Parity Quality Beam (PQB)

B-Team Meeting

December 03, 2008
PQB ATLis 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:
Notes:
1. Injector iocse11, iocse12, and iocse19 have “TRANSPORT” style IF cards

<table>
<thead>
<tr>
<th></th>
<th>TRANSPORT</th>
<th>LINAC</th>
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</thead>
<tbody>
<tr>
<td>Sample Time</td>
<td>140 µs</td>
<td>8.6 µs</td>
</tr>
<tr>
<td>Fixed Delay</td>
<td>70 µs</td>
<td>4.3 µs</td>
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<tr>
<td>Dynamic Range</td>
<td>70 nA – 200 µA</td>
<td>700 nA – 2,000 µs</td>
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</tbody>
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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:
   o Hall C iocse18 and iocse14 have “TRANSPORT” style IF cards
   o Hall C iocse17 has “LINAC” style IF cards

4. Hall A?
Hall C Current Scan

Hall C Current Scan, Run 413, QWK_0I05

\[ A_q = 134.00 + 0.22 \times I \]

\[ \Delta x = 1343.62 + 1.07 \times I \]

\[ \Delta y = -153.69 + 0.73 \times I \]
Hall C Laser Phase Scan

Hall C Laser Phase Scan, Run 414, QWK_0105

\[ A_q = 132.21 + 0.04 \times \phi \]

\[ \Delta x = 1173.95 + 0.22 \times \phi \]

\[ \Delta y = -151.33 + 0.08 \times \phi \]