



Progress at JLAB – 04-10-2014

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JLAB



Off-project and HPS milestones

| | Off-project milestones | Start date | Finish date | Responsibility | Comments |
|------------------------------|---|------------|-------------|--------------------|--|
| Beamline | | | | | |
| | Hall-B transport line | | 8/29/14 | Accelerator | Installation is completed |
| | Hall-B upstream beamline ready | | 8/29/14 | Accelerator/Hall-B | Beamline is elevated |
| | Commissioning of RF separator | | 10/3/14 | Accelerator | Tentative |
| | 1/2/3 pass separation and beam delivery | | 10/10/14 | Accelerator | Tentative |
| | Commissioning of the Hall-B beamline | 10/10/14 | 12/5/14 | Accelerator/Hall-B | |
| Hall-B work | | | | | |
| | CLAS12 PCAL and FTOF are mounted | 10/1/13 | 2/28/14 | Hall-B | PCALs and FTOF are installed |
| | Preparing alcove | 10/1/13 | 3/17/14 | Hall-B | Work is started |
| | Forward carriage move to upstream | 3/25/14 | 3/25/14 | Hall-B | Chicane Magnets can be installed |
| | Install platform and chicane magnets | 3/25/14 | 5/15/14 | Hall-B | Rails and supports will arrive in 2 weeks |
| CLAS12 Torus assembly | | | | | |
| | Start assembly of the Spitt | 7/18/14 | NA | Hall-B/Magnet | 4 weeks delay, but will not effect alcove installation |
| | Install Torus Coils | 7/21/14 | 1/7/15 | Hall-B/Magnet | |
| | Cold-to-worm supports | 3/16/15 | 3/28/15 | Hall-B/Magnet | |
| | Weld VJ | 2/28/15 | 4/11/15 | Hall-B/Magnet | |
| | Orient and secure Torus to Hall B floor | 4/11/15 | 4/28/15 | Hall-B/Magnet | |
| | Connect leads and piping | 4/28/15 | 5/19/15 | Hall-B/Magnet | |
| | Leak test and Pump VJ | 6/2/15 | 6/26/15 | Hall-B/Magnet | |
| HPS | | | | | |
| | Installation of HPS apparatus | 08/15/14 | 9/30/14 | Hall-B/HPS | |
| | HPS commissioning and engineering run | 12/5/14 | 6/12/15 | HPS | Tentative |

Completed tasks

Machine is doing great - CEBAF delivered beam to Hall-A dump!

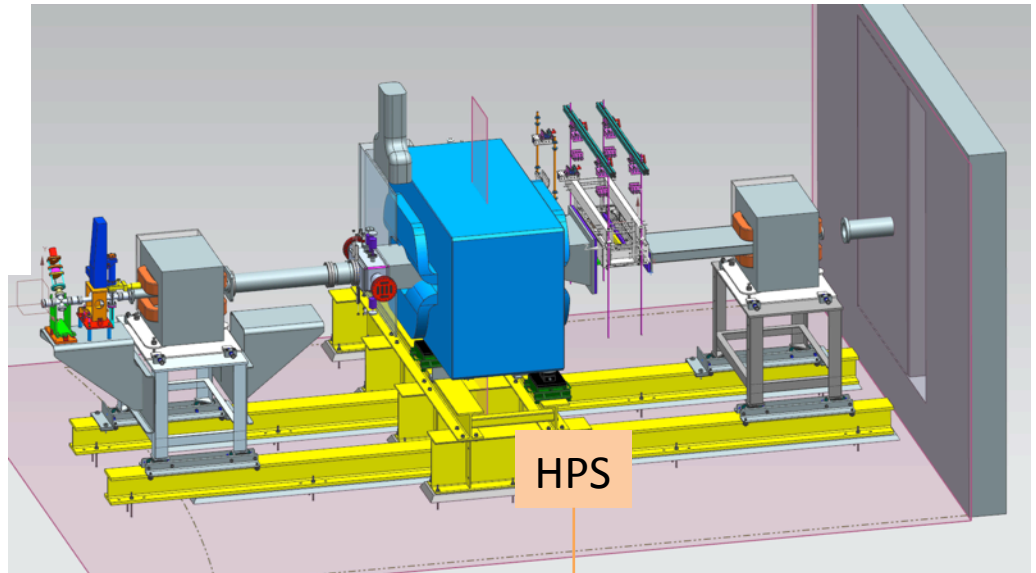
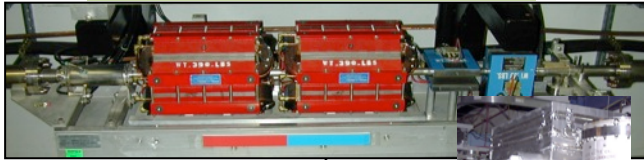
“off-project” milestones are tracked in regular meetings with accelerator and Hall-B groups



