

# Brief Status Report on $D\bar{0}$ in Run 2A

Harry Weerts

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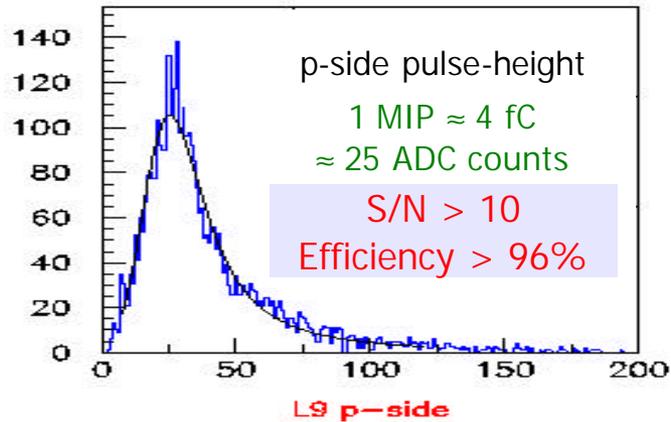
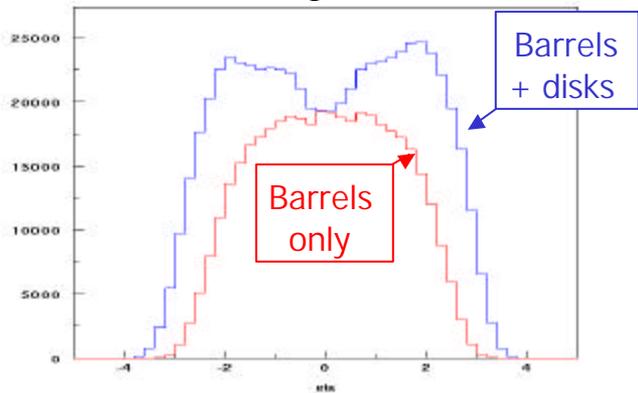
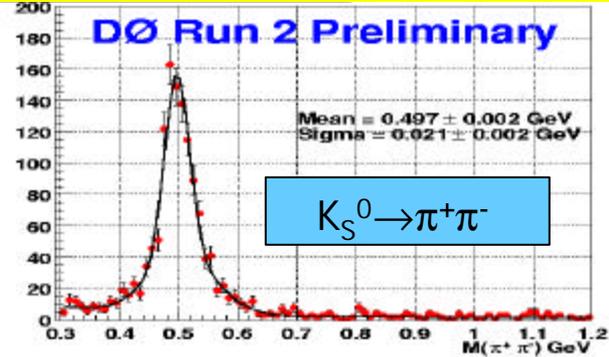


# Silicon Microstrip Tracker Status



100% commissioned  
 Barrels: 95.2% operational  
 F-disks: 95.8% operational  
 H-disks: 86.5% operational

