

HAPPEX: To Do

Dec. 1 2006 Collaboration Mtg

- What are constraints for the August 10-day test run? Who is running then? (Bob)
- Next Collaboration Mtg: late February 2007?

HAPPEX-III

- Will we see distinct bumps in oxygen, iron at $Q^2=0.6$? Do we need to drop to one pass to get distinct levels? Kent/Rob F; need memo for Kees about need for 1 pass
- H_2 target design: minimize end windows to keep Al QE small (Cal State LA/W&M)
- Examine HAPPEX-I detectors; refurbish or rebuild. (W&M) segment?? Check resolution
- Check elastic stripe coverage in focal plane, optimize. (UVa/W&M)
- Linearity of PMT/bases (?? @ JLab)
- Finite Acceptance (simulation) (Kent/Guido)
- Scanners - needed? what do this time? (Smith/UMass)
goal: stability vs. run; shape of scanner vs. VDC shape
- Use Fast Feedback for coil modulation - test in Spring 07? (Kent)

PREx

- Source systematics: Effect of other Halls (Cathode: B&C; Linac cross-talk: C)
- August 2007 Test run:
 - study beam cross-talk from other halls
 - Compton tests (Syracuse, Sirish)
 - Noise test with LUMI, 18 bit ADCs - can carbon target work? (KK)
 - Pb detector test (use Moller spectrometer as test beam?)
 - Tests for Moller: duty cycle/DAQ tests? Eugene

PVDIS

- 25 cm racetrack hydrogen cell (use for HAPPEX-III? think about this?)
- Compton (see later)
- PVDIS DAQ → critical path; what will the pion asymmetry be, thus what pi/e rejection is needed?

Compton:

- Rewrite code (how much?) in C++ (Syracuse→talk to Sirish...)
- Integrating mode (Sirish, Alex C, Bob M, Syracuse, CMU)
 - program FPGA to use firmware cut? (Bob)
 - add inductor: make big background pulse's tails ring (average to zero)? (Paul)
- Green light Fabry-Perot cavity (Sirish N. , Duke, UVa...)
- new photon detector (CMU/Guido)
- servo electronics for mode-locking (need electronics engineer/student?)
- new electron detectors (Bernard Michelle et al.- Clermont-Ferrand)
- Bob's idea: go to very low beam current, put electron detectors "very close to beam" to calibrate, so can see whole Compton spectrum even if halo...?
 - investigate FSD issue: how were existing e detectors cooked?
- Goal: get 1% test of integrating method in test with IR light/high energy beam- summer 07 goal?)
- Need: Monte Carlo to check linearity of photon detector at low end; GDR production of neutrons? (Rich J/Paul?)

Electronics:

- Can/should we use Qweak/TRIUMF electronics? (U. Mass)
- 18 bit ADCs → test with Lumi's during Pb(e,e'p) (Bob M./KK)
- Do we have ground loop problems? What is pedestal noise? (Bob M./KK)
- Critical test: can we get < 100 ppm noise with Lumi? (Bob M./KK)
- Who "owns" the Lumi's this time? (need a student → Brian Hahn (W&M))

Detector: (Smith/U.Mass)

- Thin quartz; need to demonstrate narrow response to single electrons;
simulation: thinner is better; test in beam summer 2007?
- Optimize geometry, understand cosmic results (factor of 4 mystery)
- Quartz PMT? More light, less neutrons! (DSA- borrow G0?)
- Linearity
- Beam dump → where shower counters are (Bogdan)

Other PREx issues:

- High-Field Moller as cross check (Eugene) (ensure is approved project)
- Poletip Monte Carlo (Kent→Guido)
- Transverse Asymmetry (can new Moller measure sideways polzn? → Eugene)
remember what was proposed...
- Low current running issues: cavity monitors, etc.?

Warm Septum Magnet: (Syracuse/Smith + ROM)

- MRI (NSF January deadline; approved internally at Smith, submitted to SU; if Syracuse internal failure → W&M submit?)
- *or* Plan B build at JLab if NSF not funded.
 - Can the new magnet use the old scattering chamber/vacuum system?
Need designated integration expert (Bob M.)
 - Could we use the BLAST p/s on loan? (Bob M. → Stanley)
 - Optics commissioning plan
 - can we avoid vacuum coupling? John LeRose

Infrastructure/Integration

- Need memo for Kees to outline serious JLab resources (already exists?)
 - Warm septum/scattering chamber
 - Moller upgrade
 - Compton upgrade
 - John Musson → low current cavity monitor electronics

Cavity Monitors:

- Cross talk, oscillation issues; largely solved (Musson; GO experience)
- Confirm the GO 10 ppm double difference statement (Bob→talk to Riad)
- Need a collaboration expert (Lisa replacement) → Syracuse student
- Modifications for 50 nA sensitivity (parallel electronics path) Bob → John Musson

Source: (UVa)

- Remote linear motion control for Pockels Cell? Kent & EGG
- Continued development, optics bench test setup UVa, including two students
- cross talk from other beams
- helicity-correlated spot size sensitivity (understand Qweak spec)

Targets: (Dimitri M./Cal. State LA)

- **Pb:** There is a Pb(e,e'p) experiment (E06-007) this spring; similar target, high I...
- **Hydrogen:** any issues?
- Water cell, solid targets: need to define...

Moller : (Eugene & Moller group)

- with new foils: 2.1% error
- Upgrade plan: clone Hall C Moller target (spare magnet), fast raster, pulsed beam > 1 ms pulse @ 30 Hz, 1 μm round target foil; should get to 50 μA inst. (1% stats in 30 min); install new target in Fall 2007
- test pulsed beam mode in August ?

Feb-April run

1. Lumi (Brian Hahn/Bob)
2. Beam modulation system
3. Electronics Noise
4. 18-bit ADC/Qweak ADCs
5. New Cavity prototype electronics (but not low current?)
6. Pb target
7. Revive DAQ

Collaboration Meeting: Feb 23/24?

August 2007 Test run:

- study beam cross-talk from other halls (primary goal) (UVa)
- Compton tests (Syracuse, Sirish)
 - need new regular electron detector, high-gain PMT on photon
- Noise test with LUMI, 18 bit ADCs - can carbon target work? (KK)
- Pb detector test (use Moller spectrometer as test beam?) (Piotr)
- Tests for Moller: duty cycle/DAQ tests? Eugene
- Low current cavity tests (Musson/Bob)

Thesis Students

- Brian Hahn - *William & Mary*
 - Diana Seymour - *CMU*
 - Zafar Ahmed , Abdurahim Rakhman - *Syracuse*
 - Luis Mercado - *U. Mass*
 - Botao Jia (*non-thesis*) - *Duke*
 - ?? - *U. Virginia (three hoped for - Cates/Paschke/Zheng)*
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- *Postdocs: U.Mass, 50% CMU?*