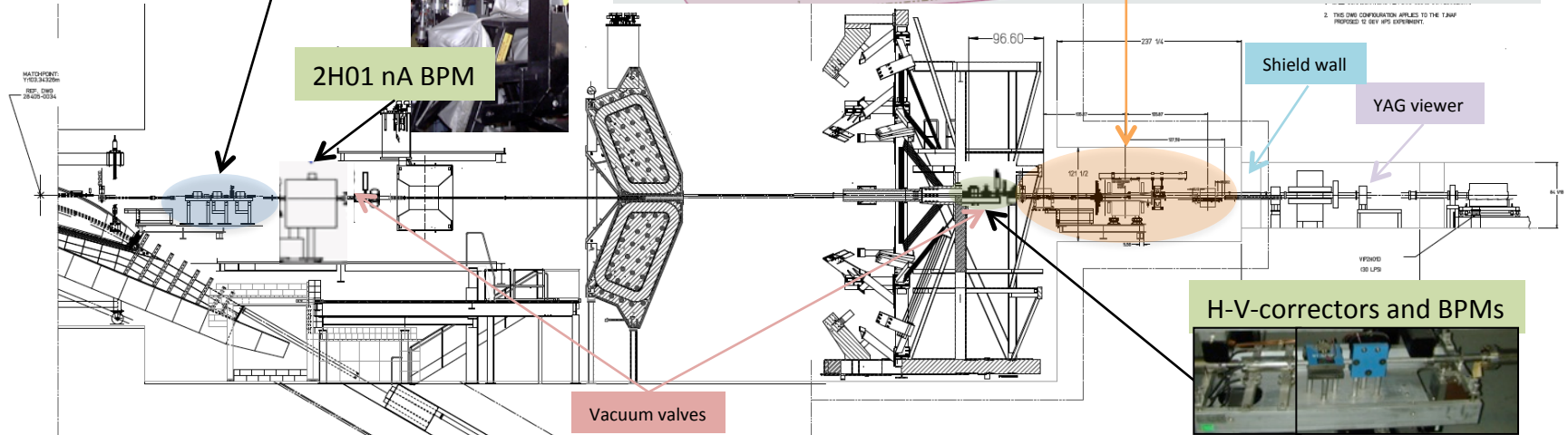
HPS beamline

- Alcove assembly will start in couple of weeks
- Power supply is now in the new location
- Installation of magnets will take place between 4/25/14 and 5/29/14

BPM, 2-QA, and H-V-correctors



HPS



ETC for alcove installation

| Mechanical | | M&S | MD | ME | MT |
|---|---|-------------------|-----------|-----------|-------------|
| Alcove assembly | 1 | <u>\$33,302.0</u> | 4 | 2 | |
| Gantry crane | 1 | <u>\$2,016.0</u> | | | |
| Floor supports | 4 | \$6,672.0 | | | 2.4 |
| Assembly of rails and stands | 1 | \$- | | | 8 |
| Installation of magnets | 1 | \$- | | | 4 |
| Survey | 1 | \$- | | | 2 |
| Connecting magnets | 1 | \$5,000.0 | | | 2 |
| Total | | \$46,990.0 | 4 | 2 | 18.4 |
| Total w/overhead & manpower in hours | | \$70,485.0 | 160 | 80 | 736 |
| HPS budget (manpower in hours) | | \$61,090.0 | 240 | 96 | 200 |