## $K^0$ signal, silicon standalone tracking

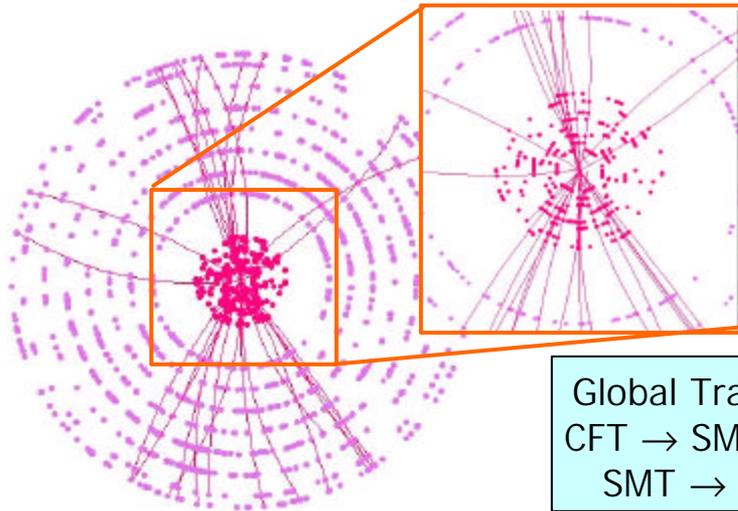


Work in progress:  
 Integrating disks into tracking

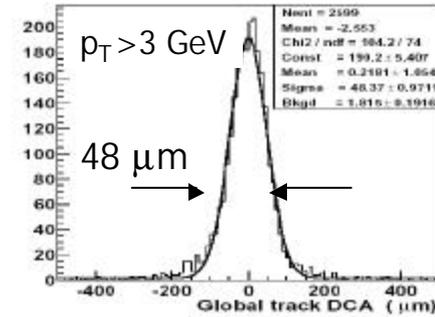
Harry Weerts



# Tracking Status



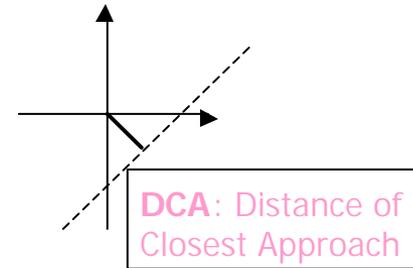
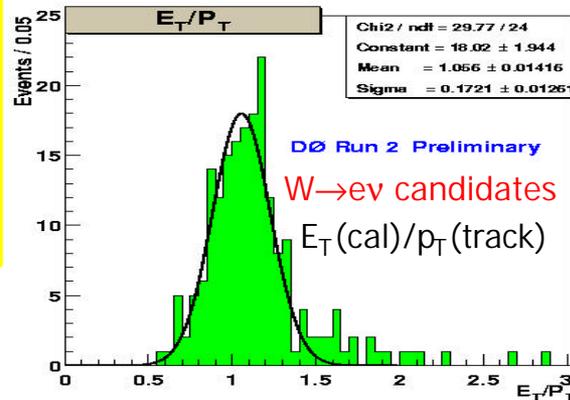
Global Tracking  
