

# Lumi Highlights

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Apr. 9 2009

# Outline

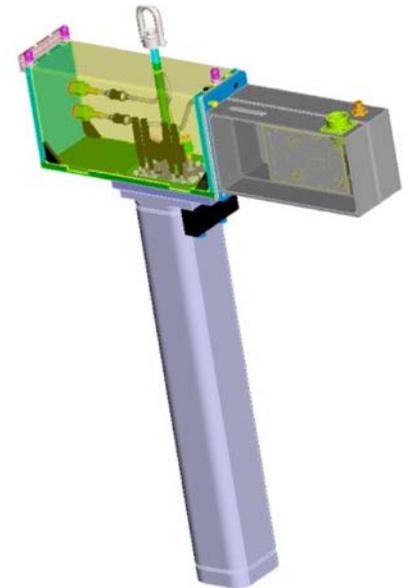
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- Experimental results (HM)
- Fabrication update
- Installation update
- Hardware commissioning
- Beam commissioning plans (HM)
- Bringing to completion
- Budget and Schedule

# Lumi highlights

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- Overcame HV cable problem
- Completed all detectors
- Completed all electronics
- Focusing on hardware installation commissioning
- On schedule to have systems completed in FY09 as planned
- Will be ready for LHC beam as planned





# System production

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- System production complete
- All hardware built by January
  - Received at CERN in February
- Includes:
  - 4 preamps
  - 4 shapers
  - 2 interface chasses
  - 2 local interface controllers
  - Several spares



