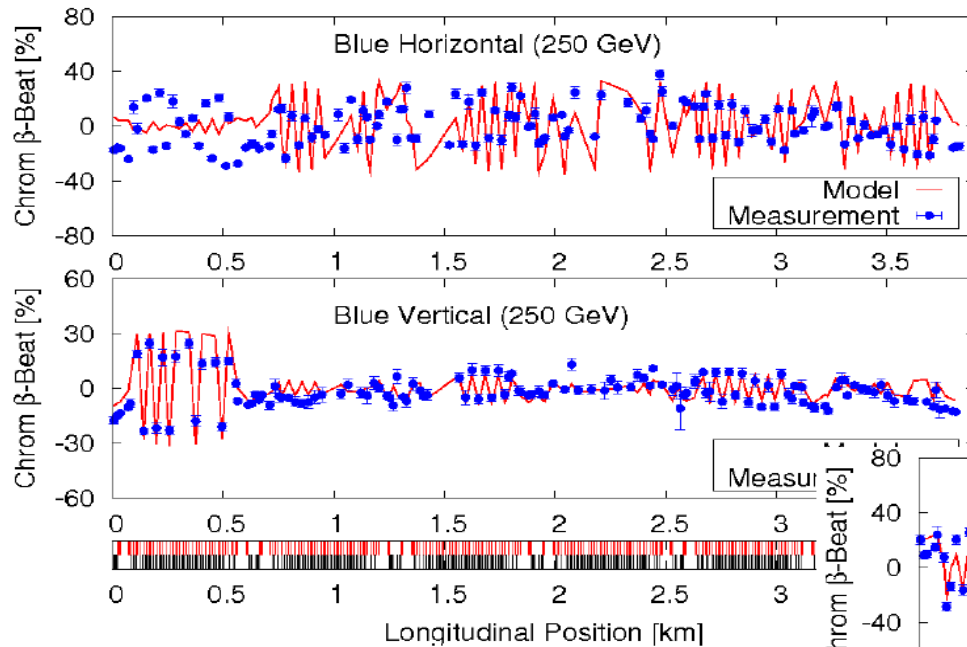


# Status Report on Chromatics Optics Measurements and Correction

M. Bai, R. Calaga, Y. Luo, S. White

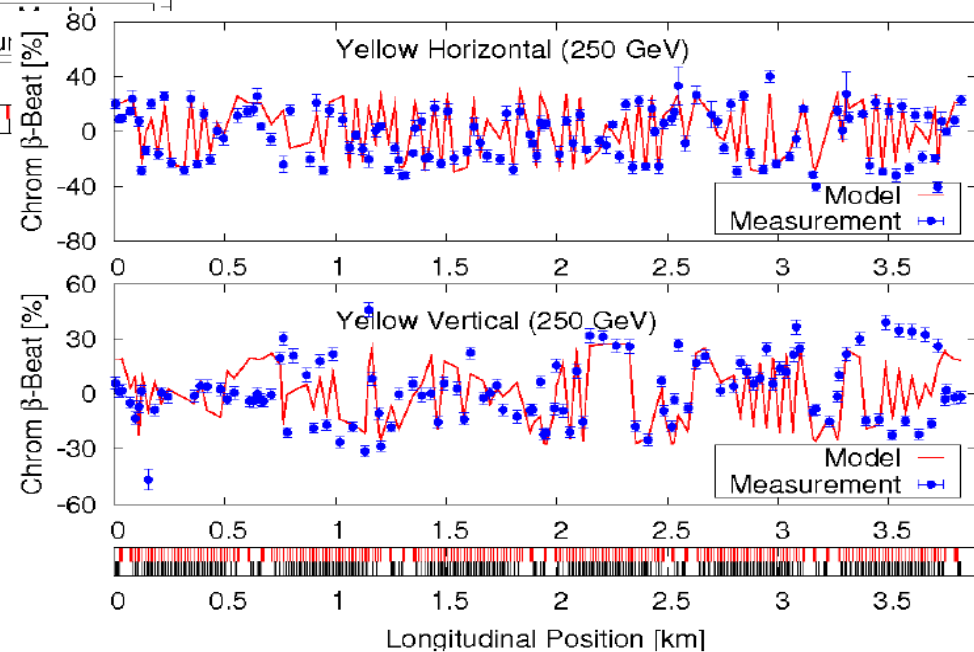
# 2009 Measurements (R. Calaga et al.)