CFT → SMT and  
SMT → CFT



DCA resolution ~ 50 μm (using as built + surveyed alignment)

beam spot ~ 30-40 μm

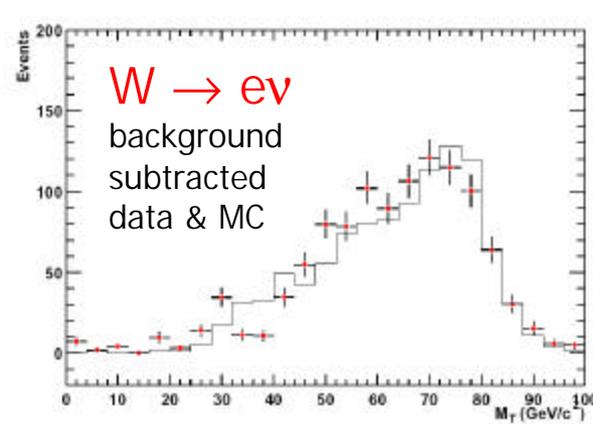
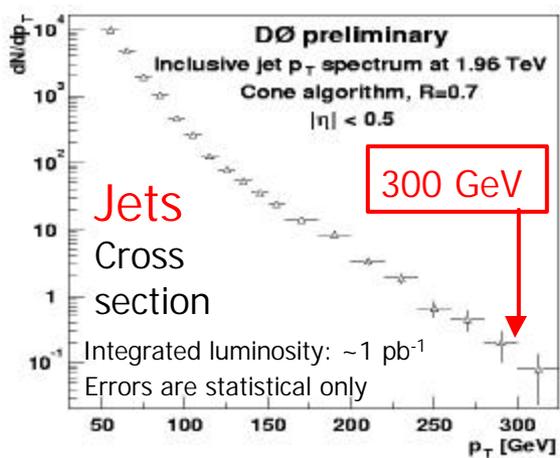
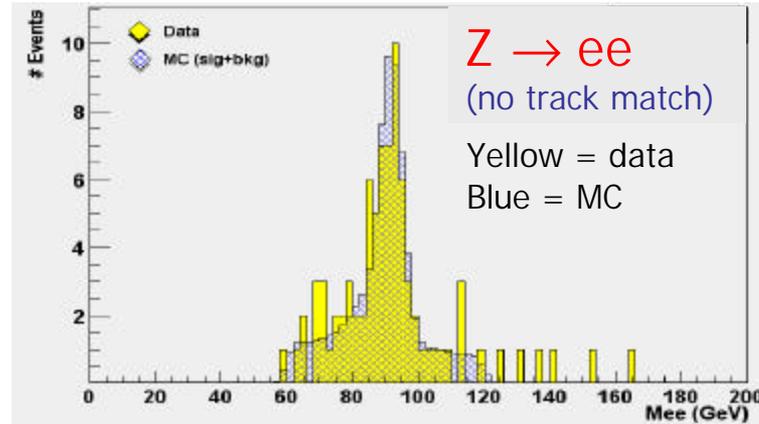
Fiber Tracker  
Electronics  
Axial: complete  
Stereo: complete  
this month



