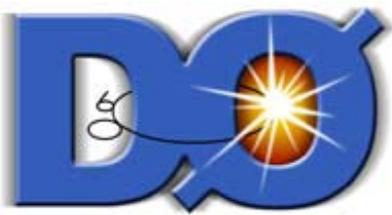




# 2006 Shutdown Update

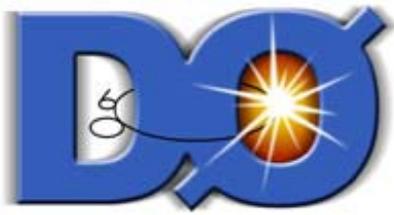
George Ginther  
University of Rochester

1 May 2006

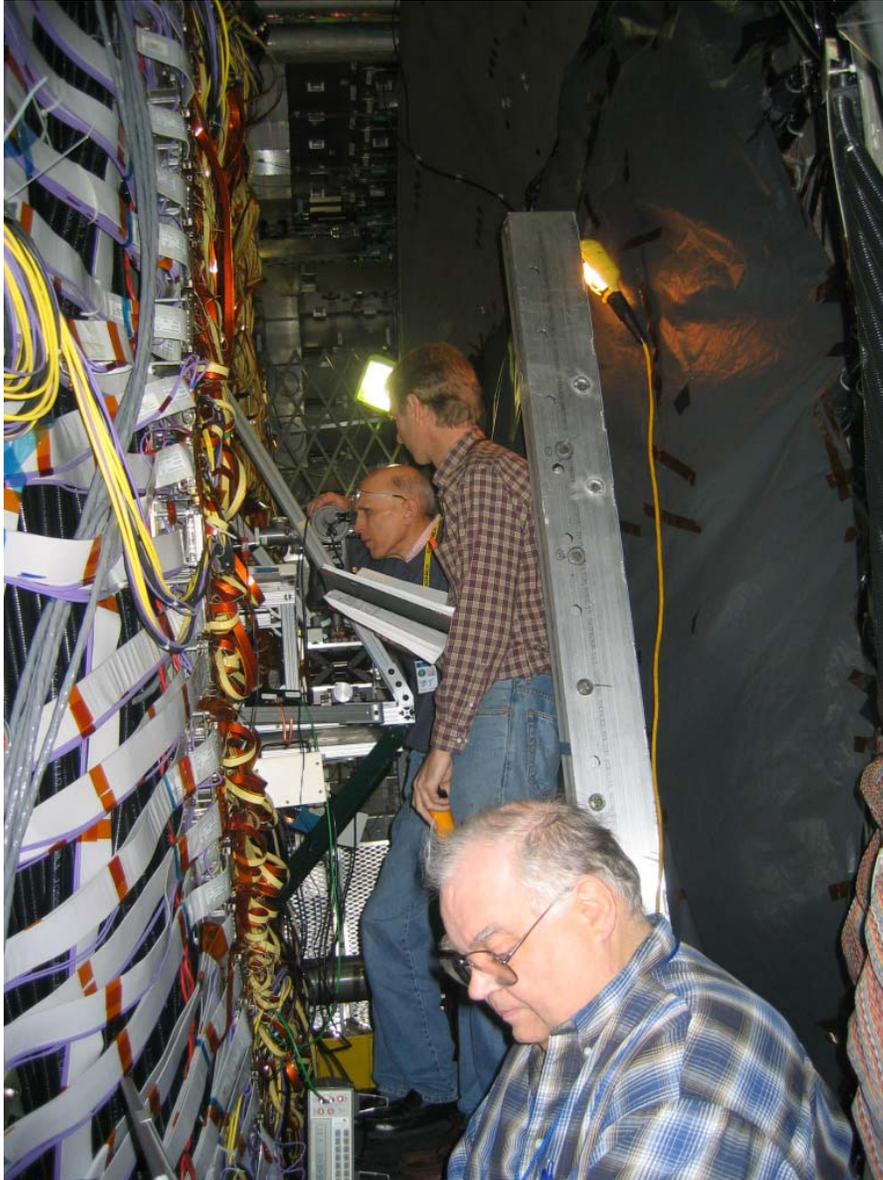


# Layer 0 Installation

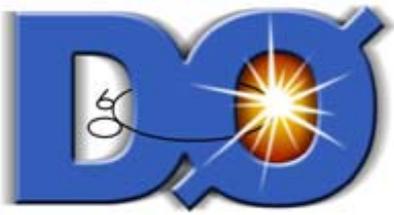
- Completed alignment and installation of Layer 0 mounts on SMT support structure
- Prepared for inserting Layer 0 in SMT
  - Configure and align tables/rails and stages
  - Install long tool and guide through SMT while monitoring transverse position
- Inserted Layer 0 into SMT and mounted on SMT support structure
- Installed junction card mounts on SMT support structure
- Pushed Run IIb beampipe through Layer 0 support structure
- Connected cooling for Layer 0
- Completed junction card mounting, cable routing, and infrastructure installation and associated testing
  - Capacitance between Layer 0 and beam pipe measured as anticipated
  - Almost all channels downloaded and readout
    - Noise looks relatively good (so far)
    - One potentially troublesome module (the same module that caused concern at SiDet)
- Welded stubs on EC beam pipes
- Completed in-situ evaluation of Layer 0 readout performance
  - All SVX4 chips have been successfully readout with the sensors biased
- Connected spool pieces and leak checked joints
- Re-installed inner H disks
- Re-cabling of inner H disks currently in progress



