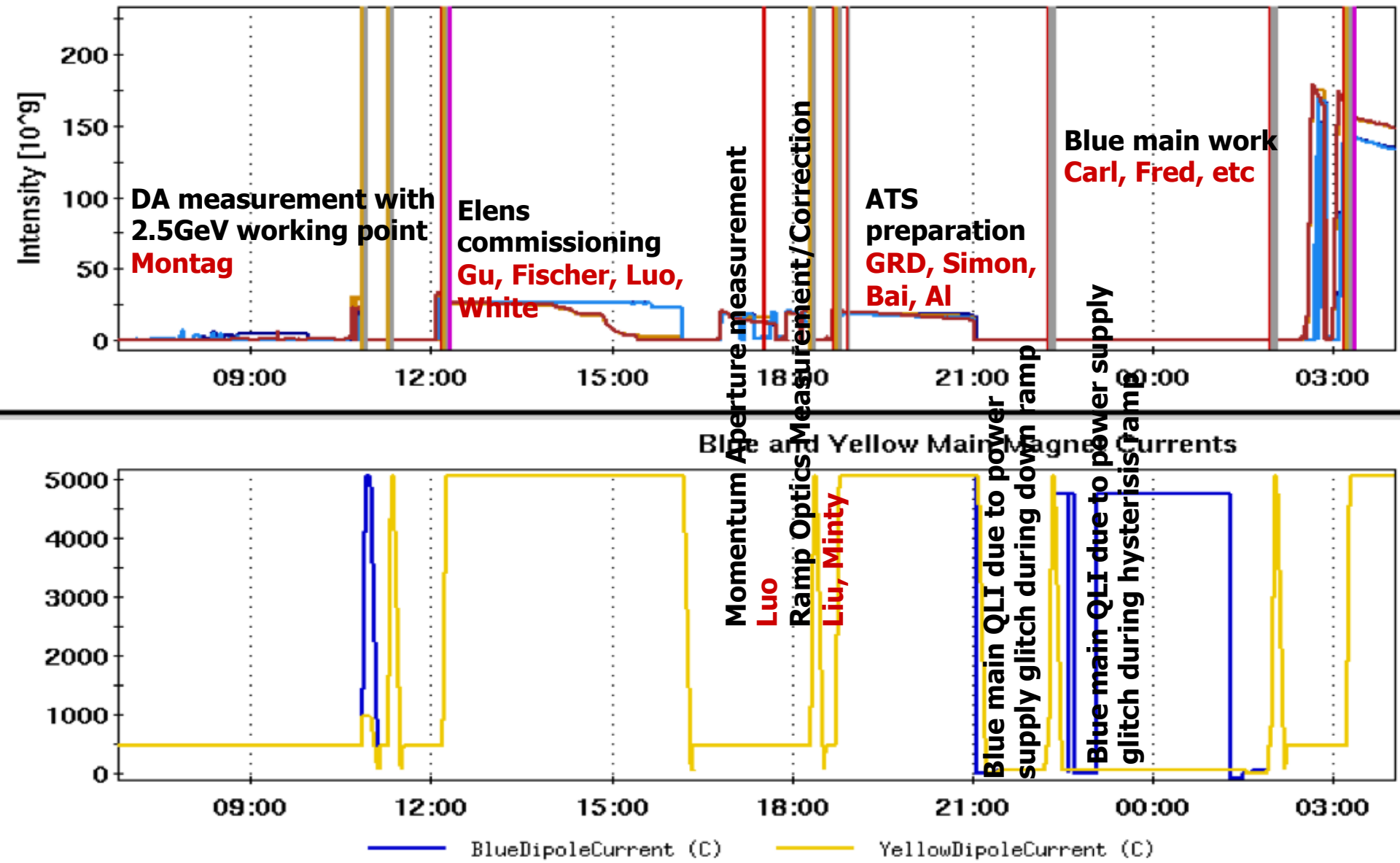
APEX RUN-14

APEX Schedule April 9, 2014

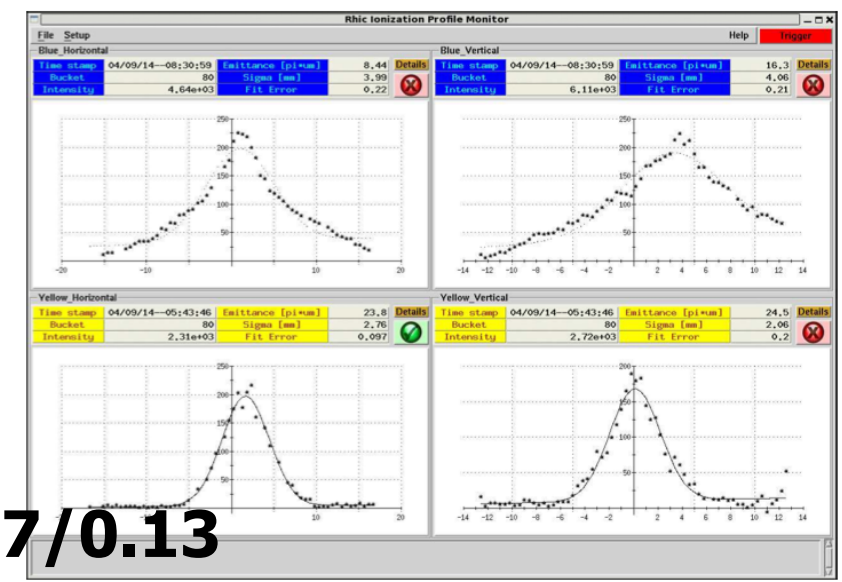
Injection	Store	Store	Injection	Store	Injection		
DA measurement with 2.5GeV working point Montag	Elens commissioning Gu, Fischer, Luo, White	Momentum Aperture measurement Luo Ramp Optics Measurement/Correction Liu, Minty	Coupling matrix measurement Tepikian Stochastic Cooling Kicker impedance measurement White, Blaskiewicz	ATS preparation GRD, Simon, Bai, Al	AC dipole setup, aperture scan Bai, Oddo	Back2Physics	2 APEX hours in the 5 hour low lumi store during daytime of April 10, 2014
