

# LCG-LHCC Referees Meeting: Experiments status

Experiments' status, results (first data ?) and prospects



LHCb

Philippe Charpentier



# Recent activities

- **Commissioning of DIRAC3**
  - ▶ Fully reengineered system
  - ▶ Main features:
    - Single framework for services, clients and agents
    - Fully integrated Workload and Data Management Systems
    - Supports production and user analysis activities
      - Allow to apply VO policies: quotas, priorities...
    - Uses pilot jobs as DIRAC2
      - Ready for using generic pilot jobs (not switched on yet)
      - Full scale test with generic pilots will take place in the coming weeks
    - New bookkeeping system (also integrated)



# Recent activities

- **Production activities**
  - ▶ Complete simulation and stripping of MC data (so-called DC06 as was launched in 2006)
  - ▶ CCRC-like activity at low rate (10%)
  - ▶ Start 2008 simulation
    - Mainly for alignment and calibration studies
    - Wait for first data for tuning generators and detector response



# Recent issues encountered

- **Storage**
  - ▶ Instability of SEs, in particular dCache
    - Very good response from sites and dCache developers
    - Permanent struggle due to various causes:
      - Software issues (addressed with sites and developers)
      - Sub-optimal hardware configuration at some Tier I's
      - Unavailability of files: are in the namespace at site but cannot be accessed or even get the tURL
        - Dammmaged tapes, unavailale servers ...
  - ▶ Transfers are OK (low throughput needed)

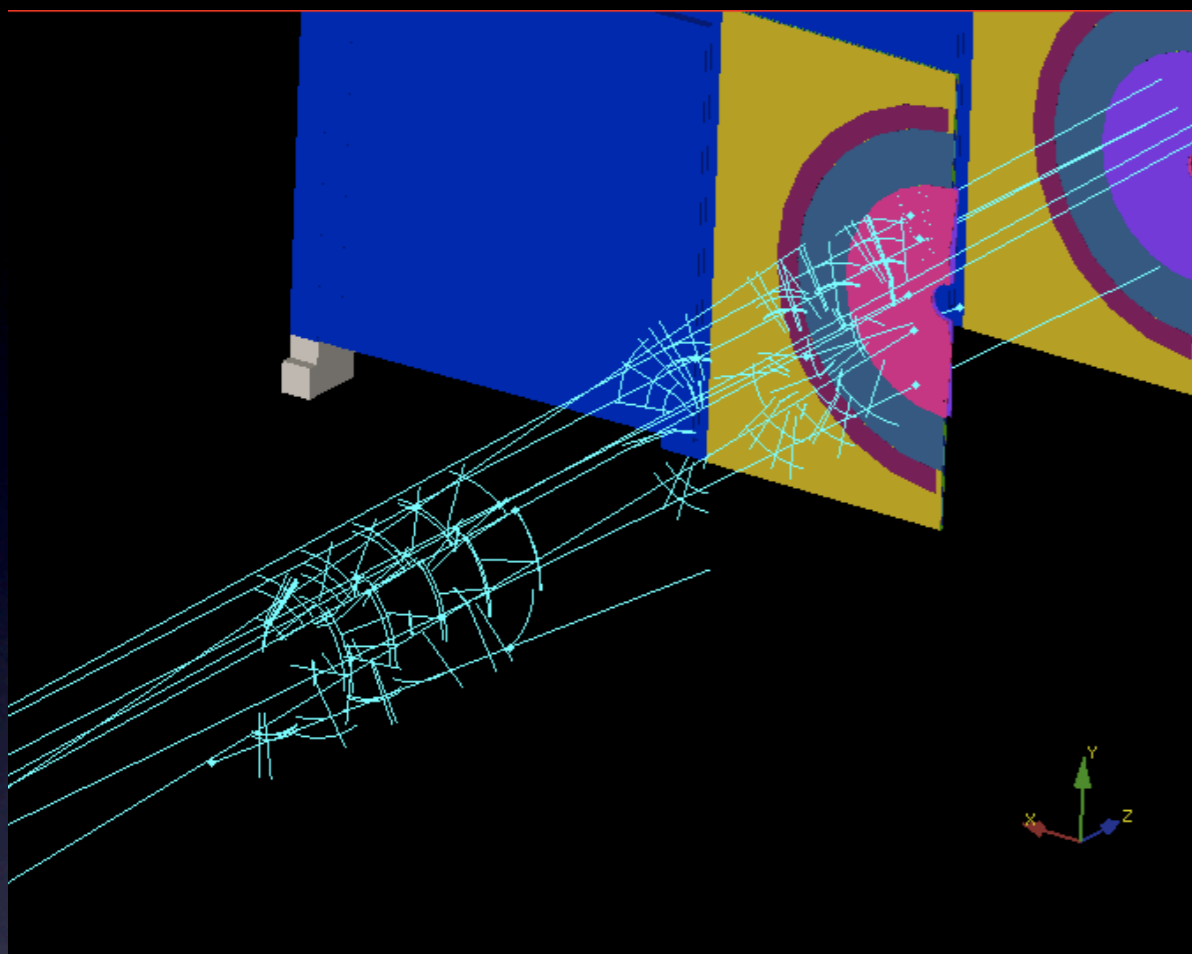


# Recent issues encountered

- **Workload Management**
  - ▶ Several severe issues with WMS
    - Mixing up credentials of jobs if submitted by the same user with different roles
    - Limitation in proxy handling (too few delegations allowed) preventing some users to run jobs (e.g. from French CA)
    - Misbehavior of WMS after some idle time: cannot find suitable sites even for a job without requirements!
  - ▶ Issues with local shared software repository at sites
    - Stability and access rights (being addressed)