# Aligning South Layer 0 Mount

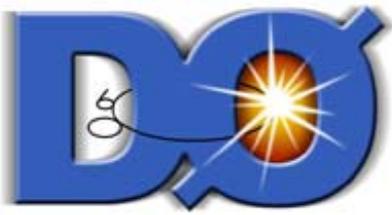


inther



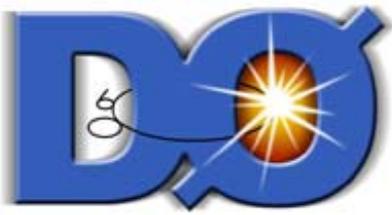
# South Layer 0 Mount



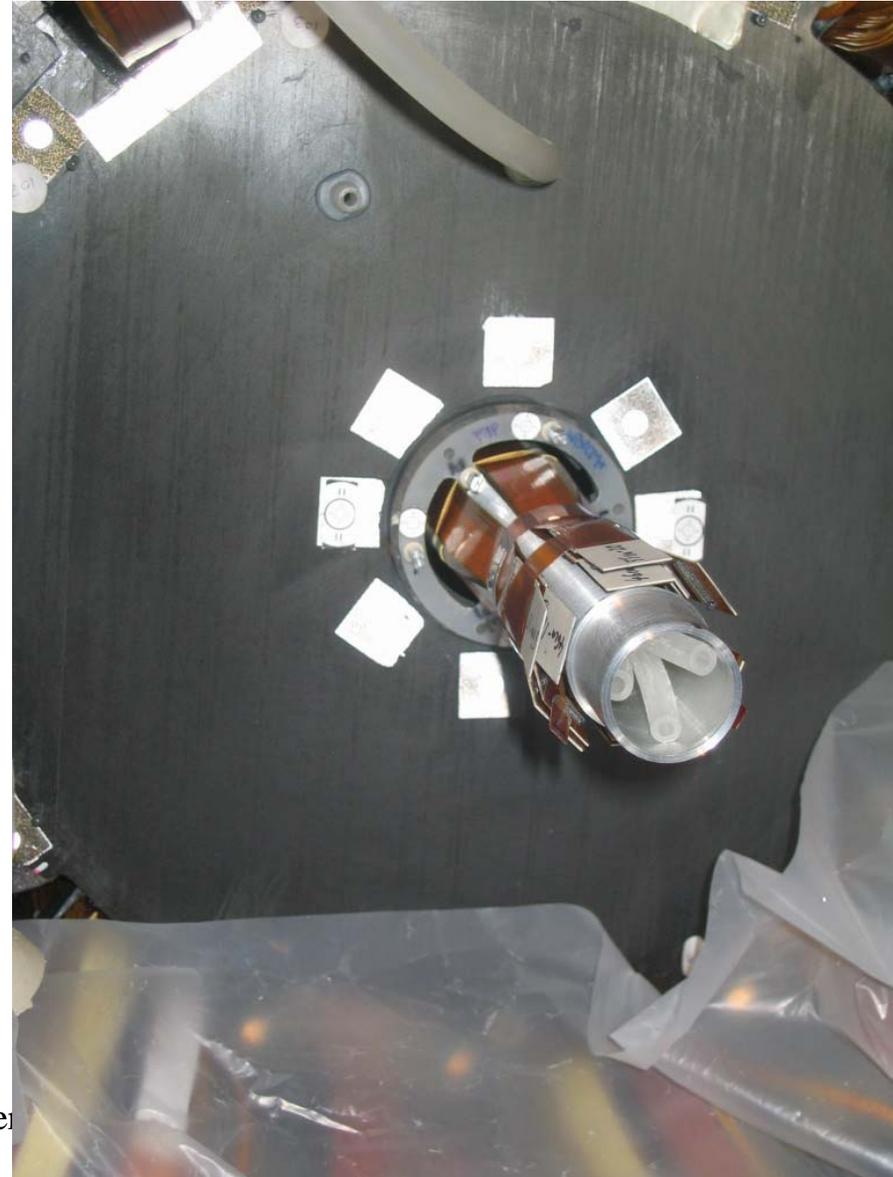


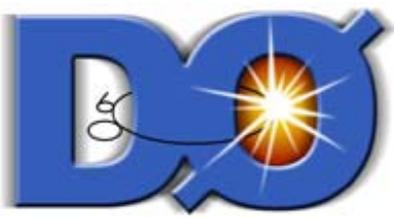