8:00am	10:00am	2:00pm	4:30pm	5:30pm	8:30pm	9:00pm	10:00pm

APEX Overview

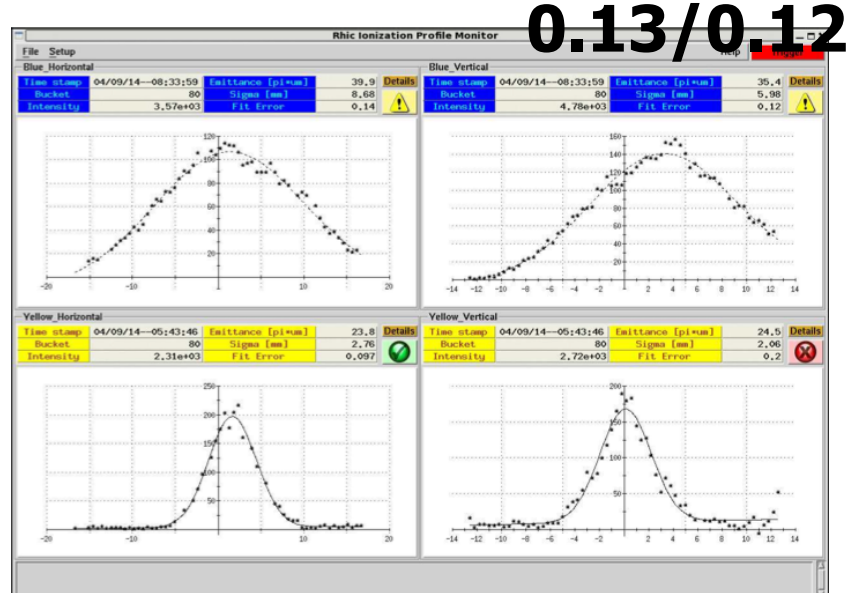


Dynamic aperture measurements at injection: Montag

- Measured beam profiles are not Gaussian in most cases, making quantitative analysis difficult
- Qualitatively, the measurement confirmed that the dynamic aperture at the low energy tune (.17/.13) is worse than at other tunes, especially .13/.12, which had been used at other low energies
- Measurement is quick; can and should be repeated parasitically to other APEX studies



