

RC report March 10-17

# Summary of Tues-Fri

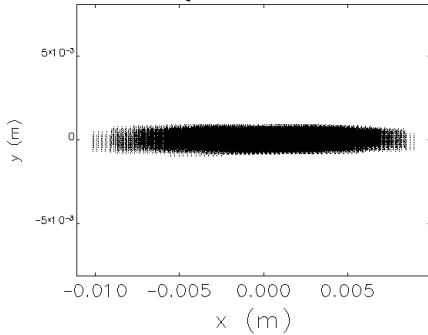
- Tues thru end of Friday shift , ACC was mainly battling beam loss in the 9S and 7S region. Had made some progress with the RF separator.
- End of Friday day were able to send 5uA CW to Hall A. But still problems with beam loss.
- Noticed immediately that the beam was hitting something and went to “home”.
- MQO1H02 could not be turned on.
- Tried to calibrate the raster with only 3 quads.

# Saturday summary

- MQO1H02 was fixed over owl
- Harp weren't working. Javier suggested that problem with software IOC. Problem fixed in the morning.
- Yves and Jay developed a plan with walk thru the 6 quads in the Moller region using the OTR to monitor the beam size and compare to optics calculations.

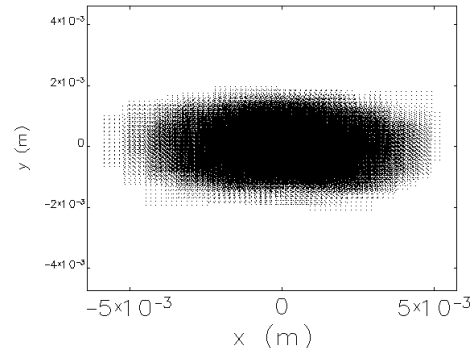
# Walk thru Quads

MQK1H01 on



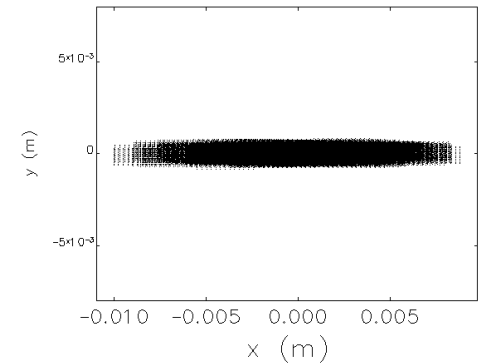
watch-point phase space--input: simuroster.ele lattice: HALLNew.lite

