Qweak Coordination Meeting

Parity Quality Beam Tasks

February 17, 2009

PQB Tasks

1. **Task:** *Fast Helicity Reversal*

   - **Required by Qweak – Hall B knows.**
   - **Does Hall A want Fast Reversal? Everyone needs to know.**

   - Status:
     - ✓ 30 Hz Reversal: The standard PQB at 30 Hz Reversal was achieved.
     - ✓ 250 Hz Reversal: The PQB was similar to 30 Hz Reversal otherwise for the very large 60 Hz line noise in position differences.
     - ✓ 1 kHz Reversal: The PQB was very similar to 30 Hz Reversal (*even better*), less sensitive to 60 Hz line noise than at 250 Hz Reversal.

   - Issues:
     - Parity DAQ did work at 1 kHz and 500, 100 and 60 μs but partially with 10 μs.
     - BPMs "Transport" style IF cards are affecting short T-Settle studies:
       - ✓ Changed iocse11 IF cards to "LINAC"– almost finished with analysis – once done, request to change:
         1. Injector iocse12 and iocse19.
         2. Hall C iocse18 and iocse14 (Hall C iocse17 has "LINAC" IF cards).
         3. Hall A? First, what about fast reversal?
     - Need to find the "right" T-Settle (ideally 50 μs).

- Charge Feedback:
  - New feedback scheme needed: No slow controls (EPICS), zeroed the asymmetry for each of the 4-helicity sequences. Requires new hardware:
    - ✓ Use “Injector Net” for faster communications.
    - ✓ New IA Electronics.
    - ✓ New Helicity Board: 2 new outputs to the IA.

- Build new Helicity Board:
  - Goal: easy to program, more outputs (IA, Clock).
  - Will meet soon to write a spec sheet.

- *Check Helicity Magnets, Mott Polarimeters at 1 kHz:*
  - Checked fine at 250 Hz last year.
  - Need to check at 1 kHz – need new IF cards in the 5 MeV region.

- Eliminate 60 Hz Line Noise:
  - Found noise from 500 keV PSS Dipole Current Sensor – will be fixed.
  - More noise still there; Ion Pumps VIP0L02/3 local power supplies (ATLis Task submitted).

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

   - Did Hall C current and laser phase scans and measured Hall A PQB in Injector – No crosstalk observed, repeat once QE is bad.
   - Did Hall C IA scan and measured Hall A charge asymmetry in Injector (change charge asymmetry of one beam, measure effect on the other) – No crosstalk observed.
   - Need to measure crosstalk in the Halls to look for RF beam loading (ATLis Task submitted).

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

   - Tried once (see plot on next slide).
   - Repeat again before photocathode activation.

4. **Task:** *Accelerator FFB Measurement of PQB:*

   - Runs fine on Hall A iocse9 and Hall C iocse14.
   - Need to implement in Injector iocs.

The Photocathode Rotation