## Chromatic $\beta$ -beat at 250 GeV



About  $\pm 40\%$  chromatic beating in both rings at  $1 \times 10^{-3}$

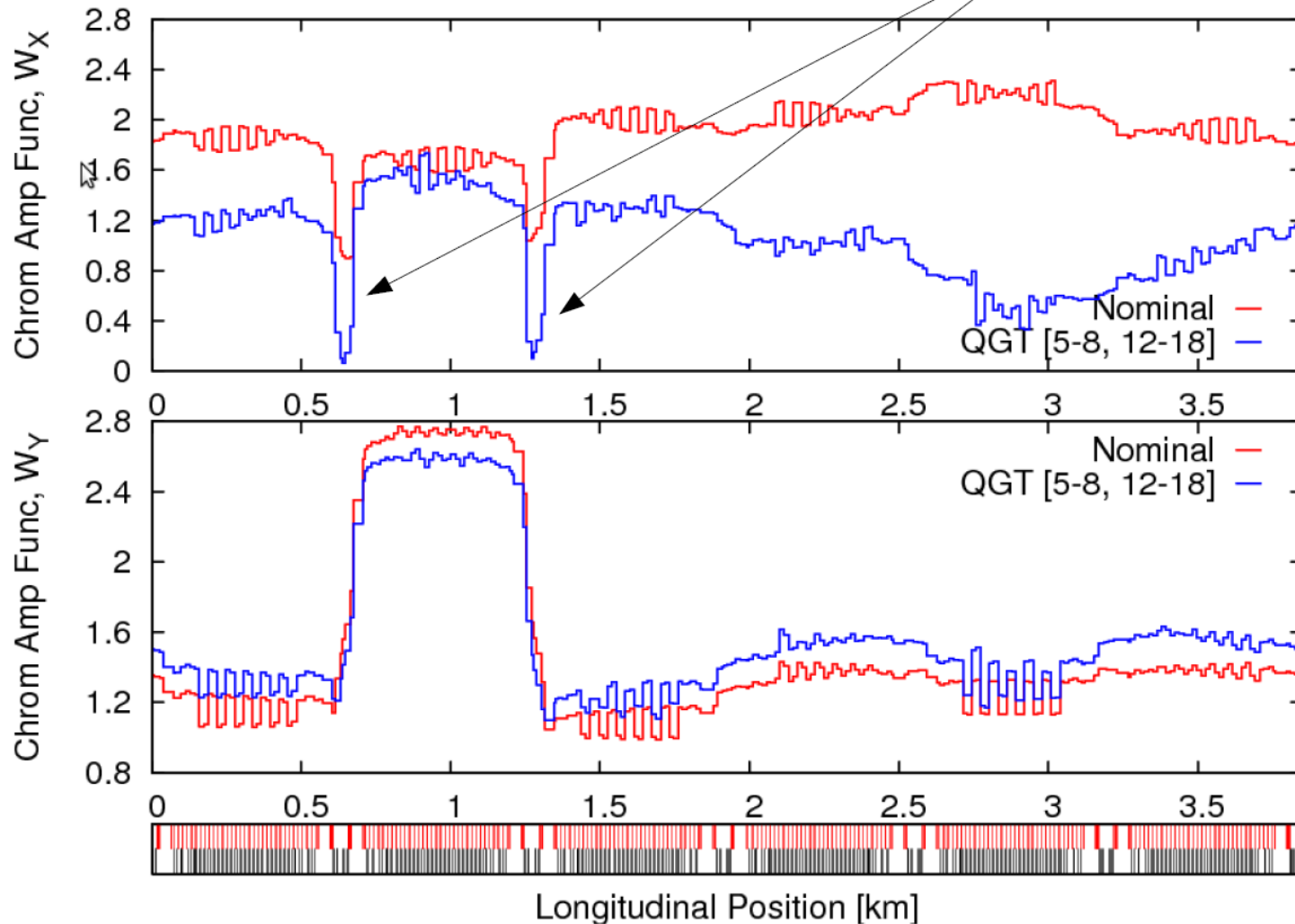
Beating also present in the model



# Proposed Correction

Chromatic Amp Func,  $W_x$  &  $W_y$

Reduction in IP6/8  
QGTs effective



# Initial 2011 Proposal (R. Calaga)

## Experiment Goal:

250 GeV off chromatic optics using kicked data + radial loop

Lifetime measurement at extreme offset ( $\sim 1 \times 10^{-3}$ )

Modify phase advance between IP6-IP8 & check optics, lifetime

## Prerequisites:

2 hrs: 250 GeV setup and radial loop both beams

1-12 bunches per ring, moderate intensity ( $\sim 5 \times 10^{10}$ )

