

# Hall A Transversity Experiments Progresses and Milestone Check

Xiaodong Jiang, July 9th, 2007. Transversity Collaboration meeting.

## Our Goal:

all sub-system fully tested and ready for installation by end-of-year 2007.

Move into Hall A on Jan. 1<sup>st</sup>, 2008.

Parasitic electron detector package debugging/testing starts April, 2008.

## BigBite detector completed tasks since May:

- Shower blocks were taken out. Replacement of 20 PMTs.
- chamber-1+chamber-3 tracking, HV scan and threshold scan.
- Preparations for chamber-2 readout.
- Software tools for chamber tracking.
- FASTBUS readout and scalers working.

# Milestone check: BigBite detectors and DAQ

April 30, 2007:

Trigger and DAQ set up, pre-shower+shower DAQ check. **Done.**

May 30, 2007

chamber-1+chamber-3 readout check. **Completed June 25th.**

All preAmp card delivered and checked (210 + 30).

**!!!!!!Still missing 50 cards, no MAD chips yet !!!!!!**

July 1, 2007:

Fix shower PMTs. **July 15th. Re-install July 20th.**

Pre-shower block rework. **PMTs not delivered yet, housing units in UK. Finish re-install by end-of-July ?**

# BigBite Chamber-2 Milestones

## 4. Multi-Wire Drift Chamber-2 (MWDC)

Wire stringing and Preparation of wire frames **Complete**

**March 31, 2007:** Preparation of cathode frames complete

**April 10, 2007:** Middle chamber arrives at UVa

**May 10, 2007:** Complete middle chamber assembly with new frames

**June 1, 2007:** Complete middle chamber testing **Delayed till end-of-July ?**

**June 10, 2007:** Middle chamber arrives at Jefferson lab

4-6 weeks: Installation of the chamber in detector frame, connect gas and power and cabling

8-10 weeks: Testing and commissioning the detector package in the test lab

**Missing many parts (preAmp cards, card supports, low voltage connectores). Still hopeful for a readout test by mid-August.**

## Setbacks on chamber-1.

June 30, chamber-1 HV tripped, likely a broken wire.

July 25, finish preparing chamber-1 move.

July 31, remove chamber-1, start repair.

August 15, finish repair.

August 25, chamber-1 re-installed.

August 31, chamber-1 readout and debug.

### **Similar chamber problems might happen again**

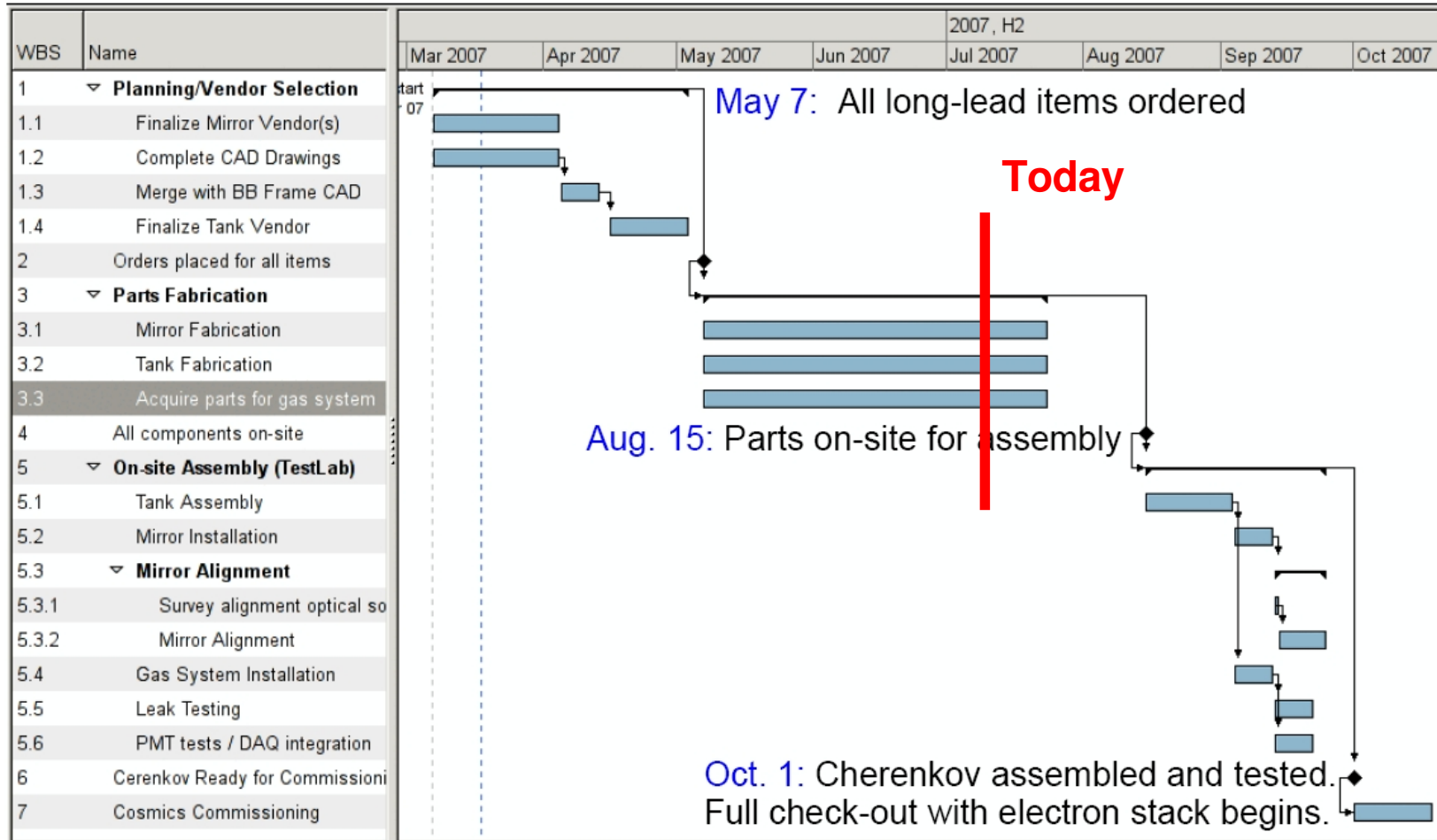
Avoid operations (drill/cut/shake) on the detector frame.

