

Parity Quality Beam (PQB)

B-Team Meeting

December 03, 2008

PQB ATLI Tasks

1. Task: Commissioning of the Fast Helicity Reversal

- 30 Hz: The standard PQB at 30 Hz was achieved.
- 250 Hz: The PQB is very similar to 30 Hz otherwise for the 60 Hz noise.
- 1 kHz: The PQB is very similar to 30 Hz, again issues with 60 Hz noise (less sensitive than at 250 Hz).
- **Issues:**
 - DAQ did work at 1 kHz and 100 μs but did not with: 500, 60, and 10 μs .
 - Just fixed 1 kHz with 500 and 60 μs , still DAQ is not working with 10 μs .
 - **BPMs Electronics are affecting short T-Settle studies (see backup slides).**
 - **Find the right T-Settle.**
- **Action:**
 - New charge feedback scheme need be implemented: No slow controls (EPICS), zeroed the asymmetry for each of the 4 helicity sequences → use **“Injector Net”**.
 - **New Helicity Board design:** Easy to program, more outputs.

2. **Task:** Halls Crosstalk and the Effect on Parity Quality Beam

- Did Hall C current and laser phase scans and measured Hall A PQB (no crosstalk observed), **To do (30 Hz):** repeat once QE is bad.
- **To do (30 Hz):** Check with IA scans (change charge asymmetry of one beam, measure effect on the other).
- **To do (30 Hz):** Measure crosstalk in the Hall to look for RF beam loading (new ATLis Task).

3. **Task:** Eliminate the Vacuum Window Birefringence by Rotating the LLGun2 Photocathode

- Tried once, but PQB was bad to start with.
- **To do (30 Hz):** Repeat again when we get a chance (before re-activation).

4. **Task:** Check Helicity Magnets, Mott Polarimeters at 1 kHz

- Checked fine at 250 Hz last year.
- **To do (1kHz):** Check at 1 kHz.

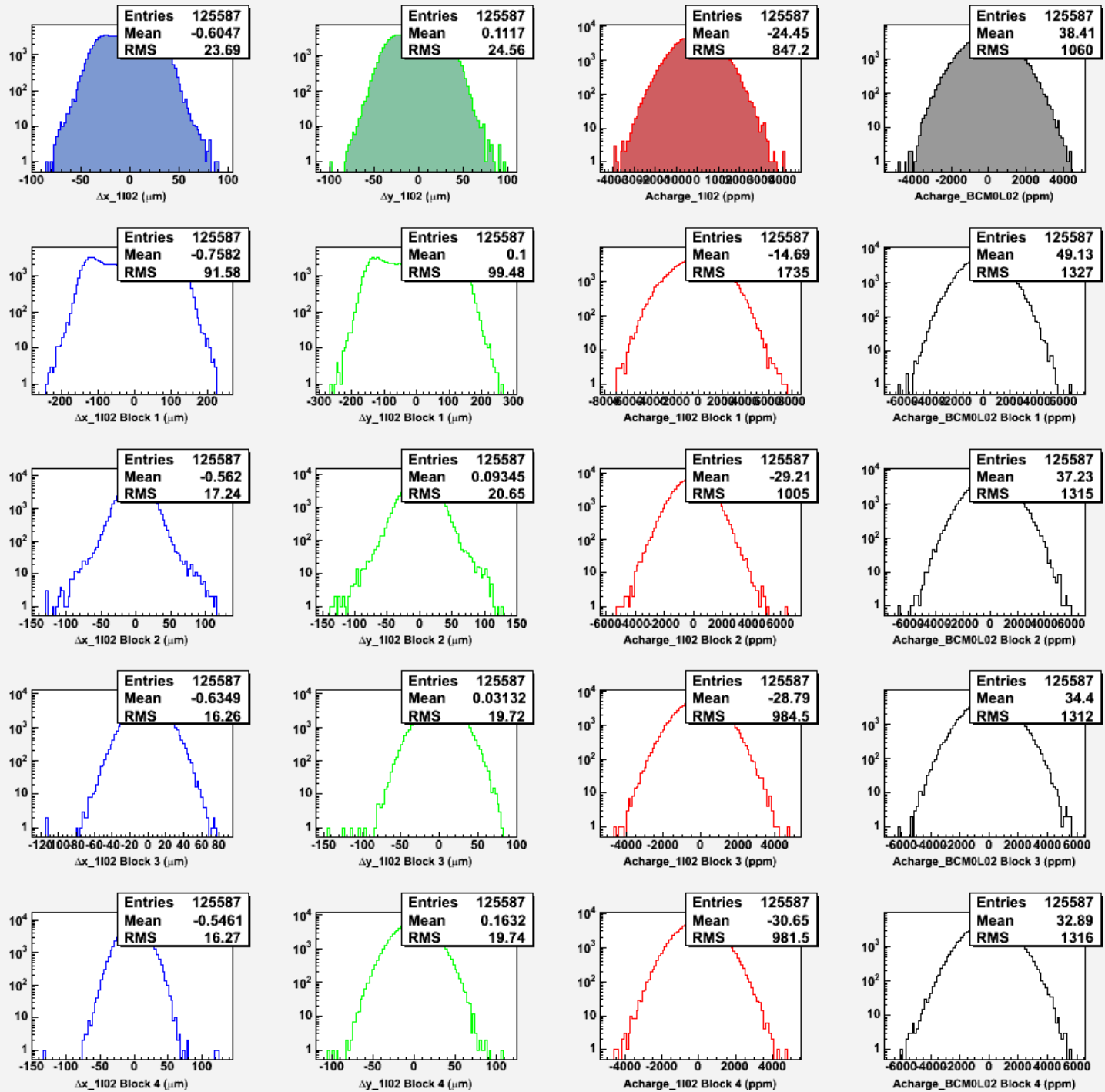
5. Task: Commissioning of the New Pockels Cell HV Switch