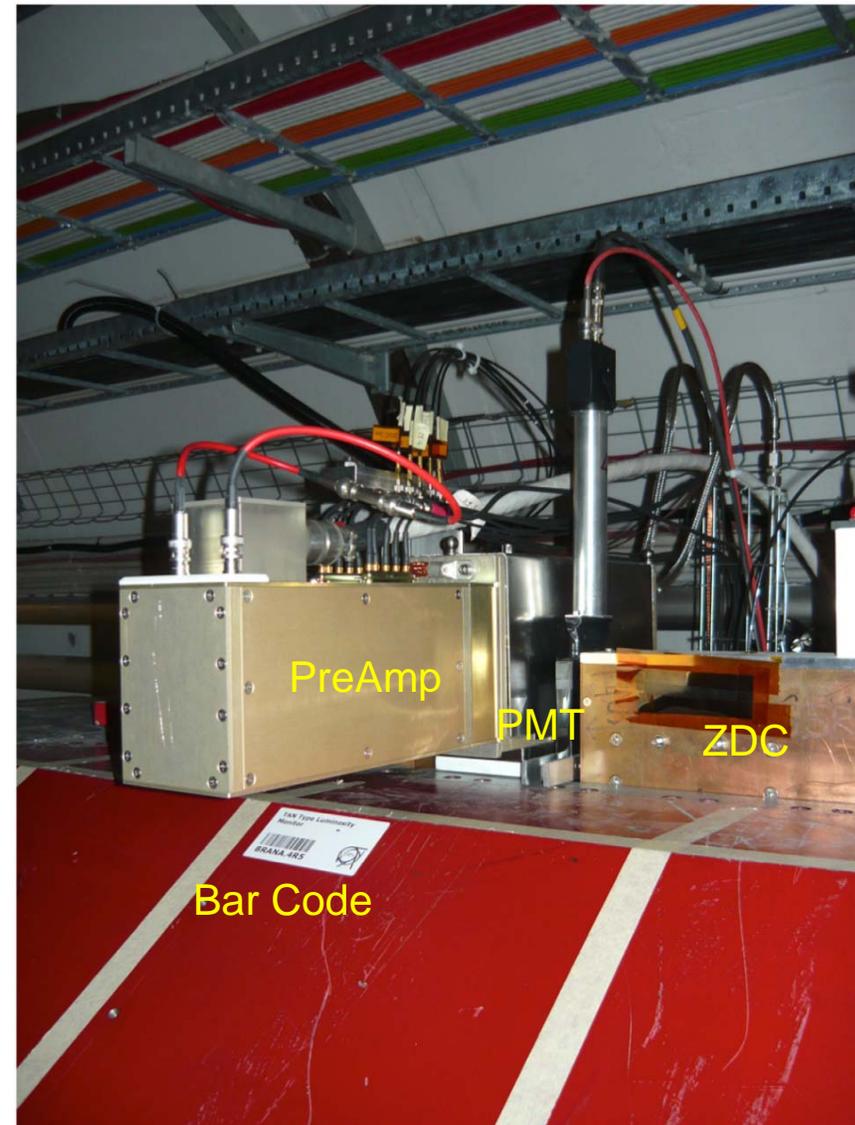
# HW Installation Highlights

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- Detectors: 3 out of 4 installed
  - Both detectors at point 5
  - Installed 1R, will install 1L in May
- Gas Systems
  - All installed, connected to detectors
    - 1L bypassed
- Rack Electronics
  - Pt 5 complete
  - Pt 1 started
    - Plan to complete in May when 1L is installed

# Installation at CMS Complete

- Detectors,  
Electronics, Gas,  
Cabling



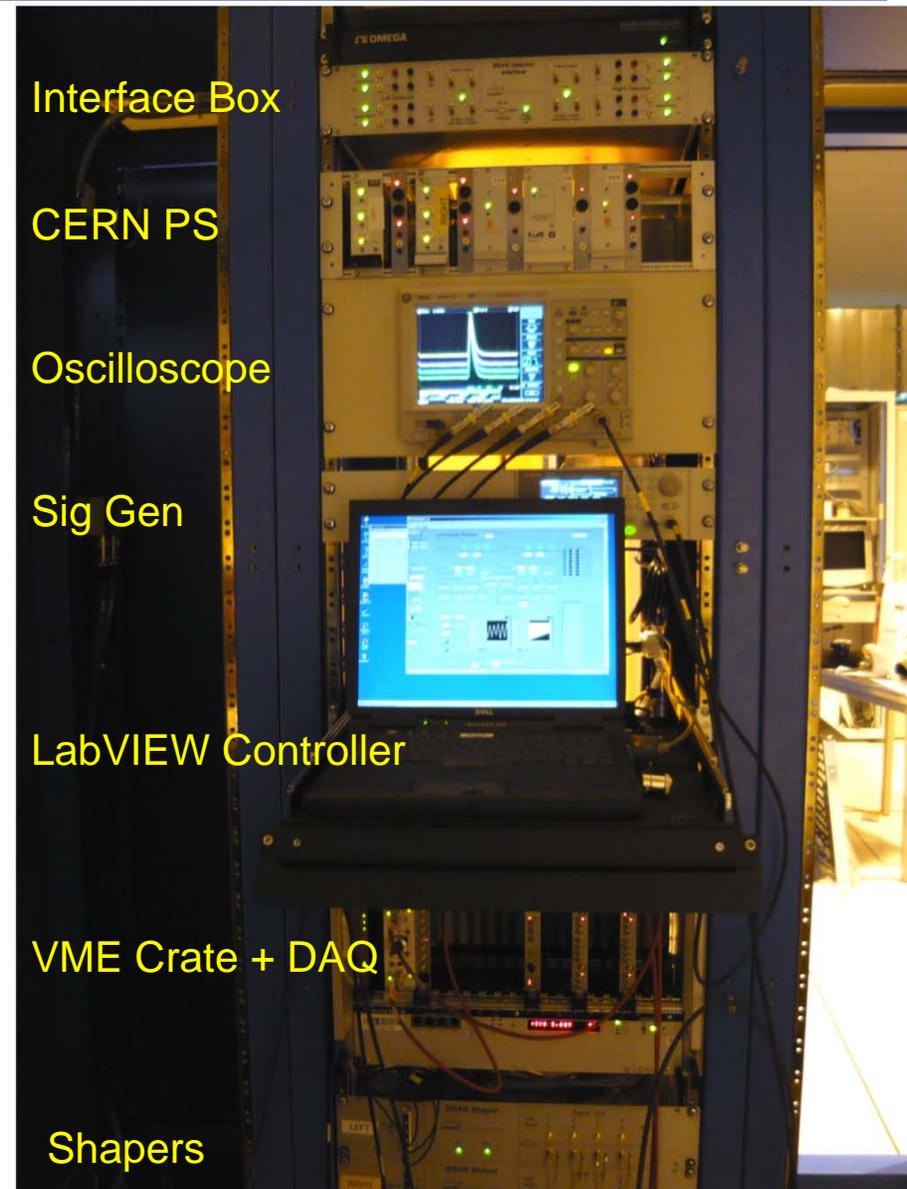
# Gas Controller

- Gas system under pressure
  - No major leaks
- Remote monitoring operational
  - Added remote AC power switching