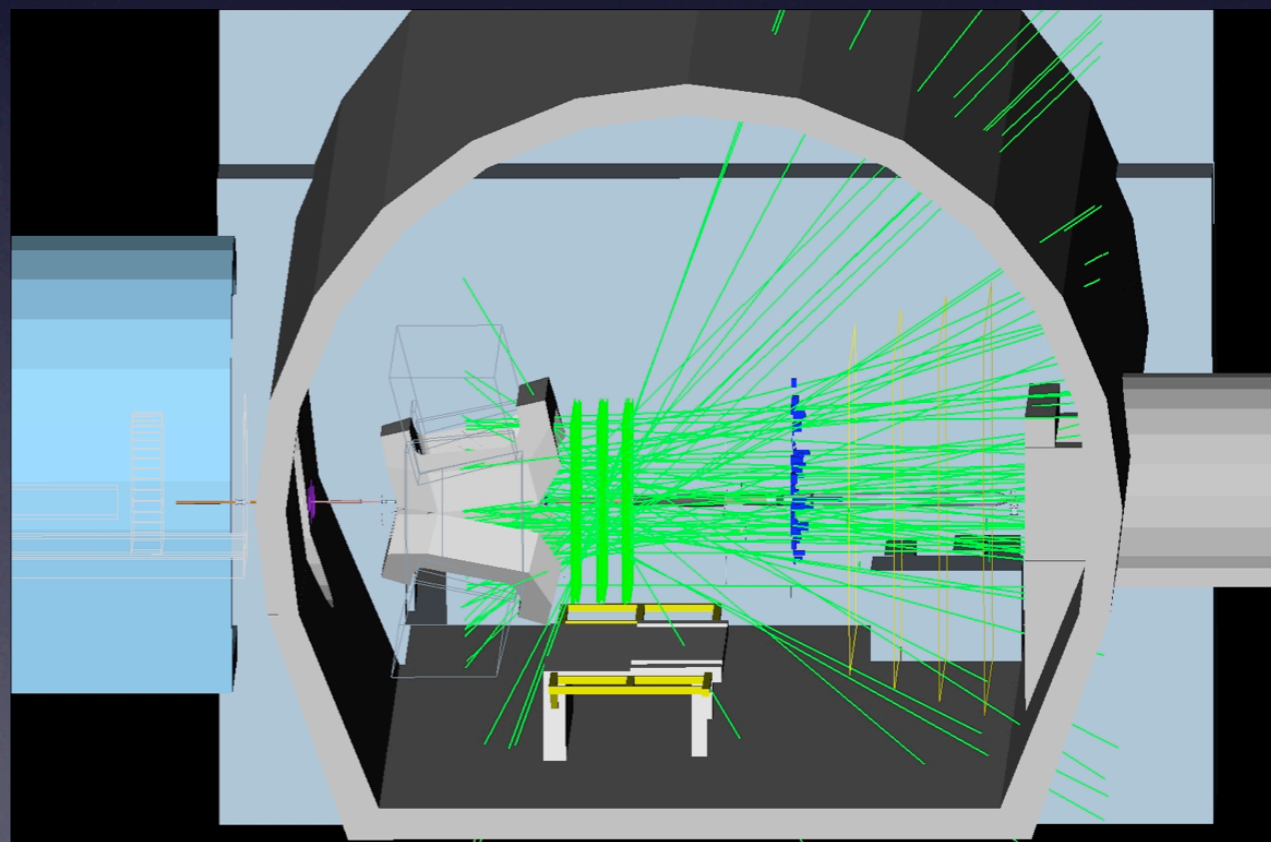


# First events from LHC at LHCb



22/08/2008: event seen by VeLo (1/4) from injection test

10/09/2008: from first circulating beam





# Outlook

- **DIRAC3 will be ready for first data**
  - ▶ Analysis will have fully migrated
  - ▶ End of September: no dependency any longer on SRM v1 (1.4 Mio legacy files with V1 endpoint in LFC)





- **Still to come:**
  - ▶ GExec on worker nodes
    - Will allow to exploit the full power of DIRAC
      - Allows late binding of jobs, VO policy etc...
    - Running analysis jobs with higher priority without site intervention
    - DIRAC3 model was certified long ago by the GDB working group
    - Waiting for middleware to be ready (SCAS service)



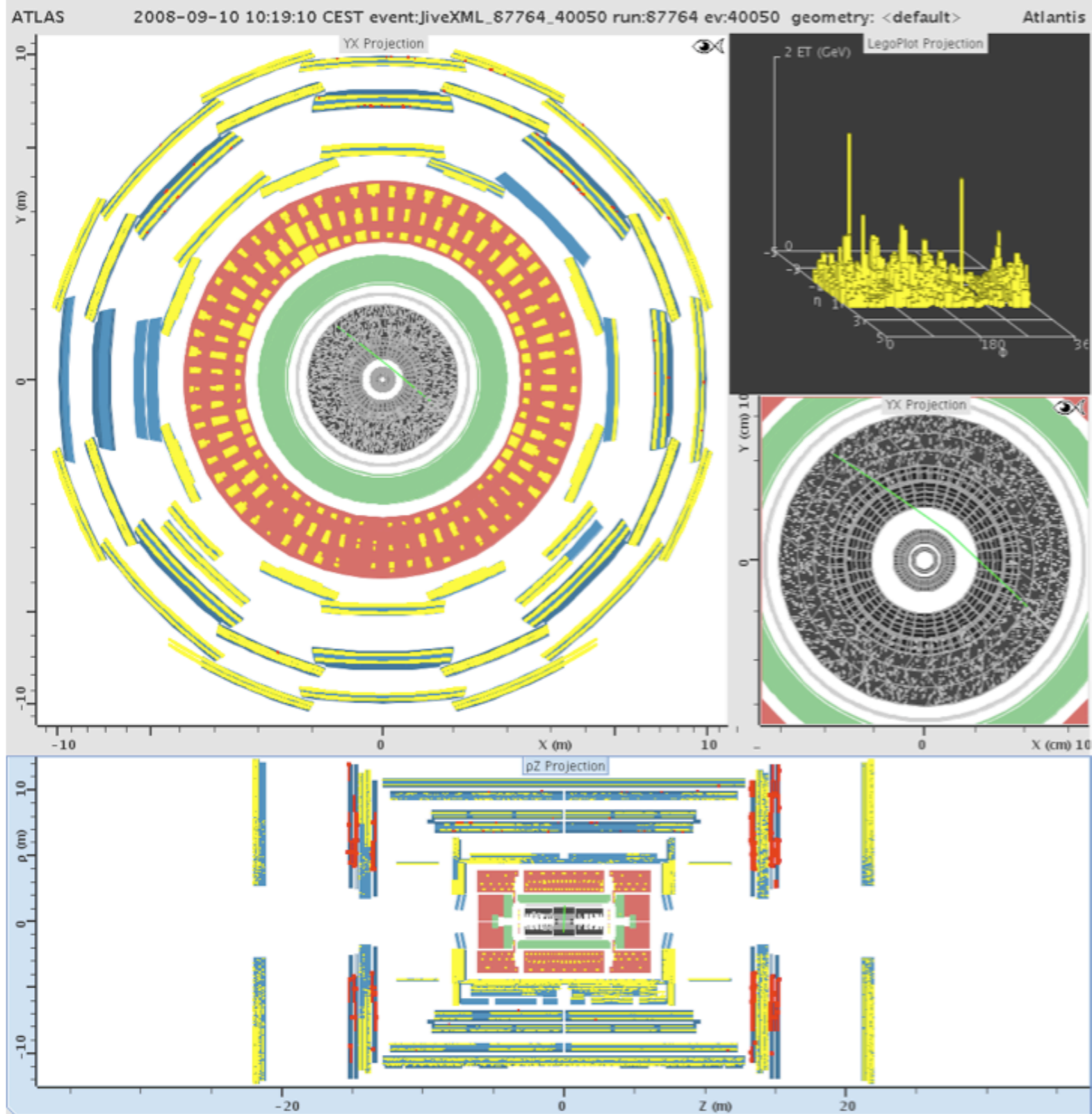
- **Still to come:**
  - ▶ Commissioning of the alignment and calibration loop
    - Setting up on LHCbCAF (calibration and alignment facility)
      - Requirements are rather modest (“simple” detector)
      - Start with 2 8-core machines, 200 GB of disk
    - Full commissioning of Conditions Database update and streaming
      - Currently very few commits to ConDB
    - Surprises from the first data... hope they’ll be good!



# ATLAS

Dario Barberis

# First beam event (10/09/08)



first beam  
event seen  
in ATLAS



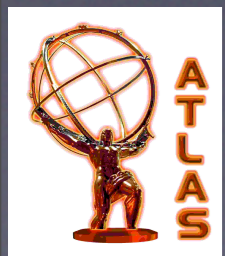
# Software Readiness

- Cosmics reconstruction relatively (SCT, pixels) well exercised over last few months with real data
  - ▶ Specially configured Inner Detector, Calorimetry, Muon and Combined Muon reconstruction algorithms
- Now some experience with single beam data using similar configuration
- Collision reconstruction well exercised with simulated data
  - ▶ Differently configured Inner Detector, Calorimetry, Muon, Combined Muon, e-gamma, jet/b-tagging, Missing ET, tau algorithms
- Full merger of the two configurations with dynamic reconfigurations has taken longer than expected
  - ▶ Available for first collisions ... this week-end



