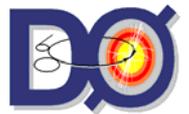


# Status of DØ

**John Womersley**

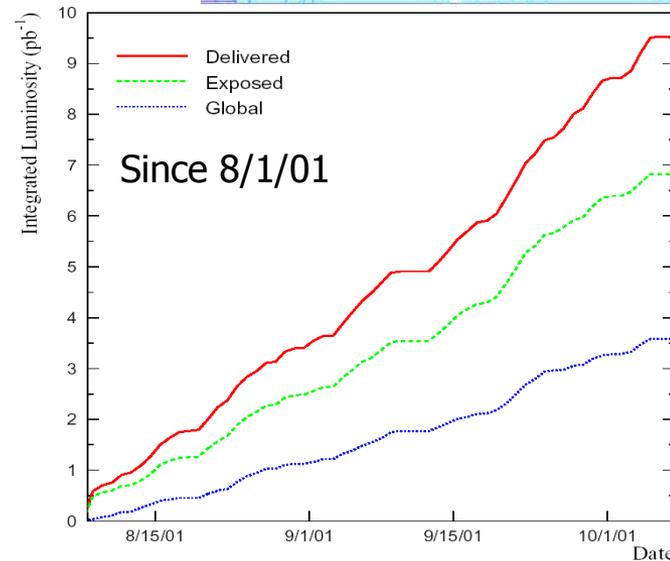
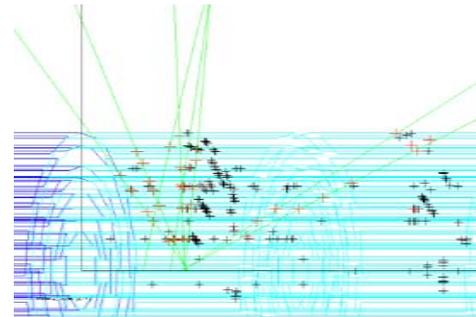
**DØ Experiment Department  
Fermi National Accelerator Laboratory, Batavia, Illinois**

<http://www-d0.fnal.gov/~womersle/womersle.html>



# Run 2 so far

- **January 26**
  - Rolled detector into collision hall
- **March 1**
  - official start of Run 2
- **April 3**
  - first collisions
- **early June**
  - consistent  $36 \times 36$  bunch running
- **August-September**
  - take data for commissioning, timing, improve DAQ
- **October 8**
  - start six week shutdown
  - installation of fiber tracker electronics
- **November 17**
  - run resumes



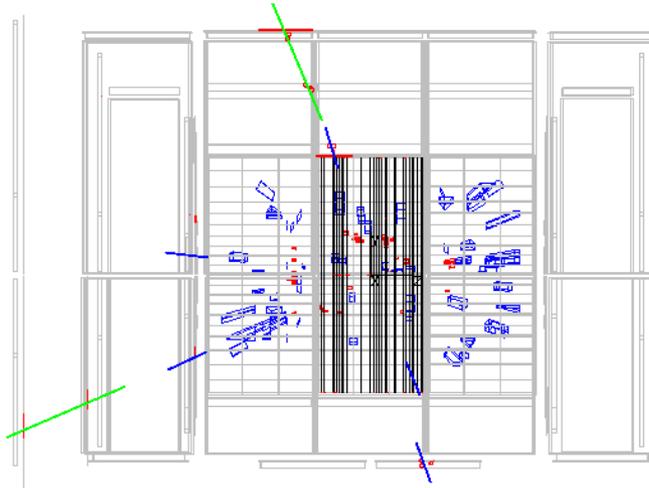
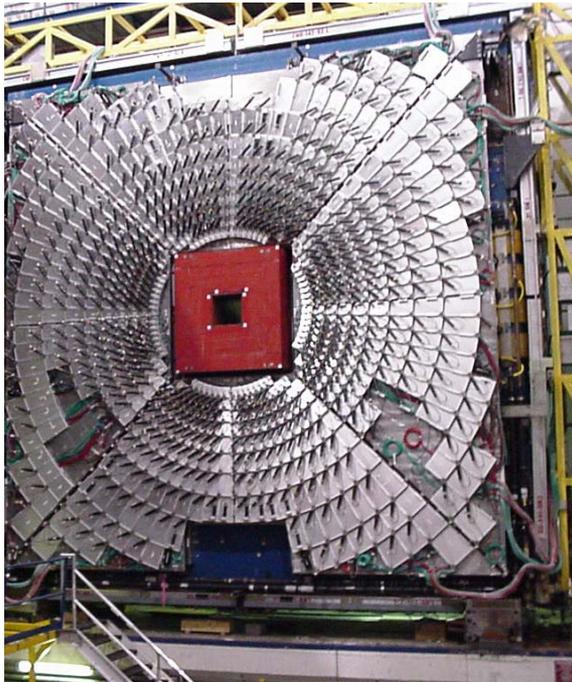
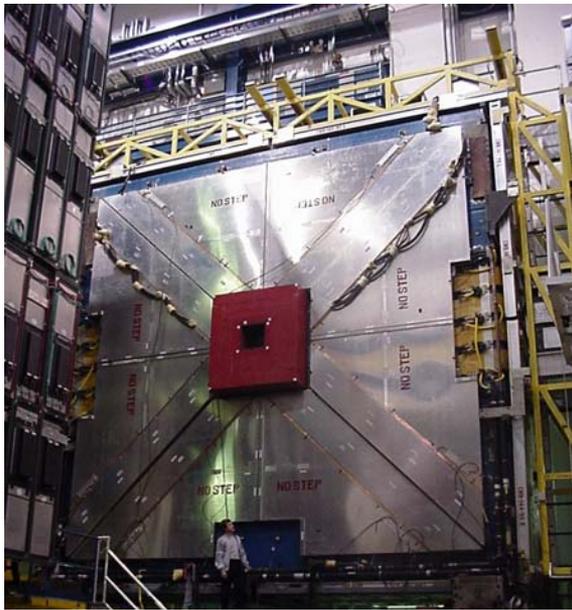
**9.5 pb<sup>-1</sup>  
delivered**