| Magnet Power | | M&S | MD | ME | MT |
|---|--|-------------------|-----------|-----------|------------|
| 800 A feeder | | <u>\$18,200.0</u> | | | |
| Move PS | | <u>\$-</u> | | | 0.5 |
| Installation of cables | | \$4,000.0 | | | 3 |
| Total | | \$22,200.0 | | | 3.5 |
| Total w/overhead & manpower in hours | | \$33,300.0 | 0 | 0 | 140 |
| HPS budget (manpower in hours) | | \$29,800.0 | 0 | 0 | 60 |

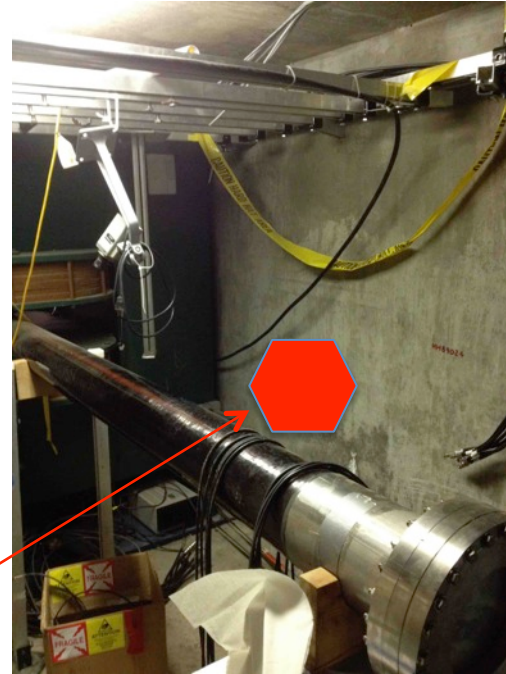
- Contracts on alcove mechanics and power supply relocation came lower than previously were estimated, net deficit on M&S are \$9,500 and \$3,500.
- Better estimates on manpower, budget underestimates MT.