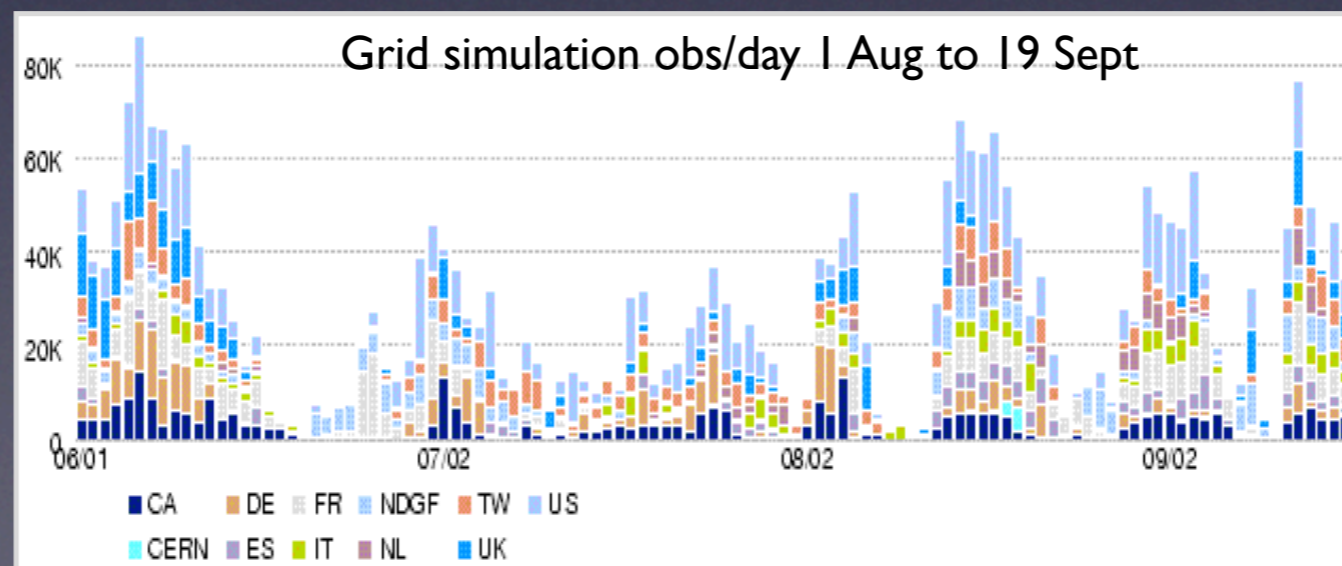
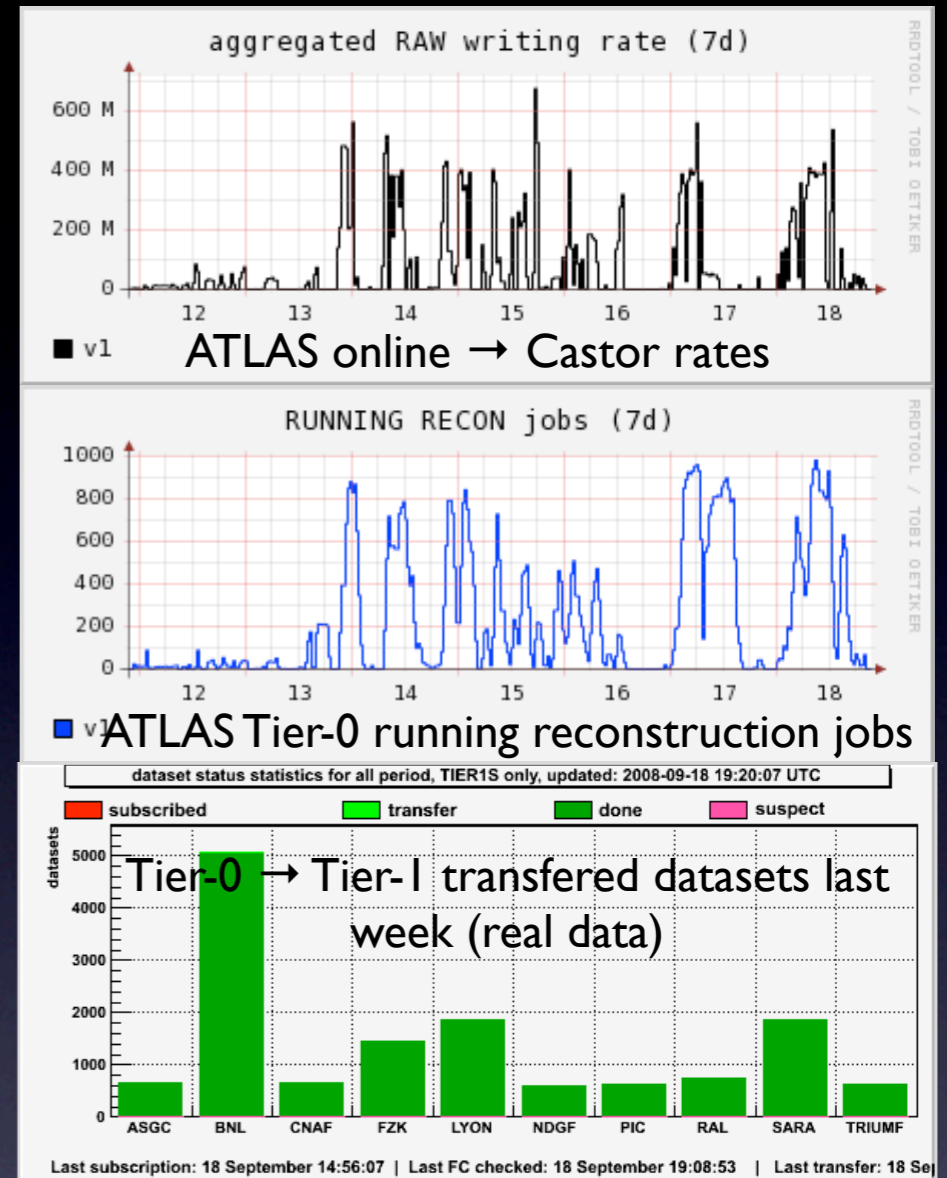
# Software Readiness

- A lot of emphasis on good validation and stress testing
  - ▶ But it is still difficult to find right balance to fit tight schedule
- We've put in place a rapid response structure in order to be able to respond rapidly to unexpected problem with real ATLAS data
- The CPU time per event for Tier-0 processing is approaching the baseline but we have more work to do with pileup data processing
- Memory usage getting under control
  - ▶ OK for Tier-0 processing but still problem with simulated data (some very complex events)
- Conservative strategy adopted to progress from essential processing through lower priority levels



# Real data processing and distribution

- Tier-0 machinery well tested through FDR and cosmic data-taking for many months
  - ▶ Datasets automatically formed from run and stream information
  - ▶ Reconstruction jobs also running automatically
- Data export to Tier-1s tuned according to MoU shares
  - ▶ Exceptions for very first LHC data run (sent to all Tier-1s)
- Simulation production also continuing in the background









# CMS

Matthias Kasemann

# Computing status

- **Improvements after CSA08 and CCRC:**
  - ▶ Several “Integration Campaigns” improved data handling, monitoring, analysis job submission
  - ▶ Implemented T1 and T2 site commissioning procedure:
    - based on SAM, JobRobot and Data Transfer performance
- **Preparation for LHC data taking and analysis**
  - ▶ Resources for CAF high priority use cases associated (Alignment, Calibration, Commissioning and low latency Physics monitoring and analysis)
    - Discussing with IT about requirements for CAF-T2 use cases
  - ▶ Coordinated analysis by assigning physics topics to T2’s
  - ▶ Computing + Offline Run Coordination started
    - 2 people on duty for 1 week
- **Computing shifts in CMS centre and at FNAL started**
  - ▶ backed up by Experts-On-Call (being defined)