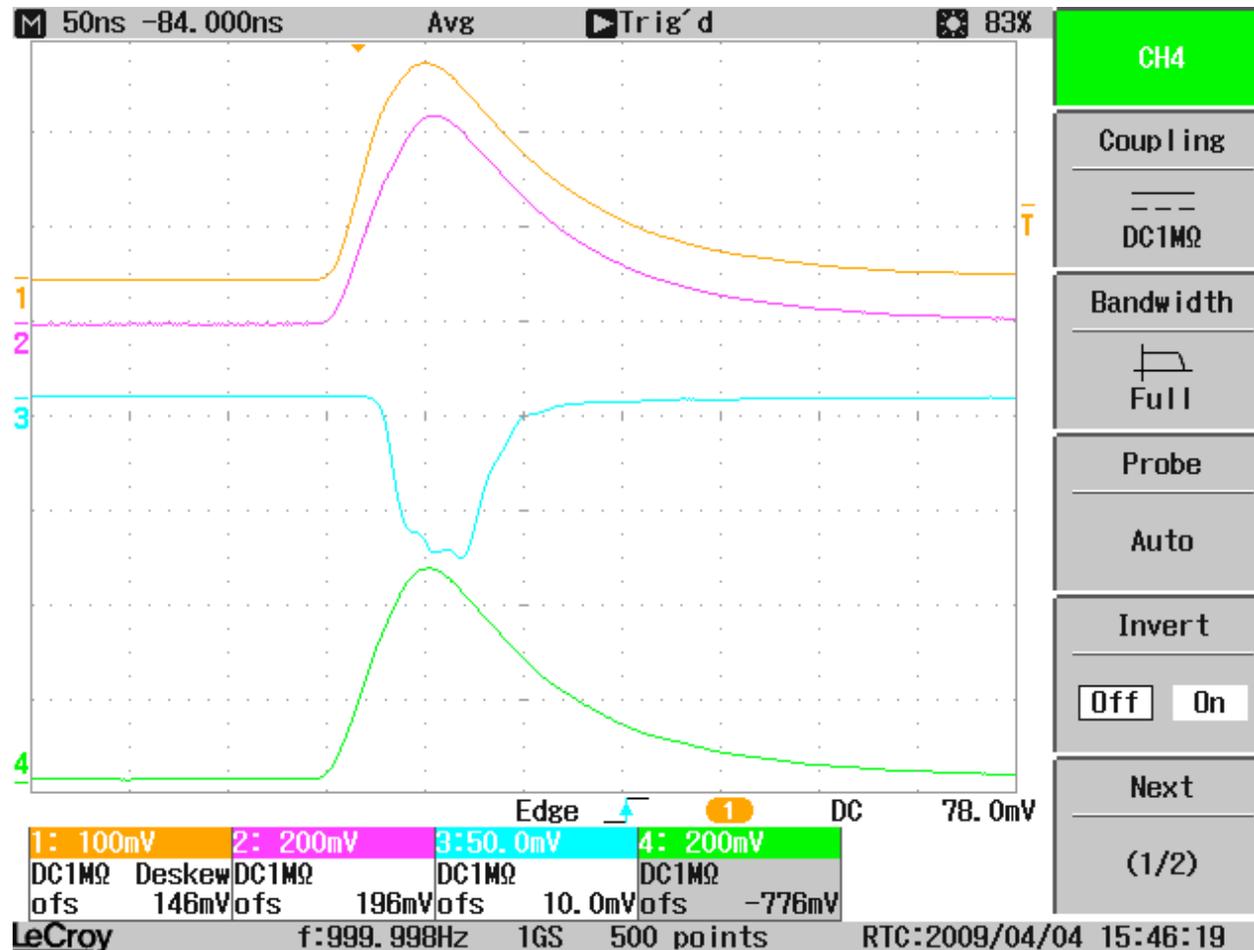
# Readout Rack for Pt 5

- Readout Rack complete
- All connections and functions tested ok
- Programming underway



