

# Off Momentum Beta-Beat Exp

M. Aiba, R. Calaga, R. Tomas, G. Vanbavinckhove, May 13, 2009

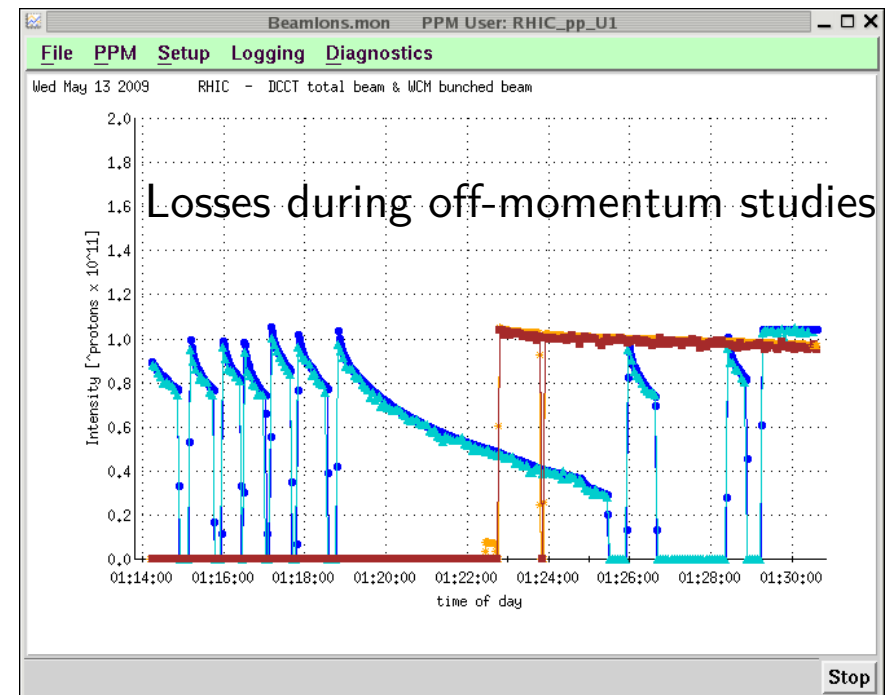
Experiment Goal:

Injection measurements of kicked data (on/off momentum)

Test optics package from the LHC

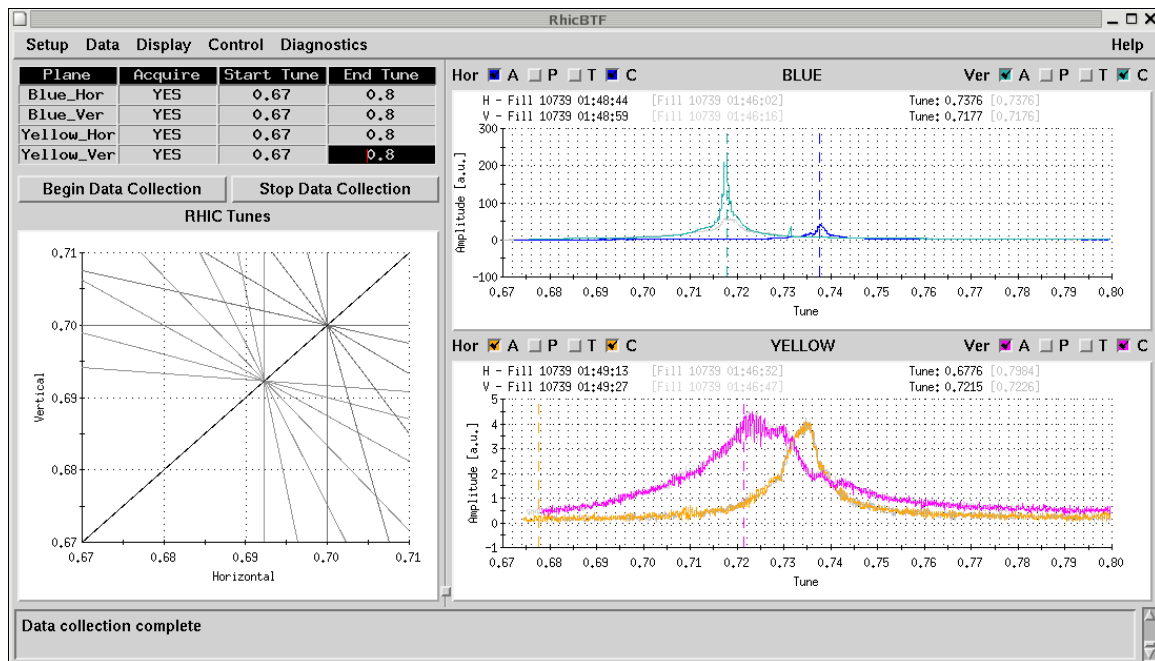
Measure off-momentum beta-beat @injection