# Inserting Layer 0 into SMT



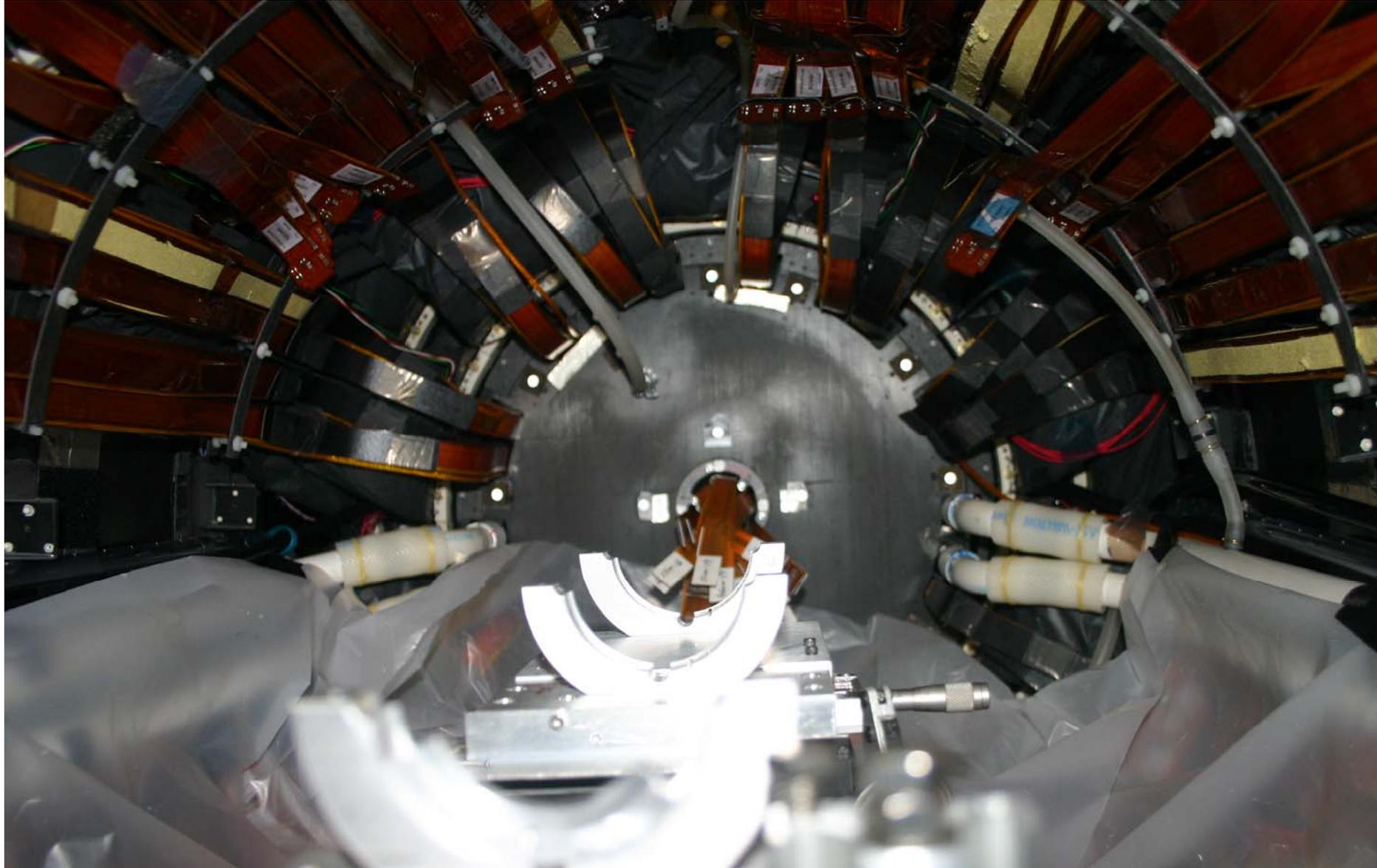


# Layer 0 Installation





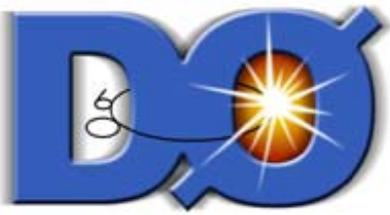
# Layer 0 Installed





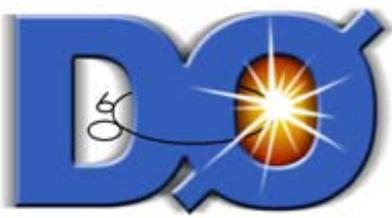
# Preparing North End for Run IIb Beampipe Installation