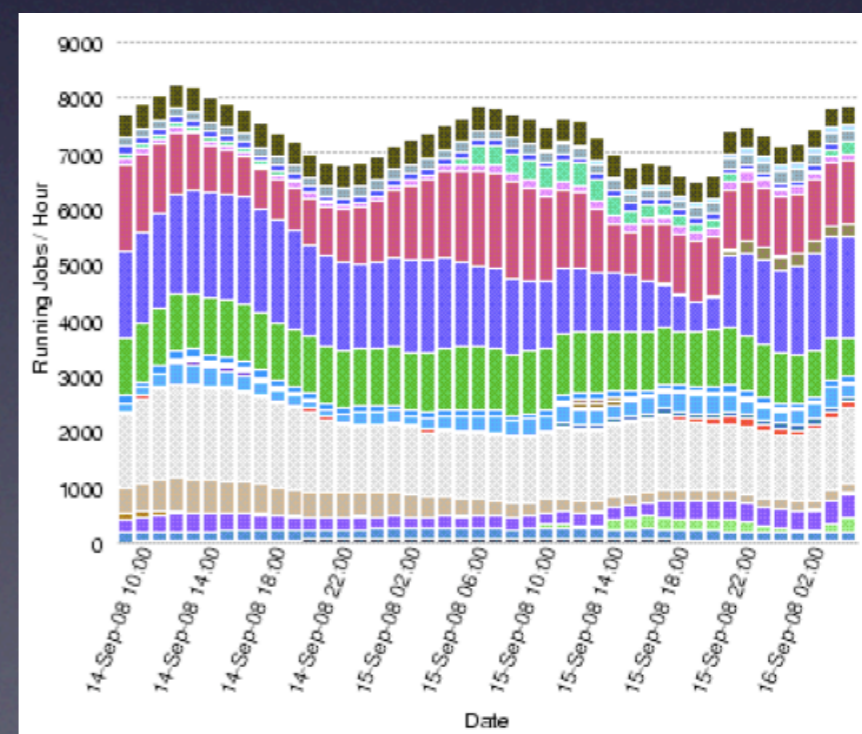


# Data taking over the summer

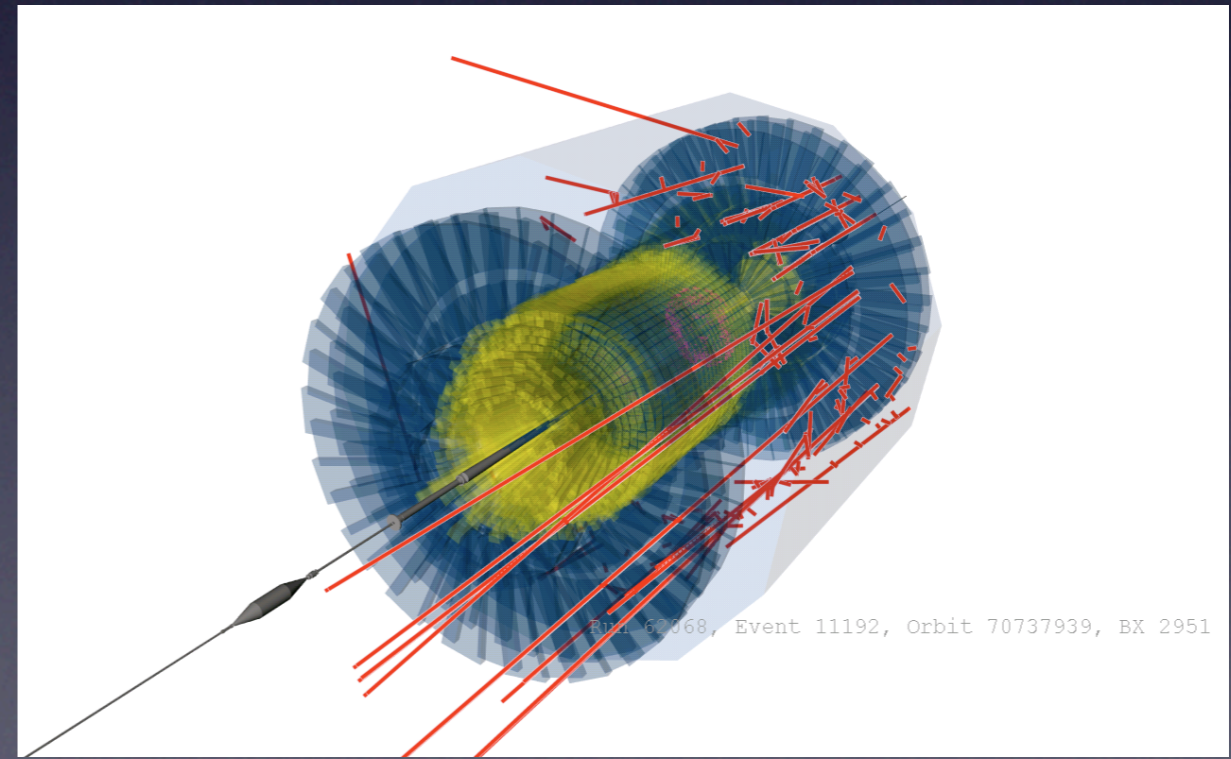
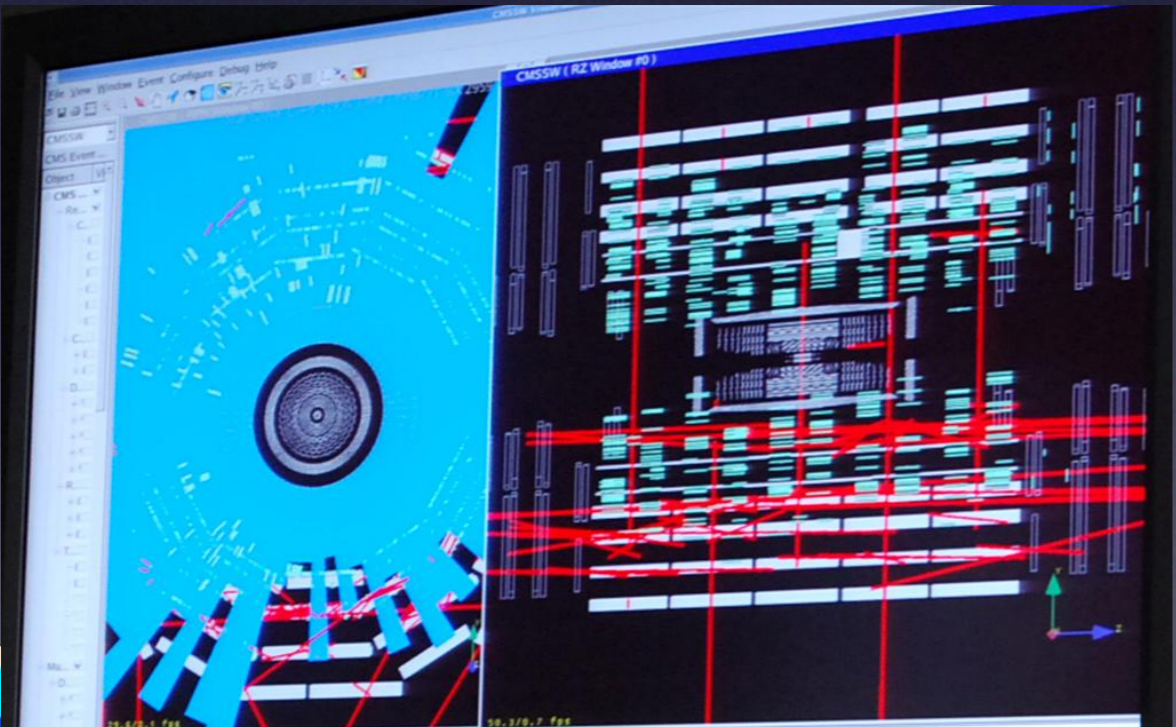
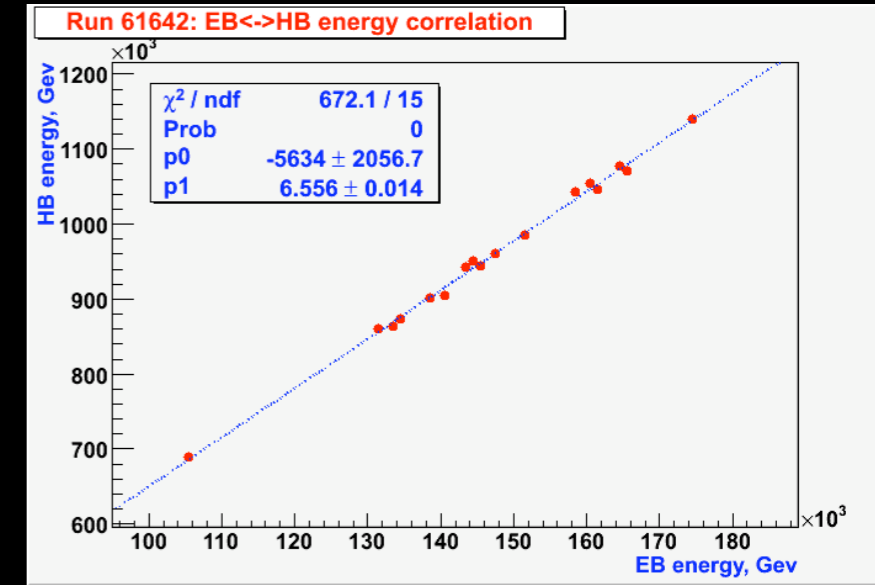
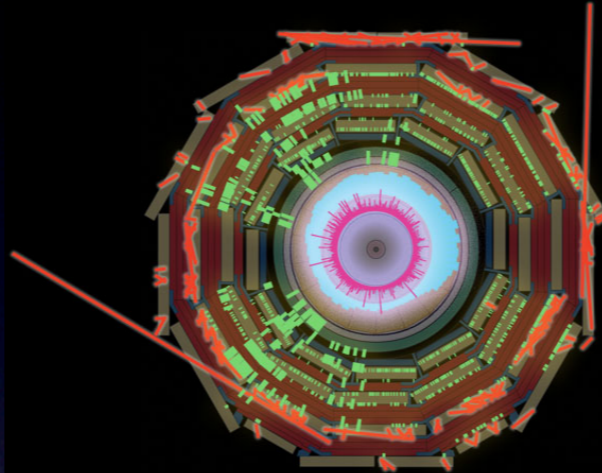
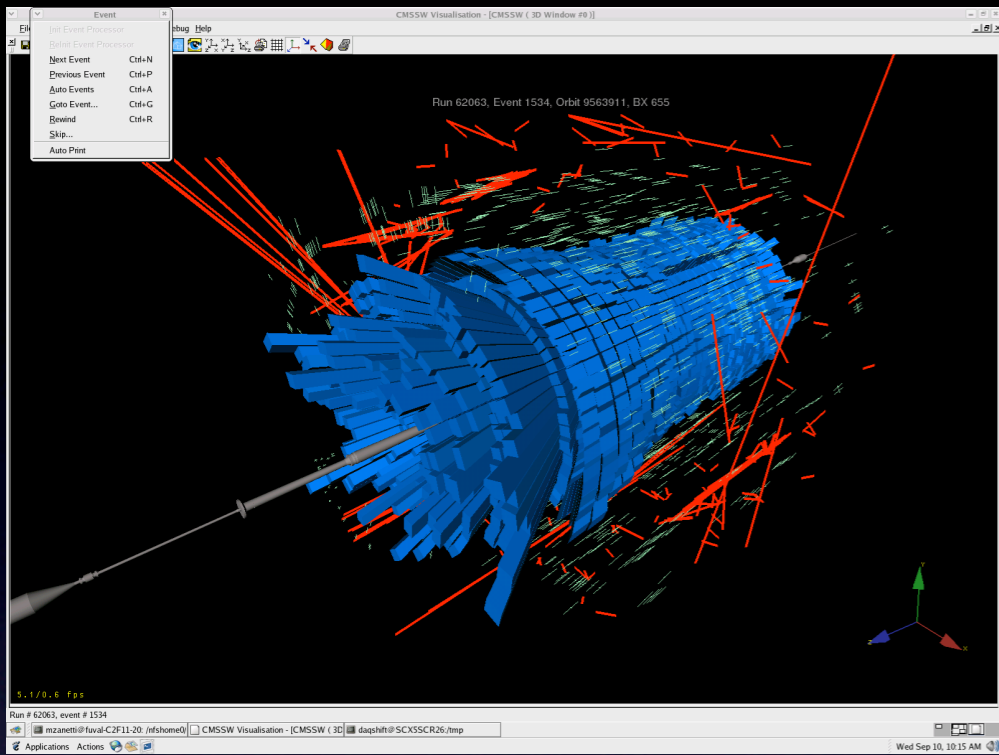
- Data taking over the summer: (data were routinely processed and distributed)
  - ▶ CMS data taking every week (Mid-Week-Runs)
    - increasing portion of detectors read out
    - some data taking with magnet on
  - ▶ CruZet3 and CruZet4: 1 week runs
  - ▶ performed commissioning and Calibration and Alignment tasks on data