Separate HV connections to partially survive HV trips.

Prepare for emergency chamber repair at JLab.

# BigBite Gas Cherenkov Milestones

## Cherenkov Timeline and Milestones



- Note: Fabrication and Assembly start times are keyed on Milestone dates, providing additional slack in schedule.

# Milestones on BigBite detector

Sept. 1, 2007: (still hopeful)

three chamber read out check, demonstrate clear cosmic tracking.

Nov. 1, 2007:

Gas Cherenkov integrated into detector package. Whole-package cosmic ray test. ch1+ch2+gas-C+preshower+Scint+shower.

Dec. 1, 2007: Prepare to move into Hall A.

Dec. 31, 2007: Ready for installation.

# HRS Detector Milestones

## Timeline

- Jun 25 2007 summer down
  - A1 refurbishing **A1 checked.**
  - S2m installation **S2M checked.**
- Oct 1<sup>st</sup> 2007
  - Coulomb Sum Rule running ( S2m, gas Cerenkov, pion rejector checkout)
- Jan 2008
  - Installation A1
  - Installation RICH

March 19th 2007

Big Family Readiness Review  
HRS Status

**Still on track !**



# HRS RICH Detector Milestones

## Milestones

### Upgrade

- End Sep 2007: RICH frames Ready, availability of the upgraded frames (and accessories).
- Mid Nov 2007: RICH Assembled in Rome, ready to be shipped to JLab.
- **Mid Dec 2007: RICH Ready for installation**, all parts of the RICH (included the new electronics) have been tested and ready for integration and installation.

# Polarized Target Milestones

## 2.2.6 Time lines and Milestones

### 1. Polarized $^3\text{He}$ target

- (a) Spin-Flip test: done
- (b) NMR/EPR system working: done, will keep improvement.
- (c) New over ready for cell testing/characterization: April 1, 2007
- (d) Vertical coils test: June 1, 2007 **Not done yet ?**
- (e) Cell production: 10 by July 1, 2007, 20 by December 1, 2007
- (f) New target structure: Sept. 1, 2007
- (g) Compass: Sept. 1, 2007
- (h) Laser optics line: Oct. 1, 2007
- (i) NMR FM water (optional): Oct. 1, 2007
- (j) Complete system test: Nov. 1, 2007
- (k) Ready for installation: Jan. 1, 2008

# Transversity Hardware Work in Hall A

July 14th-Oct 7th, 2007

1. BigBite magnet support, mount the new right foot, clear interferences with the downstream section.
2. Mount the new BigBite magnetic clamp piece.
3. Test mount the collimation boxes inside the magnet.
4. Measure the BigBite fringe field with the new field clamp.
5. Modify BigBite platform right wring, clear downstream interferences.
6. Prepare the near-beam shielding pieces.
7. Install S2M in HRS\_L.
8. Install optics fibers for laser.
- 9.
- 10.
- 11.

# BigBite Design Items

0. Gas Cherenkov related.

1. A frame to mount chamber1+chamber2 when gas cherenkov is in place.
2. Modification of BigBite detector mount point on the support.

