Status Report on the Drift Chambers

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Massachusetts Institute of Technology
OLYMPUS Collaboration Meeting
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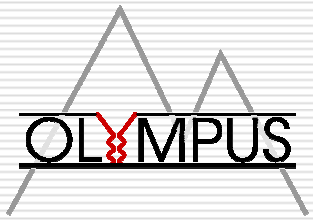


Outline

- Installation and alignment
  - Pre-installation tests
  - Installation of chambers into detector frame
- Recent and in-progress work
  - Testing of all wires
  - Electronics installation
  - Wire repairs
  - HV conditioning
- Work to be completed before roll-in
  - Completion of repairs and conditioning
  - Testing, cosmic ray runs

Pre-Installation Work

- Chambers moved to DORIS hall in late April
- Leak checking
  - Douglas Hasell
  - $2 \cdot 10^{-2}$ mL/s leak detector sensitivity
  - No noticeable leaks
- Signal testing
  - Alexander Winnebeck
  - Section of chamber brought successfully to operating voltage
  - Signals from cosmics were observed

Installation

Installation

- Chambers installed into the main detector frame in early May by Jim Kelsey (MIT Bates)
- Alignment and Survey
  - Karen Dow (MIT Bates) and Martin Noak (DESY)
  - Chambers fit well between coils
  - Nominal position achieved to approximately ±1 mm
  - Final survey position will be used in MC and RECON
- Gas lines installed
- Chambers flushed and retested for leaks

