

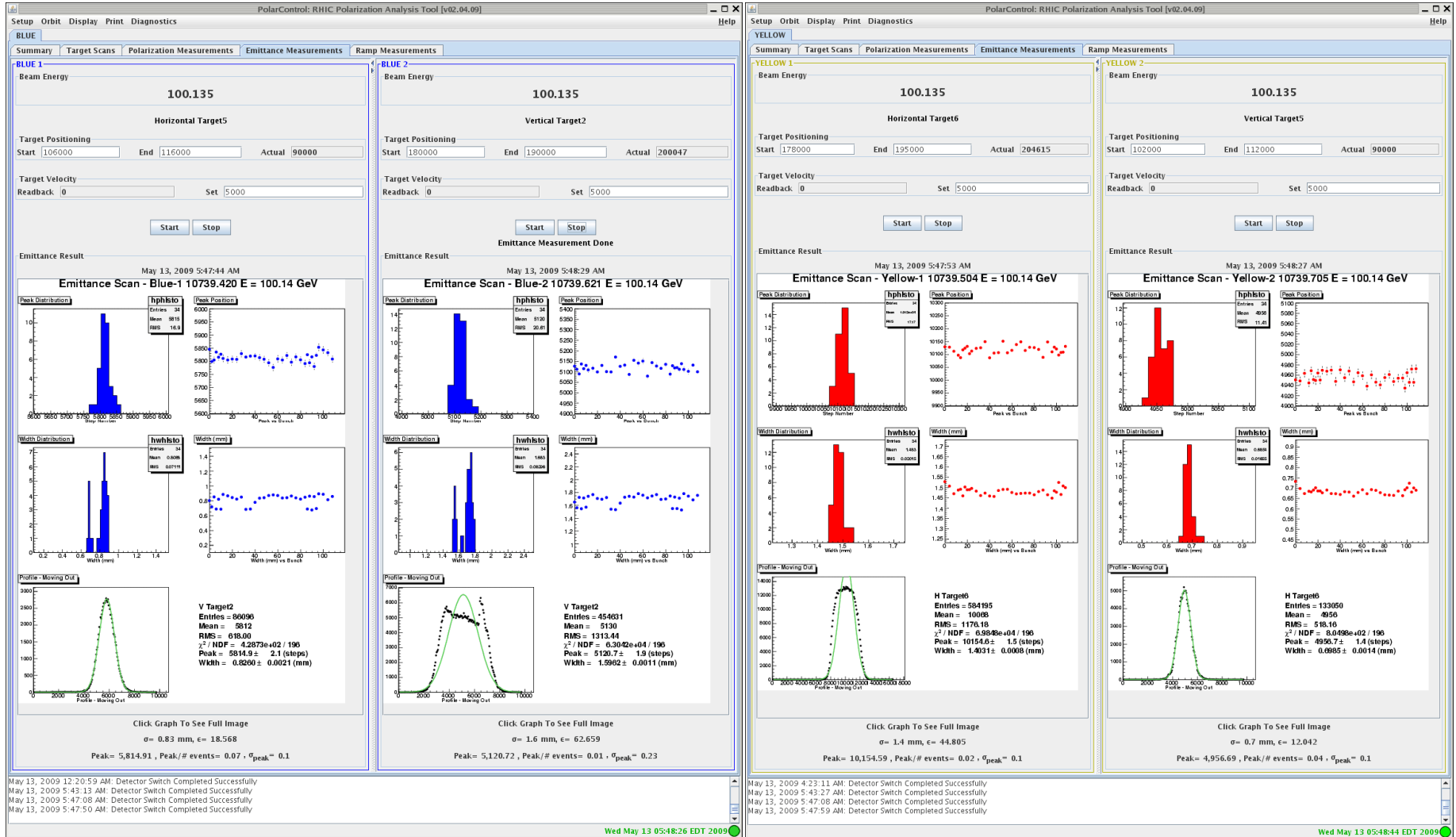
# Run9 - 100 GeV pp APEX BBLR experiment