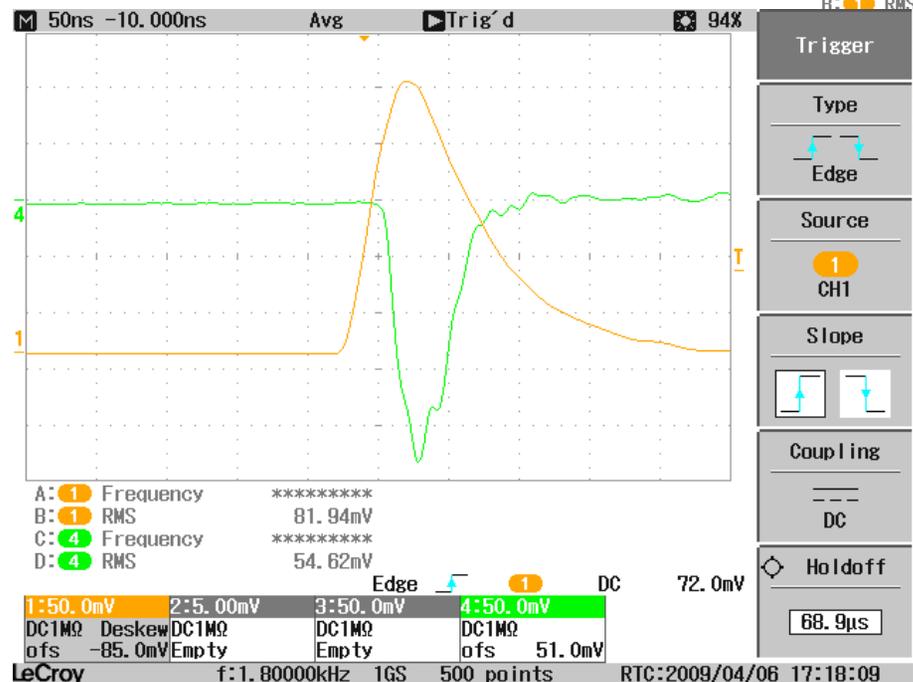
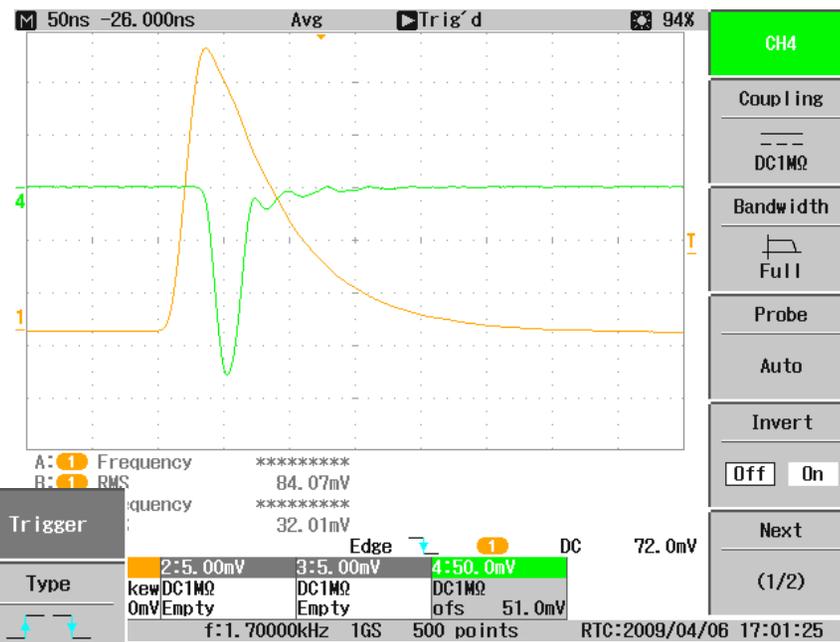