**6.8 pb<sup>-1</sup>  
recorded**

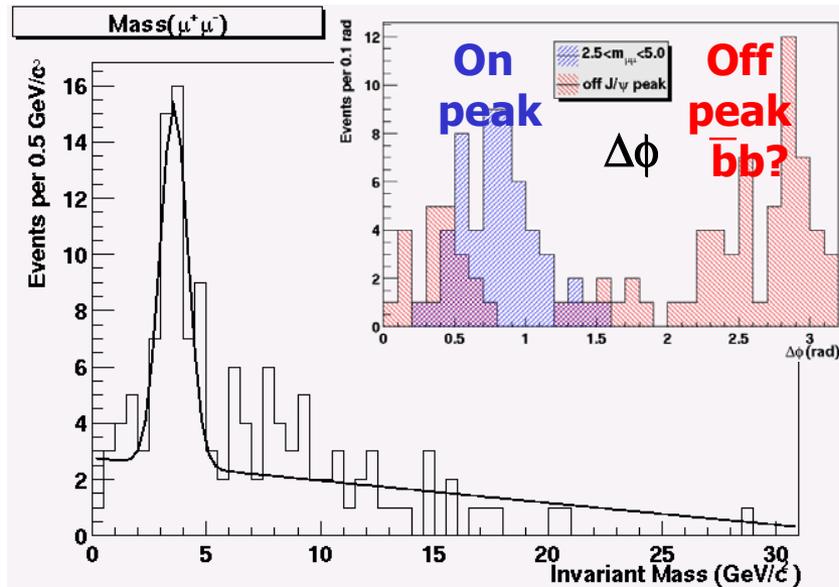
**3.5 pb<sup>-1</sup>  
physics  
running  
8M events**



# Muon System



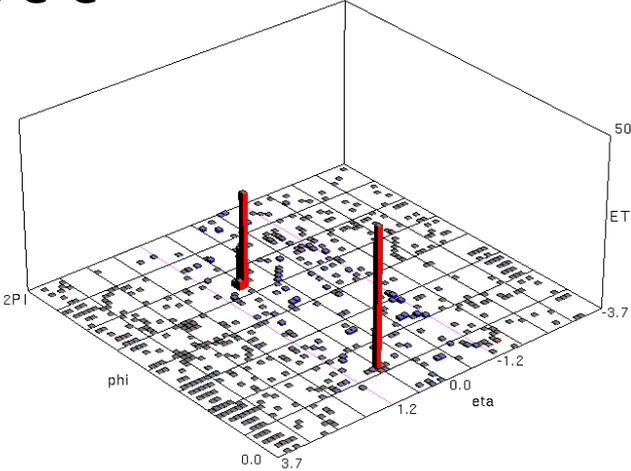
**Z + jet candidate:**  
 two muons with  
 hits in drift tubes  
 and scintillator  
 detectors  
 $M_{\mu\mu} = 55 \text{ GeV}$