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# Plan for the experiment

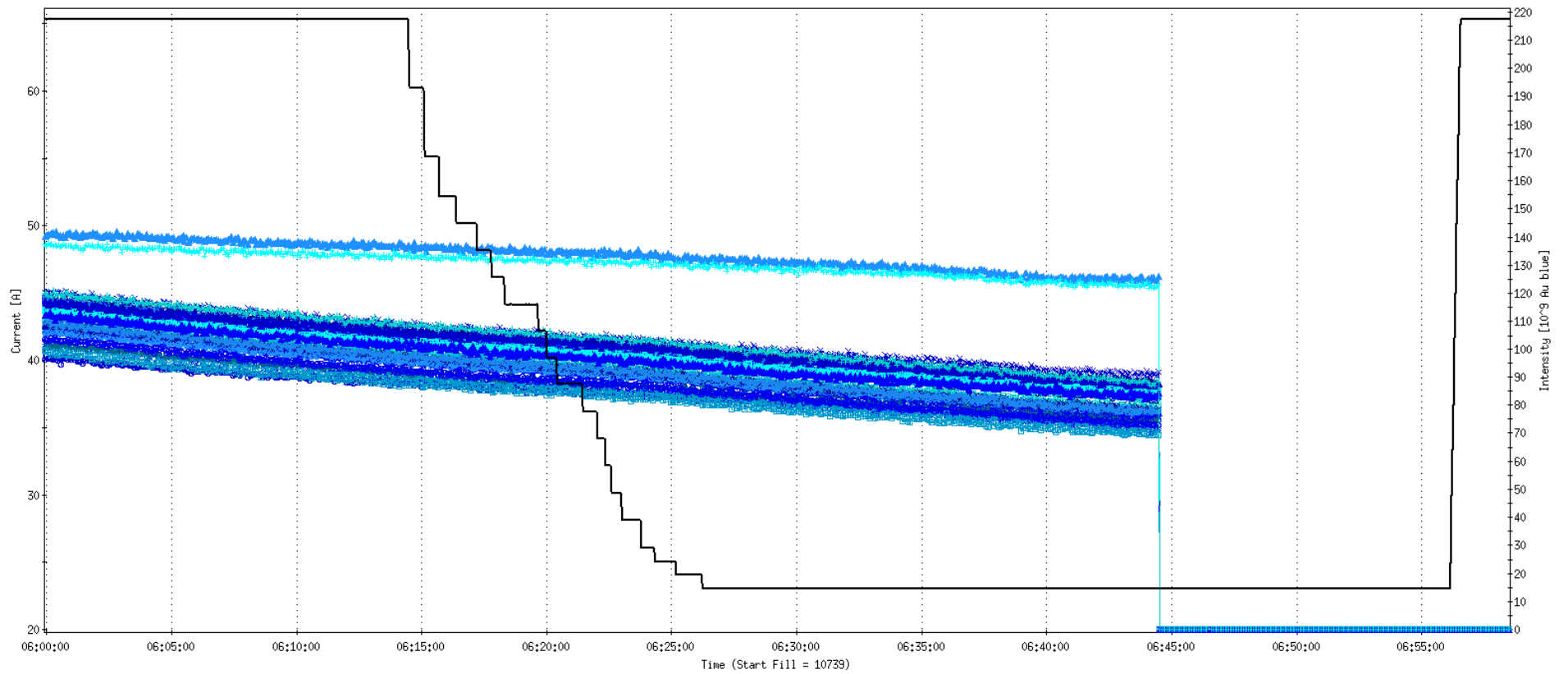
- Study the effect of a long range interaction simulated by a copper wire on both colliding and non-colliding bunches:
  - Use pattern BBLR\_34x34 (28x28 + 6 non-colliding bunches),  $2e11$  p/bunch, accelerate and collide, will not ramp up the RF voltage
  - CNI emittance measurement
  - 5A, position scan in Blue and Yellow, orbit and BTF measurements
  - Retract, CNI emittance measurement
  - 50A, position scan in Blue and Yellow, orbit and BTF measurements
  - Retract, CNI emittance measurement
  - Time permitting, change chromaticity or octupoles, repeat one scan
- Studies performed at store: ramp was done after couple of hours sitting at injection  
=> lost about 30% of Blue over the first 2 stones of the ramp !!
- One good news though: managed to ramp Yellow with  $2e11$  p/bunch with 94% transmission !