# Detector connections



# PreAmp + Shaper

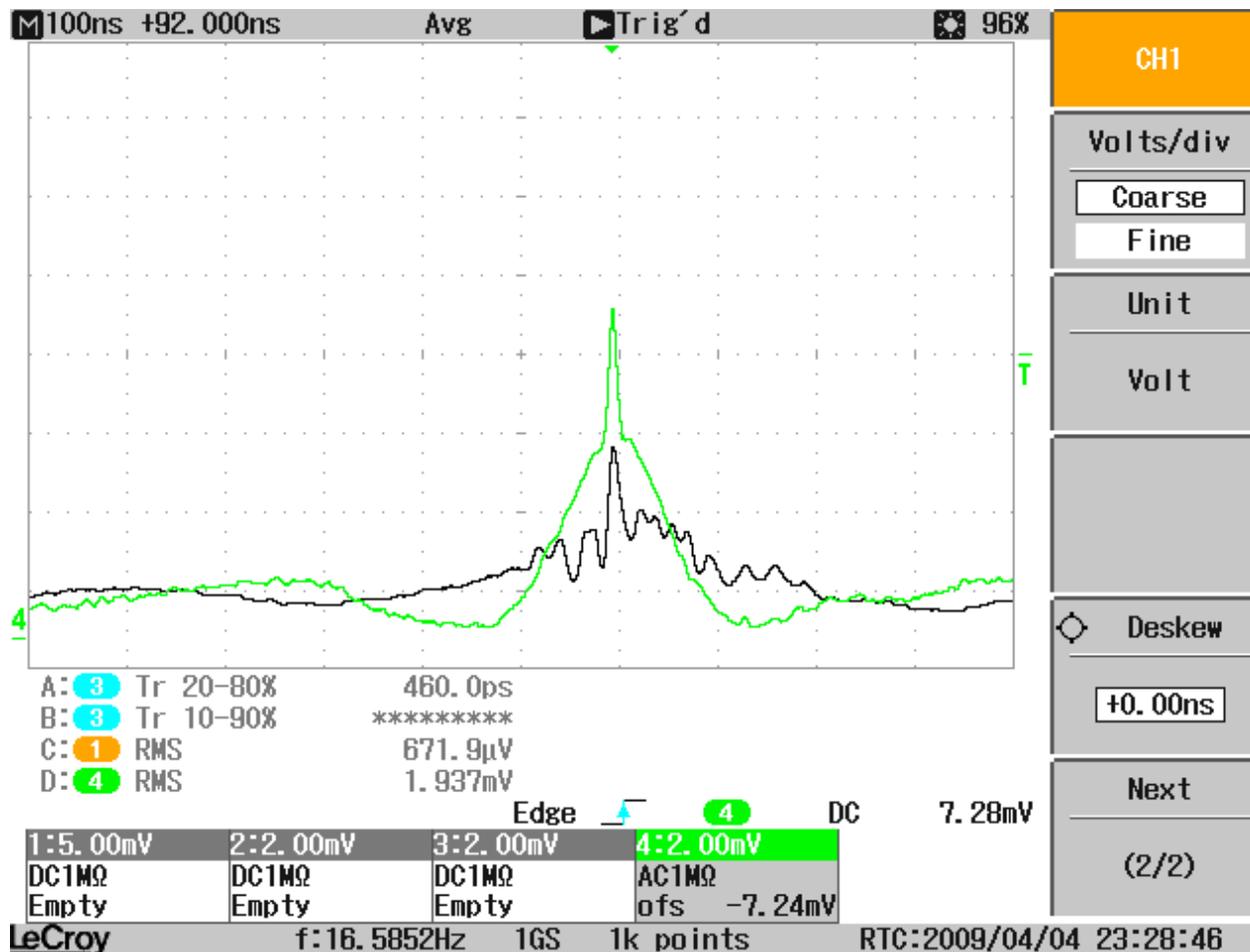
Without Detector



With Detector

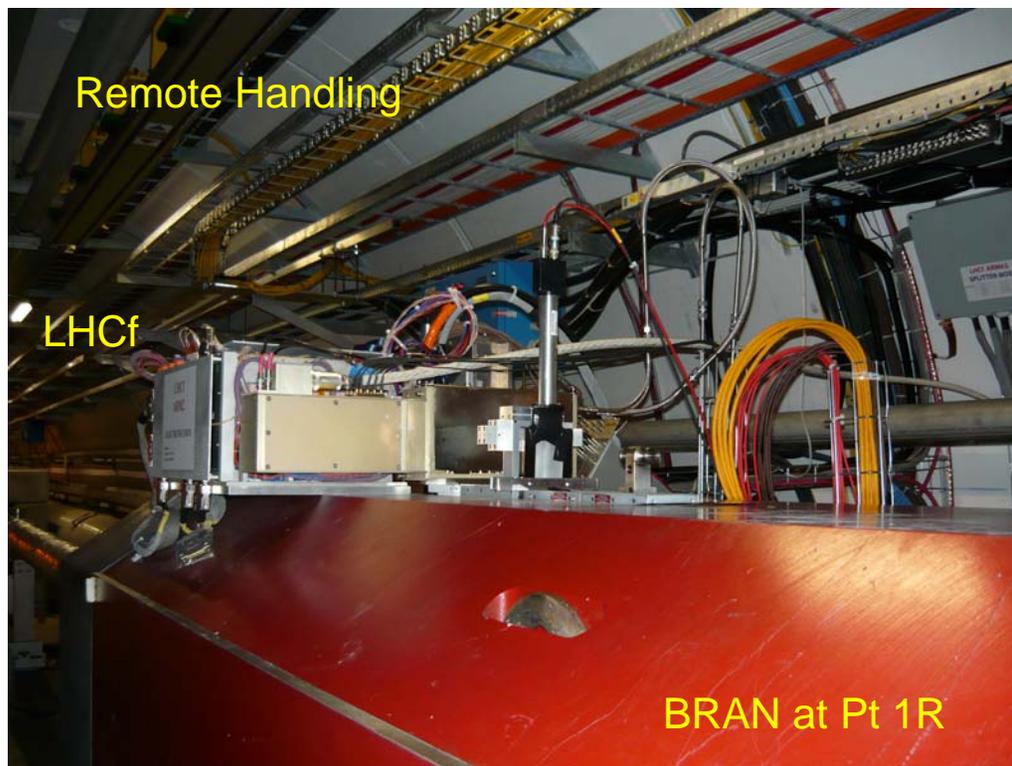


# Noise Measurements



# Installation at ATLAS

- Detector at 1R installed in March
- Tunnel wiring complete
- Gas system connected and pressurized
- Rack installation underway





# Ongoing activities

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- Complete hardware commissioning by May
- Complete firmware programming of DAQ system by August
  - First release of full set (phase II) in early June
- Support software integration
- Collaborate on systems modeling and analysis
- Documentation



# Firmware programming

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- Phase II programming underway
  - Deconvolution (25 ns operation)
  - Pulse height mode
- First release due at end of May
- Work jointly with CERN to test and integrate
  - Doolittle (LBL) – Boccardi (CERN)
- Complete by August 2009



# Handoff to CERN - 1

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Transition period – both labs involved in installation and hardware commissioning

LBL

Deliver all hardware

Install and test in LHC

Provide LabVIEW test bench

CERN

Contribute to installation

Actively participate in  
firmware development

Develop FESA interface



# Handoff to CERN - 2

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## Lumi Project Complete

1. All HW chains simultaneously lab tested for gas, HV, preamp-switching functionality with source-produced pulses processed through shapers into the LabView DAQ
2. All system units (Gas Monitors, Data Interface Boxes) working in racks with control through local PCs and with full functionality
3. Documentation of major components (detectors, preamplifier and shapers) completed, including wiring diagrams



# Handoff to CERN - 3

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- CERN takes over responsibility for device operation and maintenance
- LARP continues to be involved in beam commissioning and pre-ops
  - LTVs, Toohig fellows, collaborations with experiments



# Involvement After Completion

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- LBL plans to assist CERN through end of September 2009
  - duplicating slow readout/control functionality
  - delivering data to end users in control room or other analysis
  - verifying that data from first collisions are as expected from test beam & source results
- Funds to LBL could be available in FY10 to continue this effort in support of operations
  - not guaranteed at the moment