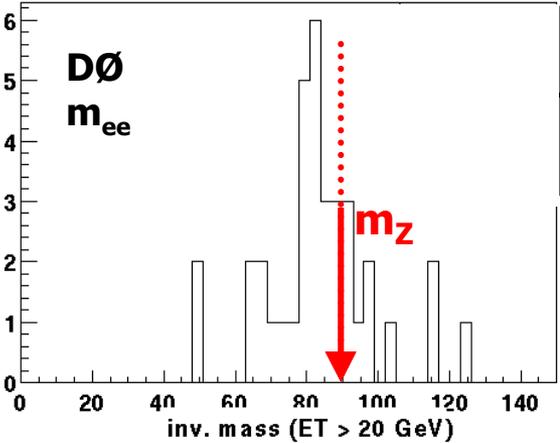
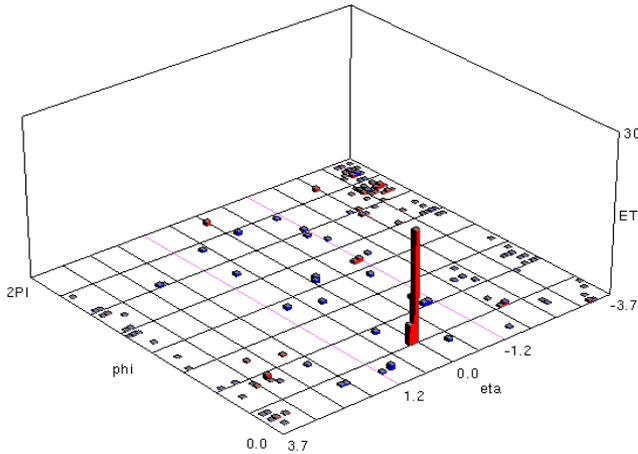
**$J/\psi \rightarrow \mu^+\mu^-$   
 signal:**  
 dimuons  
 reconstructed  
 in the forward  
 region

# Calorimeter

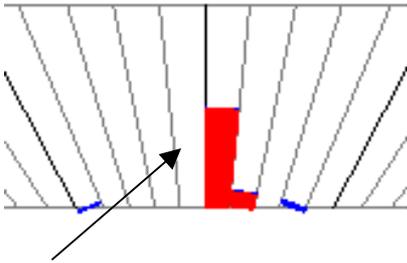
$Z \rightarrow e^+e^-$



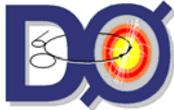
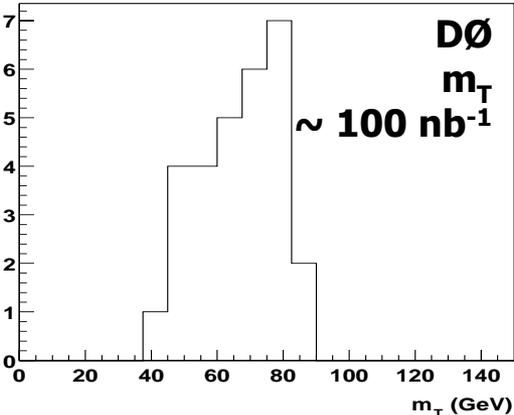
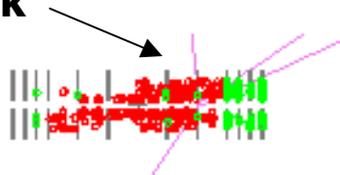
$W \rightarrow ev$



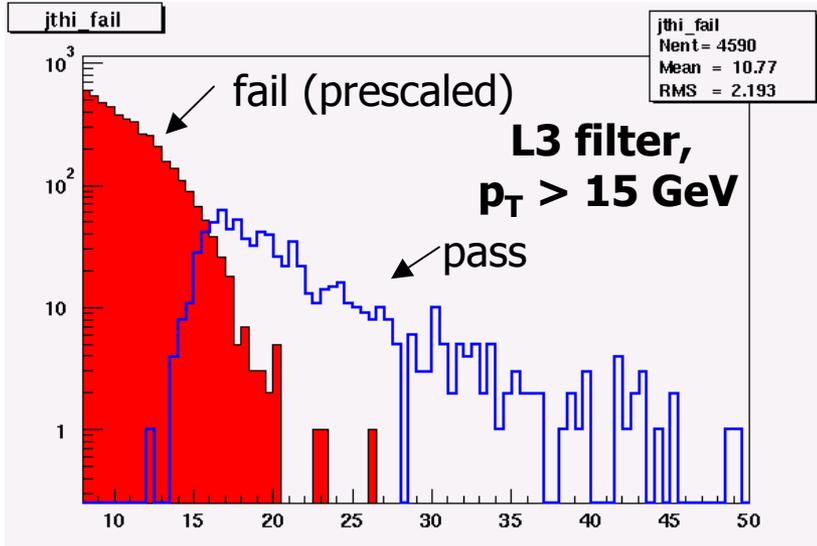
(uncalibrated energy scale)