# Emittance measurement at Store

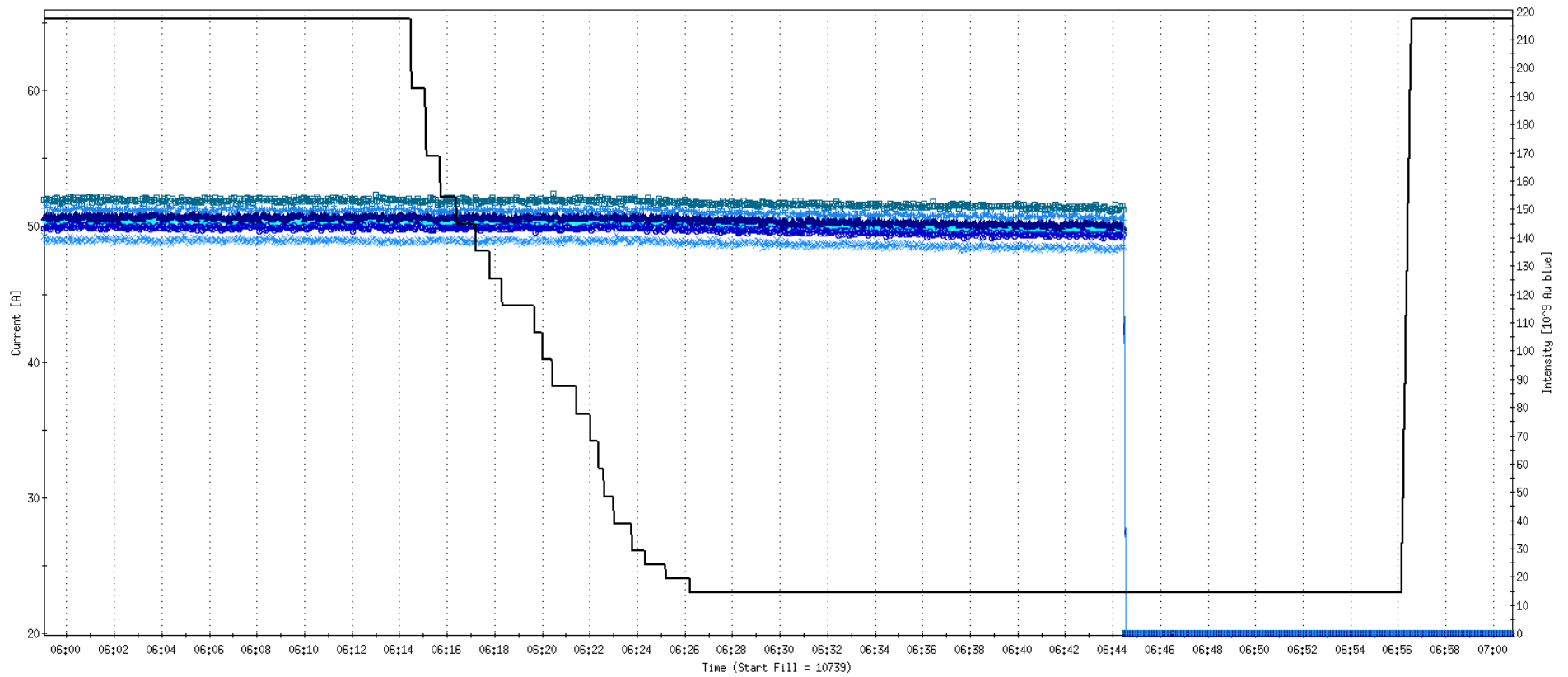


=> Blue measurements are not reliable (H=18.6, V=62.7), as is Yellow horizontal (non-gaussian shape). Yellow vertical might have too few statistics...