# Calorimeter Status

100% commissioned  
 ~55K readout channels  
 ~0.1% dead/noisy

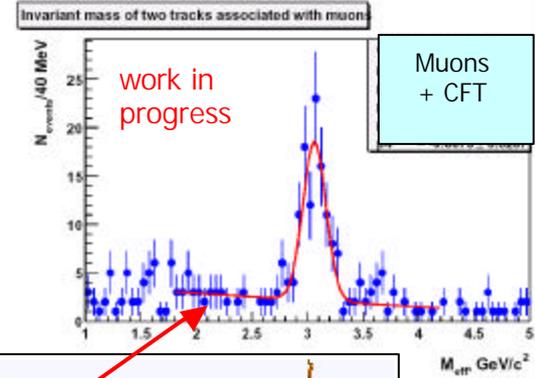
- As in Run 1, the EM energy scale is set by  $Z \rightarrow e^+e^-$ 
  - EM resolution modeled well by Monte Carlo
- HAD scale from " $\gamma$ +jet" balance



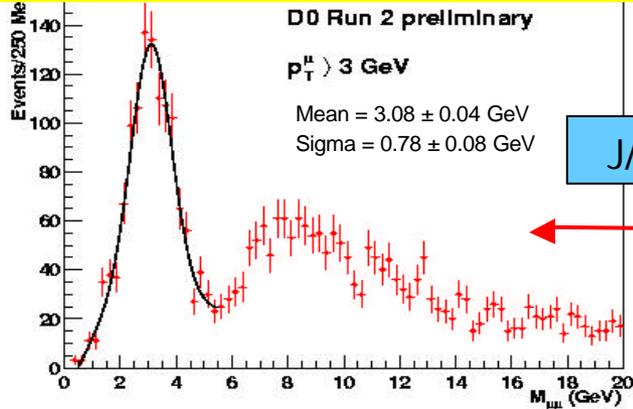
# Muon System



Muon system  
100%  
commissioned

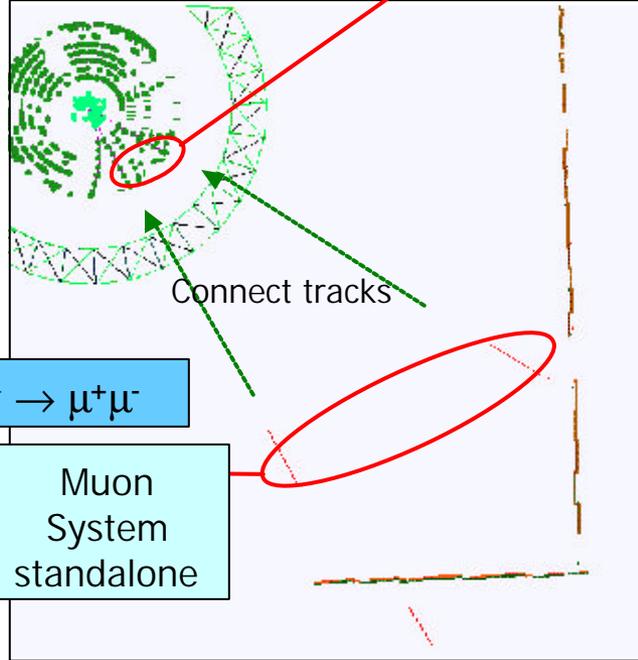


$J/\psi$  signal, central + fwd  $\mu$  triggers



$J/\psi \rightarrow \mu^+\mu^-$

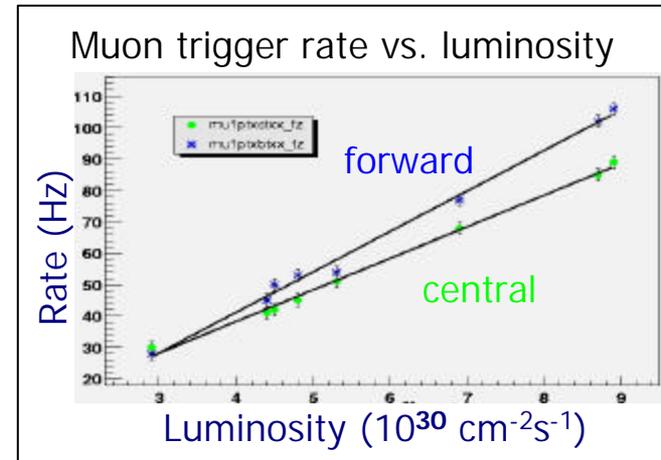
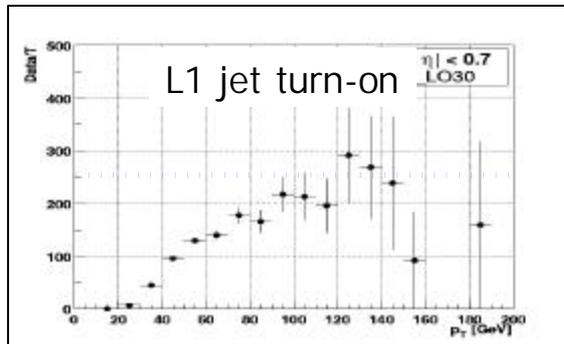
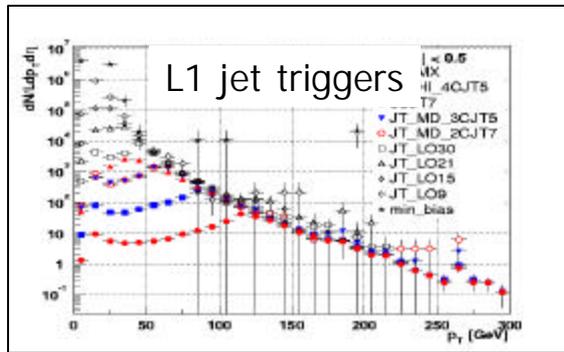
Muon System standalone