2 hrs: Most of the time in setup due to blue beam loss, chromaticity



Ack: R. DeMaria, R. Miyamoto, T. Satogata

# Injection Conditions

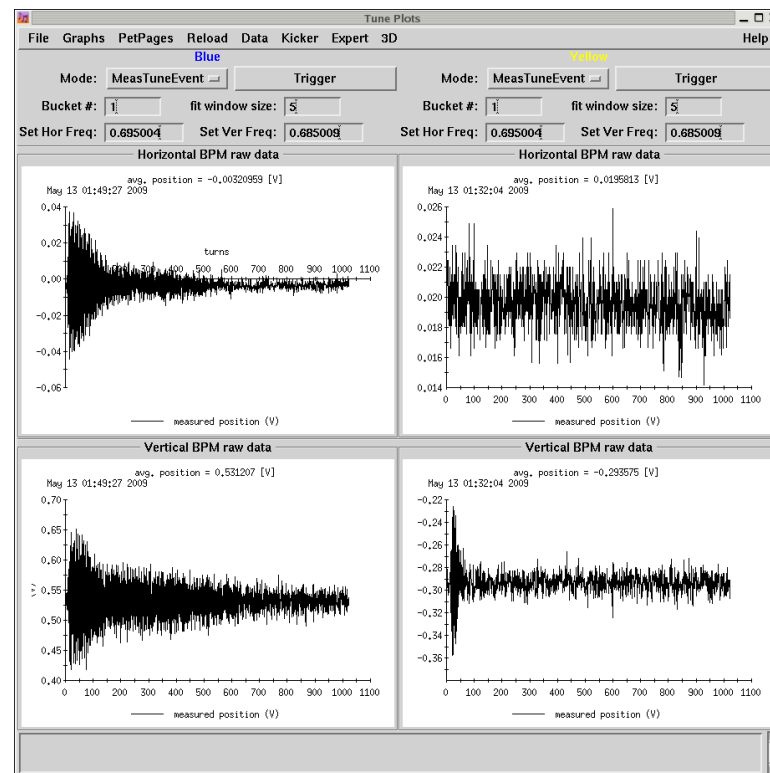


$$Q_x = 0.736, Q_y = 0.717$$