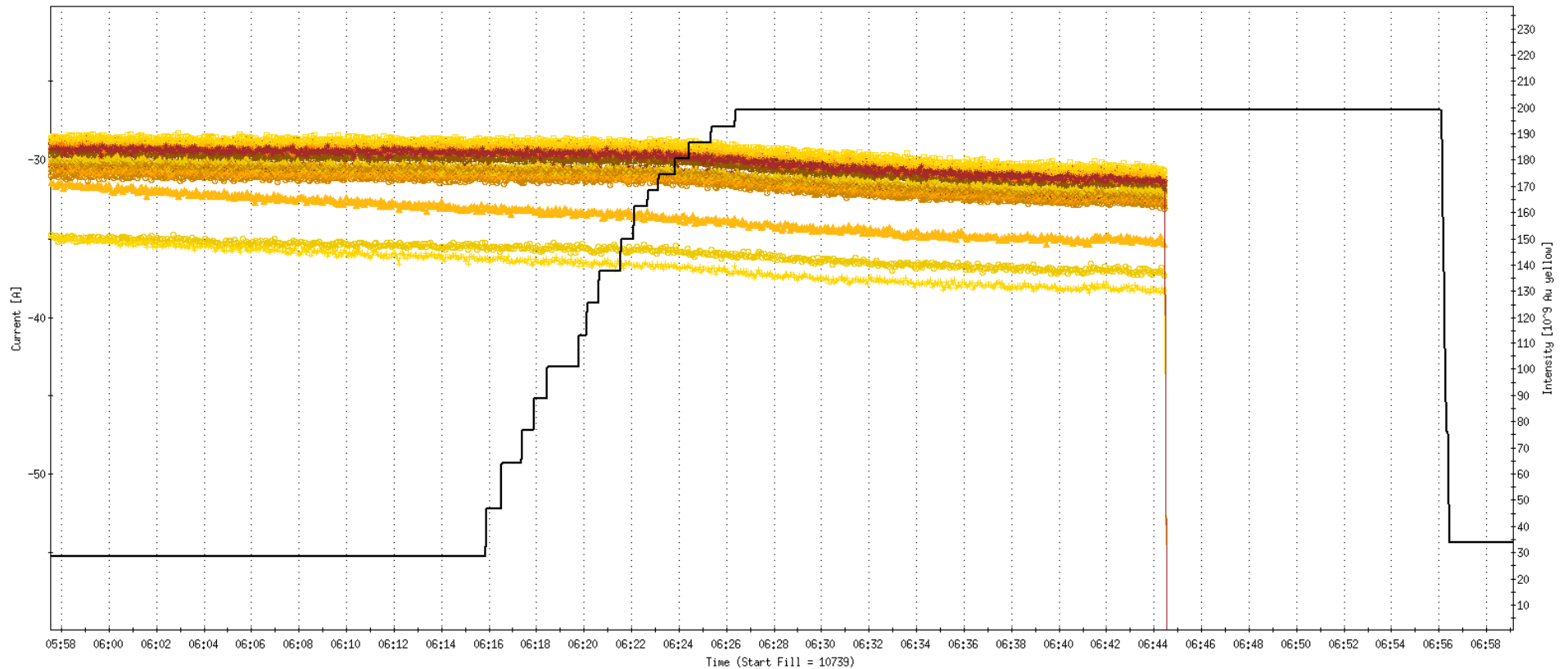
# Blue colliding lifetime during wire scan