+MQO1H02 on

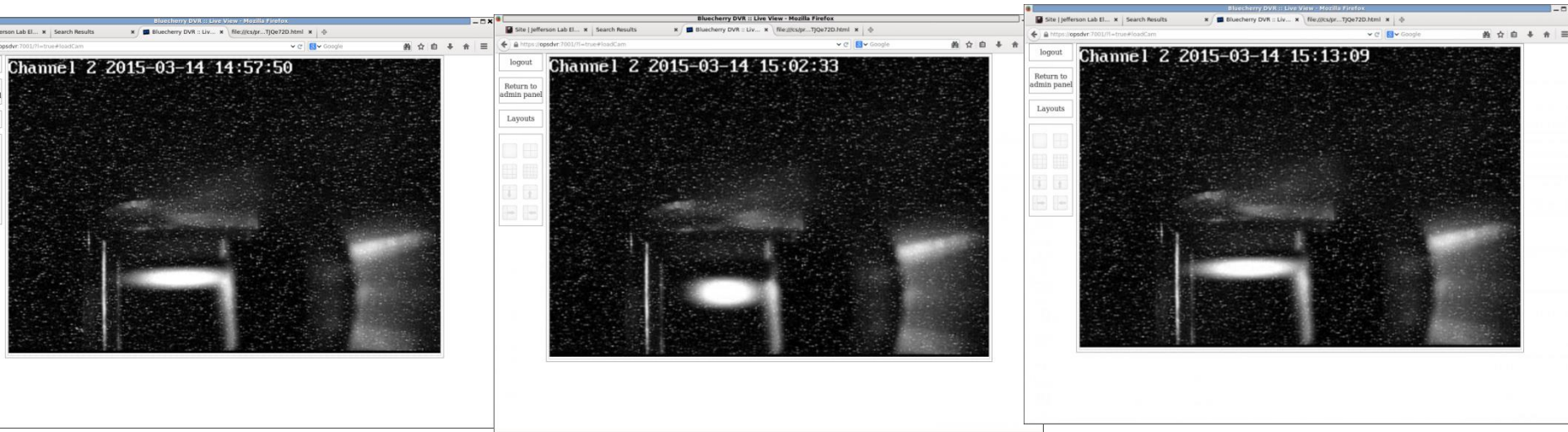


watch-point phase space--input: simuroster.ele lattice: HALLNew.lite

+MQM1H02 on



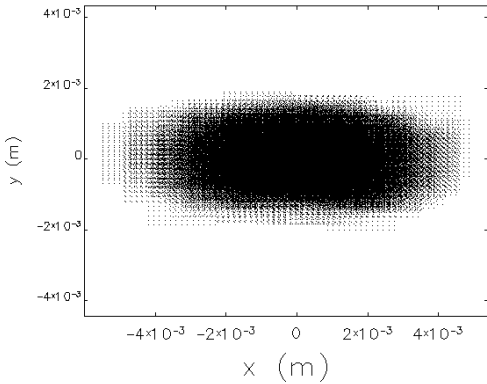
watch-point phase space--input: simuroster.ele lattice: HALLNew.lite



Used "1x1" raster

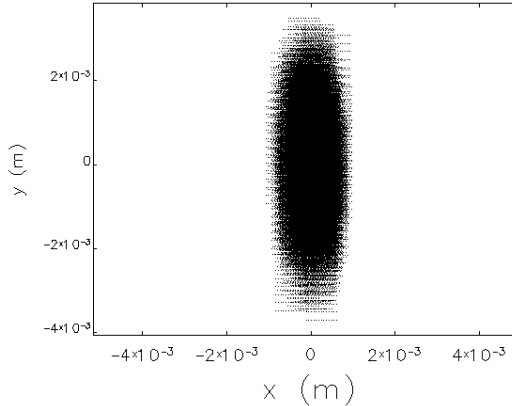
# Walk thru Quads

+MQO1H03 on



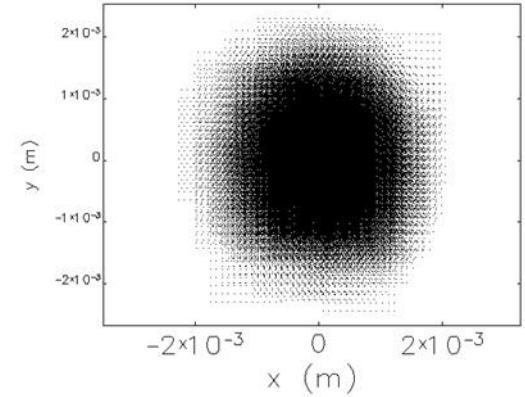
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+MQO1H03A on