$$\text{ChromX} = 2.6, \text{ChromY} = 1.5$$

$$\epsilon_x = 12 \mu\text{m}, \epsilon_y = 21 \mu\text{m}$$

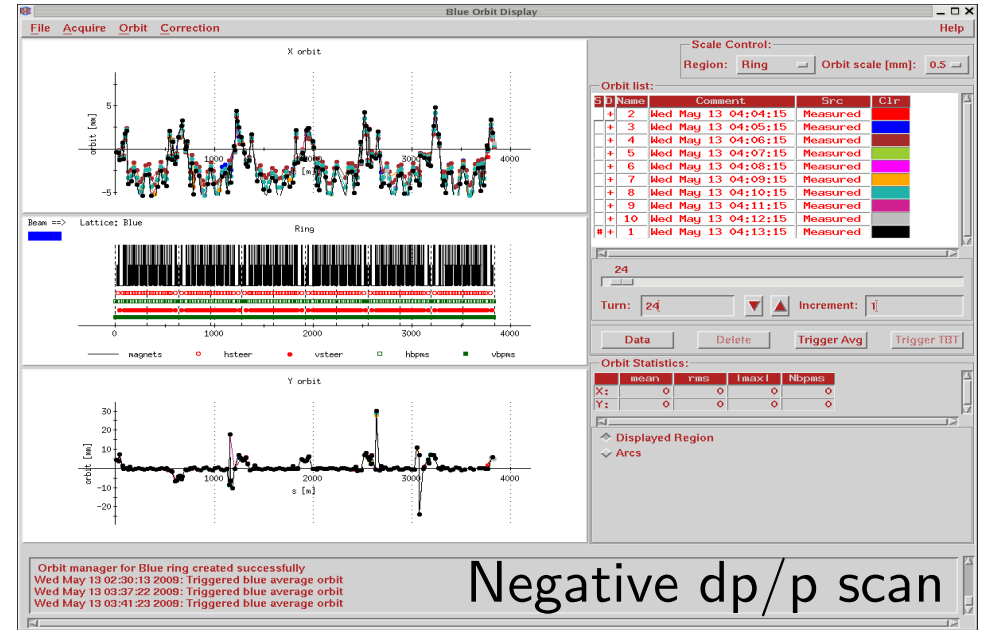
200-500 turns of coherence



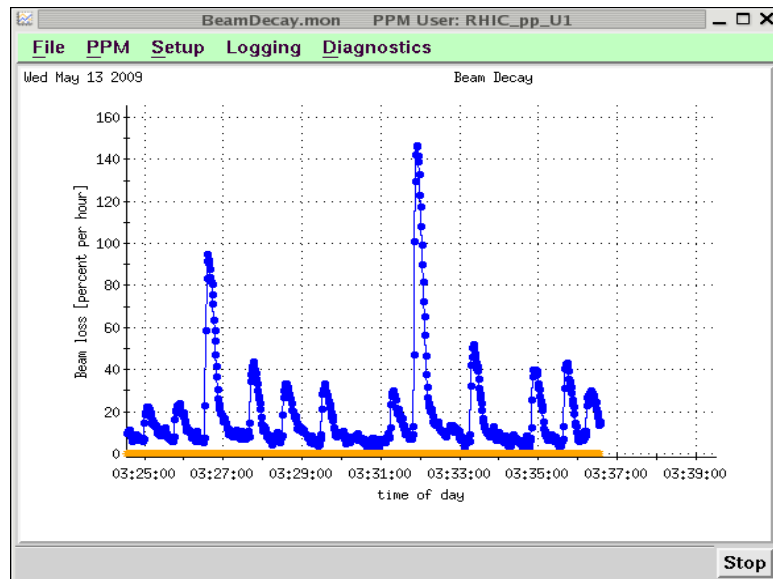