- Switch is fine.
- No electrical pickup from the switch.

6. Task: Searching for EM Noise from the 500 keV PSS Dipole Current Sensor

- Found and will be fixed
- **To do (1 kHz):** More noise still there; Ion Pumps VIP0L02/3 local power supplies (new ATLis Task).

Backup Slides

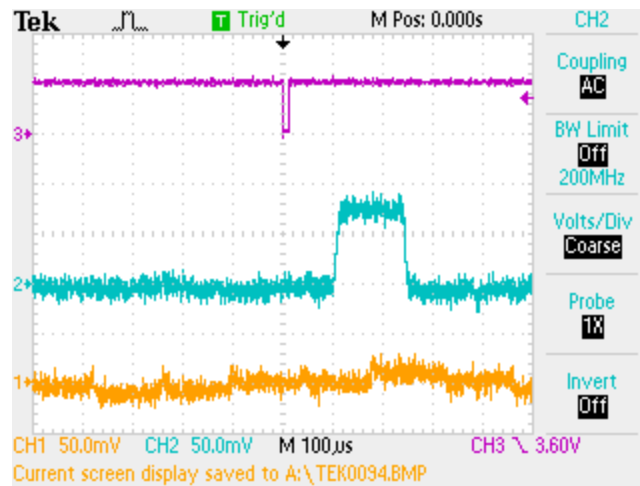


BPMs Electronics

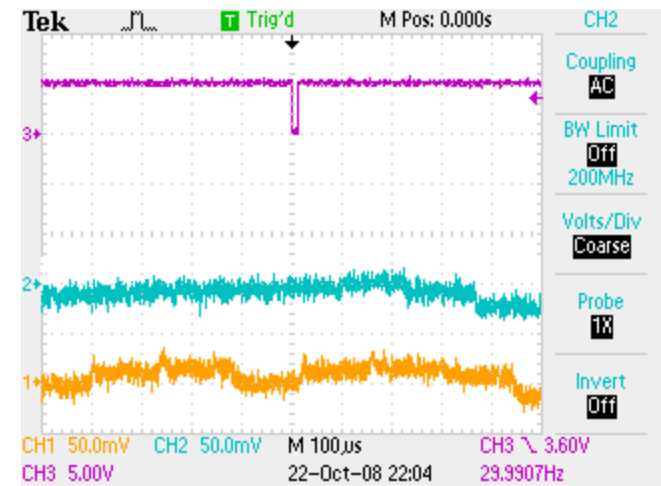
Notes:

1. Chan 1: X+, Chan 2: X-, Chan 3: MPS (Trigger)

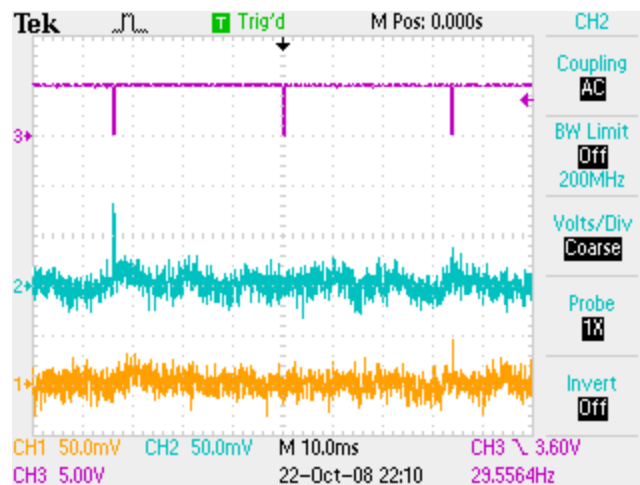
Pockels
Cell ON



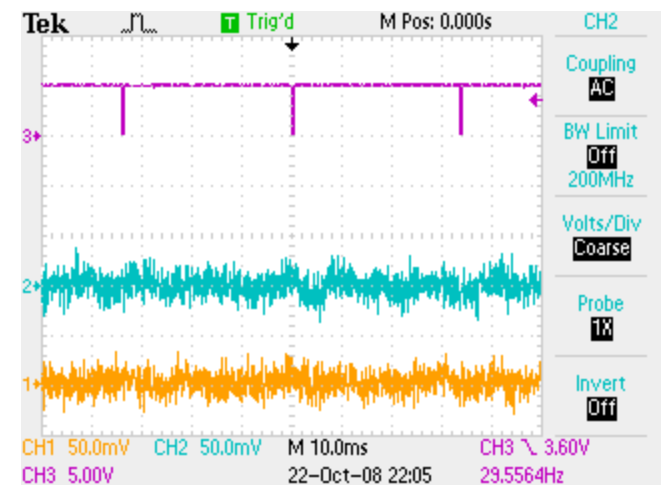
Pockels
Cell OFF



Pockels
Cell ON



Pockels
Cell OFF



Notes:

1. Injector iocse11, iocse12, and iocse19 have “TRANSPORT” style IF cards

	TRANSPORT	LINAC
Sample Time	140 μ s	8.6 μ s
Fixed Delay	70 μ s	4.3 μ s
Dynamic Range	70 nA – 200 μ A	700 nA – 2,000 μ s

2. To study Pockels Cell Settling Time, should we: Change to LINAC? Use Hall BPMs? Use laser Quad Photodiode (QPD)? Change to 12 GeV IF style cards?

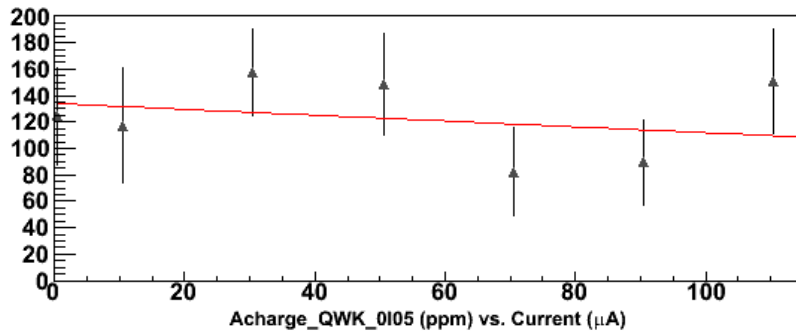
3. Hall C:

- Hall C iocse18 and iocse14 have “TRANSPORT” style IF cards
- Hall C iocse17 has “LINAC” style IF cards

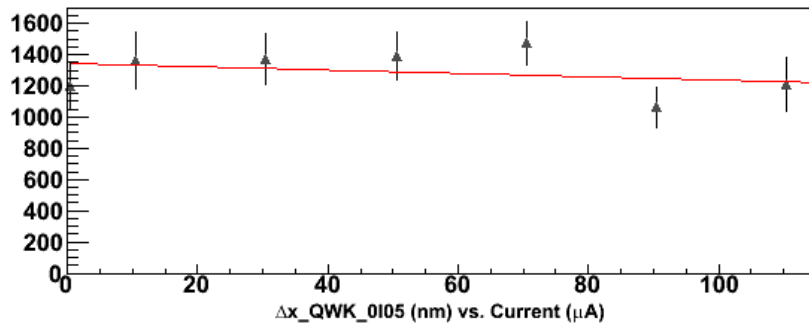
4. Hall A?