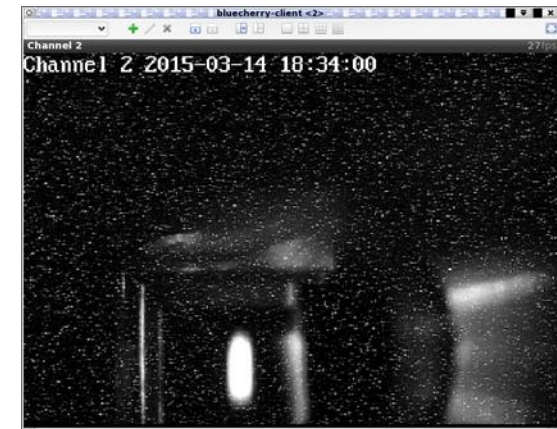
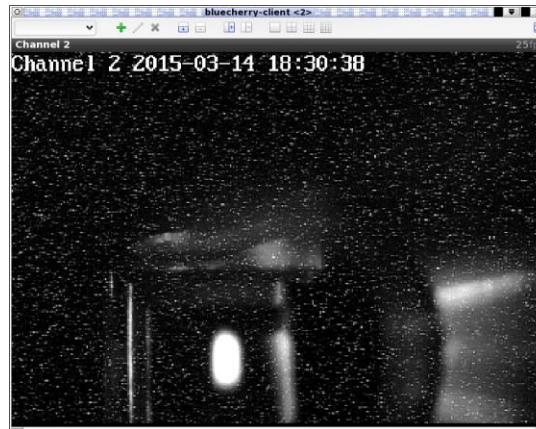


watch-point phase space--input: simuroster.ele lattice: HALLnew.lte

+MQA1H04 on



watch-point phase space--input: simuroster.ele lattice: HALLnew.lte

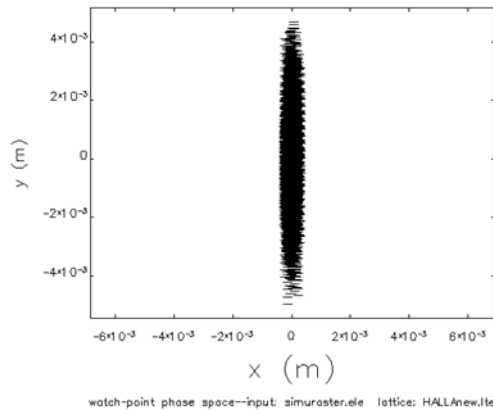


Problem !!!

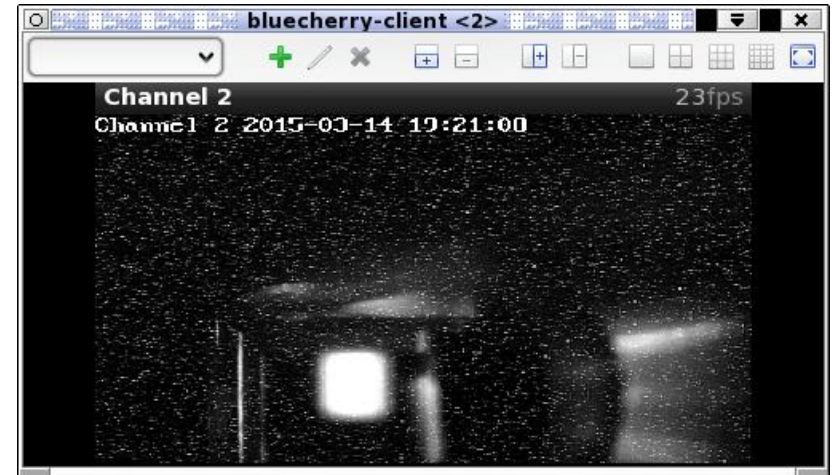
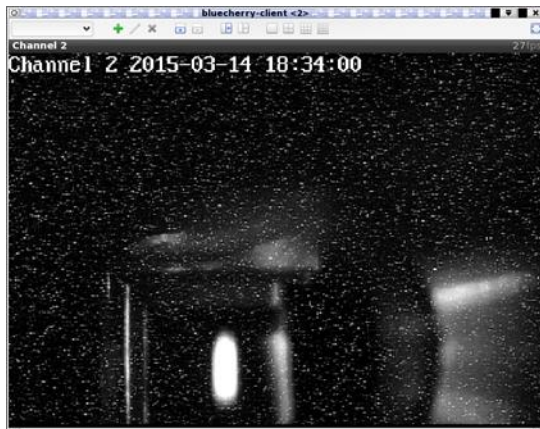
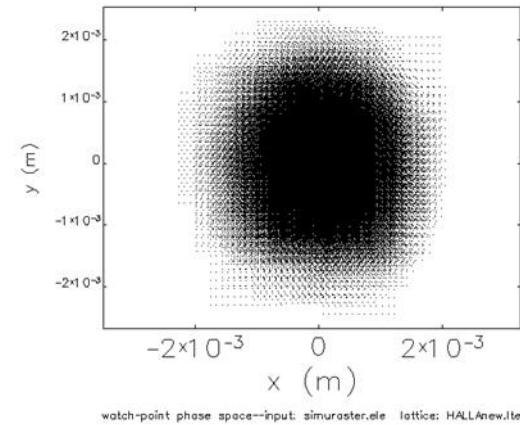
# Walk thru Quads