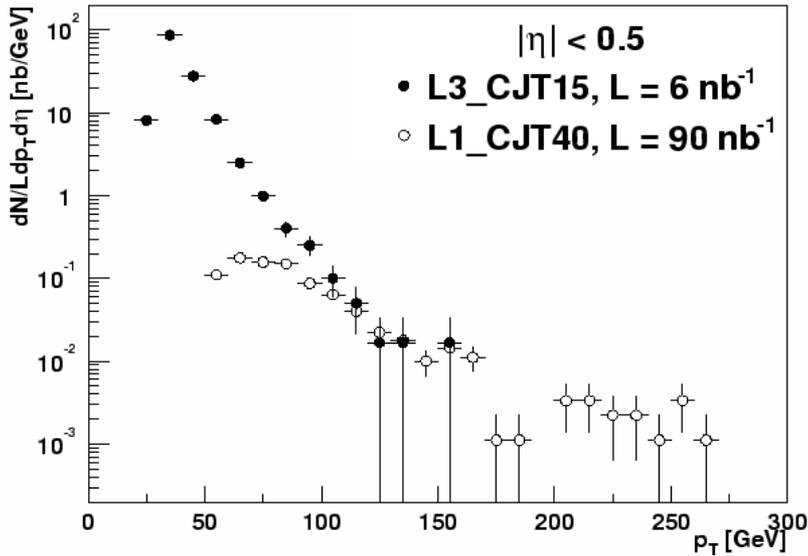
EM cluster with track



# Jets



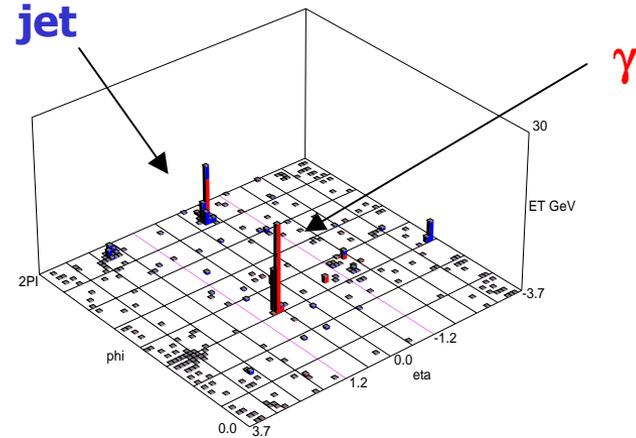
## Jet cross section



John Womersley

## Gamma + Jet Candidate

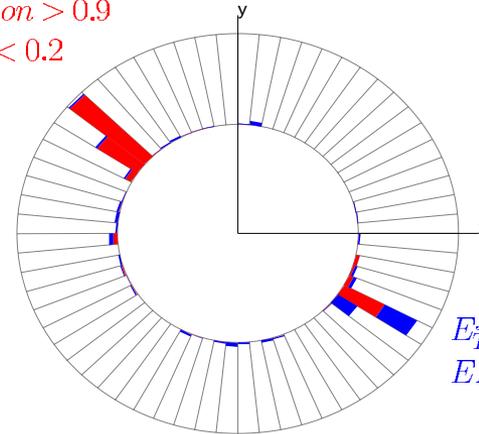
Run 128309 Event 256324



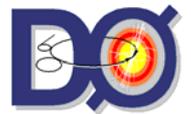
## $\gamma$ candidate

$E_T^\gamma = 27$  GeV,  
EM fraction > 0.9  
Isolation < 0.2

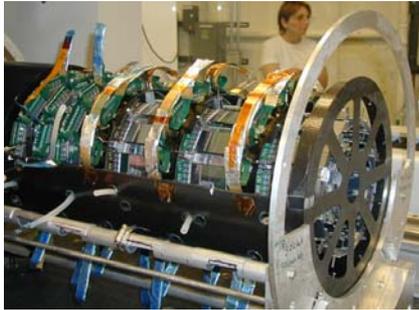
This type of event is used to derive the jet energy calibration