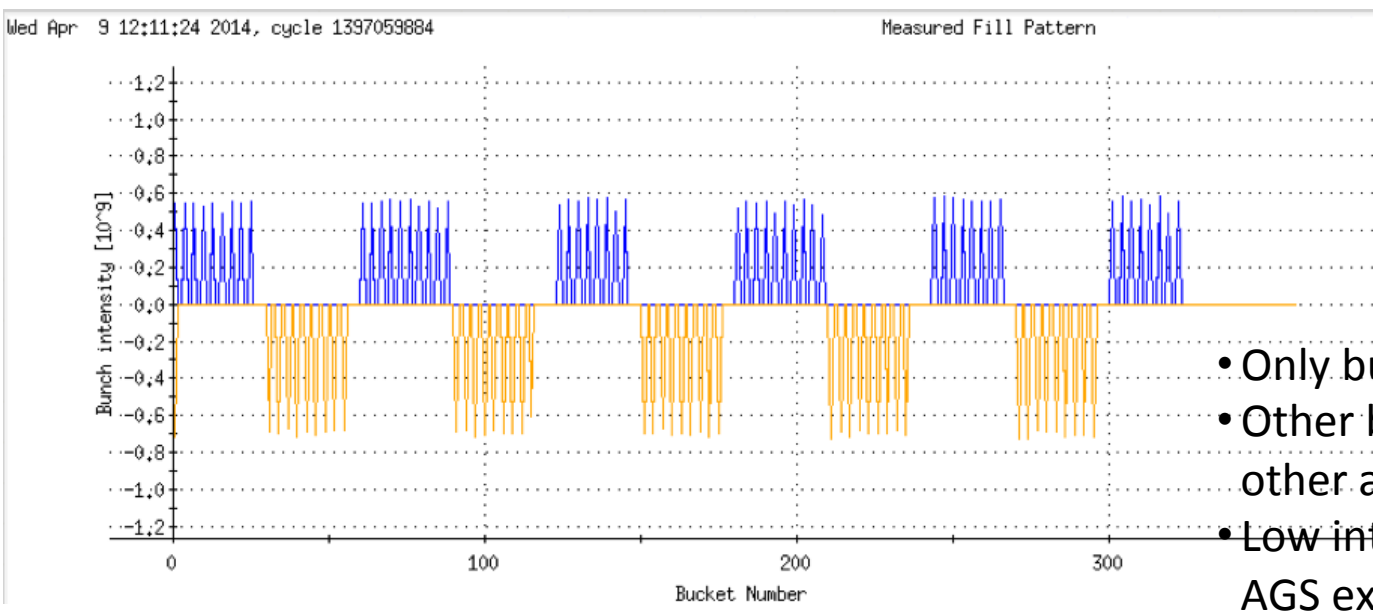
0.17/0.13



0.13/0.12

Elens: Gu, Fischer, White, Luo, etc

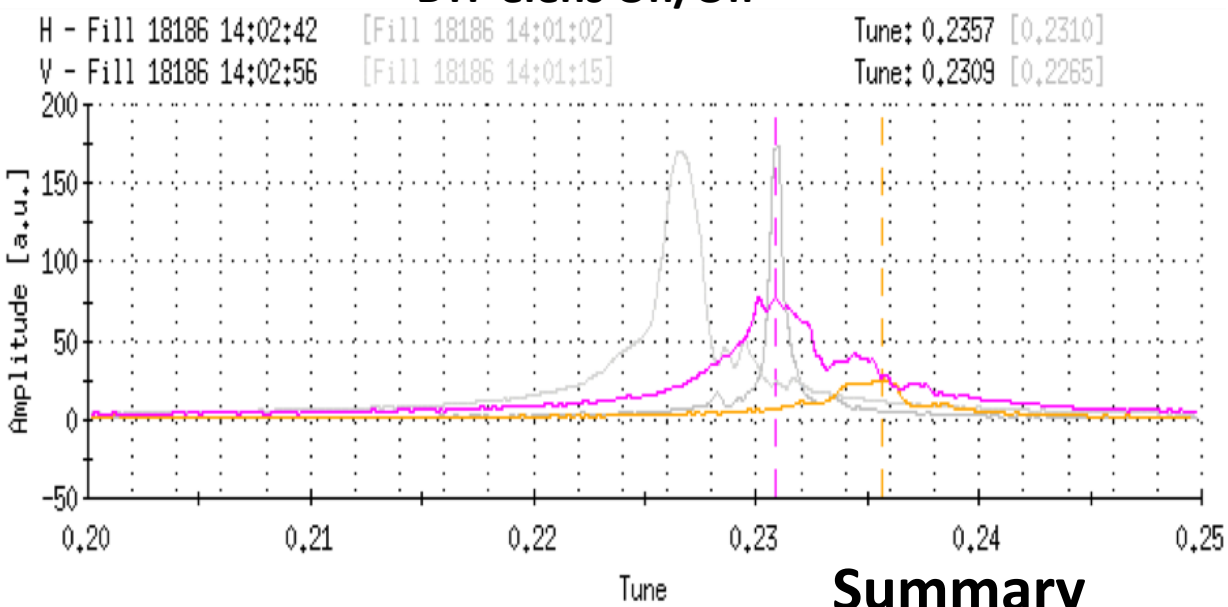
- Goal - transverse alignment of electron and ion beams
  - displacement using the elens corrector magnets
  - Initially planned for both beams but 2h were lost due to machine unavailability → only yellow could be done
- Relevant parameters:
  - Ions: σ~0.35-0.25mm, β=8m
  - Electrons: N~2.2e11 (1.0A), σ~0.5mm, β_{rel}~0.2



- Only bunch 1 colliding in PHENIX
- Other bunches do not see each other anywhere (included elens)
- Low intensity due to issues with AGS extraction

Elens: Gu, Fischer, White, Luo, etc

BTF elens On/Off



$$\xi = \frac{Z}{A}\frac{N_e r_p \beta}{4\pi\gamma_p \sigma_e^2}(1+\beta_e) \approx 0.004$$