Work on alcove installation started



Photon beam line is surveyed, shielding wall is ready to be stacked up

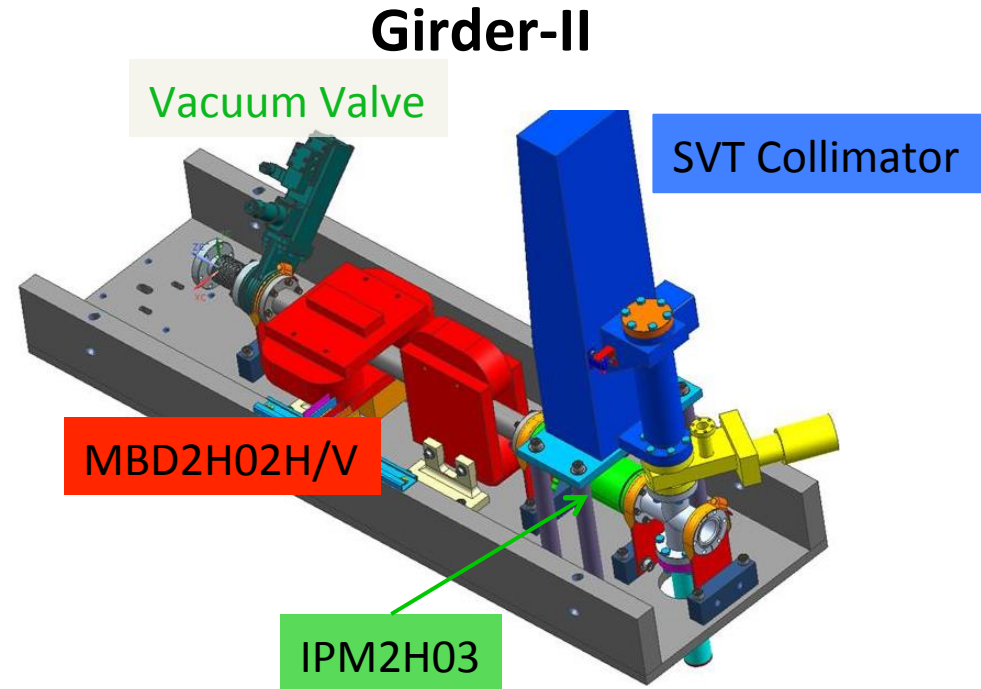
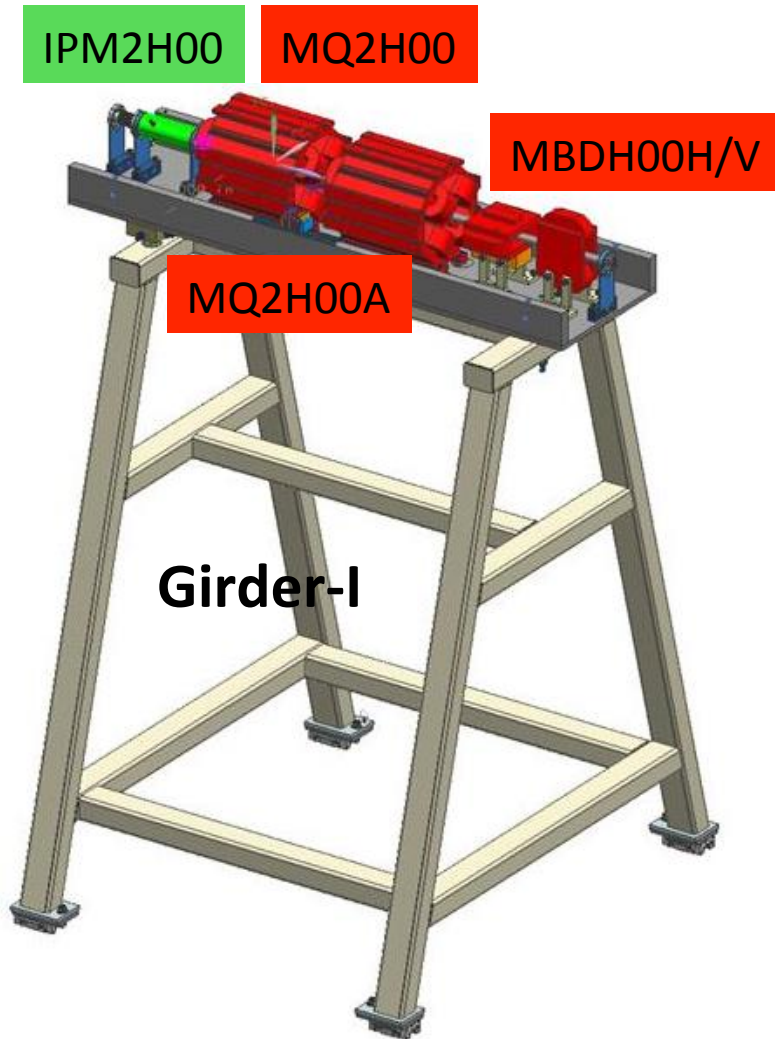


Photon beam dump will be located in the tunnel, behind the old pair spectrometer magnet (not used anymore)

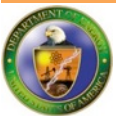
Cable trays for 535 MCM cables for analyzing magnet



New girders



- Design of girders has been completed
- Accelerator engineering group started refurbishment of magnetic elements and soon will start machining of girder chassis