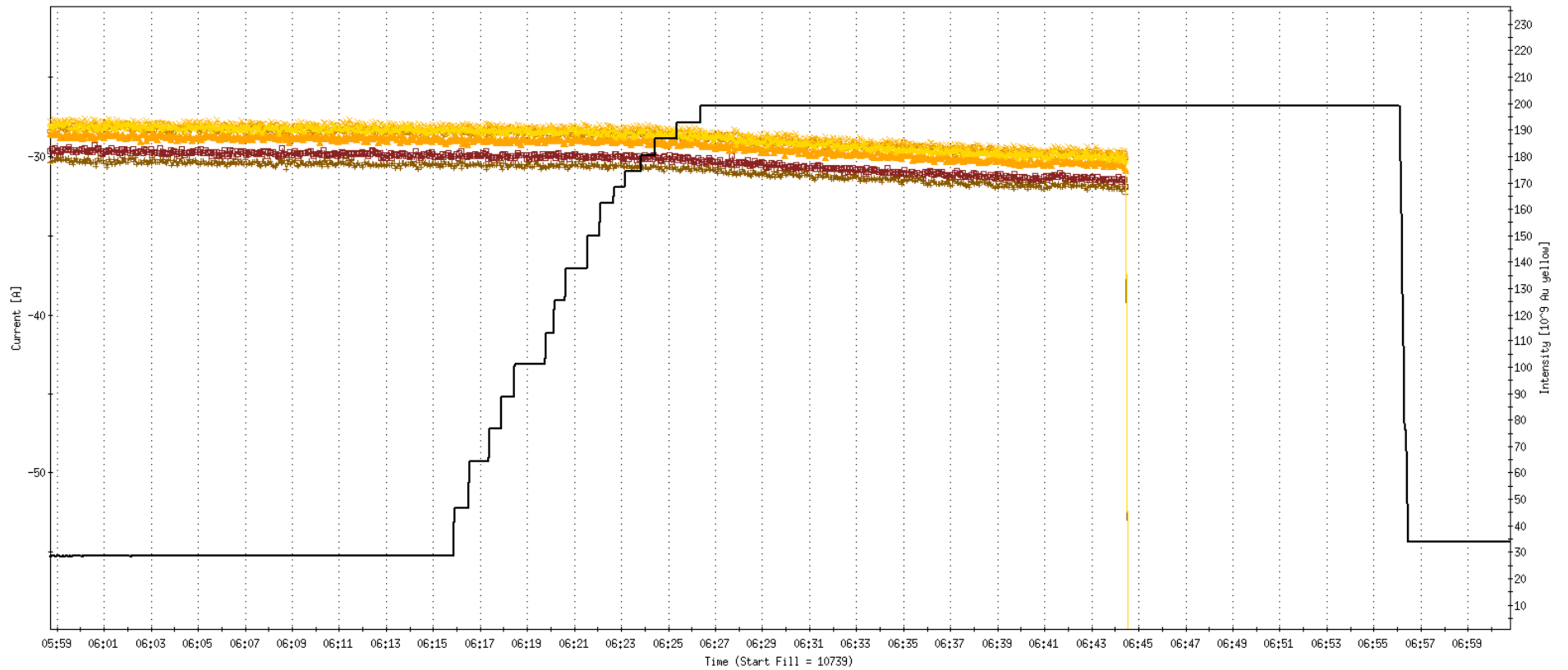
# Blue non-colliding lifetime during wire scan