# Trigger systems

One area where work is continuing

- Level 1
  - Calorimeter and muon system triggers working very well



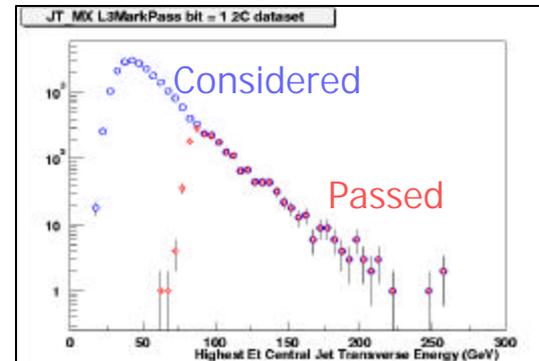
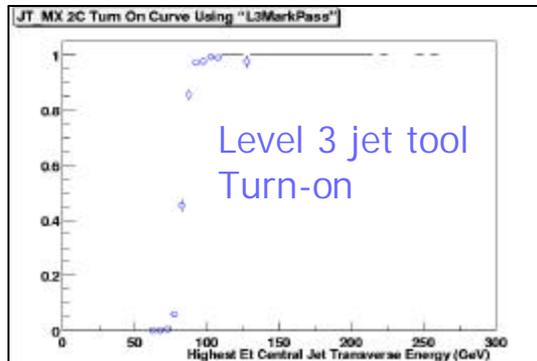
Level 1 central track trigger ready by summer

Lum can increase by ~2-3 with current trigger, without impact



- Level 2
  - Hardware done; rejected events; testing algorithms (muons done)
  - Silicon track trigger coming this summer
- DAQ
  - Technical problems with baseline implementation led to decision to move to an ethernet based system
    - uses single-board computers in VME crates and ethernet switches
  - Strong team, good progress
    - excellent role played by Fermilab Computing Division
  - Adiabatic upgrade path with **full** system in place this summer
- Level 3
  - 48-node Linux level 3 farm installed, working and selecting events:

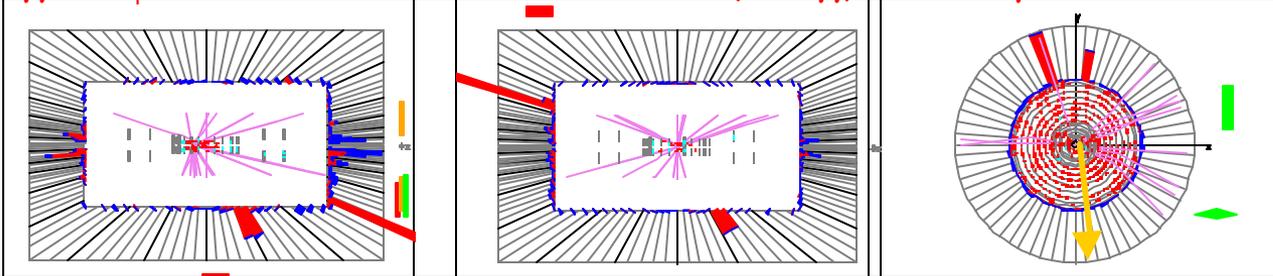
switched to new software at end of March



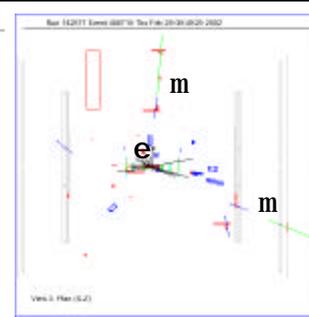
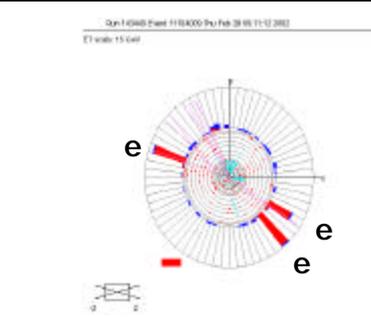
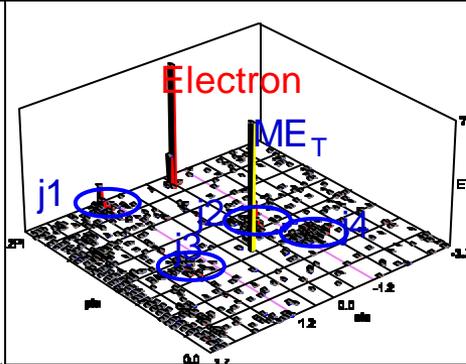
# Physics analysis is starting