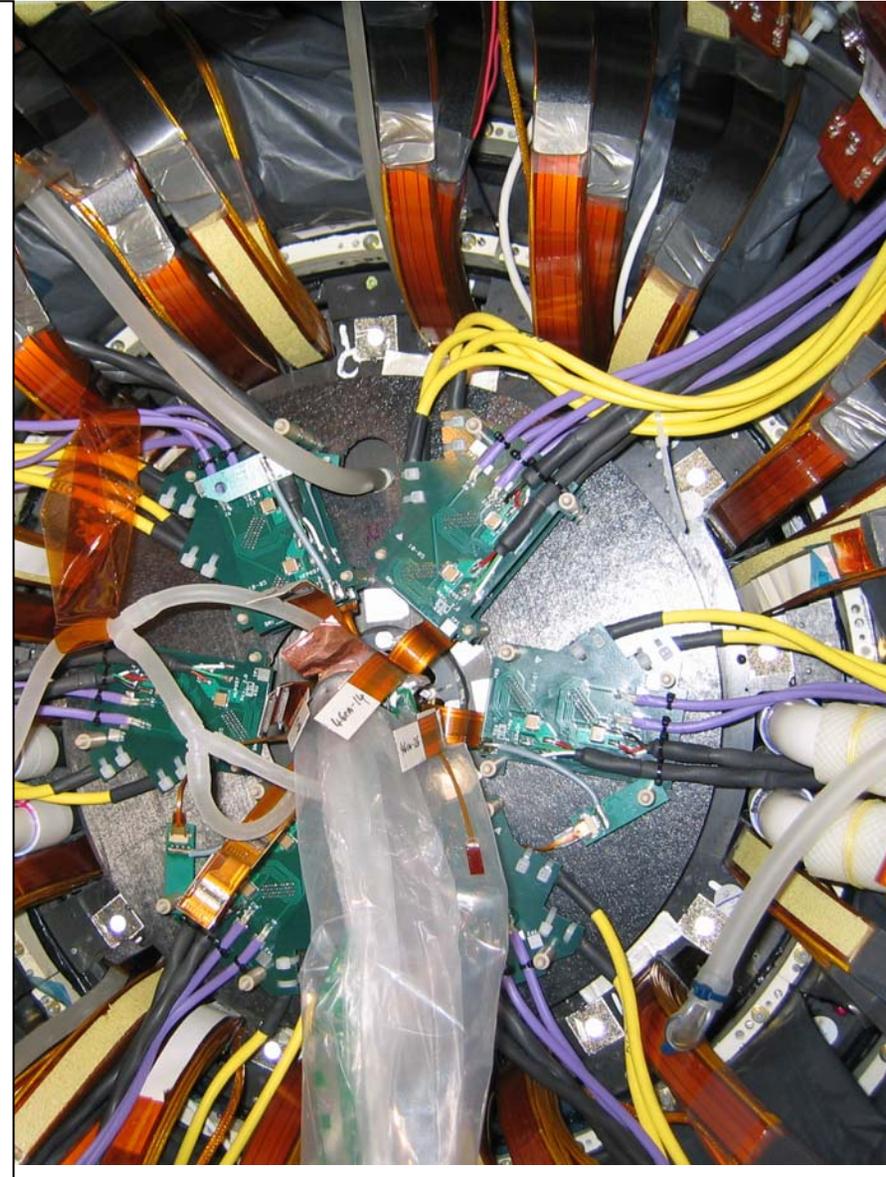


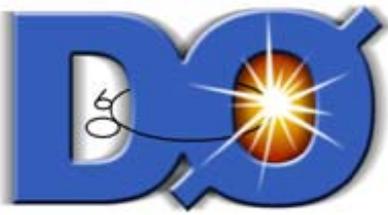
# Run IIb Beampipe Installed





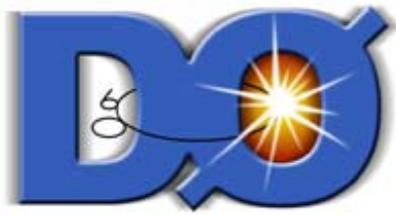
# Junction Card Installation in Progress on the North End