Expectation with wrong polarity

+MQA1H04 on



Reverse polarity on MQA1H04  
now match design optics

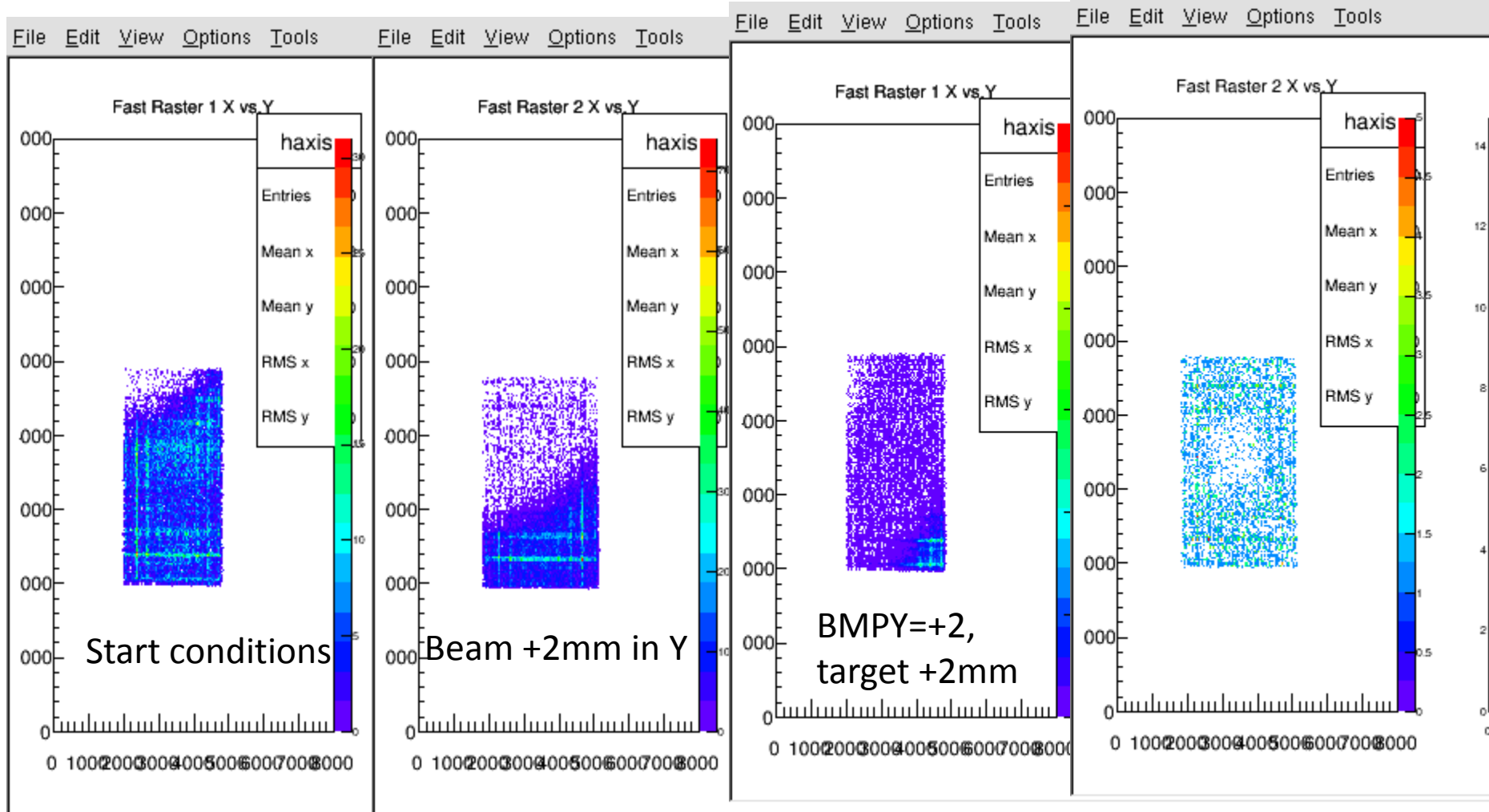


Match!