# Spares

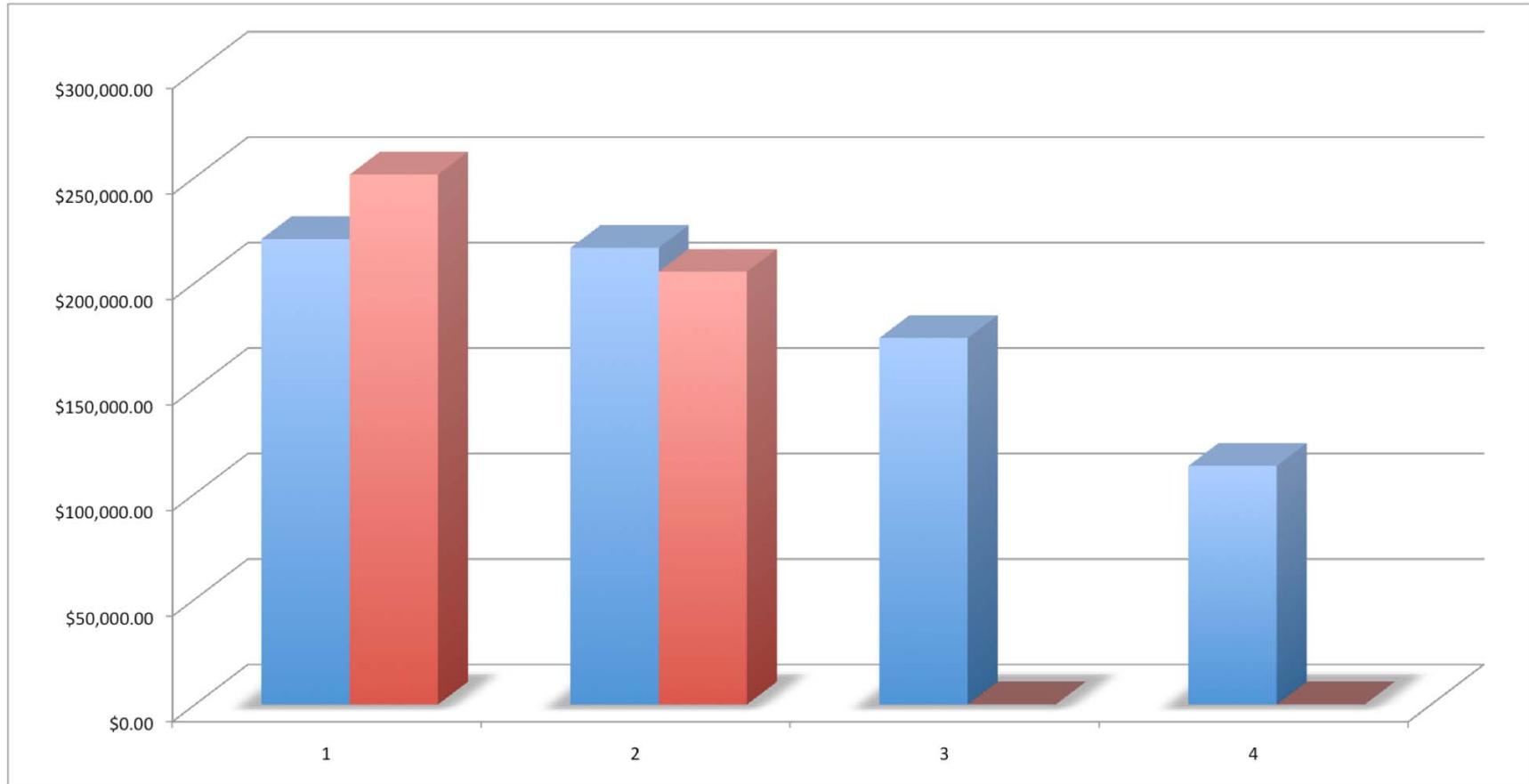
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As part of the project we produced several spares which will be delivered to CERN at project end. This includes:

- one detector
- one shaper
- one preamp
- Various components and spare parts from the fabrication of the devices
- Tooling and fixtures



# FY09 Budget



Lumi Quarterly expenses

Blue – Budget

Red - Actual

# Conclusions

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- Recent tests give good results and agreement with systems modeling (HM)
- All production complete, all hardware at CERN
- Lumi on track to support LHC beam commissioning and operations
- Spending on track with agreed upon plan