# Off-Momentum Scans



Positive dp/p scan



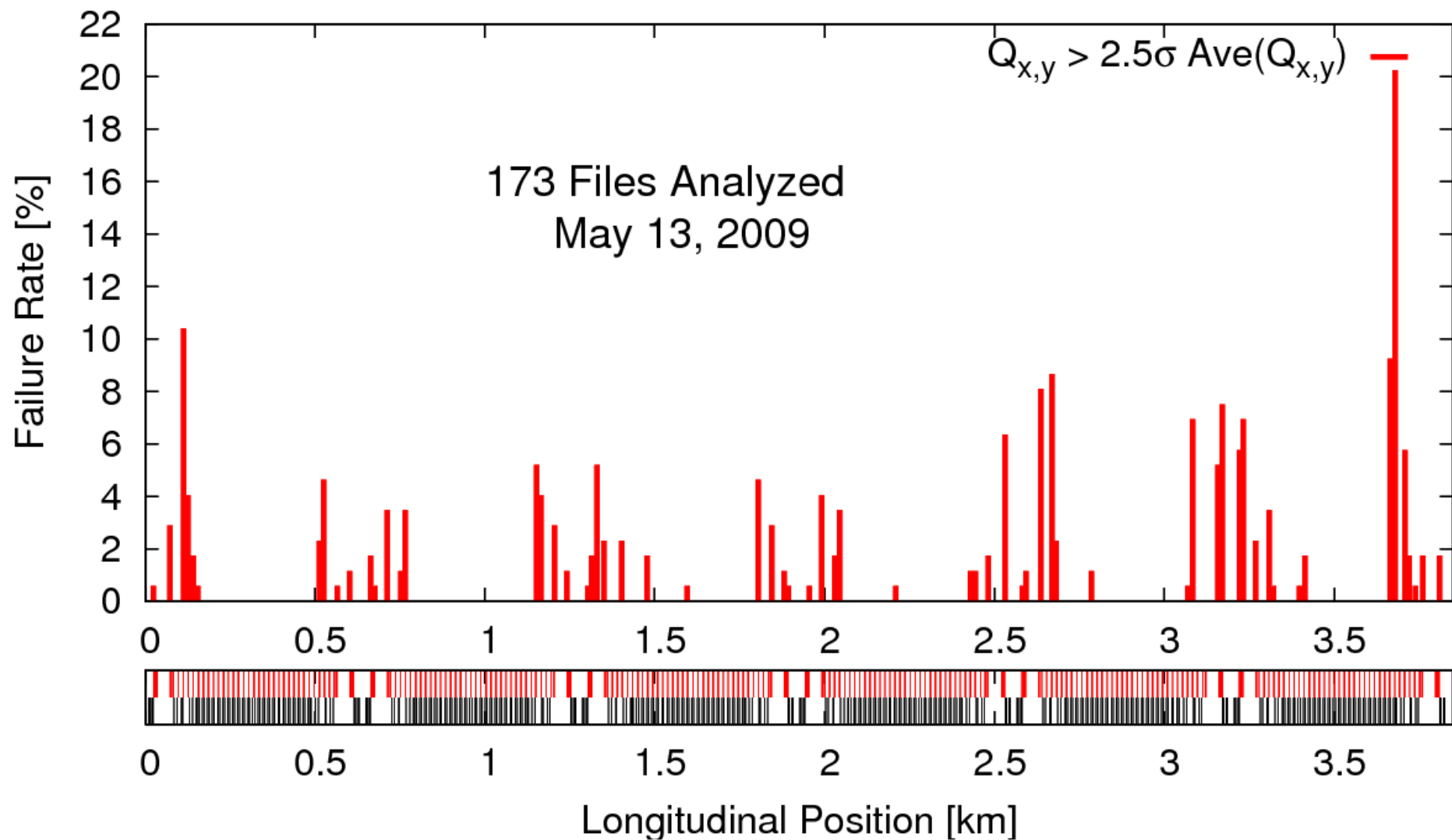
Negative dp/p scan



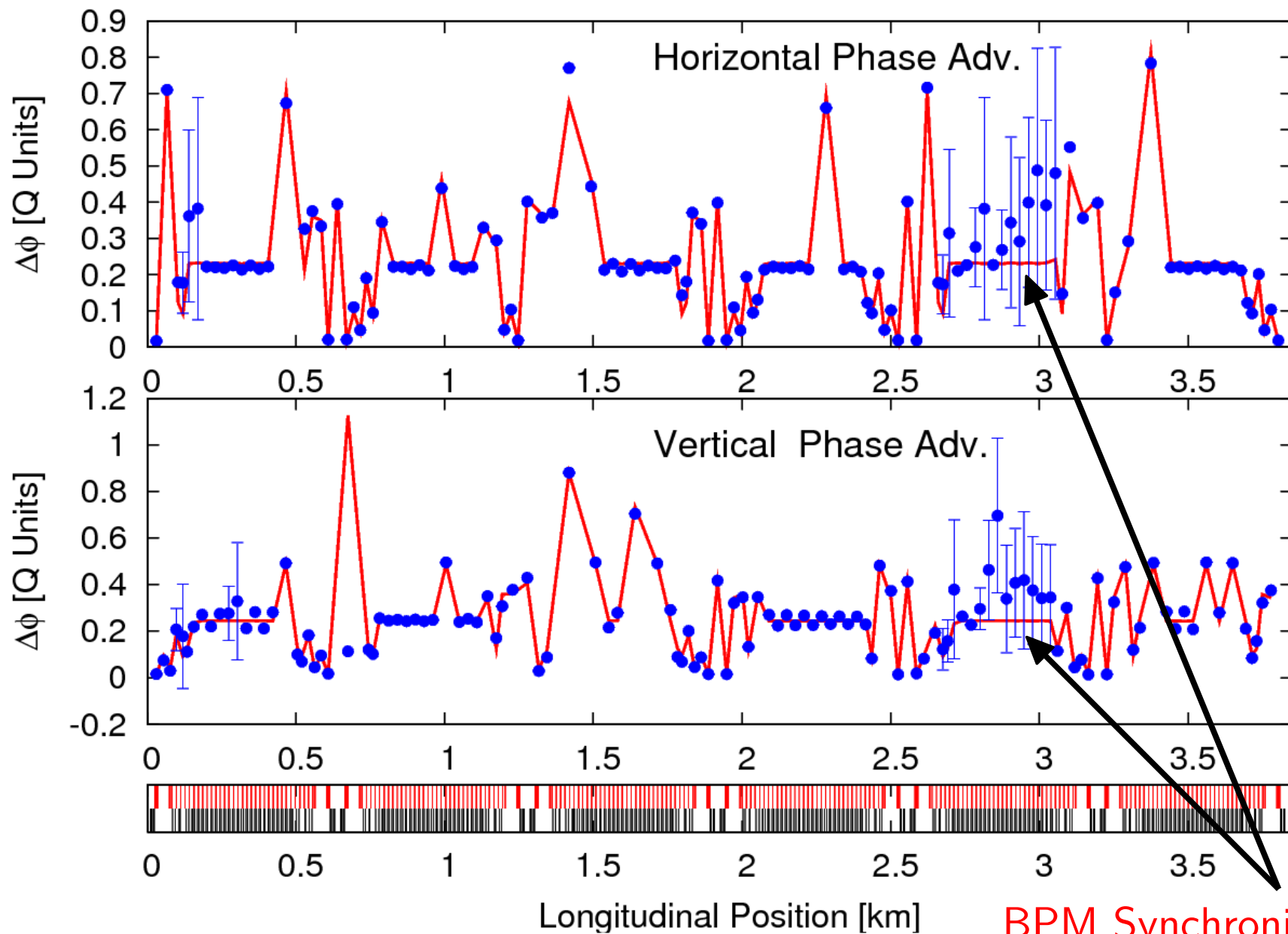
Losses during the positive dp/p scan  
0-3.5 mm radially ( $\sim 3 \times 10^{-3}$ )