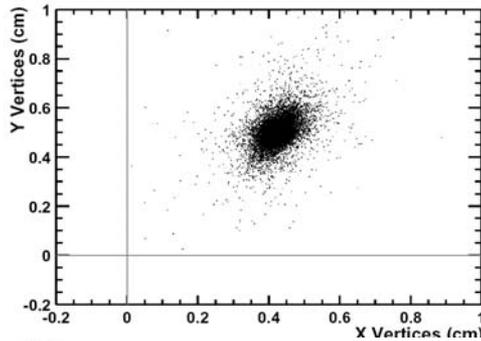
DØ



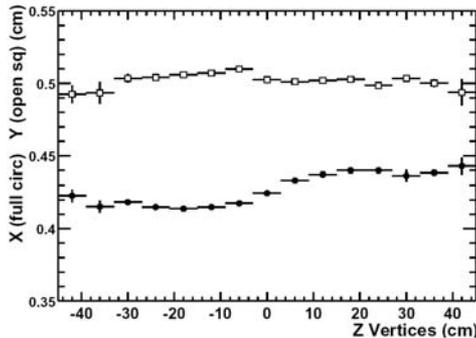
# Silicon Tracker (SMT)



95% of SMT channels will be working after shutdown

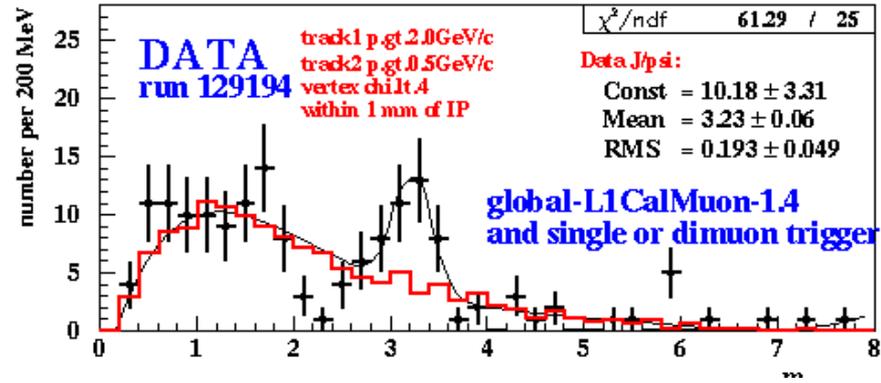


Reconstructed Primary vertex X vs. Y

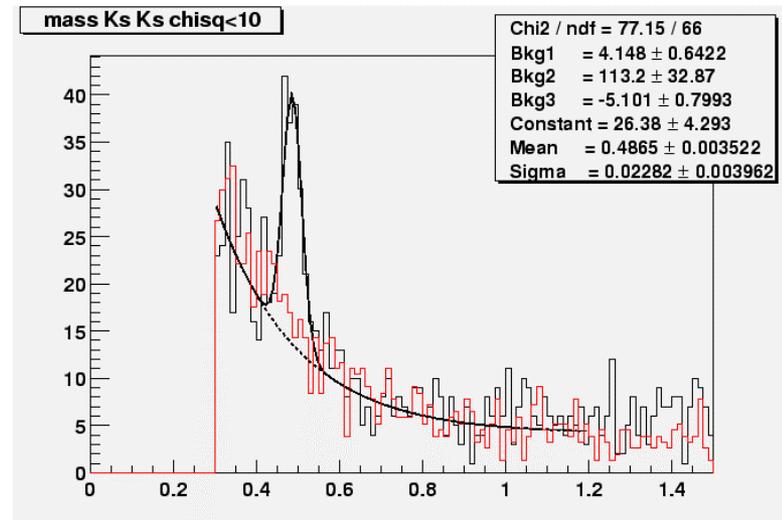


X, Y vs. Z

→ we moved the detector by 4mm x and 5mm y



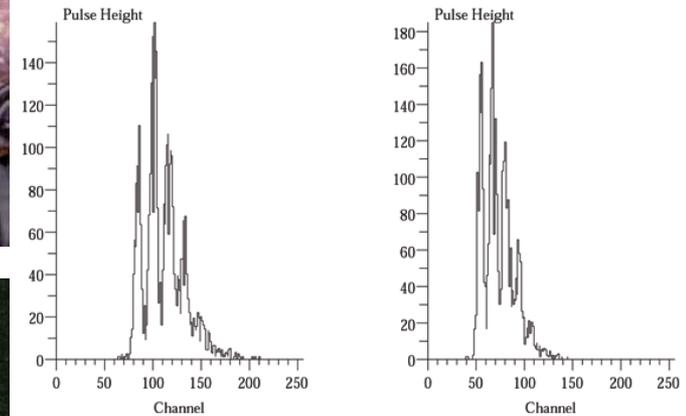
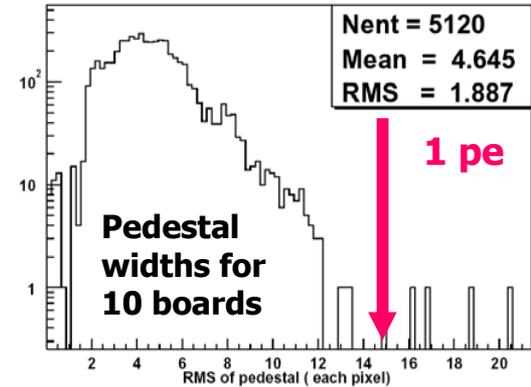
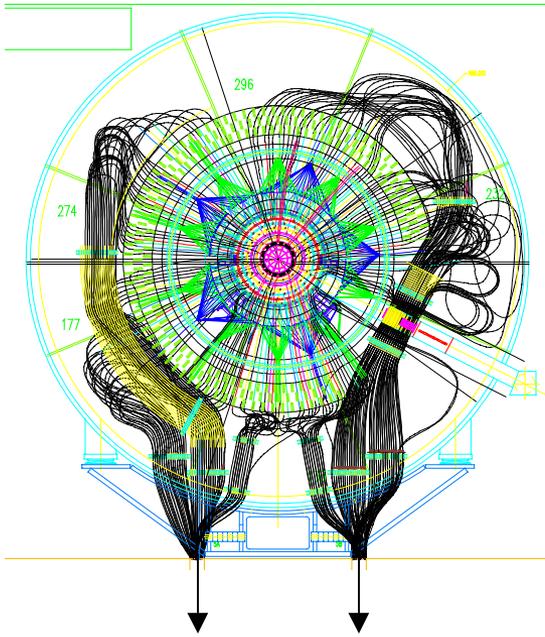
J/ $\psi$  signal from silicon tracking