8000 jobs running at T2s

- Monte Carlo Production
  - ▶ Continuous request of MC samples produced to support commissioning studies for Primary Dataset definitions
  - ▶ Huge MC production (> 200M events) started with software release for start of data taking

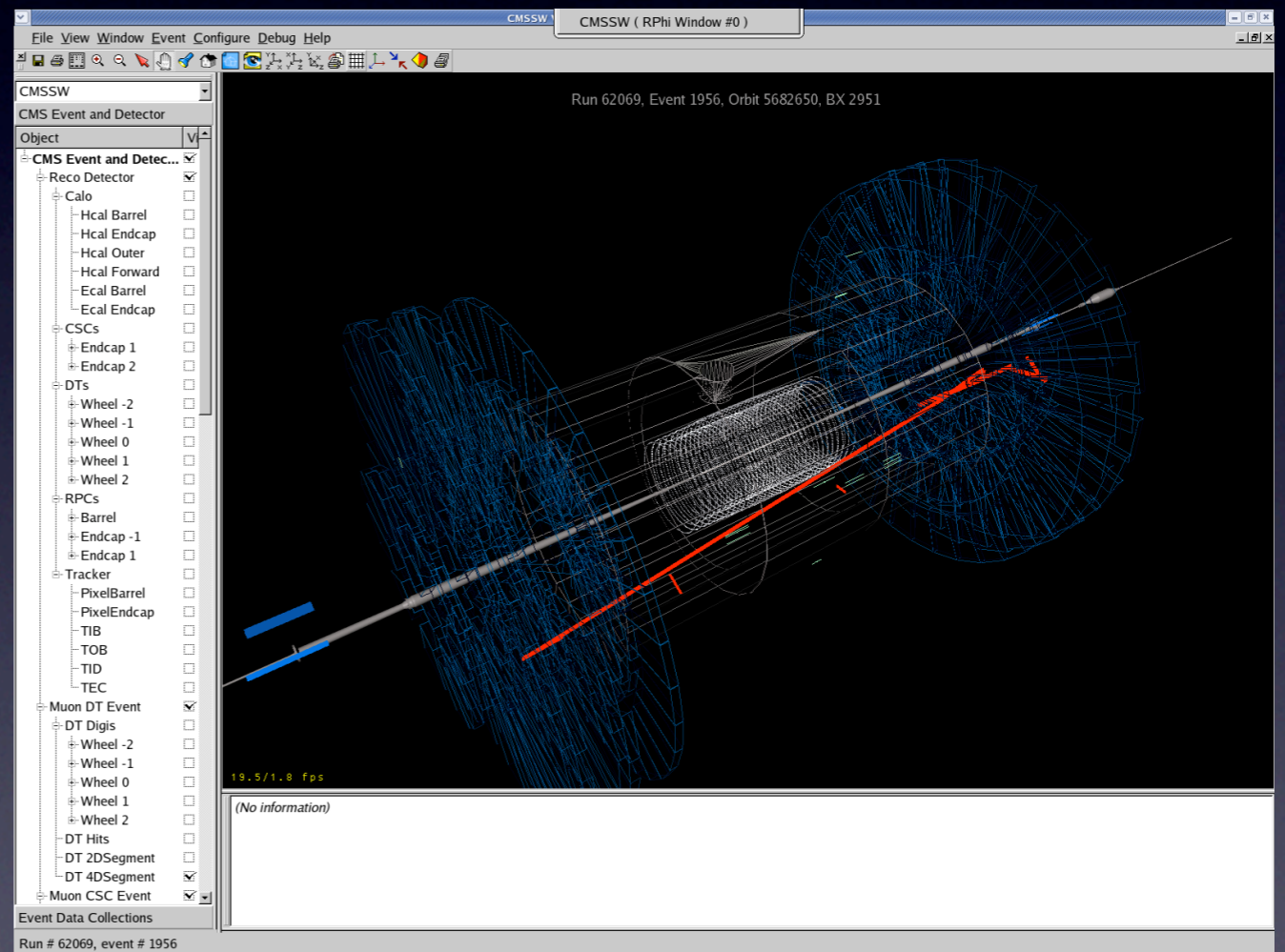
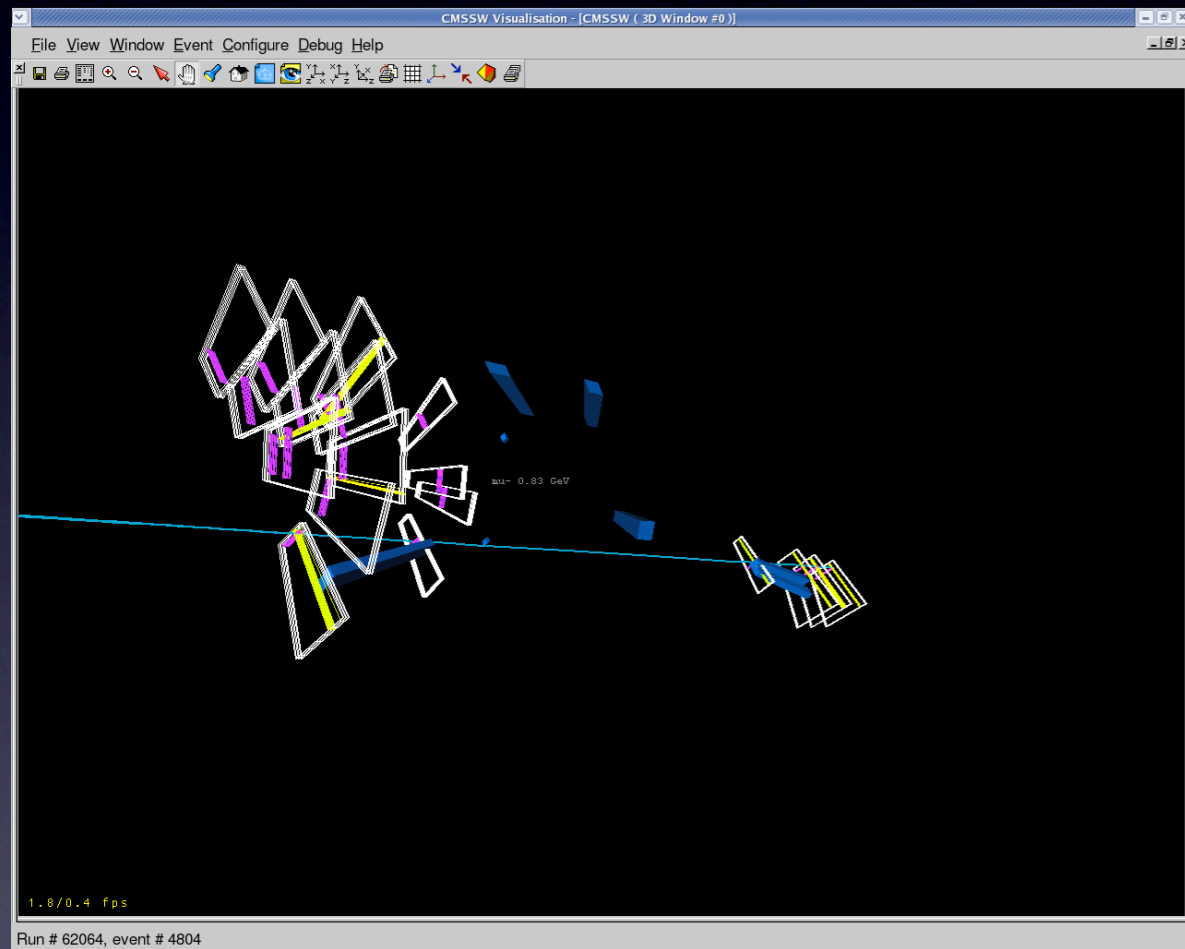