Wire Testing and Repair

Thanks to Axel Schmidt for the photos

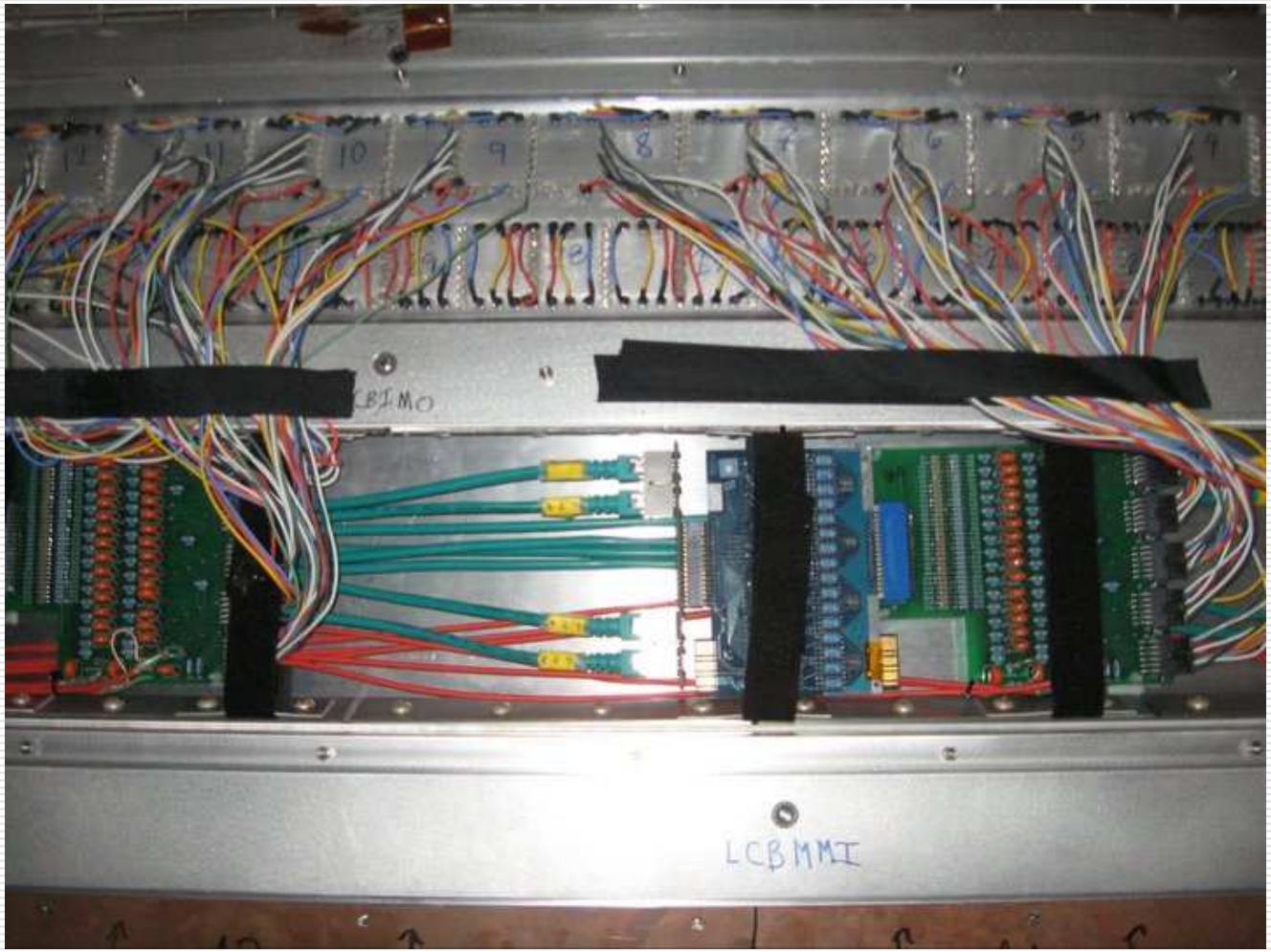
Wire Testing and Repair

- Graduate students arrived in mid/late May
  - Brian Henderson (MIT), Lauren Ice (ASU), Colton O'Connor (MIT), Becky Russell (MIT), Axel Schmidt (MIT)
- All ~10000 wires checked for continuity and crossings
  - Visual inspections for slack wires
- Necessary repairs made in situ
- Repairs are ongoing as new problems are identified

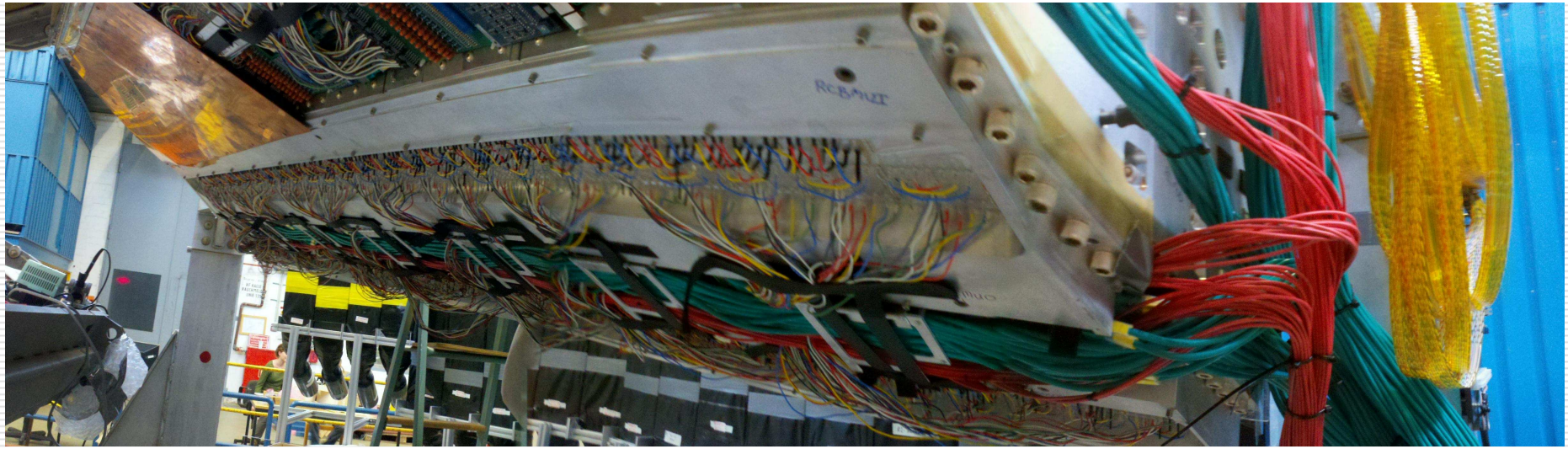
Electronics Installation

- HV cards tested at Bates last semester
  - 125% of nominal voltage
- High voltage and front-end cards installed for both chambers
  - Cards for outer layers installed using aluminum hinges
  - Works reasonably well, some air space left between cards
- All cabling (HV, LV, signal) is complete for both chambers