K<sup>0</sup> signal from silicon tracking



# Fiber tracker readout

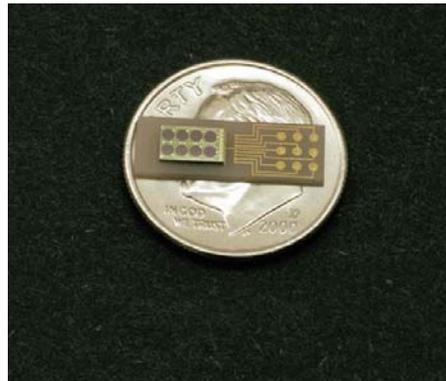


**See photoelectron peaks  
in 43 final boards in DØ**  
1 pe  $\sim$  7 fC  
1 MIP  $\sim$  8 pe

**Clear Fiber Waveguides  
carry the signals to VLPC's  
in cryostat under detector**

**Central readout uses 166 AFE  
boards**

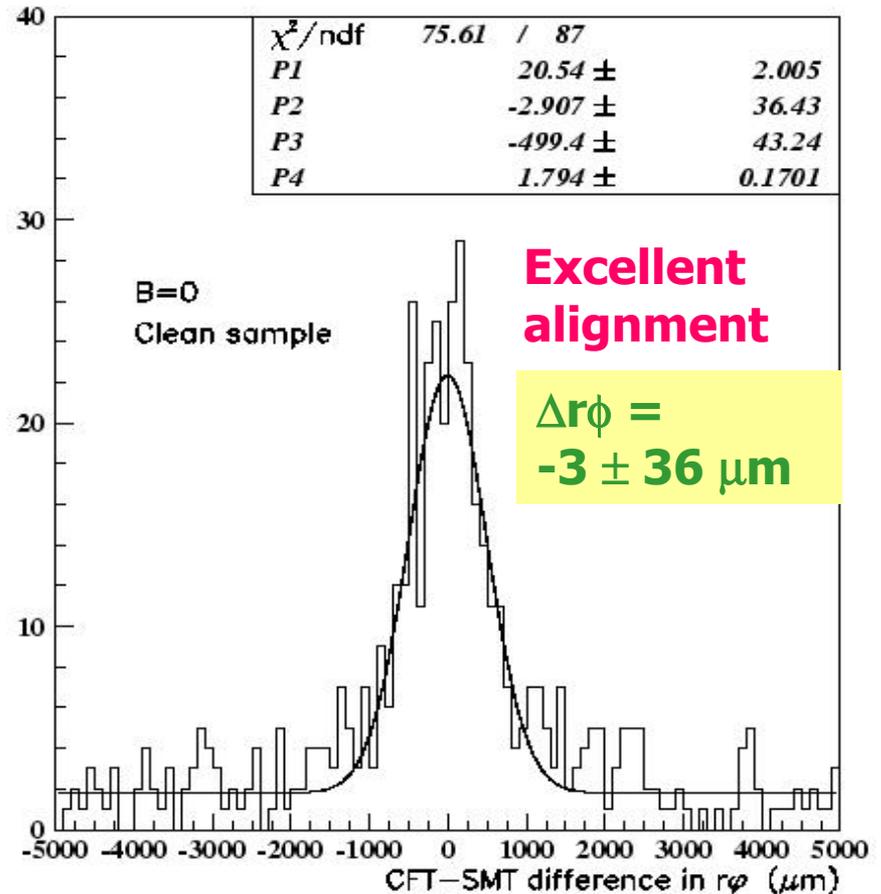
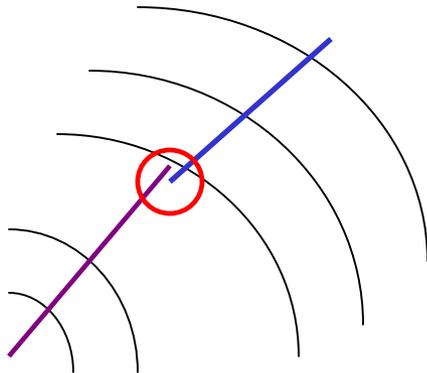
**All in hand, goal is to install all  
this shutdown ( $\sim$  50 so far)**