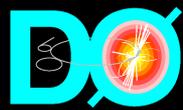
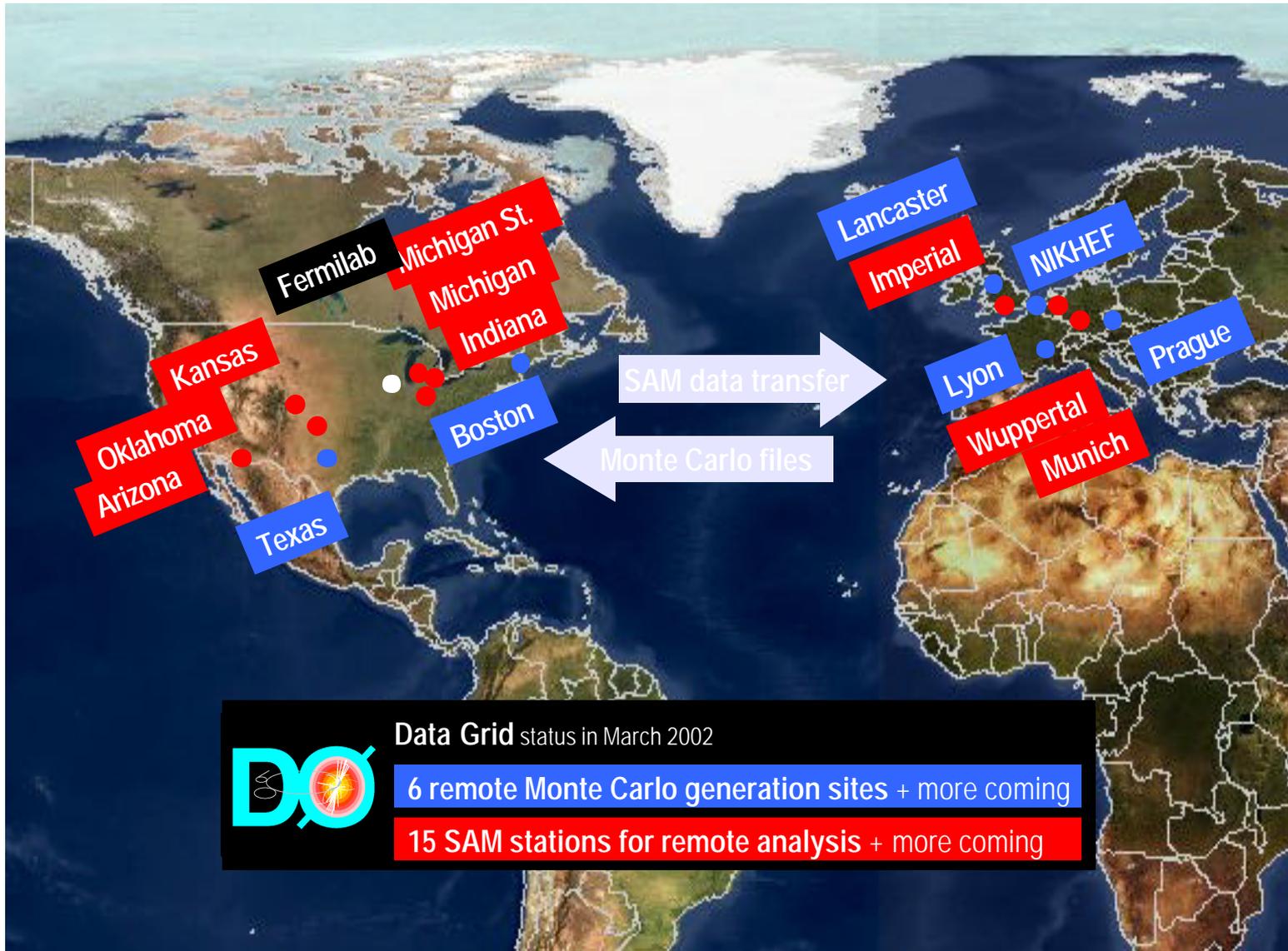
- Physics and object ID groups are very active
  - First two Run 2 theses will be defended next week
- Interesting events being collected, point to our future physics direction