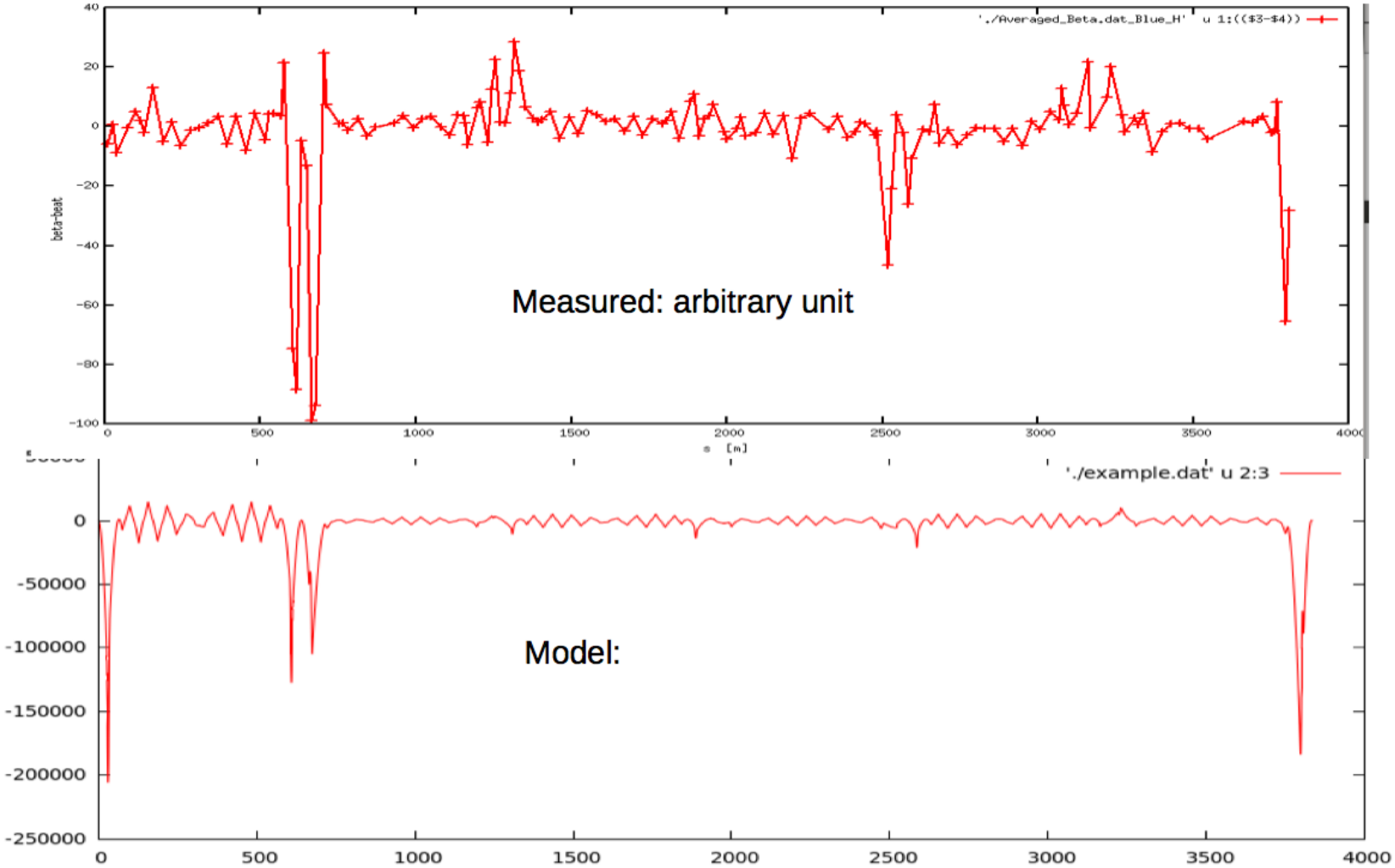
Summary

- Had only 2h (+30minutes thanks to Yun) of beam time over the 4h initially planned: could work only on yellow
- Beam alignment done using tune and orbit data (orbit to be analyzed)
- Unfortunately not data from the backscattered electron detector available online
- First test with DC beam:
  - Cooled ions good lifetime: it should be possible to make it almost transparent with finer tune adjustments
  - Matching the ion beam size to the electrons, clear degradation, could be due to tail generation: beam blown-up in an “uncontrolled” way

Momentum Aperture Measurement

Al, cait, chuyu, Michiko, **Yun**

Off-momentum Beta-beat



Momentum Aperture Measurement

Al, cait, chuyu, Michiko, **Yun**

Summary

1) Measured off-momentum beta-beat on uncorrected 0.7mm store lattice.