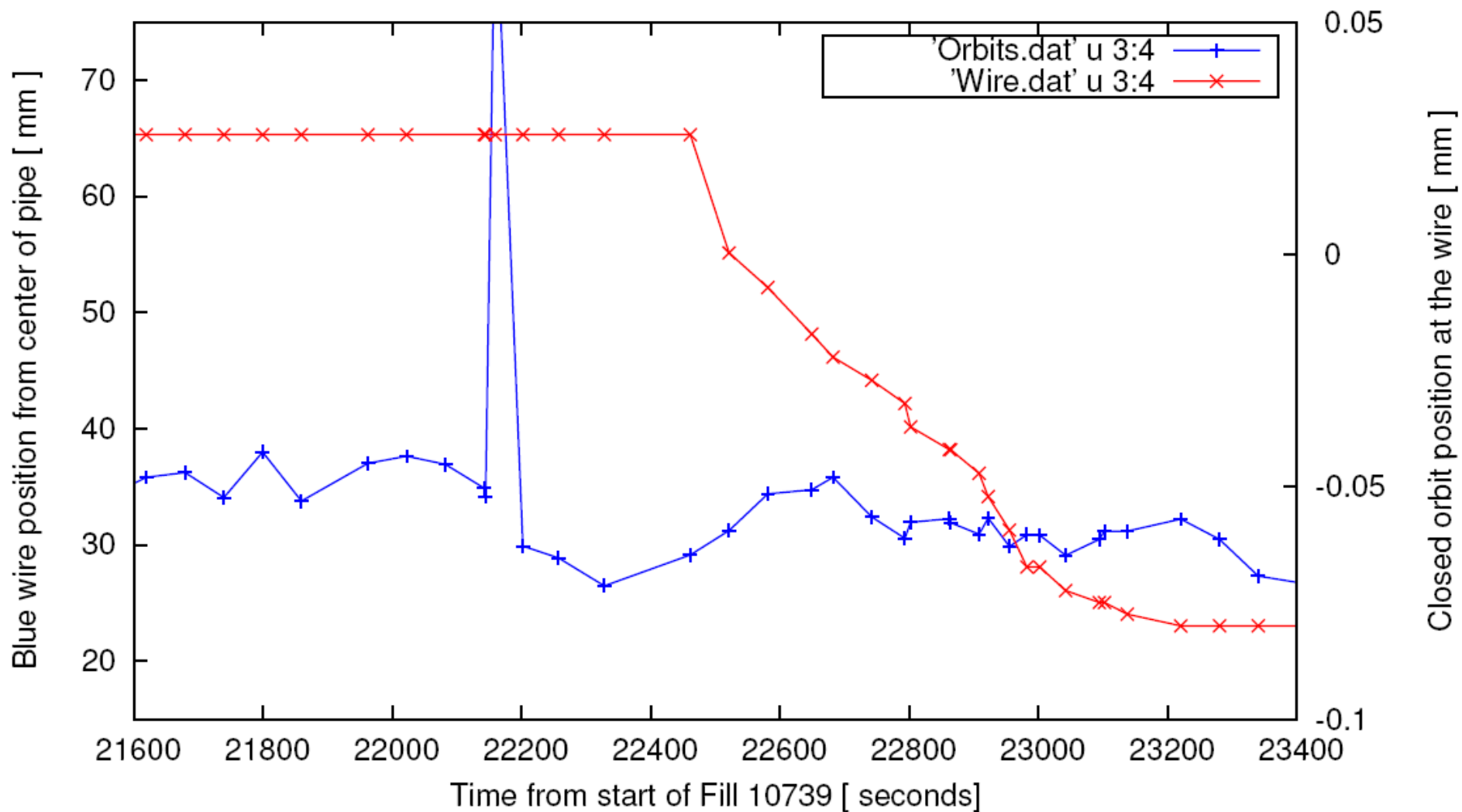
# Yellow colliding lifetime during wire scan