OTR with "2.5x2.5" raster

# Target centering

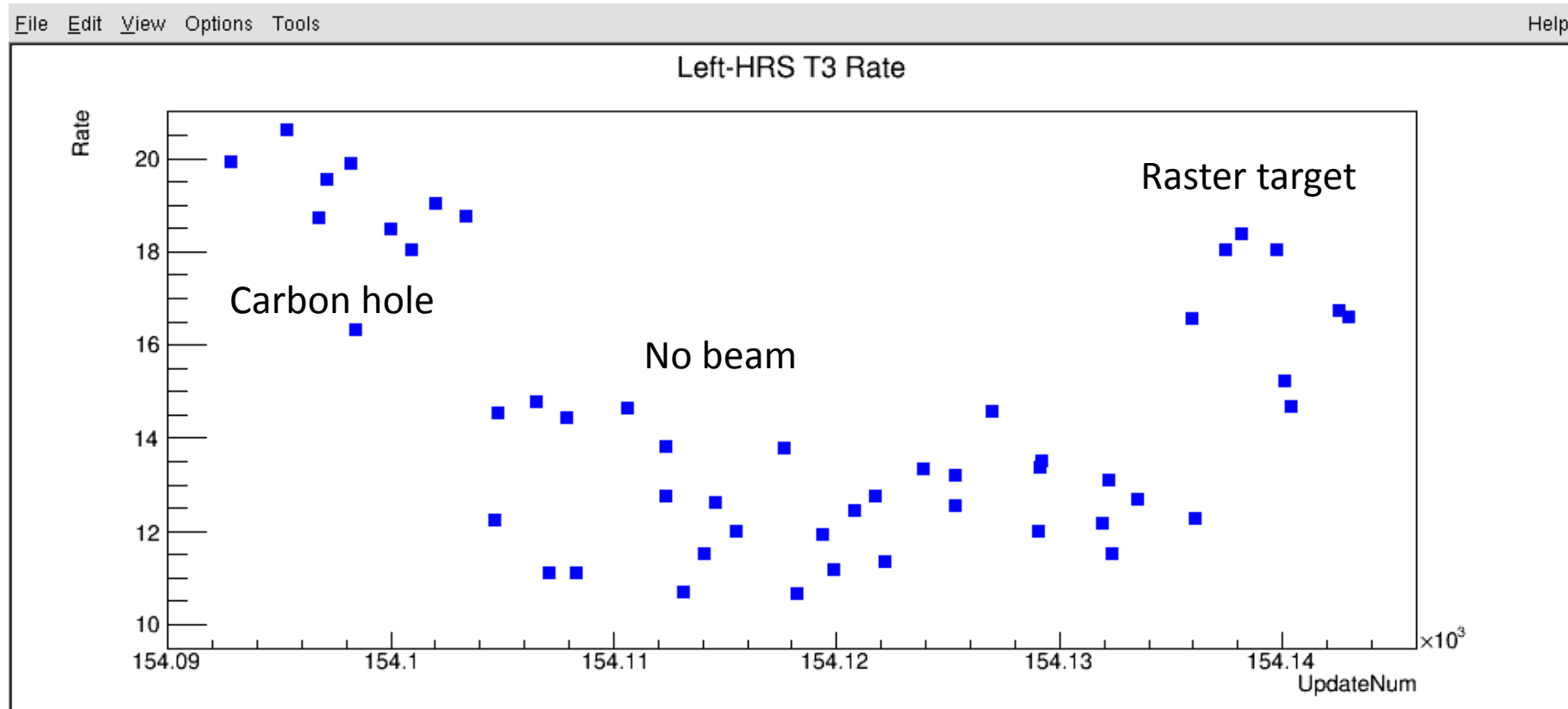
Getting 1KHz rate in HRS with empty target and 3x3 raster!?! Look for carbon hole