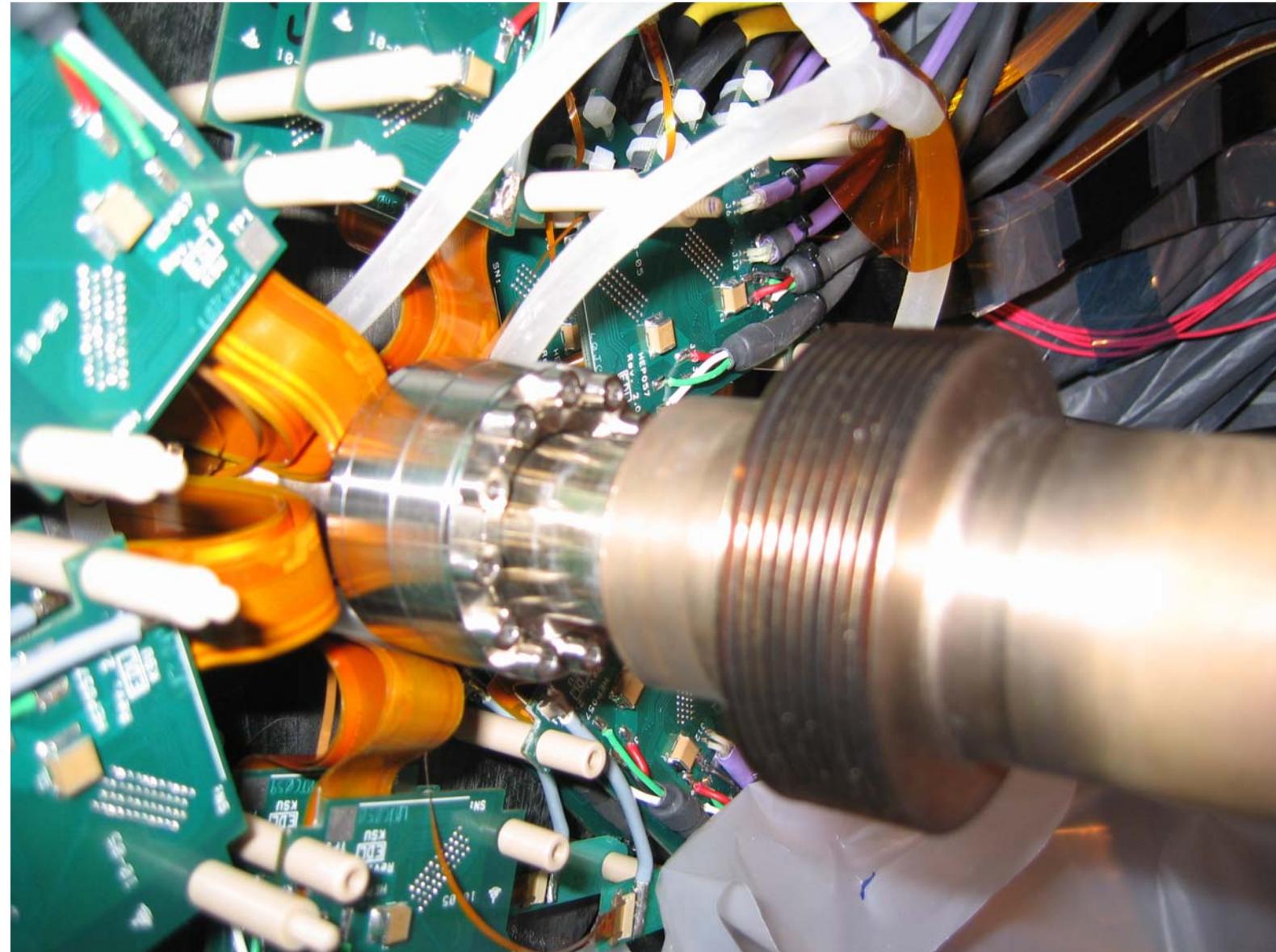


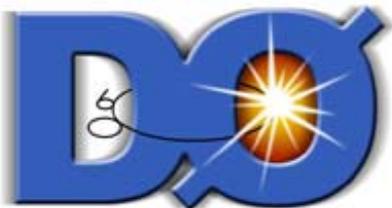
# South EC