Data taken after loss rate settles

# BPM Failure, Tune Filtering

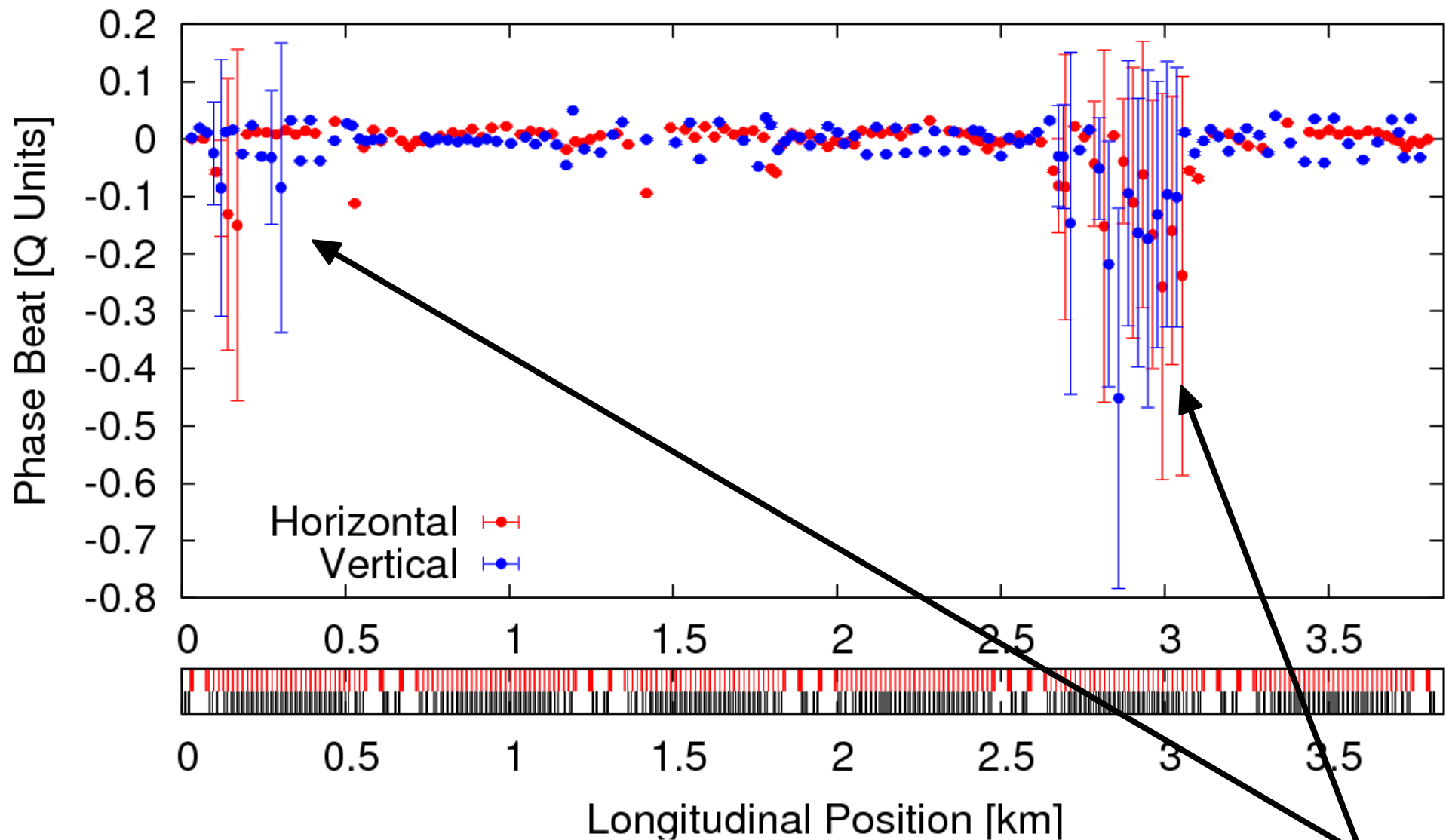


# Phase Advance, Blue Injection



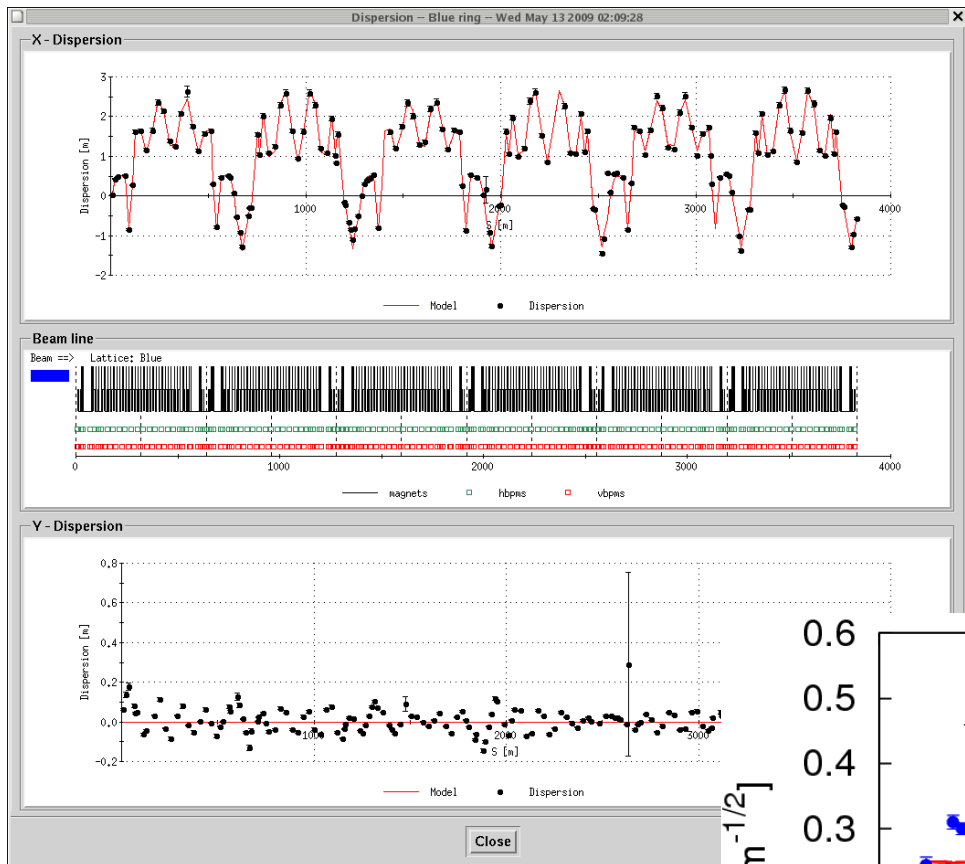
BPM Synchronization ?

# Phase Beat, Blue Injection



BPM Synchronization ?

