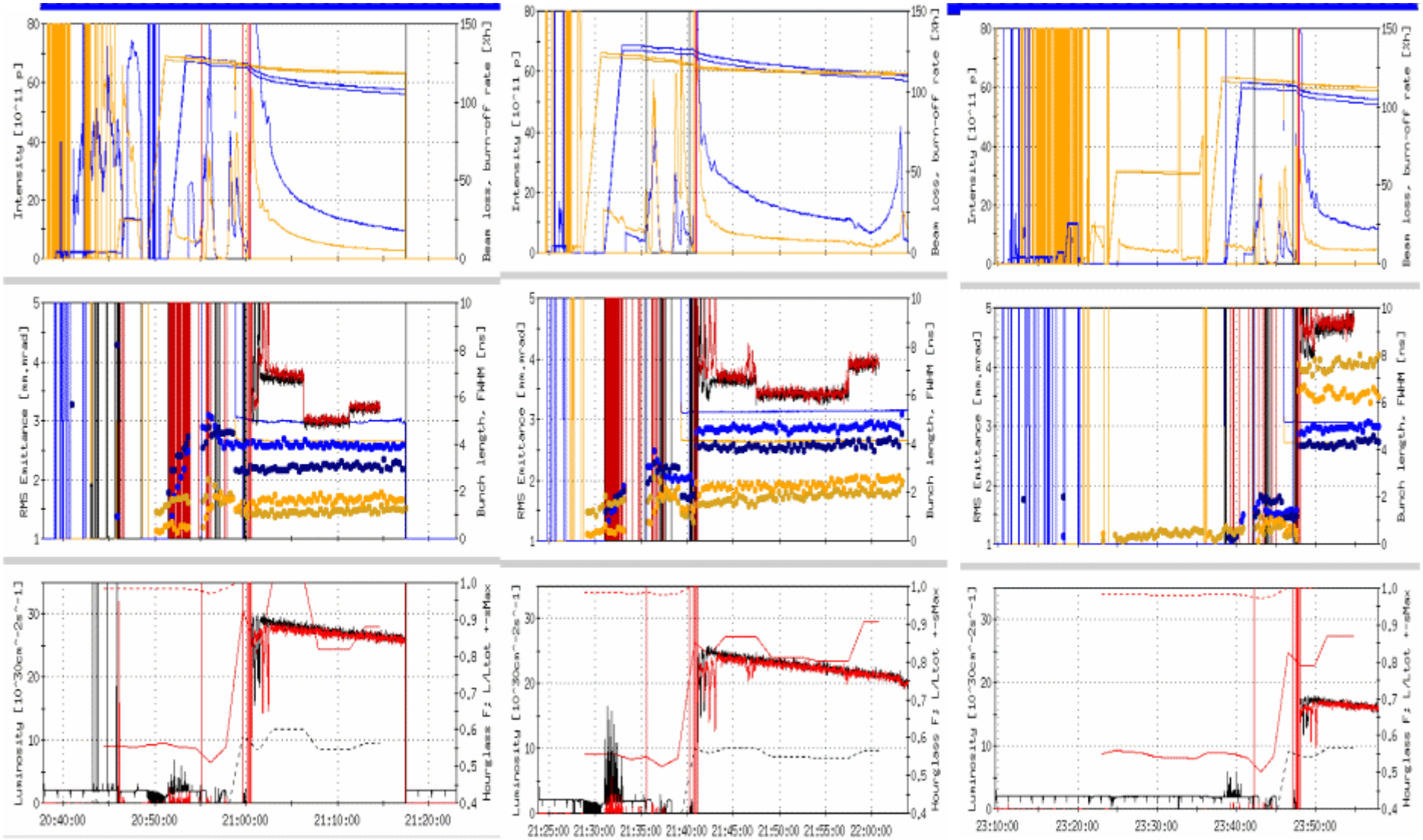
- but Blue hor chromatictiy reduced from 5 to 2 in store stone.
- Octupoles set to zero (were -3 m^{-3}) in store stone
- Hor orbit at Blue e-lens changed.
- e-beam size reduced from 0.75 to 0.64 mm.