Beampipe Welded



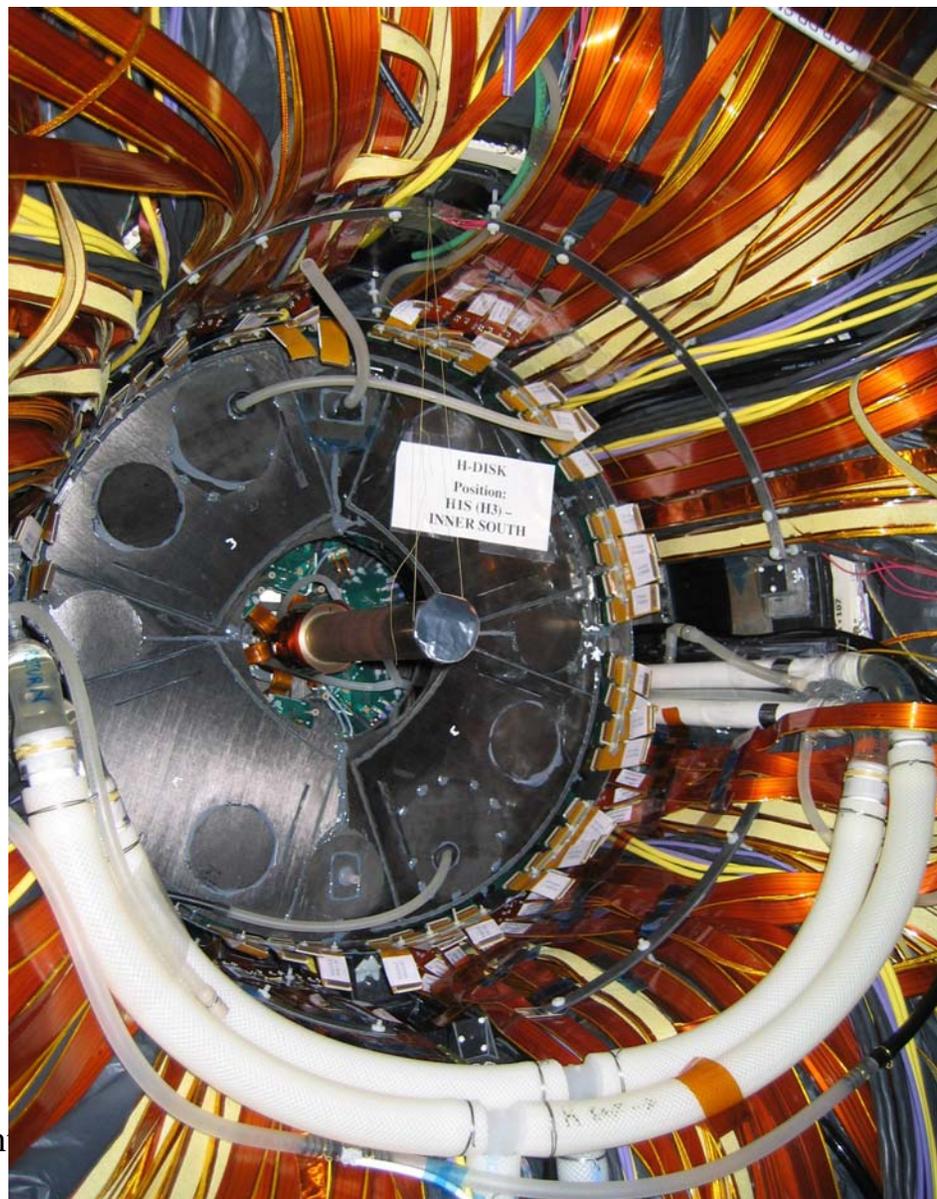
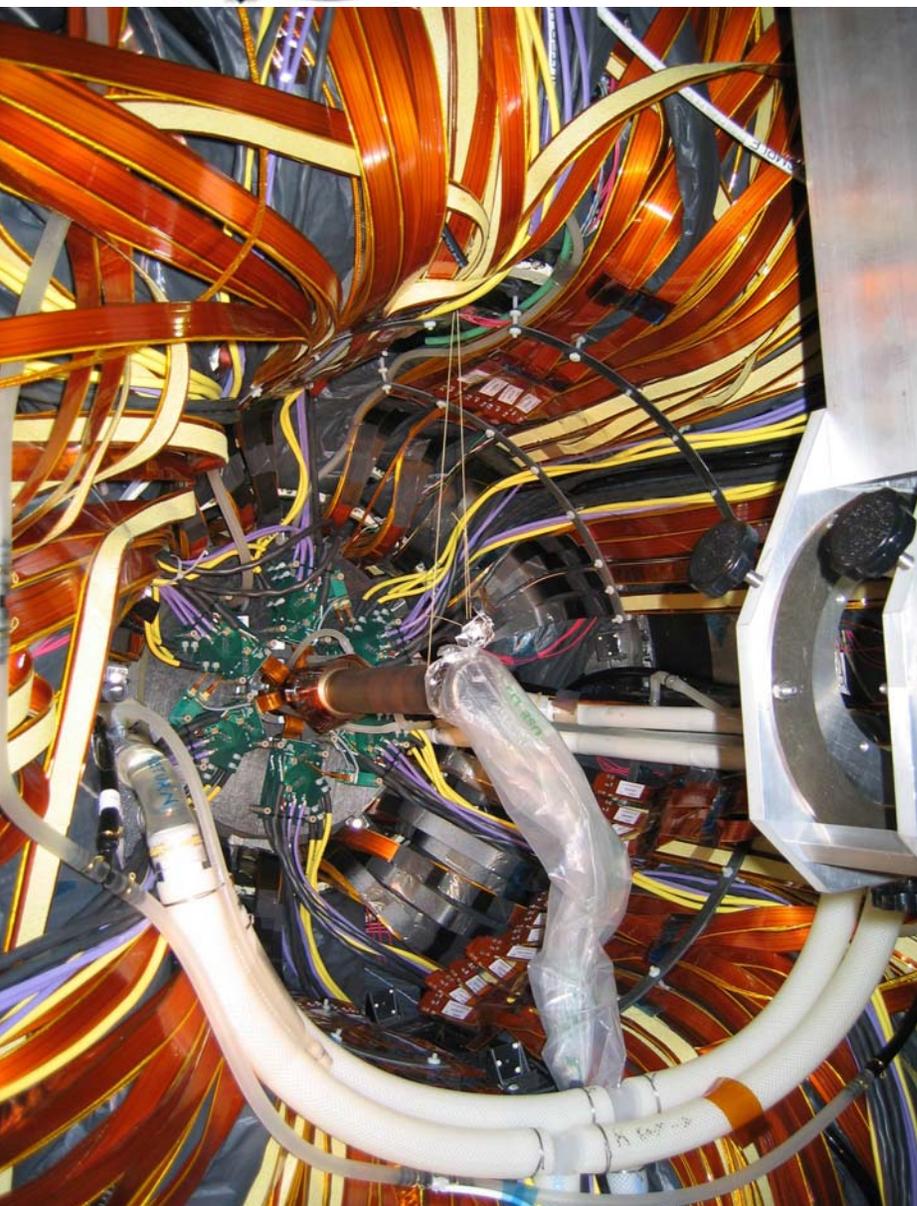