# Dispersion Measurements

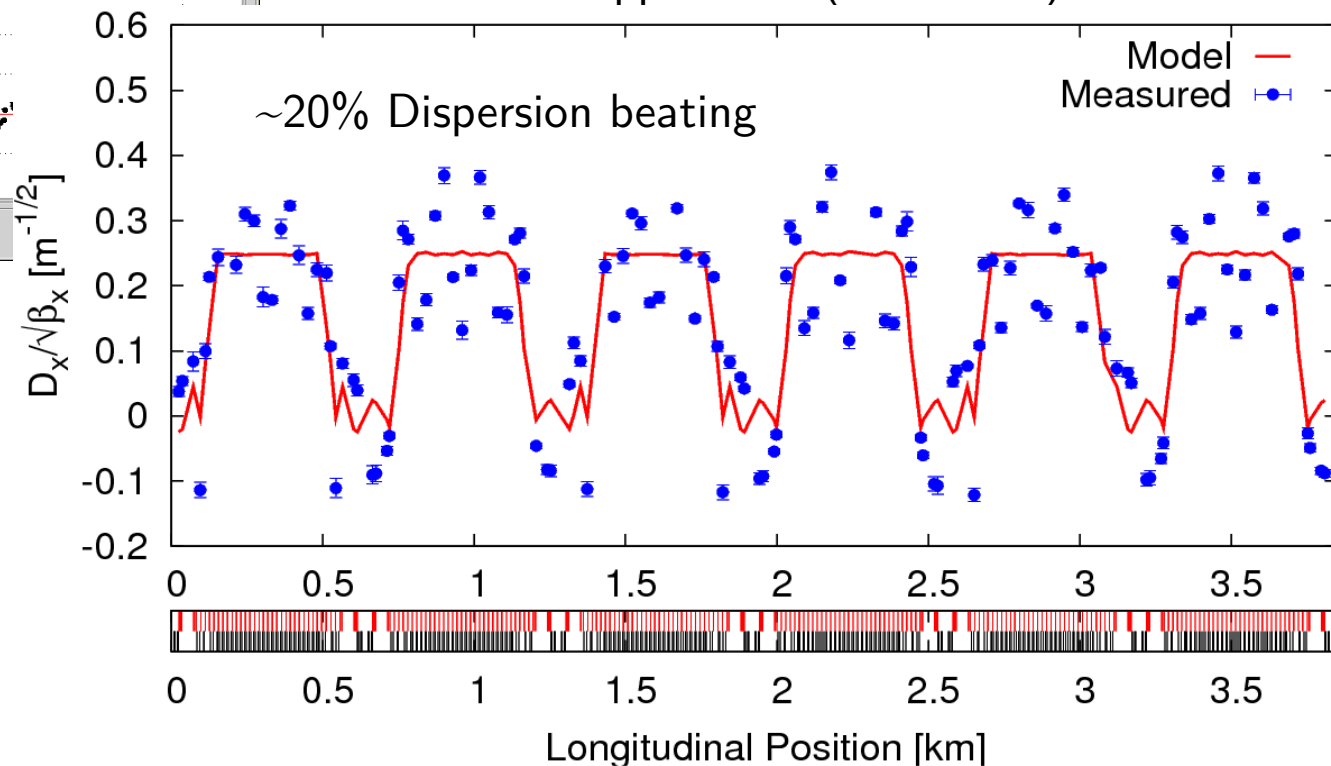


Dispersion,  $D_x$