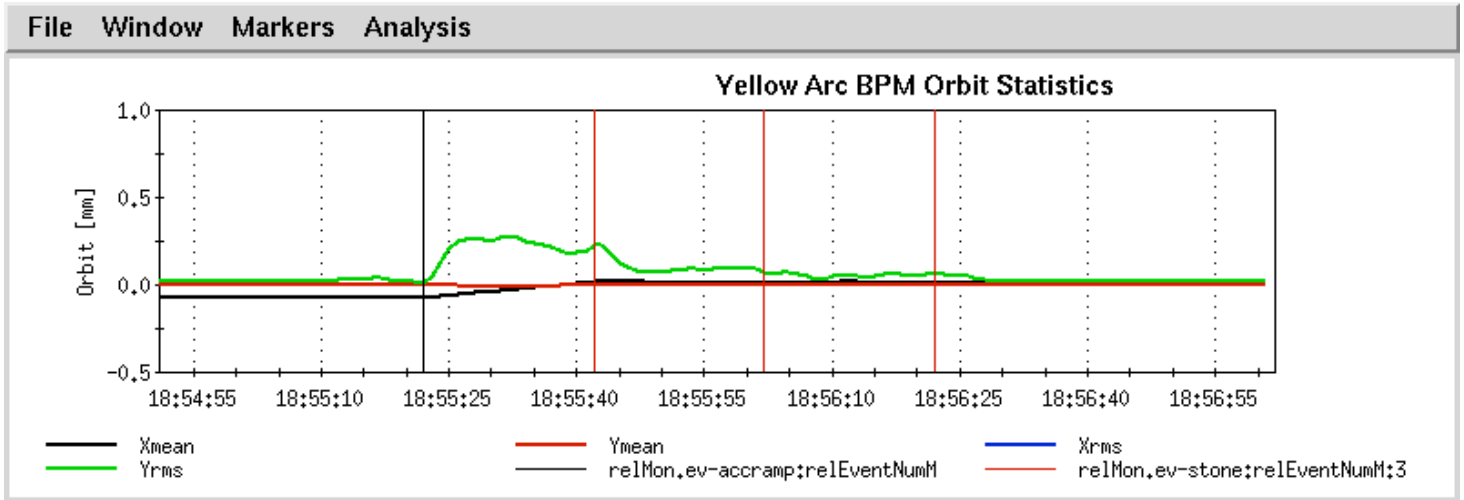
2) Applied corrections with 24 sextupole families, but did not observed much improvement in second order chromaticities.

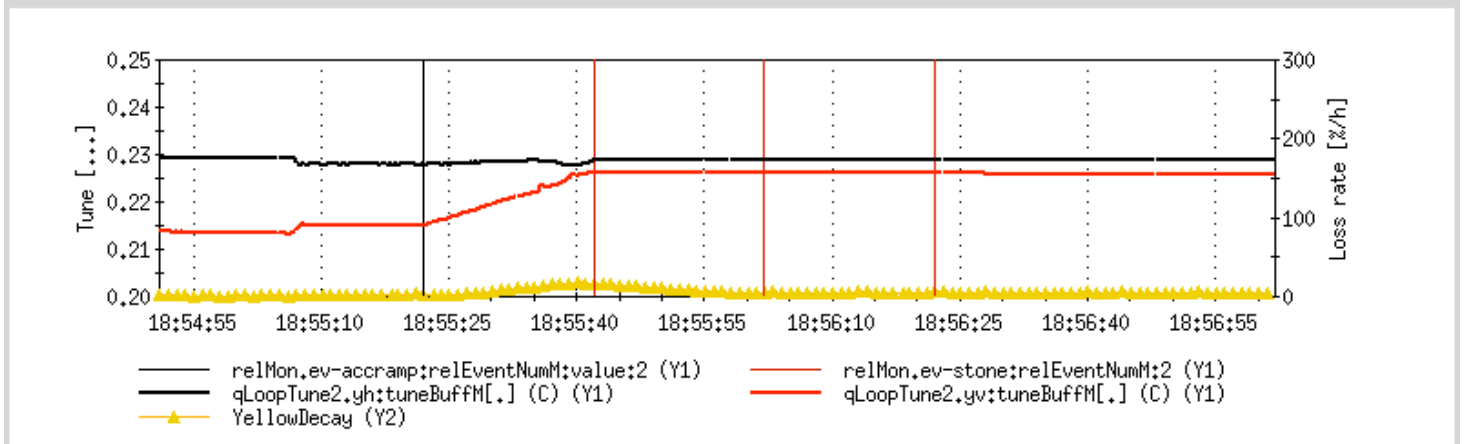
3) Measurement results differ with model predications.