# Spool piece connected to Be beam pipe





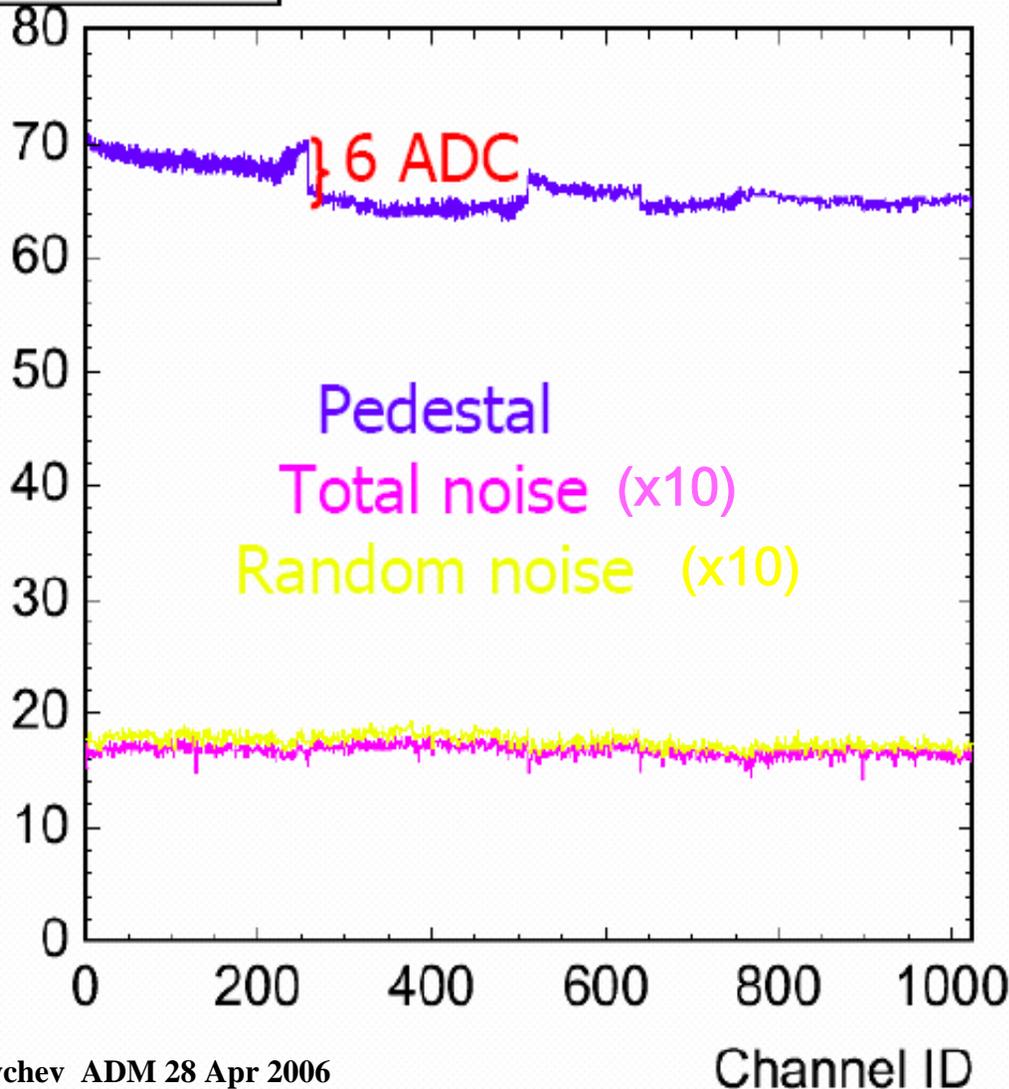
# Re-installing South Inner H Disk





## Layer 0 at DØ

North, Sector 1



- Typical noise on biased Layer 0 detector sector  $\sim 1.7$  ADC counts
- Signal to noise  $\sim 18$
- Very few bad channels
- One pinhole developed during biasing at DAB



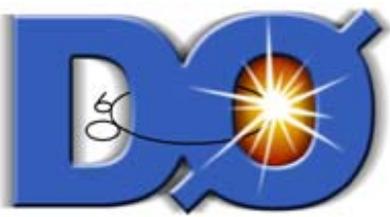
# Layer 0 Installation Milestones

ID	TASK NAME	Actual	Current Forecast	Pre-Shutdown Forecast	Milestone Dates
2	Beginning of RunIIb Tevatron Shutdown	2/23/06		2/27/06	2/27/06
28	Detector Open, Ready for Access	3/1/06		3/2/06	3/07/06
34	RunIIa Be Beam Pipe Disconnected	3/3/06		3/7/06	3/9/06
47	H Disks Removed	3/15/06		3/17/06	3/23/06
56	RunIIa Be Beam Pipe Removed	3/21/06		3/27/06	3/31/06
75	Layer 0 Tooling and Mounts Ready	4/5/06		4/10/06	4/17/06
79	Layer 0 Installed (including junction card mounts)	4/7/06		4/12/06	4/19/06
91	RunIIb Be Pipe Connected, Layer 0 Cabled	4/26/06		4/26/06	5/03/06
94	Inner H Disks Re-Installed (including cabling)		5/2/06	5/2/06	5/9/06
99	Silicon Cold and Ready for Technical Commissioning		5/5/06	5/5/06	5/12/06
103	Complete Technical Commissioning of Silicon		5/11/06	5/11/06	5/18/06
118	Detector Closed for Tevatron Resumption		5/31/06	6/02/06	6/4/06



# Level 1 Trigger Upgrade Installation

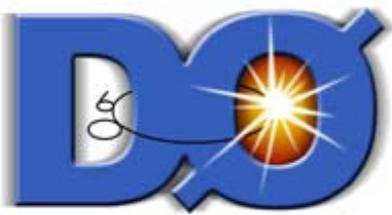
- Level 1 Calorimeter Trigger
  - Connected BLS cables to patch panels and test pulse connections
    - Repairs in progress
  - Continued verifying L1Cal Trigger installation
  - Higher quality LVDS cables delivered
  - Installation of LVDS cables in progress
    - 25% complete
    - Test transmission from ADF to TAB
    - Expect to complete installation of LVDS cables this week
  - Continue firmware debugging/development/verification
- Level 1 Central Track Trigger
  - Completed DF EA2 LVDS output verification
  - Connected outputs to Level 1 CalTrk and Level 1 Muon
    - Verification of outputs to Level 1 CalTrk and Level 1 Muon in progress
- Preparations for trigger latency change continue



# L1 Cal and L1 CTT Installations

ID	TASK NAME	Actual	Current Forecast	Pre-Shutdown Forecast
2	Beginning of RunIIb Tevatron Shutdown	2/23/06		2/27/06
	<b>Level 1 Calorimeter Trigger Upgrade</b>			
158	Retire Run Ila L1 Cal Trigger Electronics	3/6/06		3/6/06
172	Complete Clean-out of L1 Cal Trigger Racks	3/9/06		3/29/06
180	L1 Cal Trigger Racks Ready for Trigger Installation	3/20/06		4/13/06
189	L1 Cal Trigger Ready for Technical Commissioning		5/10/06	5/10/06
	<b>Level 1 Central Track Trigger Upgrade</b>			
206	DFEA Crates Extracted	3/13/06		3/13/06
213	DFEA2 Installation Complete	4/25/06		4/4/06
217	L1 CTT Technical Commissioning Complete		5/17/06	5/17/06

Switched order of some installation and verification operations to optimize cable access