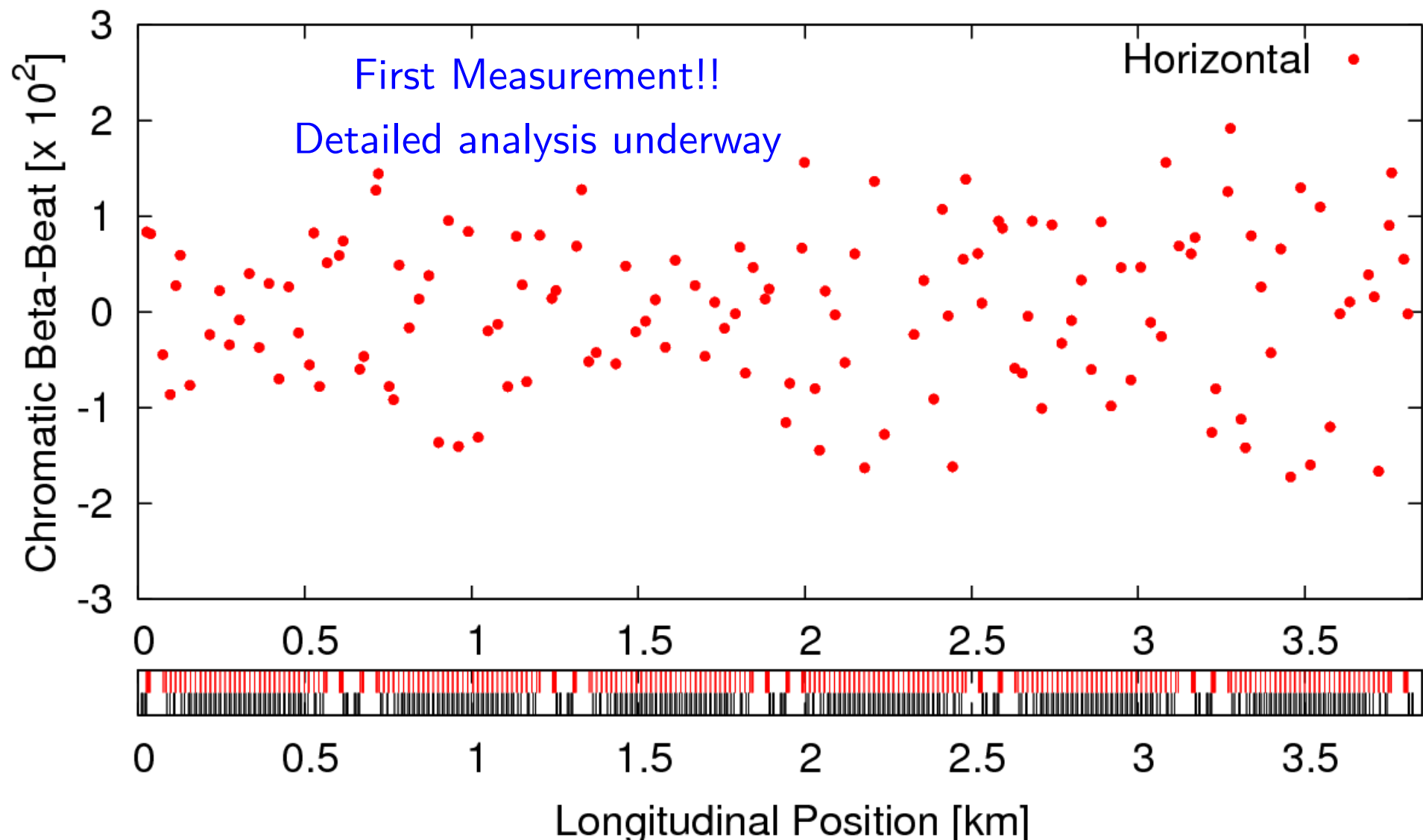
From Tepikian's application  
(average orbit data)