ATS Preparation: GRD, Marusic, Shen, White, Luo, Bai

Latest attempts

- **Regular machine setup for operations, except beams are anti-cogged to allow chromaticities to be measured. Ramp to B+Y 60cm was successful with minimal beam decay rates increase:**





APEX
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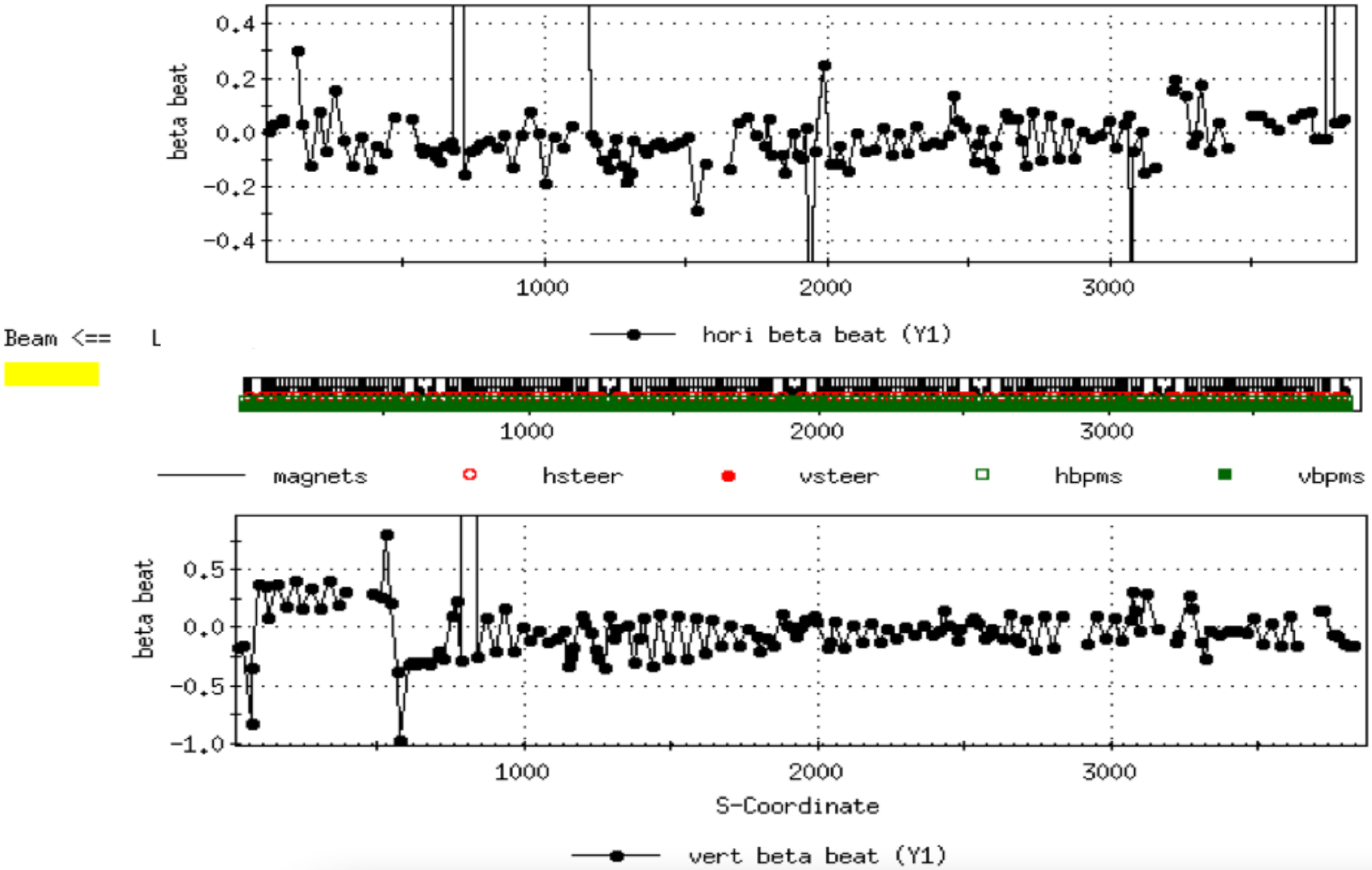
ATS Preparation: GRD, Marusic, Shen, White, Luo, Bai