Final ETC for new beamline elements

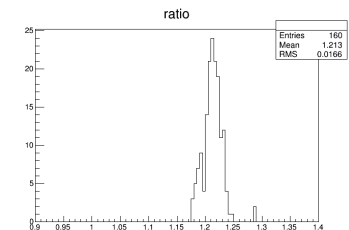
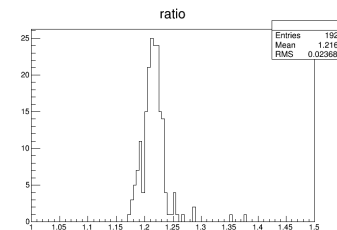
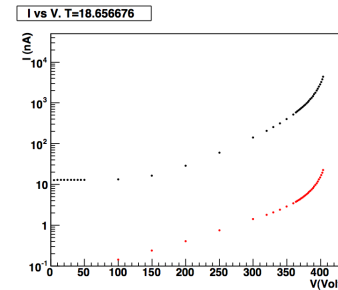
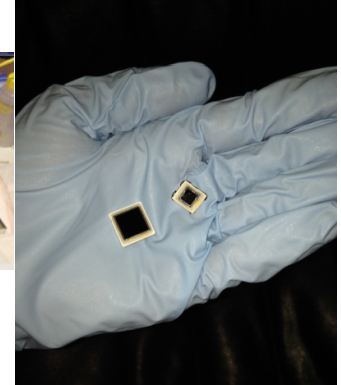
| | BPMs | New Stripline BPM Cans | New Electronics | Cabling | Labor EE | Labor ET | Labor CS |
|--|------------------------|------------------------|-------------------|-------------------|--------------|--------------|--------------|
| New | IPM2H00 | \$2,000.0 | \$6,000.0 | \$400.0 | 2 | 2 | 1.5 |
| New | IPM2H03 | \$2,000.0 | \$6,000.0 | \$400.0 | 2 | 2 | 1.5 |
| Old | 2H01 | \$- | \$- | \$- | 0 | 0 | 4 |
| Total | | \$4,000.0 | \$12,000.0 | \$800.0 | 4 | 4 | 7 |
| | Vacuum | Mechanicals | Instrumentation | Cabling | Labor EE | Labor ET | Labor CS |
| New | Valve | \$1,500.0 | \$1,600.0 | \$300.0 | 0.5 | 2 | 1 |
| New | Bellows (2) | \$400.0 | \$- | \$- | 0 | 0 | 0 |
| New | Collimator | | Hall-B | \$- | 0 | 0 | 0 |
| Total | | \$1,900.0 | \$1,600.0 | \$300.0 | 0.5 | 2 | 1 |
| | Magnets | Mechanicals | Instrumentation | Cabling | Labor EE | Labor ET | Labor CS |
| New | MQA2H00 | \$- | Spare Electronics | \$100.0 | 0.04 | 0.4 | 0.4 |
| New | MQA2H00A | \$- | Spare Electronics | \$100.0 | 0.04 | 0.4 | 0.4 |
| New | MBD2H00H | \$- | Spare Electronics | \$100.0 | 0.04 | 0.4 | 0.4 |
| New | MBD2H00V | \$120.0 | Spare Electronics | \$100.0 | 0.04 | 0.7 | 0.4 |
| New | MBD2H02H | \$120.0 | Spare Electronics | \$100.0 | 0.04 | 0.7 | 0.4 |
| New | MBD2H02V | \$120.0 | Spare Electronics | \$100.0 | 0.04 | 0.7 | 0.4 |
| Total | | \$360.0 | \$- | \$600.0 | 0.24 | 3.3 | 2.4 |
| | Girders assembly | Frames | Hardware | Cabling | Labor ME | Labor MT | Labor CS |
| New | IPM2H00 | \$3,250.0 | \$200.0 | \$- | | 1 | |
| New | IPM2H02 | \$3,250.0 | \$200.0 | \$- | | 1 | |
| Total | | \$6,500.0 | \$400.0 | \$0.00 | | 2 | |
| | Girders Install/survey | Supports | Hardware | Cabling | Labor ME | Labor MT | Labor CS |
| New | IPM2H00 | \$3,000.0 | \$- | \$- | 1.5 | 4 | |
| New | IPM2H02 | \$3,000.0 | \$- | \$- | 1.5 | 4 | |
| Total | | \$6,000.0 | \$- | \$- | 3 | 8 | |
| | MPS | Mechanicals | Instrumentation | Cabling | Labor EE | Labor ET | Labor CS |
| New | Chicane FSD | \$- | \$500.0 | \$- | 0.04 | 0.04 | |
| New | Valve FSD | \$- | \$500.0 | \$- | 0.04 | 0.04 | |
| New | Detector HV/PS | \$- | \$500.0 | \$- | 0.5 | 1 | |
| New | PMT Halo Counters | \$- | \$1,000.0 | \$- | 0.5 | 1 | 1 |
| NEW | CW BLMs | \$- | \$2,000.0 | \$2,000.0 | 1 | 1.2 | 0.04 |
| NEW | Master FSD Status | \$- | \$1,000.0 | \$500.0 | 1 | 1 | 1 |
| | | \$- | \$5,500.0 | \$2,500.0 | 3.08 | 4.28 | 2.04 |
| Totals | | \$18,760.0 | \$19,500.0 | \$4,200.0 | 10.82 | 23.58 | 12.44 |
| Grand Total (manpower is in hours) | | | | \$42,460.0 | 432.8 | 943.2 | 497.6 |
| Grand Total w/overhead (manpower is in hours) | | | | \$63,690.0 | 432.8 | 943.2 | 497.6 |
| HPS Budget | | | | \$44,700.0 | 600 | 800 | 440 |