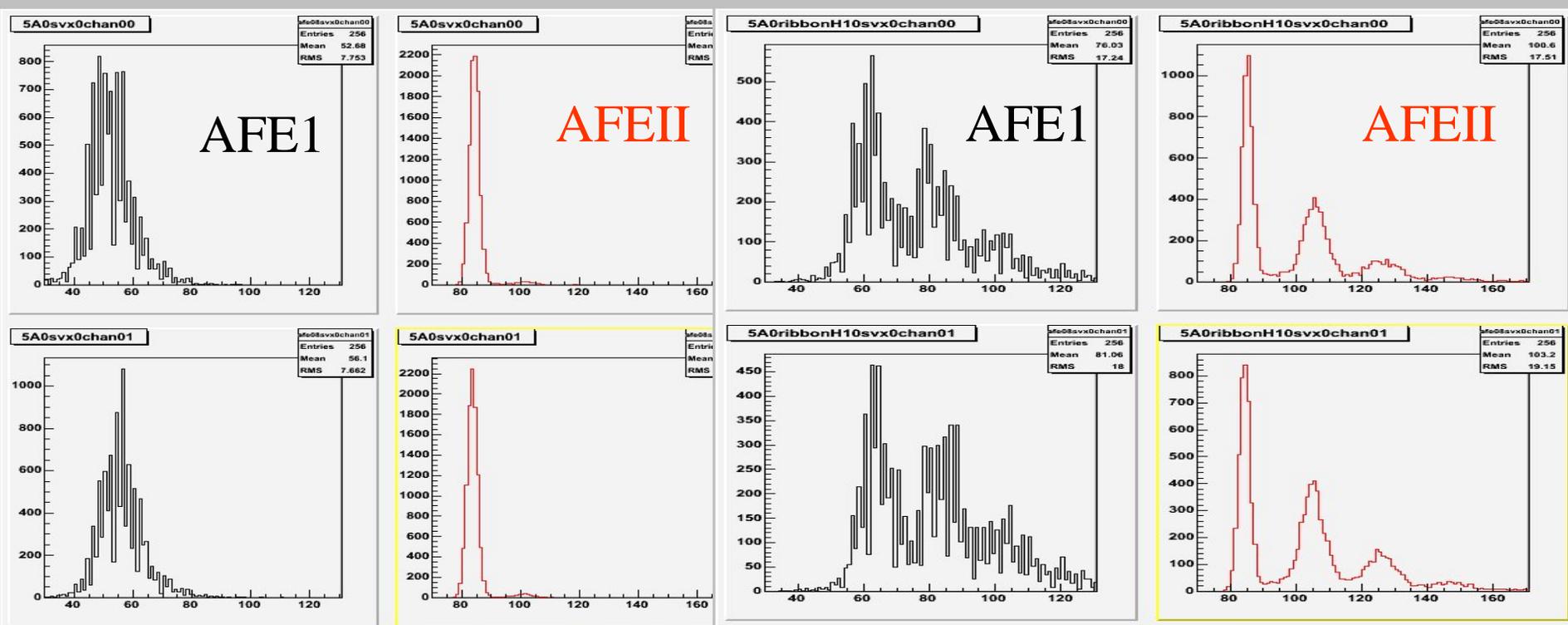
## AFEII

- Occupancies on inner layers of Central Fiber Tracker grow to significant levels as luminosity increases
  - Current Central Fiber Tracker readout electronics (AFE) is based upon SVX2 chip
  - SVX2 is reset once per superbunch
    - saturation becomes an issue as occupancy increases
  - Current AFE also exhibits undesirable features that will become increasingly important as luminosity increases
    - Pedestal shifts dependent upon discriminator occupancy
    - Channel to channel pedestal variation
    - Discriminator pedestal shifts
- AFEII addresses these shortcomings via custom ASIC (Trip-t) and commercial ADCs, and provides opportunity for enhanced performance
- Installation anticipated during summer/fall 2006
  - Designed to be plug compatible with current AFE to allow adiabatic installation during brief accesses (~200 boards to be installed)
  - Anticipate installation will be performed in series of several hour accesses



# AFE II Status

- Trip-t testing complete
- Pre-production boards tested on platform inside collision hall
  - Minor layout modifications to improve termination implemented on production boards
- AFE II bare boards in production
- Expecting first stuffed production boards in late-June





# Approaching end of shutdown

- Aim to have all possible subsystems back to full operational status before detector is fully closed to probe for outstanding issues
  - Need to complete H disk cabling, testing
  - Make EC to Be beam pipe joints
  - Dry and cool silicon tracker
  - Re-establish silicon readout systems
  - Complete detector maintenance activities
- End Cap Calorimeters scheduled to be closed ~12 May to proceed with SNEG beam pipe installation and leak check
  - Re-install BLMs and veto counters
- Aim at having subsystems fully functional by ~21 May where possible
- Toroids scheduled to be closed ~25 May
- Survey detector position
- Solenoid and Toroid tests ~30 May



# Shutdown Summary

- Substantial parallel efforts to install DØ Run IIb upgrades and prepare for a smooth transition to commissioning and operations
- Need to complete the shutdown activities in a safe and timely manner
  - 48 weekdays days into 69 weekday shutdown (70%)
  - Most activities still progressing well
  - No major upgrade related surprises detected (yet)
  - Collaborators are making important contributions
  - Lab is providing significant support for these activities
  - Second shift support and activities have been very valuable in maintaining schedule
- ~Five weeks remaining until end of shutdown