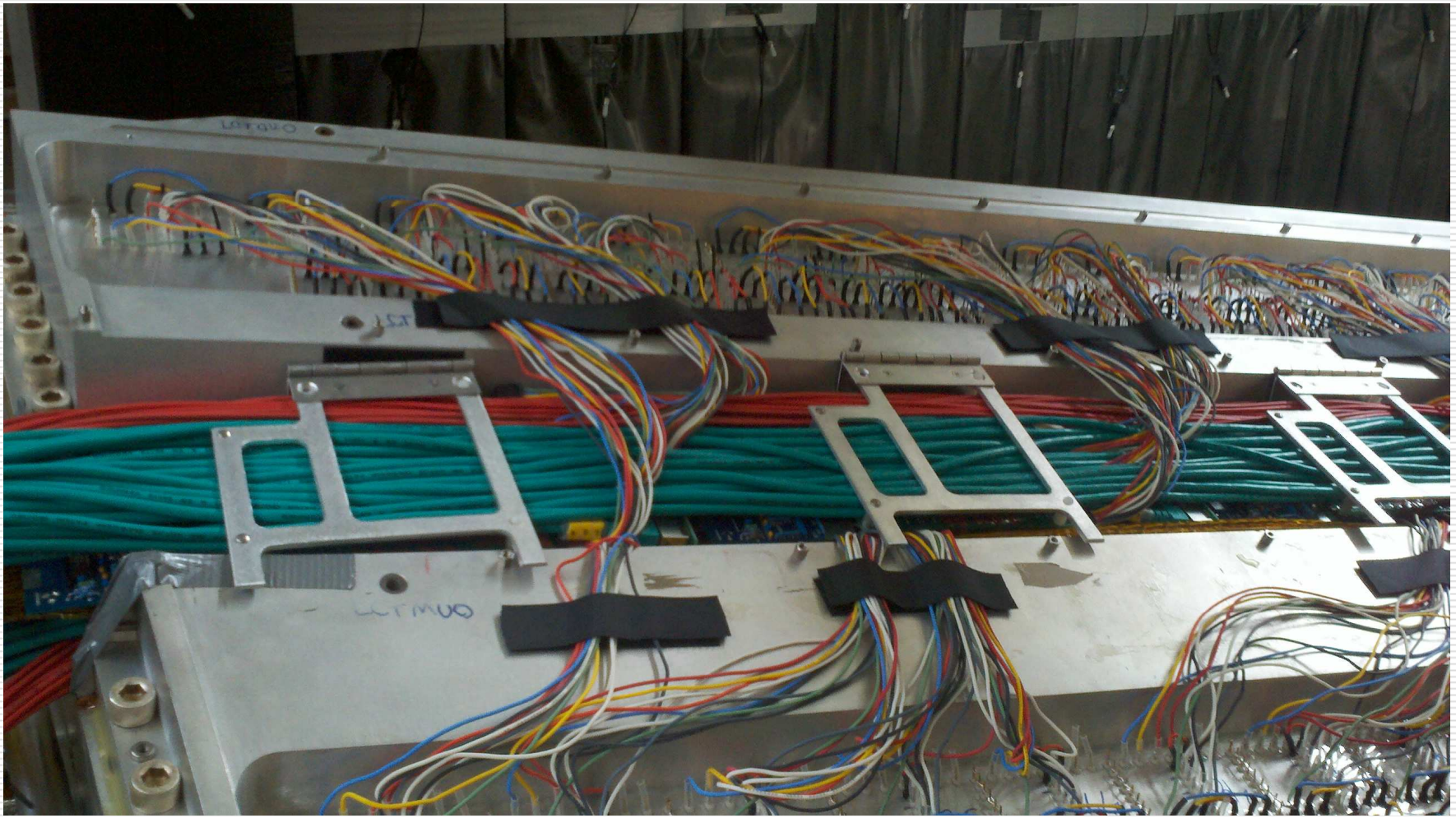
Electronics Installation



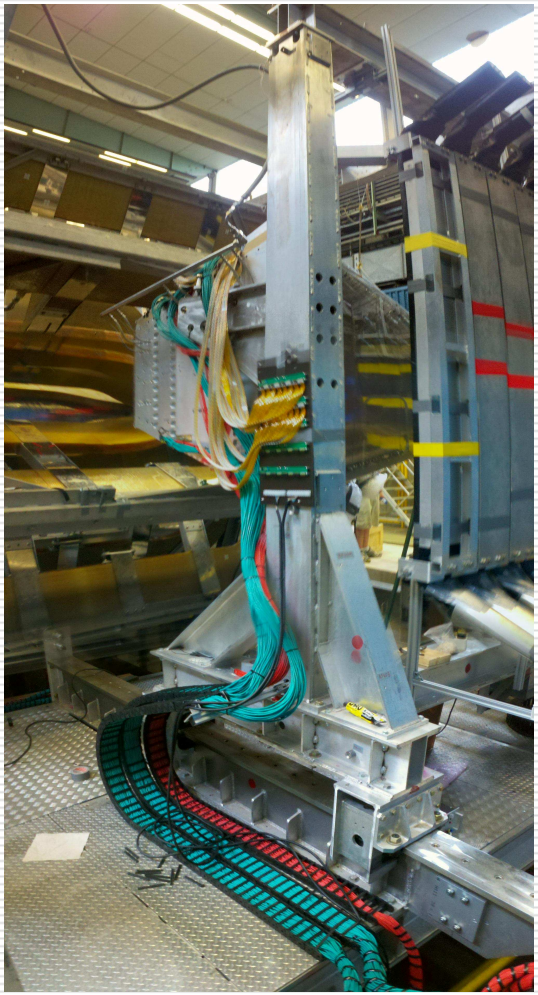
Electronics Installation

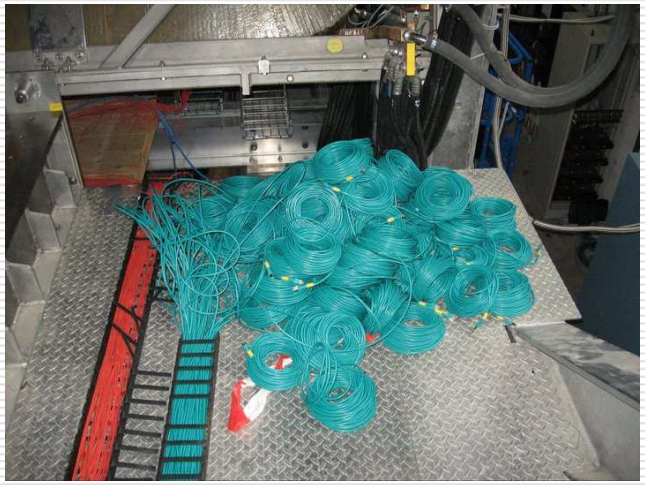


Electronics Installation



Cabling





HV Conditioning

- Voltage applied to all cells
- All but ~20 cells on each chamber held 1500 V on first attempt
- Problems
  - Slack wires
    - Often caused by loose pins
    - Easily repaired
  - Bad insulation on HV boards
    - Attempting repairs with corona dope
    - Spare cards available if needed

Current Status

- Beam right chamber
  - All wire related issues repaired
  - Only five problem cells remain
    - All HV card issues (problem persist when all connectors removed
  - HV conditioning continues on all other cells
  - Should be able to see signals this week
- Beam left chamber
  - ~15 issues identified
  - Repairs in progress, likely finished this week
  - Most cells hold 2500 V

Upcoming Work

- Finish repairs, bring to nominal voltage
- Observe signals
- Test the mapping of sense wires to the readout
- Test with the DAQ chain
- Test in the magnetic field
- Cosmic ray runs

Things are looking good for roll-in…