

# Transversity Readiness and Roadmap

Xiaodong Jiang, Oct 9, 2007.

This document specifies the overall readiness of Hall A experiments (E06-010/E06-011) at each stages of preparation to serve as a guideline for works from October-07 to July-08. Time ordered backward, from pre-beam countdown.

- Pre-beam readiness (July 30, 2008).
- Final Installation (May'08-July'08).
- Pre-installation readiness (May 1<sup>st</sup>, 2008).
- Tests during  $\pi^0$  experiment (Apr.'08).
- During  $\pi^0$  installation (Feb.'08 , -Mar'08).
- Readiness before  $\pi^0$  installation (Jan 31, 2008).
- Work in the test lab (Oct.'07 – Jan.'08).
- Work in the target lab (Oct.'07-Apr.'-08).

# Pre-beam Readiness

- Beamline.
- Polarized  $^3\text{He}$  target.
- BigBite spectrometer.
- HRS Spectrometer.
- Trigger and DAQ.
- Slow controls.
- On-line monitoring and off-line software.
- Manpower, shift workers and experts.
- Documentations, instructions and logbook.

# Pre-beam Readiness: Beamline

- Beam energy fixed for max. polarization.
- Compton ready, manpower to run Compton and monitoring results.
- Beam raster checked.
- Beam charge monitors calibrated during earlier runs.
- Moller ready for one- , two- and five-pass beam.
- BPMs ready, all harps checked.
- Beamline surveyed relative to target cell.
- Downstream correction coils and controls checked.
- Beam dump viewer checked.
- Beamloss/Ion-chamber limits checked.
- Happex luminosity monitors working, secondary-Lumis ready.
- Happex beam charge feed back working.
- Beam helicity in DAQ checked during earlier runs.

# Pre-beam Readiness: pol. $^3\text{He}$ target

- To be added by J.-P.

# Pre-beam: BigBite spectrometer

- To be added by Xiaodong.

# Pre-beam: HRS Spectrometer

- To be added by Vince+Alex+Evaristo.

# Final Installation (May'08-July'08)

- Added later by Xiaodong.

Pre-installation readiness (May 1<sup>st</sup>, 2008)  
to be added later by Xiaodong. Shieldings here:

- Hall A floor layout.
- DAQ platform shielding pieces.
- Downstream side shielding pieces for BigBite.
- BigBite detector shielding hut.
- BigBite detector platform modifications.



# Transversivity tests during $\pi^0$ experiment (Apr.'08)

Goal: to expose problems as early as possible.

- Completely transparent to  $\pi^0$  experiment.
- Debug all detector channels.
- A first round of pre-shower+shower calibration.
- Front-end trigger and timing.
- DAQ , scalers and beam helicity.
- Debug online software.
- Special test of coin. timing with HRS (?).

# Why do we need to do these tests ?

- No matter how careful we are, on the first day of beam, practically NOTHING will work. It took Gen two weeks to start taking useful data.
- Anything can possibly go wrong, will go wrong.
- Debug early to save commissioning time.
- Without these test, transversity will not be ready to run in August-08.

# During $\pi^0$ installation (Feb.'08 , -Mar'08).

- Demonstrate that BigBite can be set to  $30^\circ$ , 1.5m drift with the magnet shielding piece.
- Identify all hardware interferences for transversity.
- Cable layout. Except ch1+ch2 cables to h-package, the rest of cables to e-package.
- DAQ and controls run independent of h-setup.
- Set up beam-infor+helicity.
- Front-end ready, take cosmic runs.

## Readiness before $\pi^0$ installation (Jan 31, 2008)

- Hall-A floor layout shows where everything is.
- E-package locates on beam right, to beam height. Support blocks ready.
- Shielding blocks for DAQ platform.

# Detector/DAQ work in the test lab (Oct.'07 – Jan.'08)

- Shower +pre-shower block calibration with cosmic ray.
- Remote control of threshold on total sum signal.
- Scalers for pre-shower+scinti.+shower, sort scalers with pseudo-helicity.
- DAQ be able to run independently with the hadron package setup.
- Check out ch-2, reduce the noise level. Repair ch-3 and ch-1.
- Readout two-chambers(?) + pre-shower+scinti.+shower.
- Remote control of the chamber threshold voltages.
- Modification of the detector frame.
- Gas Cherenkov box ready, test fit into the new frame.
- All detector cables ready, fit into the new frame.
- A final cable layout scheme in Hall-A. Ready to move by end-of-Jan. 2008.

# Detector Preparation: Gas Cherenkov

- Mirror alignment.
- Gas handling system.
- Cosmic ray checkout.
- All cables ready.
- Parasitic beam test.
- Integration into BigBite e-detector frame.
- Front-end electronics ready.

# Work in the target lab (Oct.'07-Apr.'-08).

- !!! To add a detailed list from J.-P. here !!!
- Scheme of spin-flip and how to communicate with DAQ.