4. Fill Pattern = 30x30; Intensity = ~2.3E11;Emittance: <2 mm mrad

Emittance Blowup into collision:



Store Analysis:



First Store Second Store Third Store

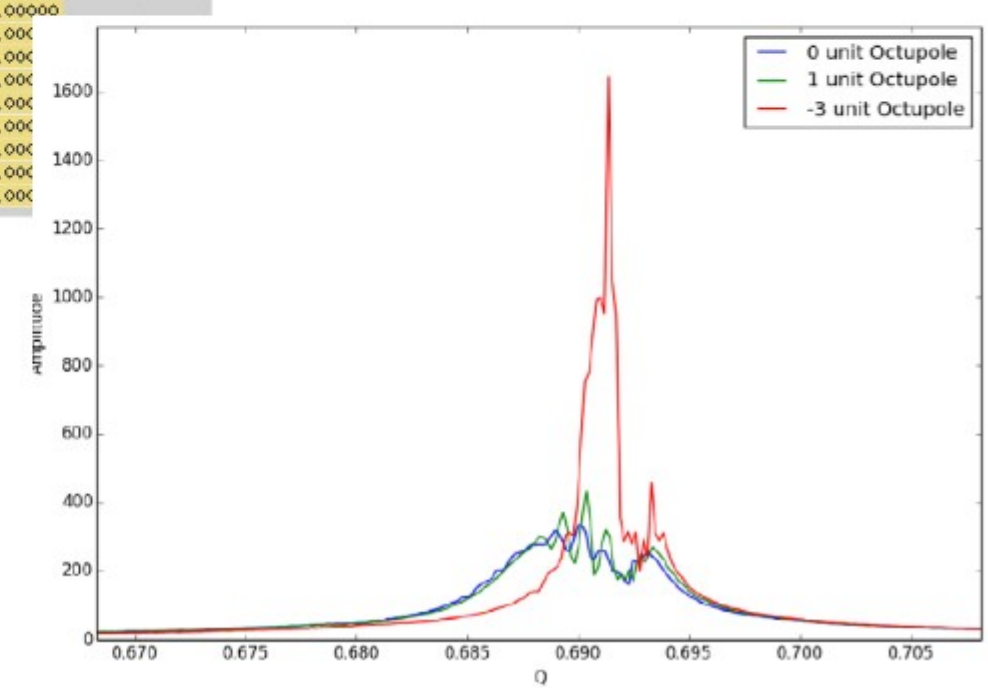
BTF with octupoles

Pebble | Blue | Yellow | Green

QUAD
SEXTUPOLE
H_STEER
V_STEER
GAMMA
SKEW_QUAD
SKEW_SEXT
NONLINEAR
ABORT
BEND
HELIX
RF

Family	Design	Trim	BDesign	BTrim
y-octd-disp	0.00000	3.00000	0.00000	-3.00000
y-octf-disp	0.00000	3.00000	0.00000	-3.00000
y-octd-nodisp	0.00000	3.00000	0.00000	-3.00000
y-octf-nodisp	0.00000	3.00000	0.00000	-3.00000

Magnet	Design	Trim	BDesign	BTrim
yi6-oct4	0.00000	3.00000	0.00000	-3.00000
yi6-oct5	0.00000	3.00000	0.00000	-3.00000
yi7-oct10	0.00000	3.00000	0.00000	-3.00000
yi7-oct11	0.00000	3.00000	0.00000	-3.00000
yo8-oct5	0.00000	3.00000	0.00000	-3.00000
yo8-oct4	0.00000	3.00000	0.00000	-3.00000
yo9-oct10	0.00000	3.00000	0.00000	-3.00000
yo9-oct11	0.00000	3.00000	0.00000	-3.00000
yi10-oct4	0.00000	3.00000	0.00000	-3.00000
yi10-oct5	0.00000	3.00000	0.00000	-3.000
yi11-oct10	0.00000	3.00000	0.00000	-3.000
yi11-oct11	0.00000	3.00000	0.00000	-3.000
yo12-oct5	0.00000	3.00000	0.00000	-3.000
yo12-oct4	0.00000	3.00000	0.00000	-3.000
yo1-oct10	0.00000	3.00000	0.00000	-3.000
yo1-oct11	0.00000	3.00000	0.00000	-3.000
yi2-oct4	0.00000	3.00000	0.00000	-3.000



Change Blue QX' down 3 unit

Notices

- The 4rd APEX Session:

  April 8, 16 hours, 8:00 – 24:00

- Beam time request:

  APEX weekly meeting,

  April 3, LCR, 10am

- Future Plan:

  the 5th APEX Session: April 22, 2015