Hall C Current Scan

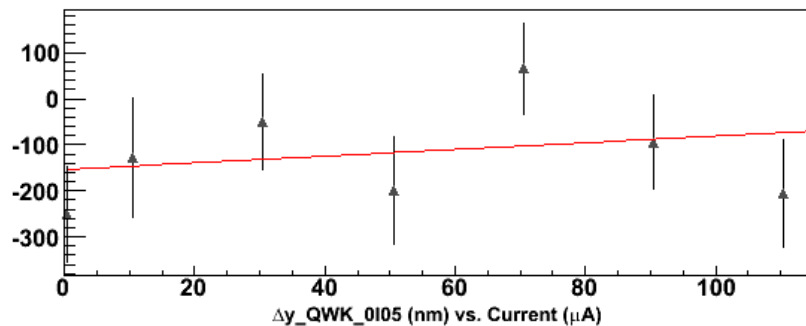
Hall C Current Scan, , Run 413, QWK_0I05



$$Aq = 134.00 +$$
$$-0.22 \times I$$



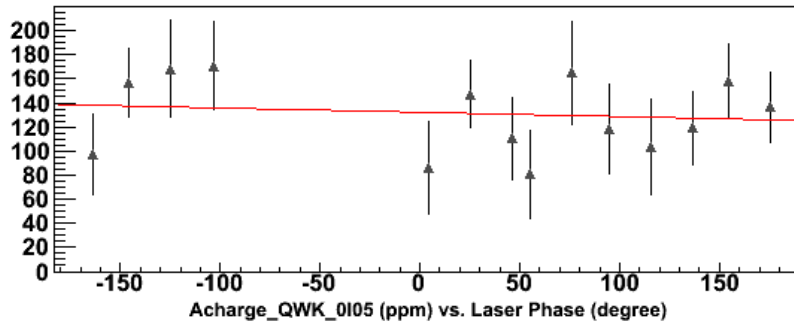
$$\Delta x = 1343.62 +$$
$$-1.07 \times I$$



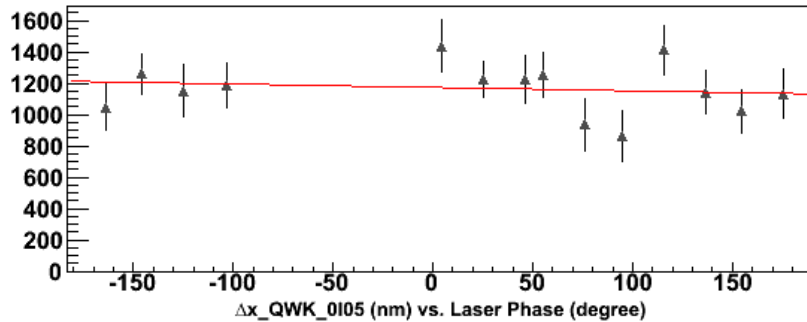
$$\Delta y = -153.69 +$$
$$0.73 \times I$$

Hall C Laser Phase Scan

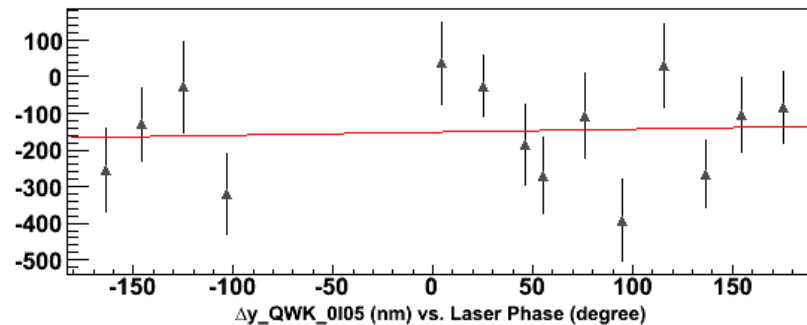
Hall C Laser Phase Scan, , Run 414, QWK_0105



$$\Delta q = 132.21 +$$
$$-0.04 \times \phi$$



$$\Delta x = 1173.95 +$$
$$-0.22 \times \phi$$



$$\Delta y = -151.33 +$$
$$0.08 \times \phi$$