Tune feedback on during phase adv. modification

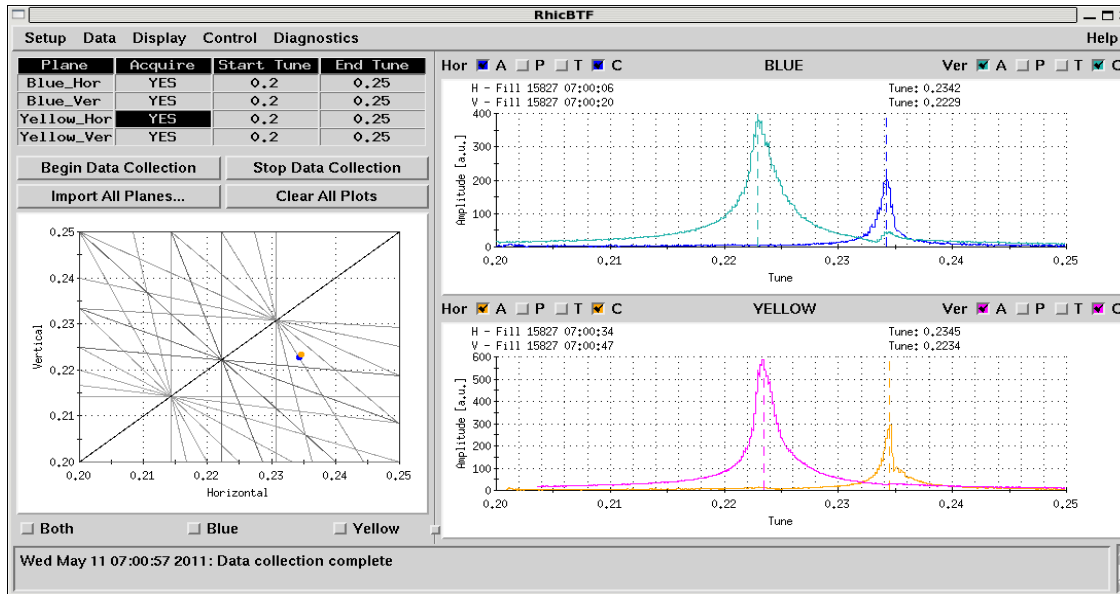
=> Merged with requests from M. Bai and Y. Luo: 2h assigned overall, first take measurements

# Summary

- APEX session planned from 6-8am. Summary (from elog):
  - Started ramp at 6:25 only
  - 6:37-7:02: chromaticity, tune adjustments
  - 7:06-7:24: on-momentum measurement for blue and yellow with AC-dipole
  - ~7:30: beams lost during radial steering
  - 7:30-8:00: back to injection, exercised radial, and tune kicker script
- Achieved on-momentum measurements for both beams simultaneously for the first time



# Outstanding Issues

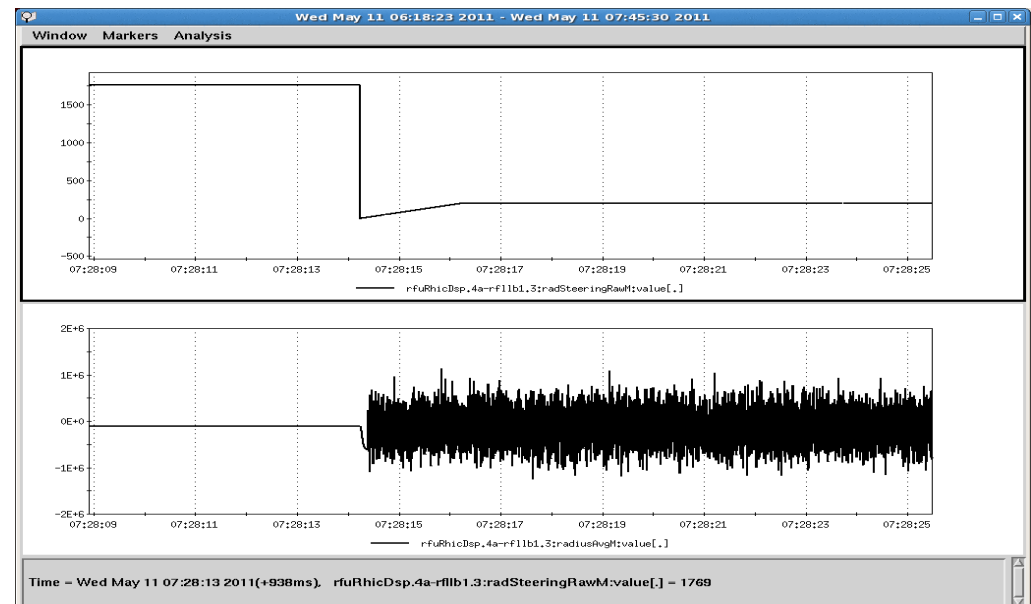


Setting-up the chromaticity:

“The other headache is to minimize the tune spread by tweaking chroms at store. Very ineffective in vertical. We tried to change the Blue V chrom in both directions, couldn't get more than 200 turns of coherent oscillations. Also, this exercise indicated that Blue V chrom is on the negative side.”

Radial steering:

From elog: “Beam was loss due a to a 1.69mm step on the radial steering function which came as a result of starting the function from zero instead of the offset value left in by the orbit feedback.”



# Proposal for next Experiment

- Repeat baseline measurements (AC dipole and tune kicker)
- Off-momentum optics measurements and correction:
  - Check available range, lifetime at maximum offset
  - Apply corrections (phase advance between IP6 and IP8) + tune feedback
  - Dump, inject ramp, repeat measurements and check for improvements
- Requirements:
  - 2h beam time
  - 2 ramps / same beam conditions as Wednesday
  - Measurements can be done in common with Yun and Mei, corrections have to be done separately (different scheme)