–  $\gamma\gamma + \text{MET}$  candidate      extra dimensions ( $ee + \gamma\gamma$ )       $W\gamma$  candidate



–  $W + 4\text{jets} = \text{top candidates}$       trilepton candidates (SUSY)





Data Grid status in March 2002

6 remote Monte Carlo generation sites + more coming

15 SAM stations for remote analysis + more coming

# Outlook

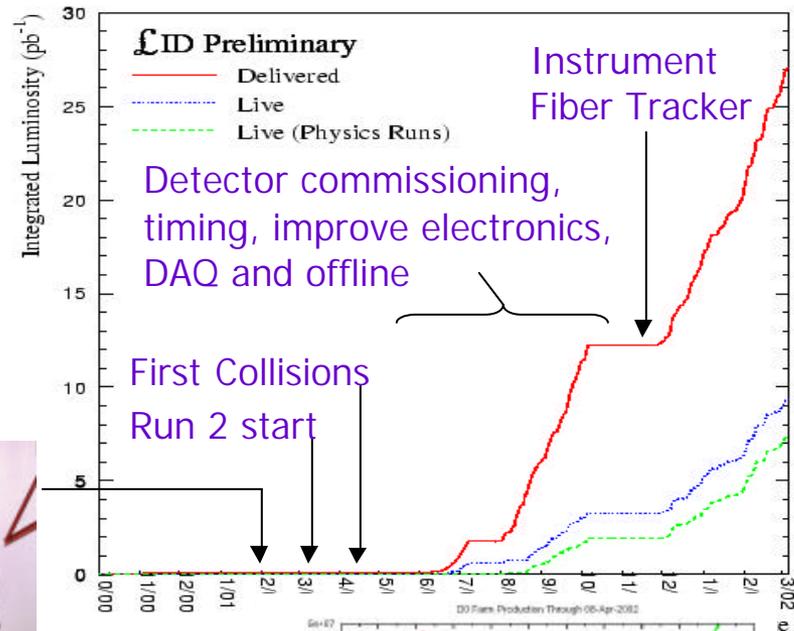
- Great progress with installation, integration, commissioning of the detector and understanding the data
  - Fiber tracker electronics and new DAQ system have made great strides
- Preliminary results very encouraging & indicate the DØ detector will be able to fully exploit the rich physics opportunities of Run 2
  - We are reconstructing electrons, muons, jets, missing  $E_T$ ,  $J/\psi$ , W's and Z's
  - We know what needs to be done and we are working very hard to
    - commission the remaining detector elements and optimize detector, trigger and DAQ performance
    - understand calibration and alignment
    - improve selection and reconstruction procedures