- Most of new items have 4-6 weeks lead time, only new stripline BPM cans have 6 to 8 weeks lead time
- Estimated manpower is close to the budgeted amount
- M&S is short by \$19K

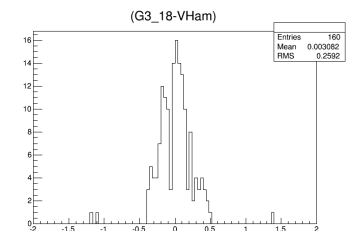
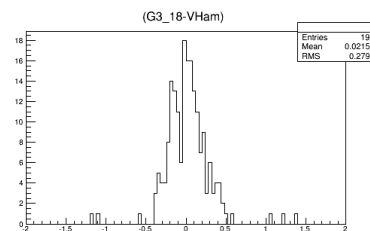


ECal assembly at JLAB: LAAPDs

- Old APDs from ~60% of crystals are removed, crystals have been cleaned and are ready for gluing of new LAAPDs
- First 300 APDs, that arrived at JLAB 3 weeks ago, have been benchmarked
- Second and final batch (216 APDs) ~~on the way~~ ^{received}



α/β :

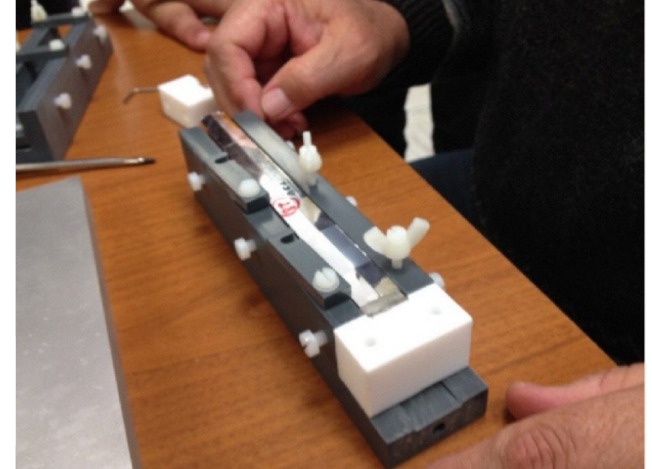


$V_H - V_M$, at 18°C and $G=150$



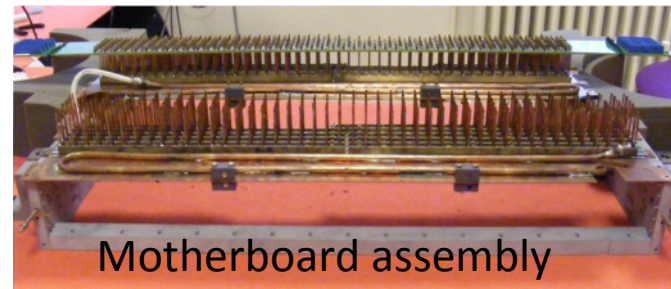
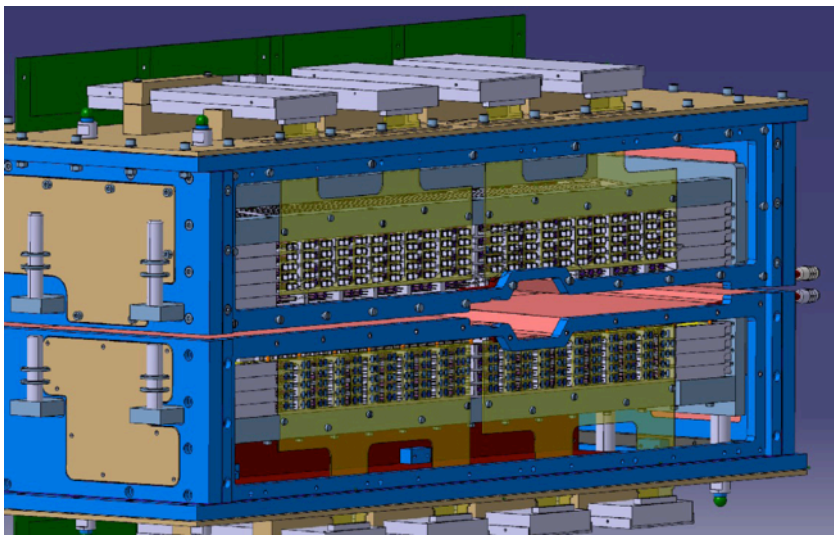
ECal assembly at JLAB: Module assembly

- All the equipment for gluing APDs and testing the modules are at JLAB
- Setup allows to glue and test 24 modules per day. First batch of 10 modules have been already glued
- Still have an open question on how to glue reflectors on LED holders. Few options do exist, tests are in progress

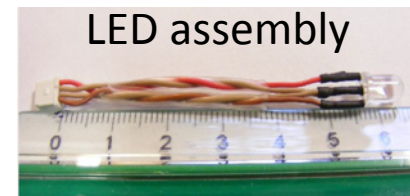


ECal work at INFN and Orsay

- ❑ INFN delivered everything as planned:
 - new motherboards - have been tested and are now at Orsay for assembly
 - LAAPDs are expecting to arrive at JLAB in any day now
 - LEDs, fully tested, and control boards for LMS system are at Orsay
 - Gluing fixtures, APD and module benchmarking setups are at JLAB and operational
- ❑ At Orsay - design modifications to the Ecal box have been completed and parts are ordered.
- ❑ Modification of pre-amplifiers has been completed
- ❑ Design of the new mounting system started
- ❑ Assembly of the new motherboards and LEDs started



Motherboard assembly



LED assembly