# 10.9.08: LHC beam events in CMS

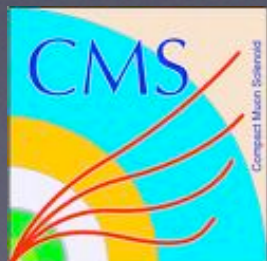


# ... and some beam halo events in CMS

Beam 1: A halo muon in both ECAL endcaps



Beam 2: A halo muon in CMS



# Summary

- **CSA08 and CCRC08 were very successful**
  - ▶ Demonstrated all key performances of the T0, CAF, T1, T2 infrastructure
- **For CMS computing it was a very busy summer:**
  - ▶ Improved infrastructure reliability, production tools, monitoring and operations
  - ▶ Started Computing and Offline Run Coordination and Computing shifts
- **Routine Cosmics and Commissioning Data taking (w.o. and w. magnet) performed over the summer**
  - ▶ Processed at T0, Calibration & Alignment performed, distributed on demand to several T1/T2 centers



# Summary

- Production of requested Monte-Carlo samples in steady state mode
  - ▶ Huge production of MC Startup Sample (>200M) started when final software and configuration became available
- CMS successfully recorded and displayed events from dumped beams and beam halo without problem !

CMS is waiting for much more LHC data. CMS, the T0, CAF, T1 and T2 centers are well prepared for data processing and analysis.





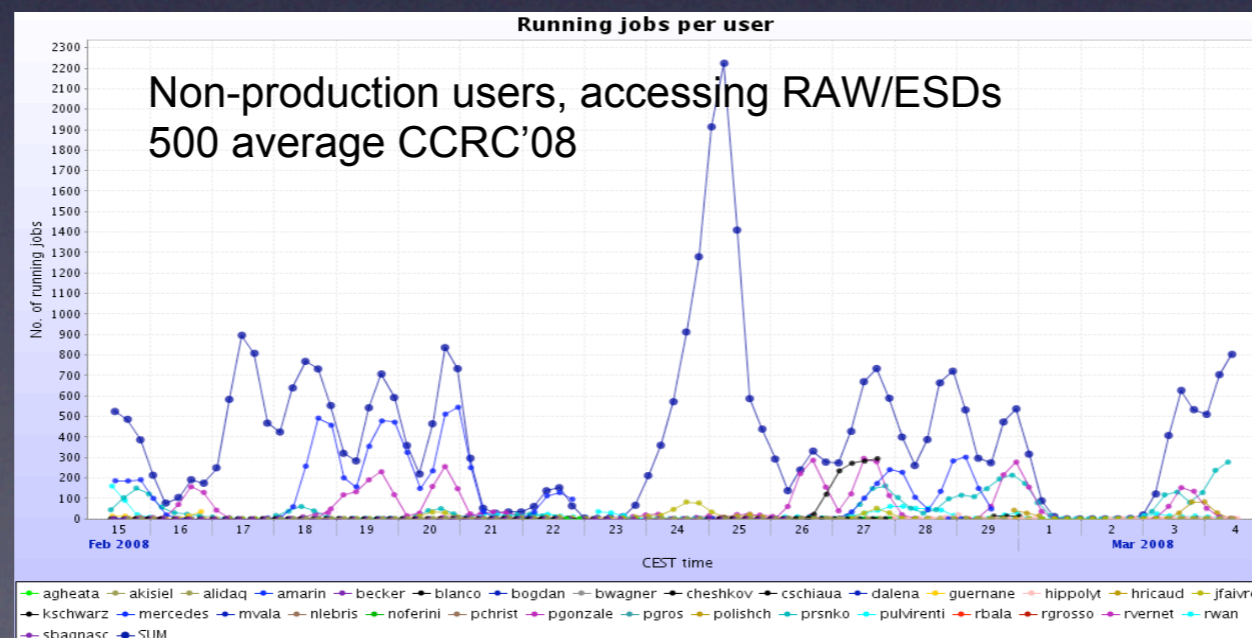
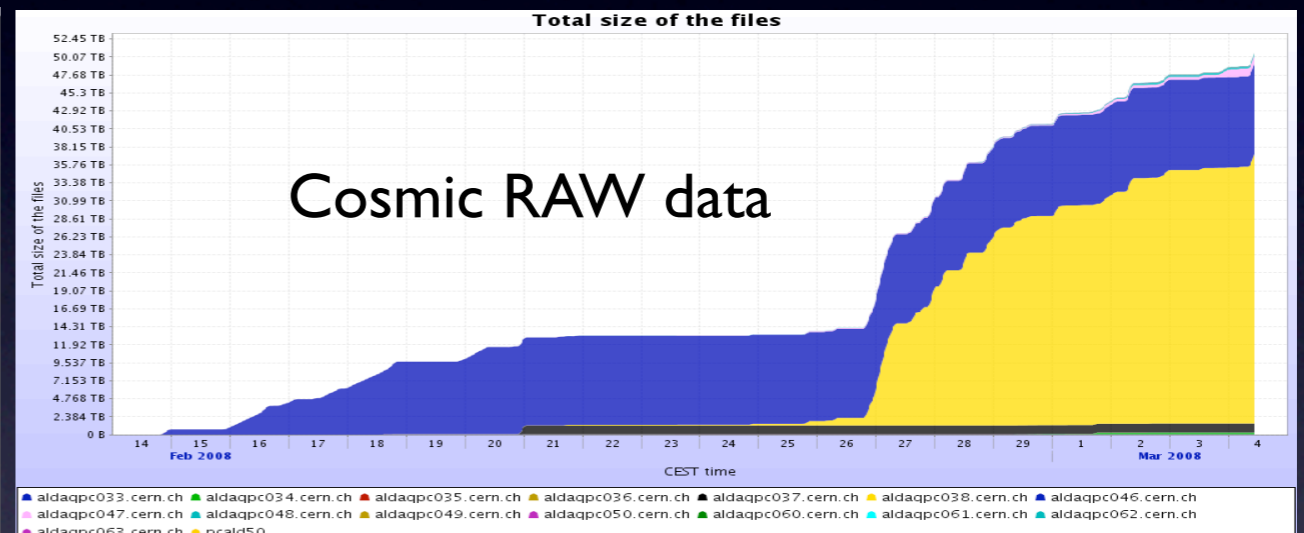
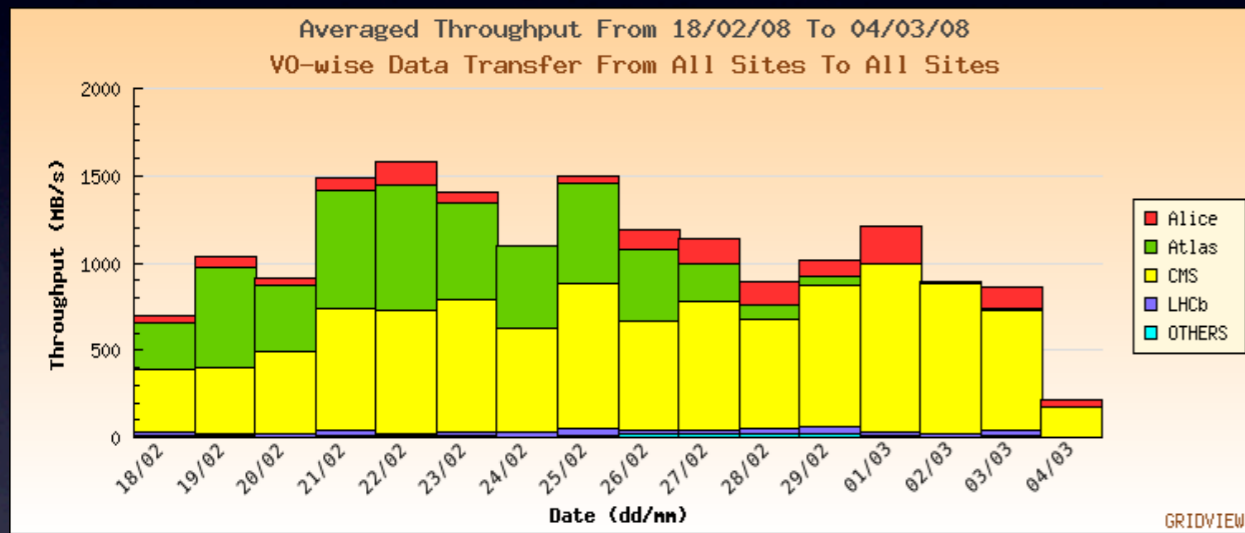
# ALICE