These three items are part of the design for including gas cherenkov in the electron-detector package (MUST for d2n, SHOULD for transversity).

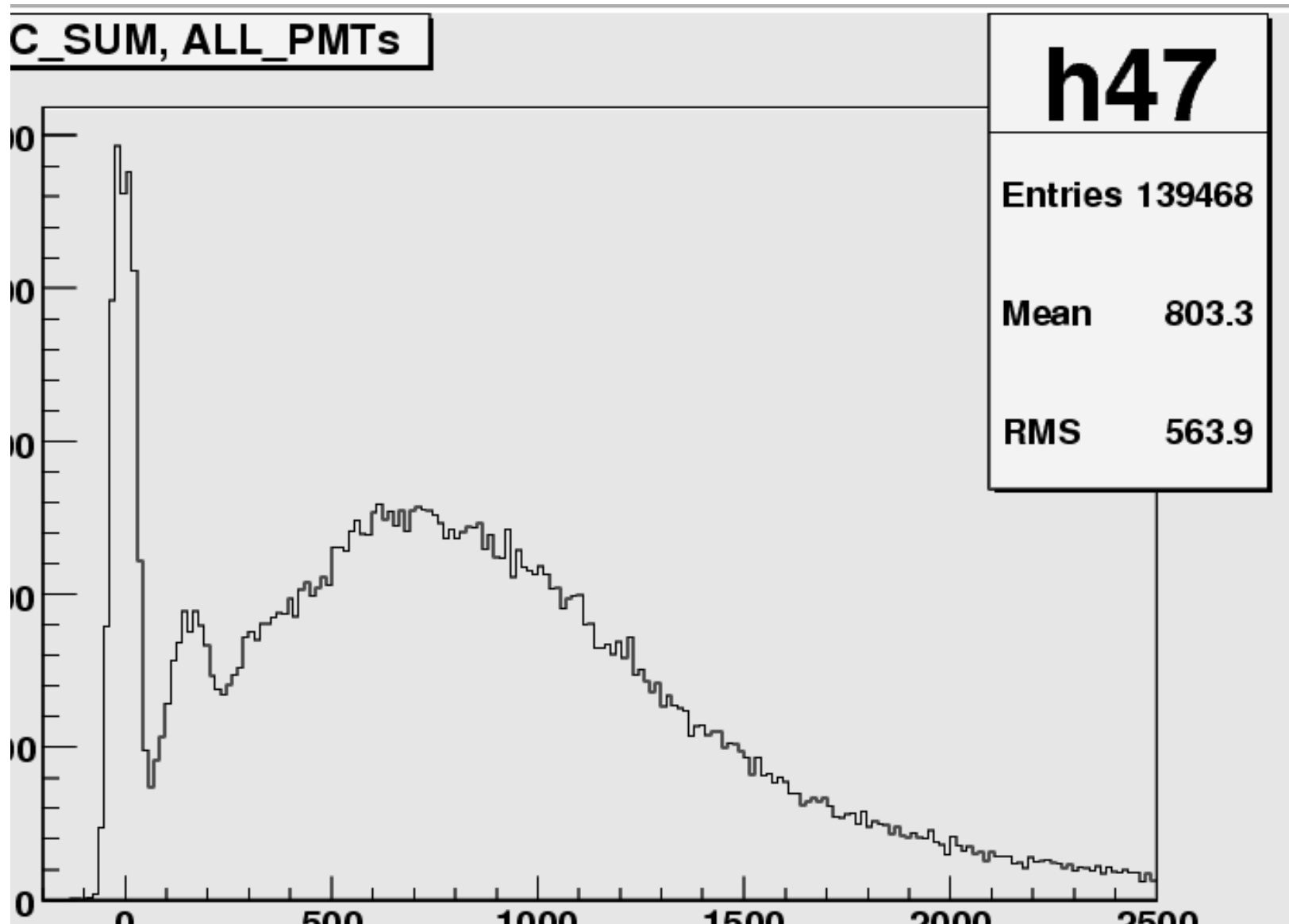
3. A light-weight near-detector shielding hut (MUST). SHOULD allow reasonable access to detectors without call-in a crane operator.