# Yellow non-colliding lifetime during wire scan

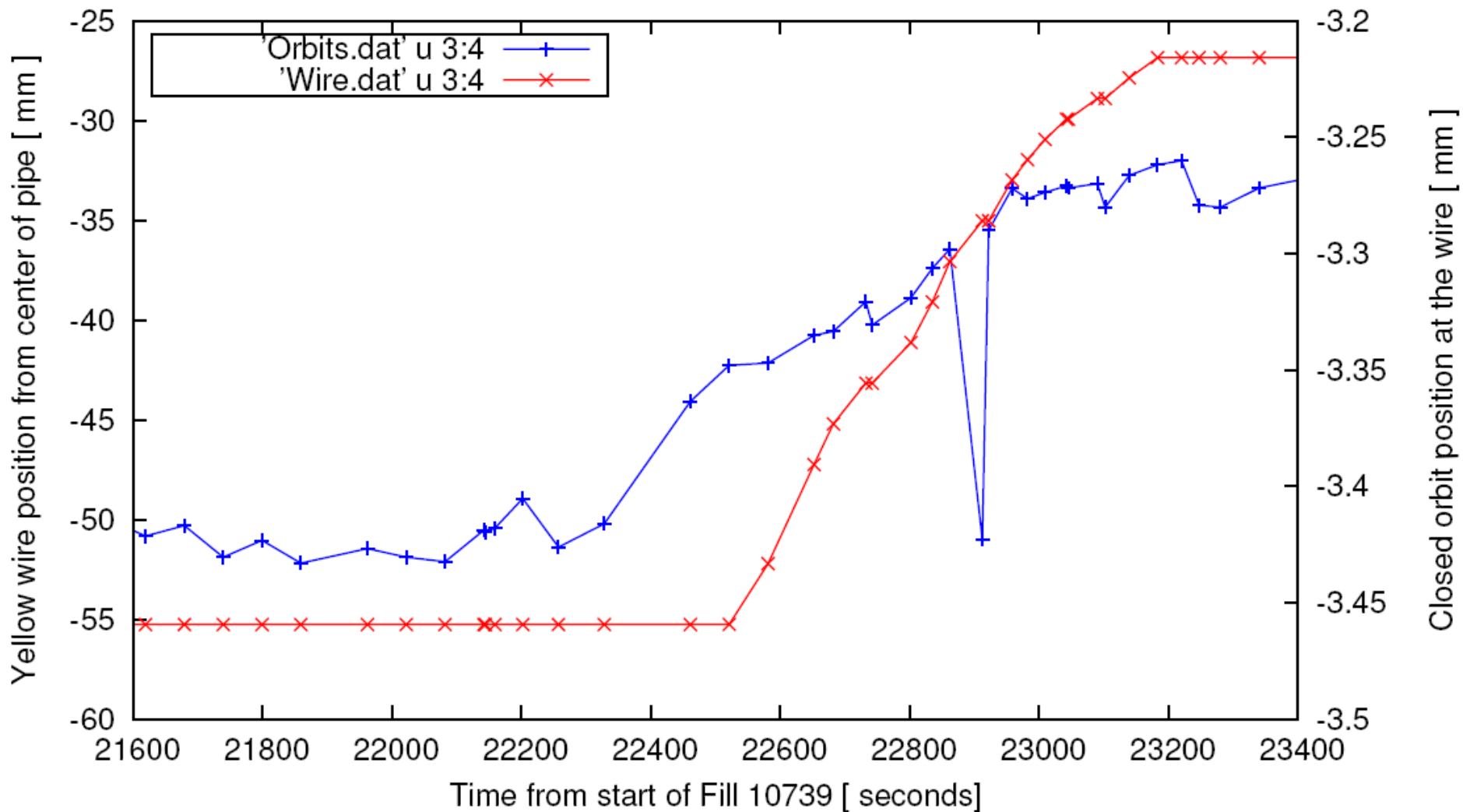


# Blue orbit change during wire scan

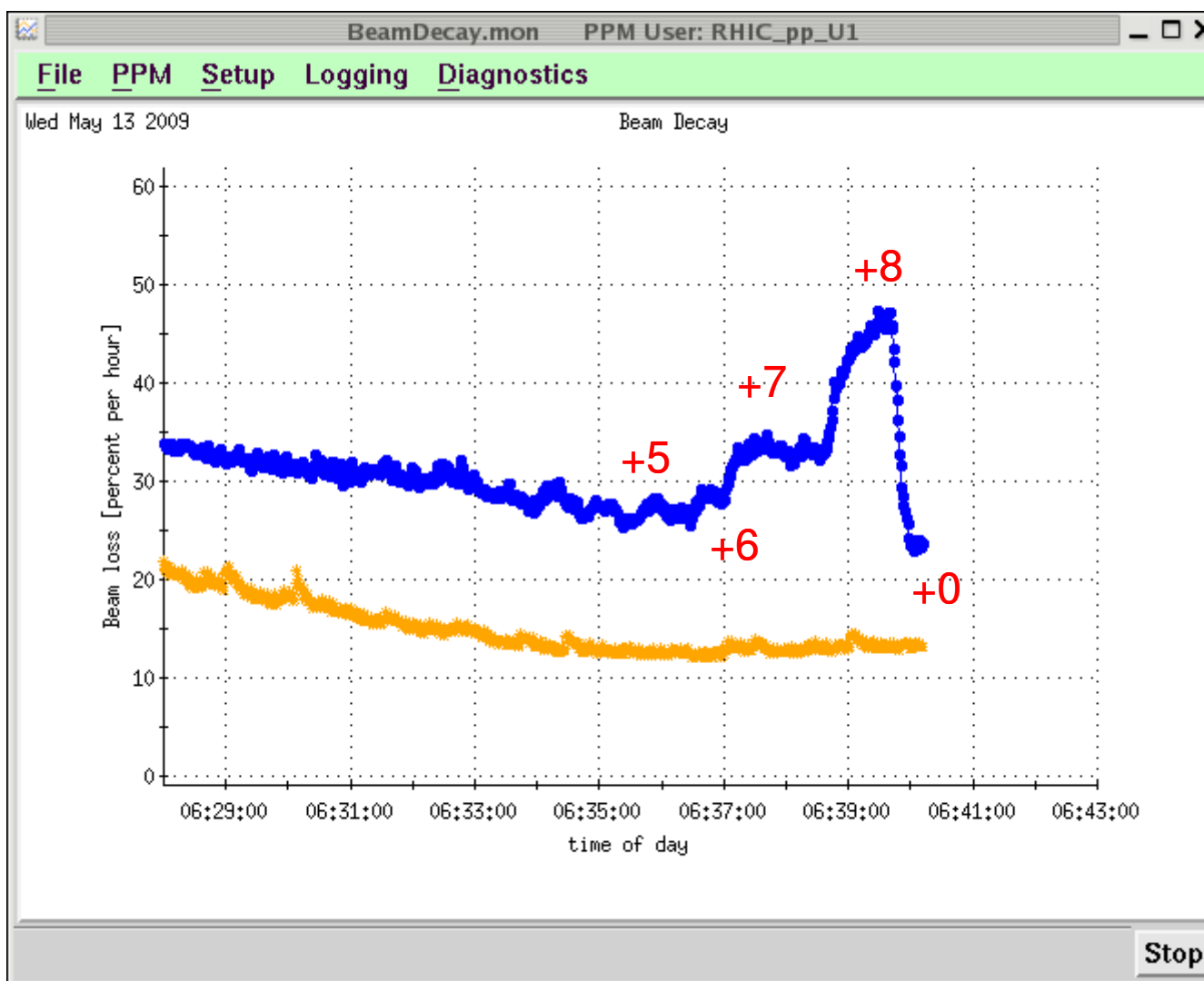




# Yellow orbit change during wire scan



# Blue chromaticity scan



BBLR wire was left at closest position to the beam

# Conclusion

- Filled 34x34 with more than 2e11/bunch in both rings. Lost about **1/4 of the intensity in Blue** (perhaps due to some earlier APEX work), 94% transmission in Yellow (the good news).
- At store, very poor Blue lifetime. Difficulties with **BTF (no vertical data) and Artus (scrambled values)** measurements.
- Did one 5A scan in Blue and Yellow: **no visible effect in blue, change of slope in Yellow lifetime**. No clear difference between colliding and non-colliding bunches.
- Did a vertical chromaticity scan in Blue, with a maximum change of +8 units.
- Store was lost when attempting a vertical chromaticity scan in Yellow: had **large  $Q'_x$  and  $Q'_y$  values in RampEditor (possibly from gamma-t quads APEX ?)**, and Roman Pot NMCs pulled the permit on our first activate. Yellow Store settings were restored to previous successful physics store.