Normalized Dispersion,  $D_x/\sqrt{\beta_x}$

From LHC application (TBT data)

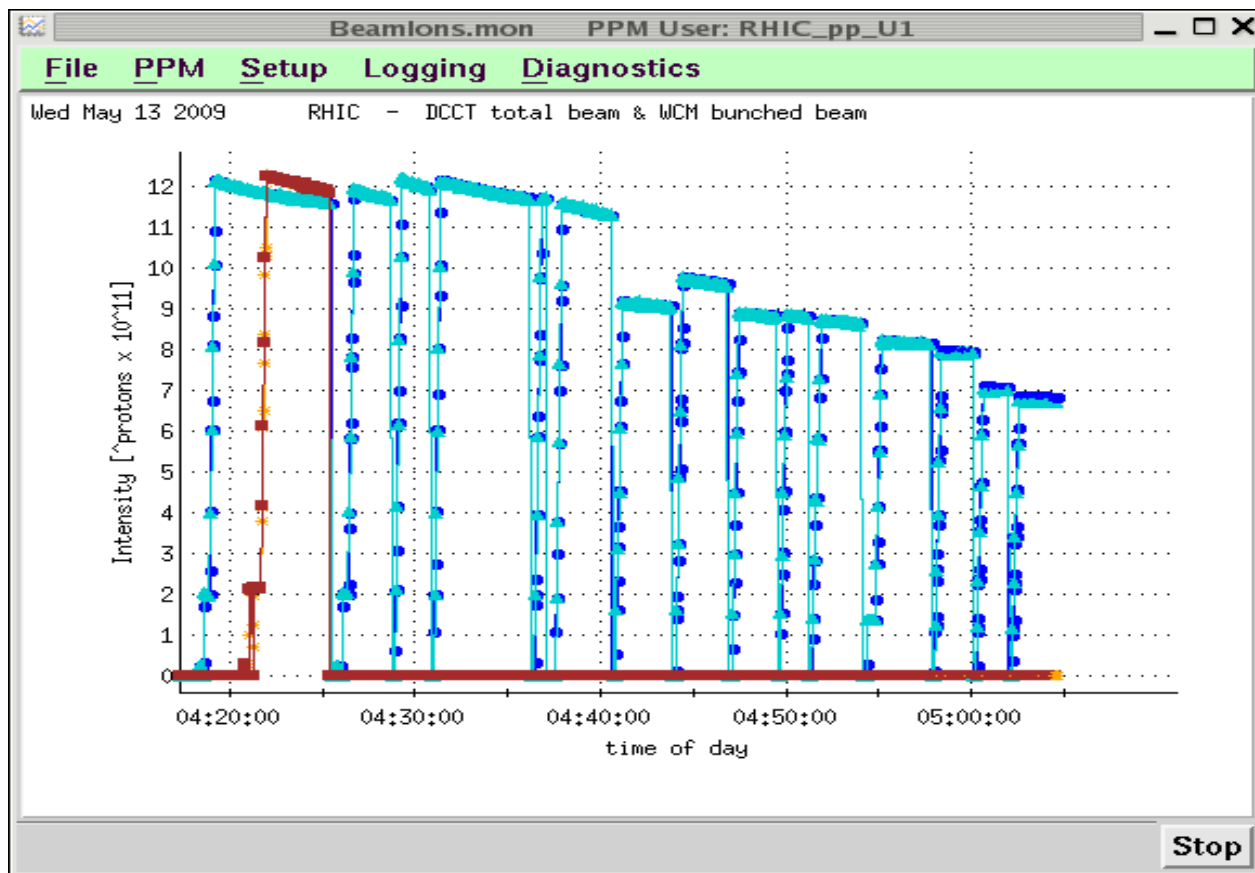


# Off Momentum Beta-Beat





# Impedance Scan



Left with 40 min for impedance measurements

Short scan 6 bunches, blue at injection

Repeat blue/yellow (constant bunch intensity & increase number of bunches)