HPS Slow Controls Progress

- EPICS IOC for SVT voltage controls has been configured and is running on Hall B server
 - Final channel mapping is still to be determined
- EPICS controls screens for the SVT bias and low voltages are done, the alarms screens for the SVT voltages are nearly complete
- The EPICS driver for the CAEN-based high voltages for ECAL has been installed on the Hall B server.
 - The slow controls software for ECAL will be nearly identical to one at the test run.
- Interlock system for the SVT power and cooling has been designed and the hardware has been procured
- The stepper motor controllers for the SVT and the target motion control has been purchased and the cables have been fabricated

Expecting to start wiring everything in the Hall after chicane is installed

Everything is on schedule and on budget, some additional resources may be needed for FSD interlocks to have more protections for SVT and SVT collimator, still under discussions



Summary

- HPS preparations at JLAB showing a good progress in all fronts (beamline, Ecal, slow controls, and TDAQ)
- There are no serious issues that may effect on the installation schedule
- Expecting to have the Hall-B beamline and HPS readiness reviews in mid July, HPS installation in September, and the beamline commissioning in October – November
- Overall budget looks OK with exception of
 - beam line, contingency funds will be needed to complete the project
 - new requirements for the beam interlocks for SVT and SVT protection collimators will require more resources for slow controls, still in discussions

JLAB will host the next HPS collaboration meeting on June 16 to 18.

Everybody is welcome –

<https://www.jlab.org/conferences/hps2014june/index.html>