# CFT tracking

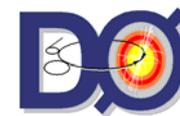
Use partially instrumented CFT with old electronics

- Tracks were found separately in the SMT and the Central Fiber Tracker (CFT)
- SMT tracks were extrapolated to the CFT at which point the track offsets were measured
- Magnet off data



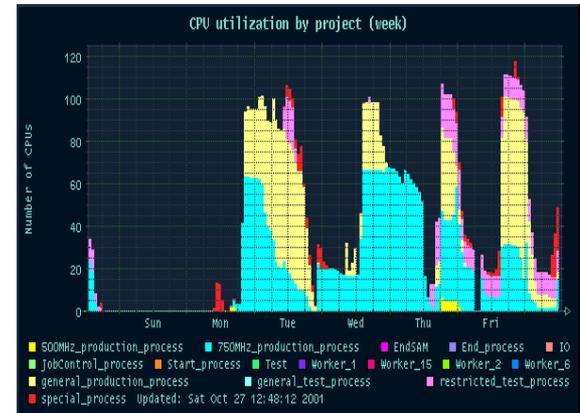
# Trigger and DAQ

System	Status Oct 8	Status Dec 1	Completion date
In: collision rate <b>L1</b> Out: 5-10kHz	Calorimeter: 50% Muon: scintillator Tracker: none	Calorimeter: 100% Muon: scintillator + drift tubes Tracker: all installed	Dec 2001
In: 5-10kHz <b>L2</b> Out: ~1kHz	None (processor problems)	Global, Cal & Muon commissioned; not filtering at start	Feb 2002
In: ~1 kHz <b>L3/DAQ</b> Out: 50 Hz	In: 80 Hz (peak) Use emulators; final hardware not ready; Calorimeter filters	In: 500Hz by end of year Cal & Muon filters; others starting	1kHz in ~May 2002