Latchezar Betev



# Grid status and readiness for first data

- Successful completion of all WLCG CCRC08 tasks
  - ▶ Raw data registration/replication, workload management, storage
  - ▶ Reconstruction chain for RAW and ESD availability fully tested and ready (T0, T1s and T2s)



# Readiness for first data - MC

- **Fast “First Physics” MC production - different scenarios of LHC energies and detector conditions**
  - ▶ Rapid changes in the code and conditions reflected immediately
  - ▶ Grid production of statistical samples equivalent to the expected RAW data in the “first hours of LHC”
  - ▶ Analysis of data on Grid and CAF by dedicated Physics Working Groups

PDC 08/LHC08c9	First physics (stage 2) pp, Phojet, No field, 900GeV	Completed	377000 - 377002	247,950	Full misalignment/decalibration
PDC 08/LHC08c8	First physics (stage 2) pp, Phojet, 5kG, 900GeV	Completed	376000 - 376002	353,250	Full misalignment/decalibration
PDC 08/LHC08c7	First physics (stage 2) pp, Phojet, No field, 10TeV	Completed	375000 - 375002	257,700	Full misalignment/decalibration
PDC 08/LHC08c6	First physics (stage 2) pp, Pythia6, No field, 900GeV	Completed	374000 - 374002	256,050	Full misalignment/decalibration
PDC 08/LHC08c5	First physics (stage 2) pp, Pythia6, No field, 10TeV	Completed	373001 - 373002	226,950	Full misalignment/decalibration
PDC 08/LHC08c4	First physics (stage 2) pp, Phojet, 5kG, 10TeV	Completed	372000 - 372001	305,250	Full misalignment/decalibration
PDC 08/LHC08c3	First physics (stage 2) pp, Pythia6, 5kG, 900GeV	Completed	371000 - 371001	265,500	Full misalignment/decalibration
PDC 08/LHC08c2	First physics (stage 2) pp, Pythia6, 5kG, 10TeV	Completed	370000 - 370001	245,850	Full misalignment/decalibration
PDC 08/LHC08c18	First physics (stage 3) pp, Phojet, No field, 900GeV	Completed	378700 - 378702	233,100	Full misalignment/decalibration
PDC 08/LHC08c17	First physics (phase 3) pp, Phojet, No field, 10TeV	Completed	378600 - 378602	196,950	Full misalignment/decalibration
PDC 08/LHC08c16	First physics (phase 3) pp, Phojet, 5kG, 900GeV	Completed	378500 - 378501	212,250	Full misalignment/decalibration
PDC 08/LHC08c15	First physics (stage 3) pp, Phojet, 5kG, 10TeV	Completed	378400 - 378401	228,150	Full misalignment/decalibration
PDC 08/LHC08c14	First physics (stage 3) pp, Pythia6, No field, 900GeV	Completed	378300 - 378301	246,900	Full misalignment/decalibration
PDC 08/LHC08c13	First physics (stage 3) pp, Pythia6, No field, 10TeV	Completed	378200 - 378202	272,550	Full misalignment/decalibration
PDC 08/LHC08c12	First physics (stage 3) pp, Pythia6, 5kG, 900GeV	Completed	378100 - 378101	318,900	Full misalignment/decalibration
PDC 08/LHC08c11	First physics (stage 3) pp, Pythia6, 5kG, 10TeV	Completed	378000 - 378001	277,500	Full misalignment/decalibration



# Readiness for first data - RAW

- Fast “First events” RAW production - any data collected with  
cosmics/LHC beam
  - ▶ Detector alignment, calibration studies and updates of  
conditions DB
  - ▶ Grid production (several passes) at T0/T2
    - Fully automatic procedure
  - ▶ Export of ESDs to CAF/T2s for expert analysis