4. Upstream and down stream beam pipe sections+windows (**DONE**).

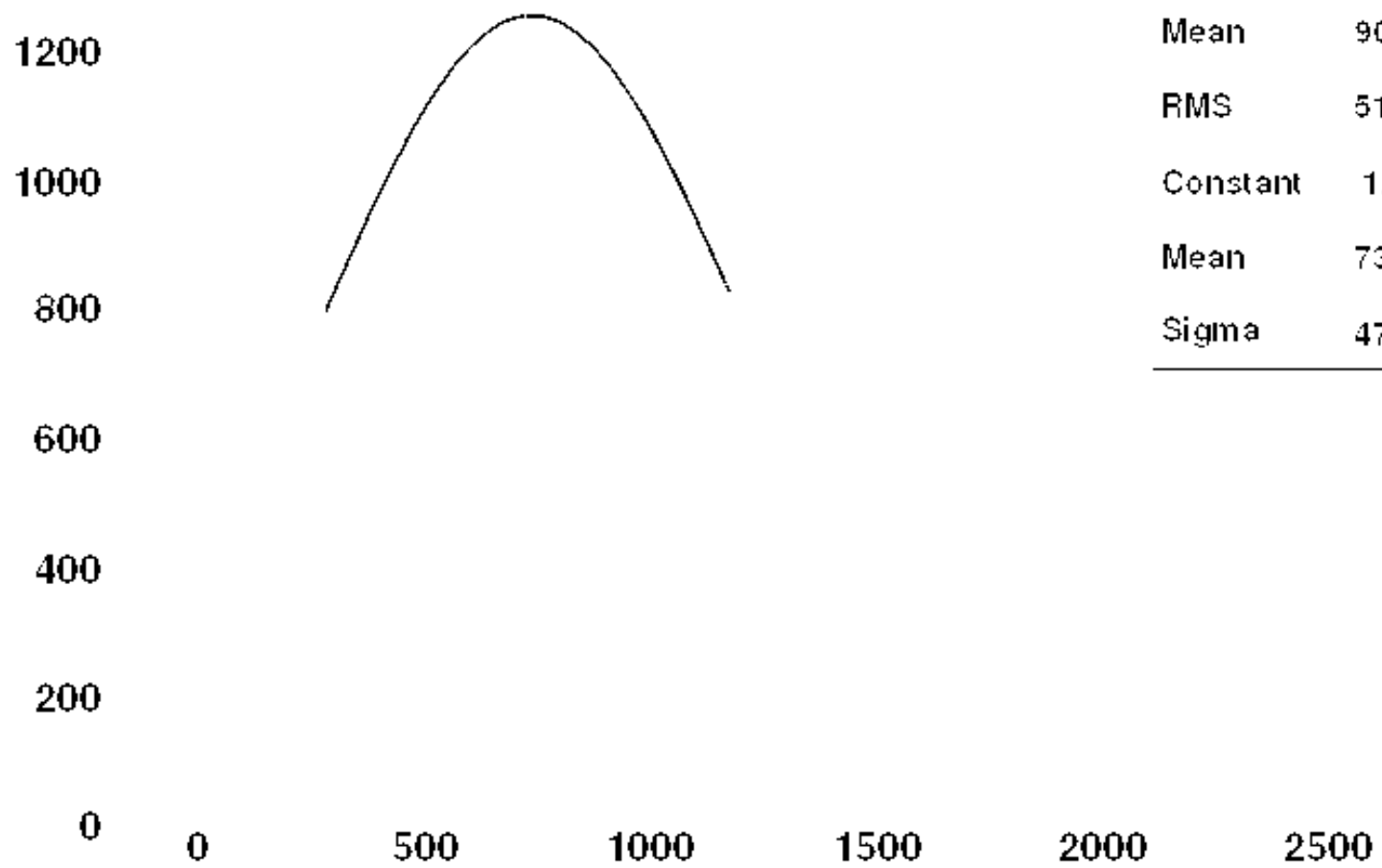
5. BigBite optics slit + mount at the magnetic clamp piece (MUST), for calibration runs. A front collimator in the same place for production runs (SHOULD).

6. Collimation boxes inside BigBite magnet to hold lead-pieces (MUST).  
SHOULD be done before summer-07 down time to test fit in the summer.
7. Modification of BigBite downstream side platform to fit into 30 degree, while HRS\_L at 16 degree (MUST). The arrangement SHOULD be checked out during the summer-07 down time.
8. A support for near beam pipe shielding (MUST). SHOULD be done before Nov. 1st, 2007.
9. A detailed plan of to concrete blocks for far-side shielding on both upstream and downstream. SHOULD be done by Jan. 1st 2008.

# HRS A1 check



**ADC\_SUM, ALL\_PMTs**



**h47**

Entries	125433
Mean	901.5
RMS	517.6
Constant	1249
Mean	733.8
Sigma	477.4

## Shielding and collimation (designs needed).

1. A 3" (st. steel) front collimator at the magnetic clamp.
2. Two boxes to hold 2"-thick lead pieces inside BigBite magnet to block low field regions.
3. A light-weight near-detector shielding.
4. A 6"ID downstream pipe section (design done).
5. Near beam height downstream shielding.
6. Concrete blocks as far-shielding.