**We are on the road to exciting physics**

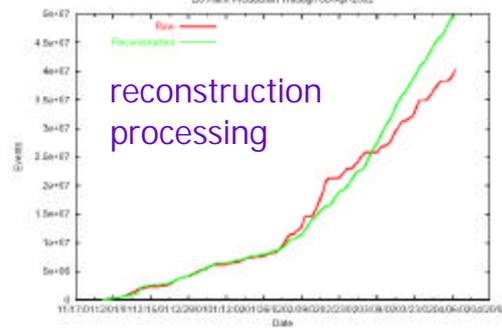


# The past year

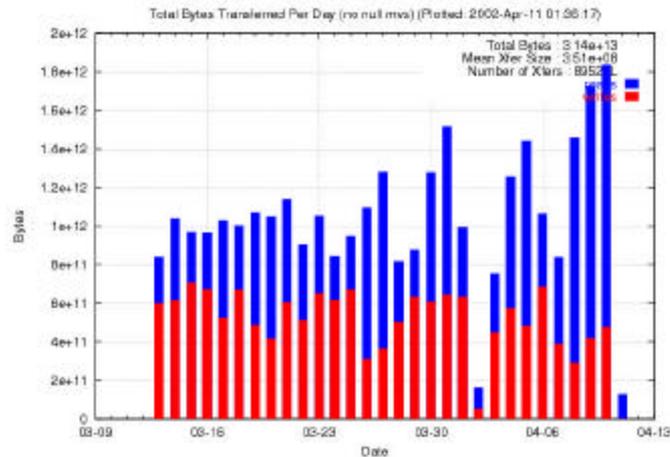
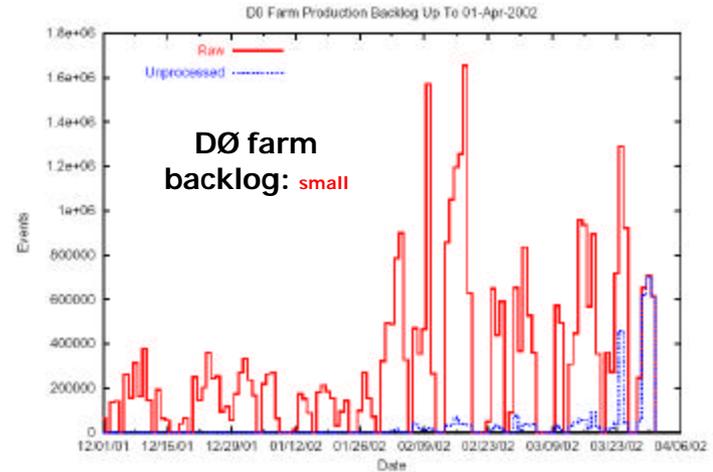
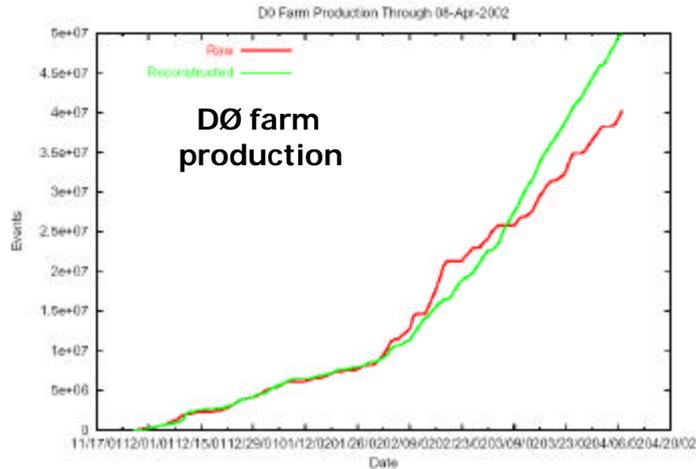
- About 27 pb<sup>-1</sup> delivered so far
- Used for commissioning of
  - Detectors
  - Offline processing
  - Worldwide data access
  - Analysis
    - e, μ, jets, EM and jet energy scales, etc.



~ 12 pb<sup>-1</sup>  
now  
on tape



# Offline production status



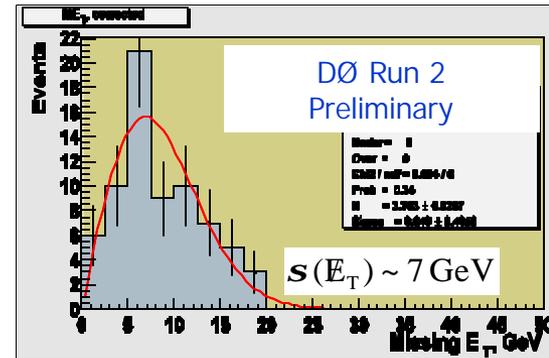
**DØ storage system: Total bytes transferred/day**



# Missing $E_T$

- Determine  $ME_T$  resolution from inclusive di-electron sample with at least one track match
  - Mainly Z, Drell-Yan

Snapshot of present performance



- Use  $ME_T$  significance to take into account event topology, found vertices, and known resolutions
  - Low significance – no physics  $ME_T$
  - high significance -  $ME_T$  not likely due to mismeasurement