Target +6.5mm vertical  
BPM4Bx=+2.5 y=.5mm

# Check of rates after centering

- Turn raster off and go through 2mm carbon hole and 7mm diameter “raster target” cylinder cleanly.





# Check of rates with raster in “raster target” 7mm diameter cylinder

T3 rate	Raster size request	SPOT++ raster size
16 Hz	1x1	1.5x2.5
19 Hz	2x2	2x3
4500 Hz	3x3	3x4
16 Hz	No raster	0.8x1mm

Did some quick checks of changing the beam positions to see if the rates for the 3x3 raster could be lowered, but did not find any. Did find that setting matching y position in BPMA and B made it worse.

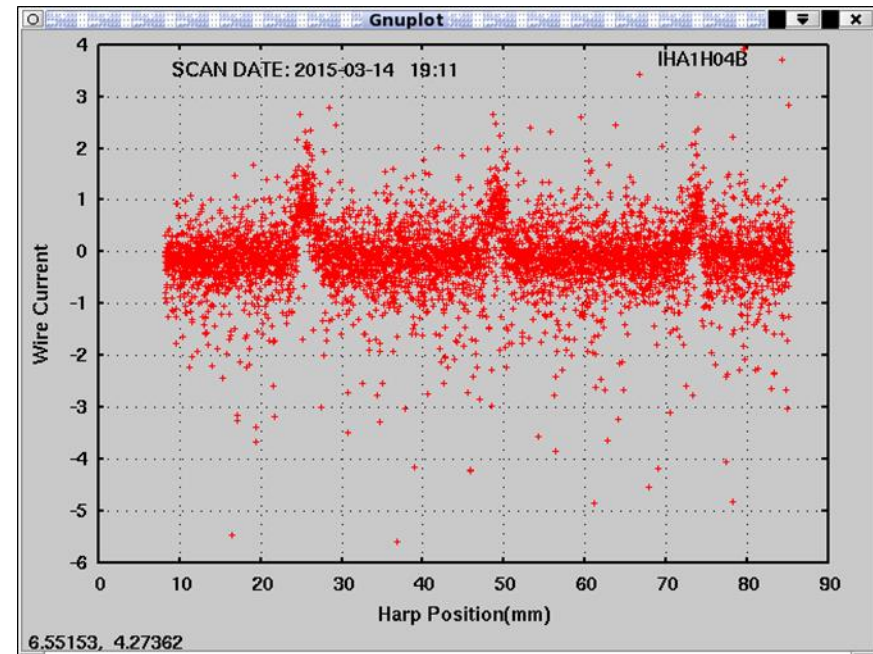
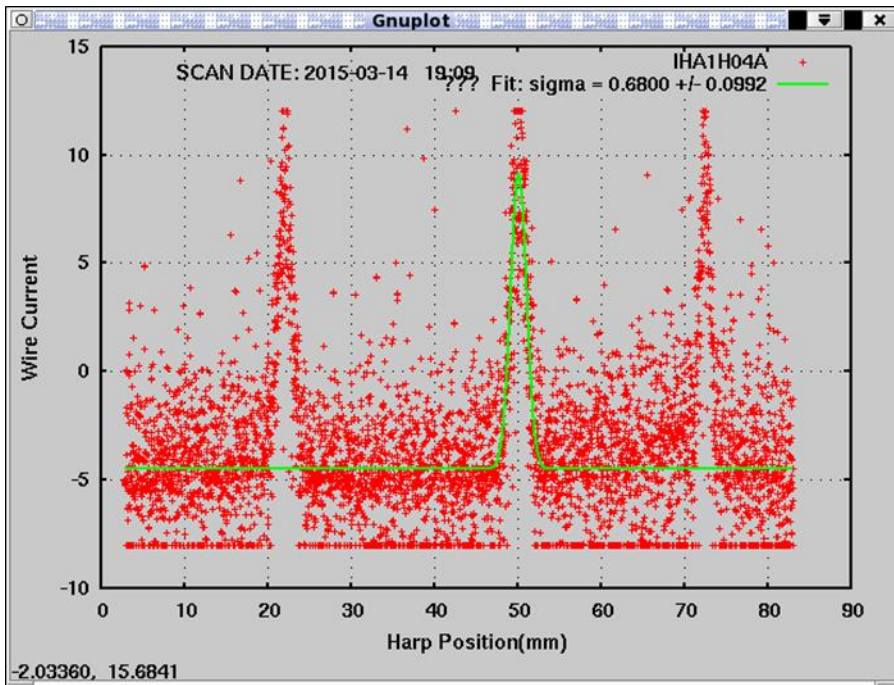
Decide on BPMA  $x = +2.5$   $y = -0.5$  and BPMB  $x = +2.5$   $y = +0.5$