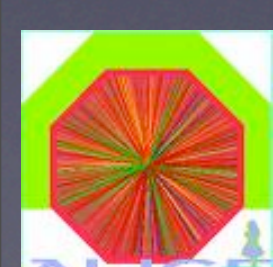
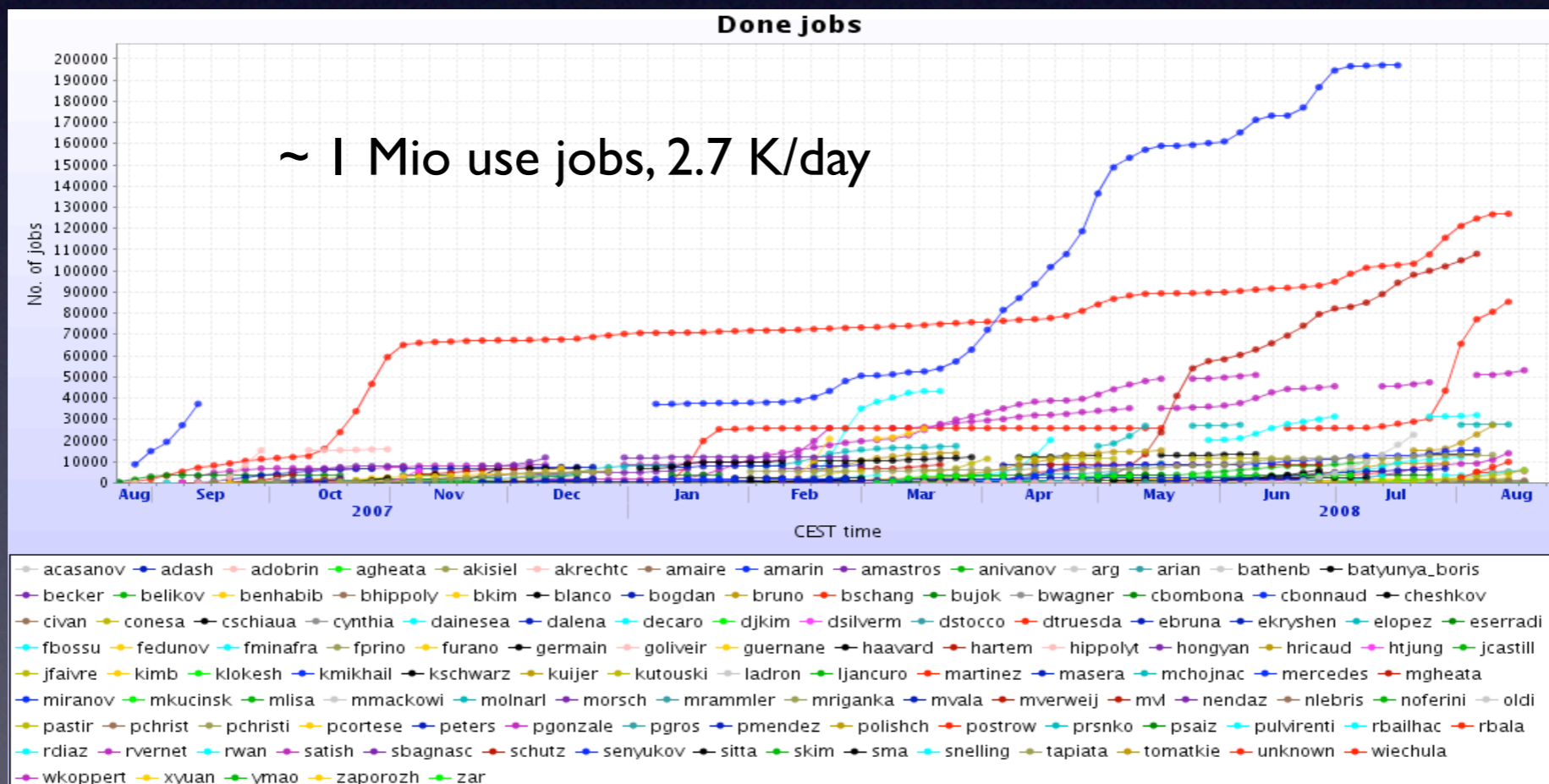
Circulating beam events collected 12 Sept. 2008

Run#	Chunks	Processed	Date/PID	Partition	ROOT	ALIROOT	Output dir	Job type <input checked="" type="checkbox"/>
				- All -	- All -	- All -		Beam-gas LHC08d
<a href="#">58378</a>	1	1	100%	12 Sep 2008	LHC08d	v5-21-01-alice	v4-15-Rev-01 /alice/data/2008/LHC08d/000058378/ESDs/pass1/	Beam-gas LHC08d
<a href="#">58376</a> ⚠	2	1	50%	12 Sep 2008	LHC08d	v5-21-01-alice	v4-15-Rev-01 /alice/data/2008/LHC08d/000058376/ESDs/pass1/	Beam-gas LHC08d
<a href="#">58343</a> ⚠	1	1	100%	12 Sep 2008	LHC08d	v5-21-01-alice	v4-15-Rev-01 /alice/data/2008/LHC08d/000058343/ESDs/pass1/	Beam-gas LHC08d
<a href="#">58338</a> ⚠	3	3	100%	13 Sep 2008	LHC08d	v5-21-01-alice	v4-15-Rev-01 /alice/data/2008/LHC08d/000058338/ESDs/pass1/	Beam-gas LHC08d
<a href="#">58334</a> ⚠	1	1	100%	12 Sep 2008	LHC08d	v5-21-01-alice	v4-15-Rev-01 /alice/data/2008/LHC08d/000058334/ESDs/pass1/	Beam-gas LHC08d
<b>TOTAL</b>	<b>8</b>	<b>7</b>	<b>87.5%</b>	<b>5 jobs</b>				



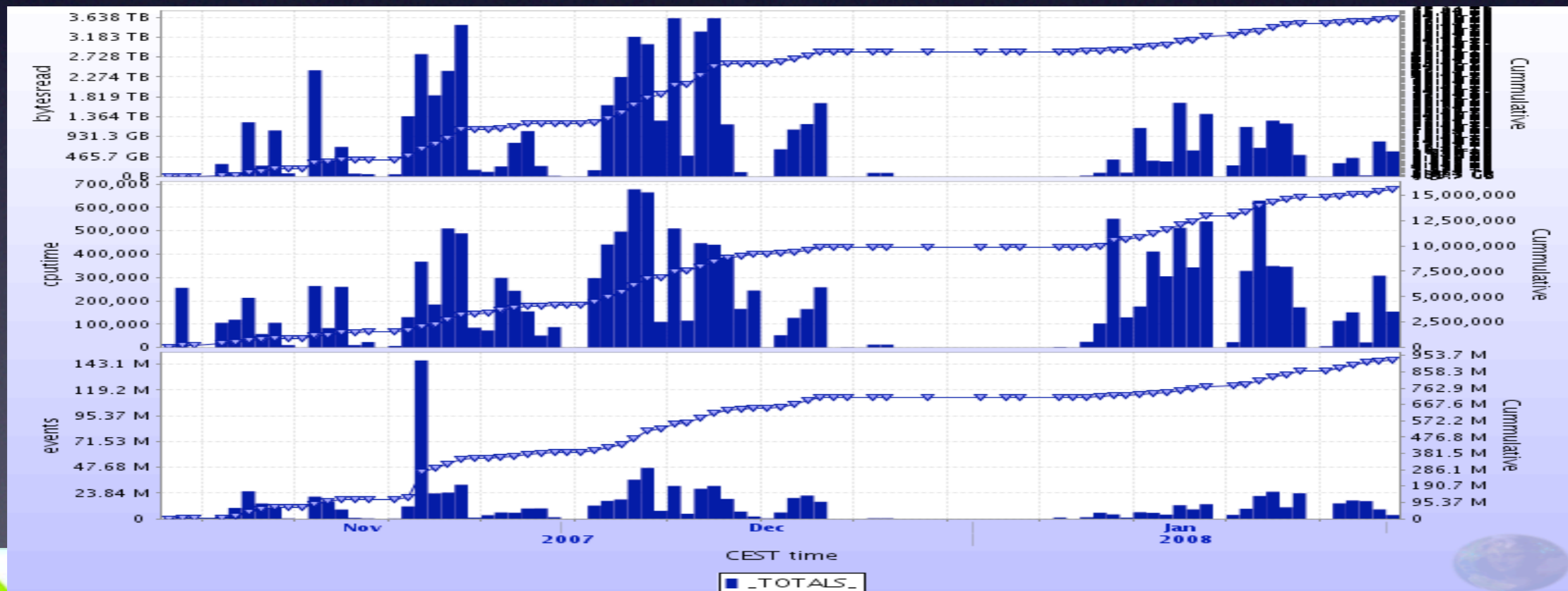
# End-users analysis

- Large data sample analysis on the Grid is a routine exercise (~ 130 regular users)
- Introduction of “analysis train” with tasks defined by the Physics Working Groups
  - ▶ Streamlined execution - faster results



# Analysis on PROOF-enabled clusters

- Parallel processing, multiple passes over the same data
  - ▶ RAW - calibration/alignment
  - ▶ ESDs from MC and RAW data production
- Time-critical data analysis, extremely high importance for fast detector calibration and “First LHC data”
- Two fully operational clusters - CERN (CAF) and GSI (GSIAF)



# ALICE events from first LHC beams