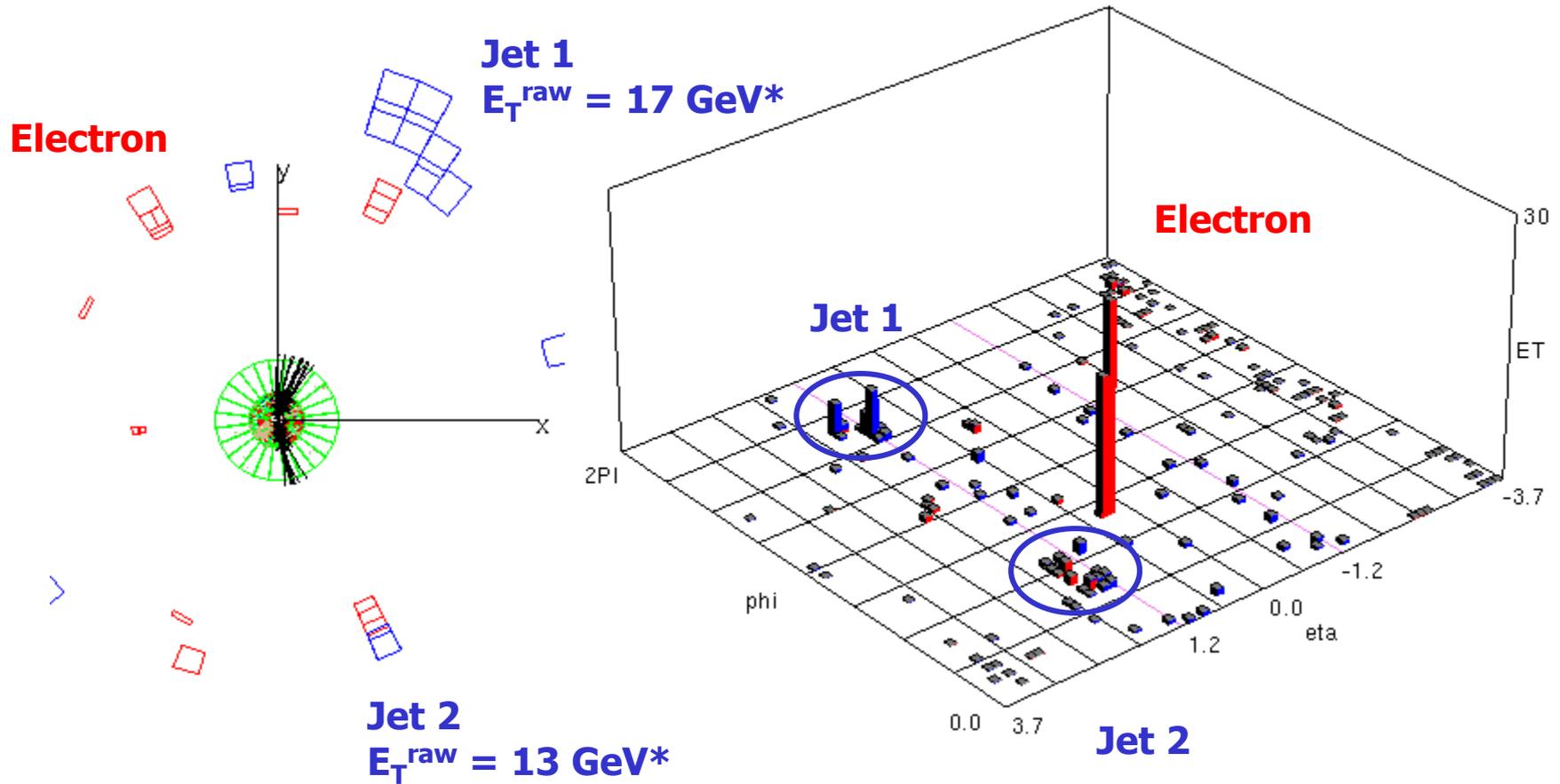
# Data processing and access

- Online system logs data to tape in Feynman center (enstore)
  - 8M physics events stored so far
- Events reconstructed in quasi-real time using a Linux farm running production software releases
  - reprocessing recent data with latest release now
- Data accessed through SAM system
  - physicists using Root ntuples
- Remote farm facilities up and running for Monte Carlo generation: capable of generating and reconstructing  $\sim 25$  Hz rate
  - Amsterdam, Lancaster, Lyon, Prague, Arlington, Boston (Manchester and Karlsruhe approved)
  - all remote sites are SAM stations (GRID)
  - ship data to Fermilab over network



# Just for fun . . .

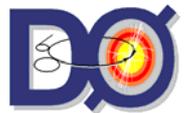
DØ W + 2 jet (Higgs!) candidate, October 2001



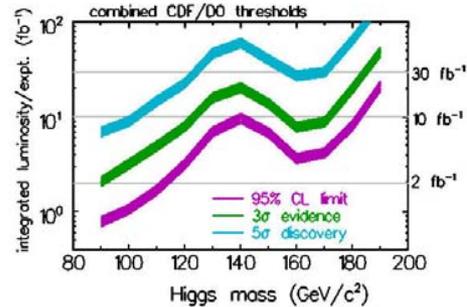
\* Jet  $E_T$  corrections will be large

# Conclusions

- **DØ has been installed and running since March 1**
- **We have commissioned all the detectors with the exception of the fiber tracker**
  - **electronics installation will be complete at end of shutdown**
- **Trigger system has been running at reduced rate**
  - **sufficient for commissioning and some physics (W/Z); not for full physics program**
  - **being addressed over next months**
- **Commissioning of detector will continue when the run resumes**
- **We have defined a clear set of priorities for results to be obtained for Moriond 2002**
- **Expect full functionality early in 2002 and physics results in the summer**



# Next Presentations



- **The committee has received:**
  - **Silicon Technical Design Report (and Executive Summary)**
  - **Trigger Conceptual Design Report (and Executive Summary)**
  - **Document on Run 2a status**
  - **Physics documentation**
- **Together these documents fully describe the present scope of the project**
  - **no additional detector hardware upgrades anticipated at this time**
- **Three presentations follow**
  - **Marcel Demarteau: Silicon**
  - **Darien Wood: Trigger**
  - **Jonathan Kotcher: Project Management issues, summary**