# Since Saturday swing

- Unfortunately, found the HRSR Q1 had water leak during Sat swing shift access. Turned off water and power for weekend. Still took data for HRSR once DAQ problems straighten out on Sunday. (Using wrong configuration).
- Owl shift Sunday, begin to take optics and detector checkout data with LH2 target. Z target reconstruction looked clean.
- Data and optics look good so decide to place DVCS calorimeter in place for kinematics during Sunday morning. Could only go to  $9^\circ$  and 2.5m instead of desired  $8.44^\circ$  because of beamline conflict. The first interference appears between the DVCS cart (not the rails) and one of the vacuum pumps downstream.
- Sunday afternoon reestablished beam and checked centering (after updating encode values in target GUI). By late Sunday swing, taking DVCS data on LH2.
- Stop beam Monday at 9, for ACC to do RF separator work.
- RF separator work went well. Able to separate Hall A and D. Could not get Hall D optics and decide to send beam to Hall A for rest of owl.
- Beam stopped at 7am Tuesday for major injector work. Expected to take 2 shifts. Maybe beam on owl?
- Beam studies during Wednesday day.
- Still problems with beam loss in the 9S and 7S region. So work needed to get to 20uA. Hall D optics work needs to be done and Hall B will be back looking for beam.

# Work in the Hall

- Fix HRSR Q1. *Work has been done. Water is flowing and being monitored.*
- Inspect target. *Chris and Dave checked the target motion. Looks ok. Decide to keep target cold.*
- New quench protection circuit for RHSL Q1. Better to monitor voltage. May allow higher momentum.
- Remove test load used to testing SBS power supply.
- New black box for the DVCS calo.
- Work on harps by ACC. No signal 18A&B and inverted signal 7A&B. Small signal 4A&B



# GMp status

- Detector checkout done with beam over weekend. All ready.
- First tune Right-Q1 and do some acceptance study. Rates too low for sieve.
- To do elastic
  1. need to move to 43deg.
  2. beam energy is fixed with accuracy 0.05%
  3. beam current is calibrated with accuracy 0.5%

# DVCS status

- Coincidence DAQ (HRS+Calorimeter trigger) working
- All calorimeter channels are operational
  - All channels are within 10-20% except 2 channels have shown a significant gain loss (50%) wrt to the Fall.
- Currently facing kinematic limitations due to the significant low beam energy (9.6 GeV), and the low momentum constraint on the LHRS:
  - We would need LHRS to go up to 3.5 GeV in order to do the current setting with sufficient acceptance
  - For the elastic calibration of the calorimeter, we need to either reduce the beam energy or, again, increase the LHRS momentum to 3.5 GeV