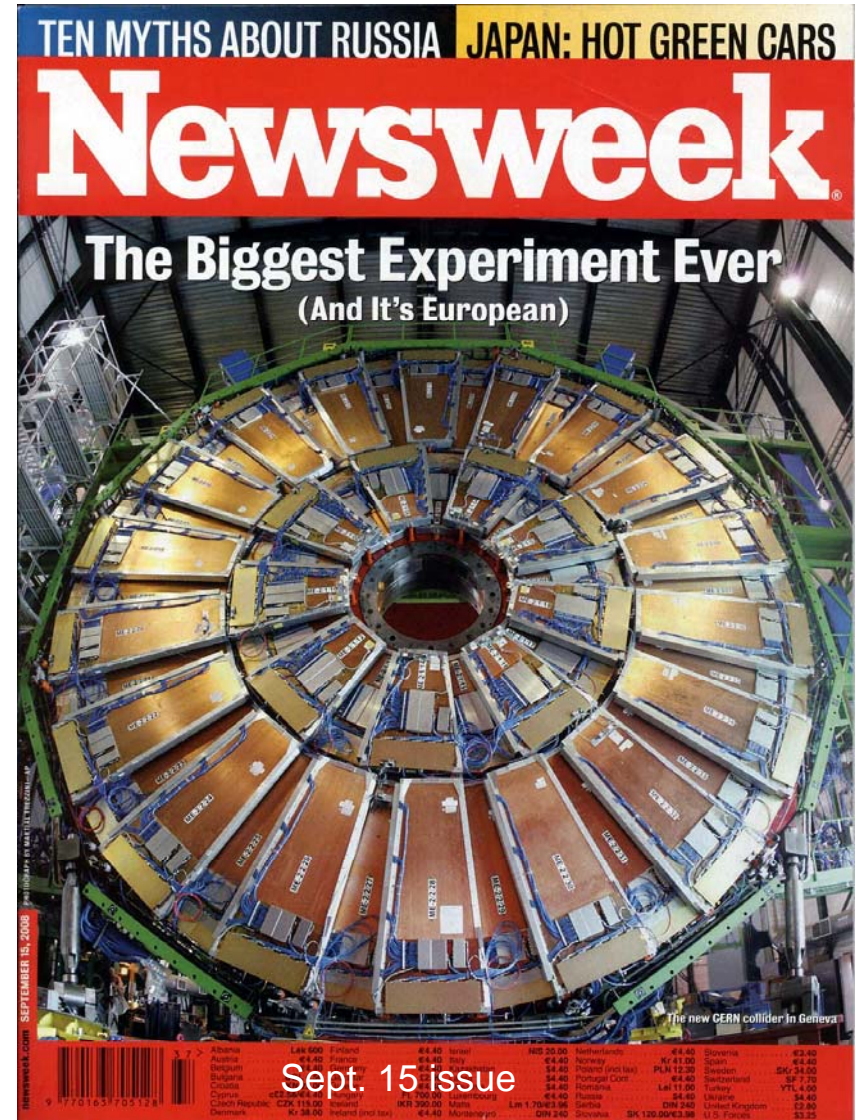




The CMS Experiment at LHC



Tejinder S. Virdee CERN/Imperial College

T. Virdee, GridFest



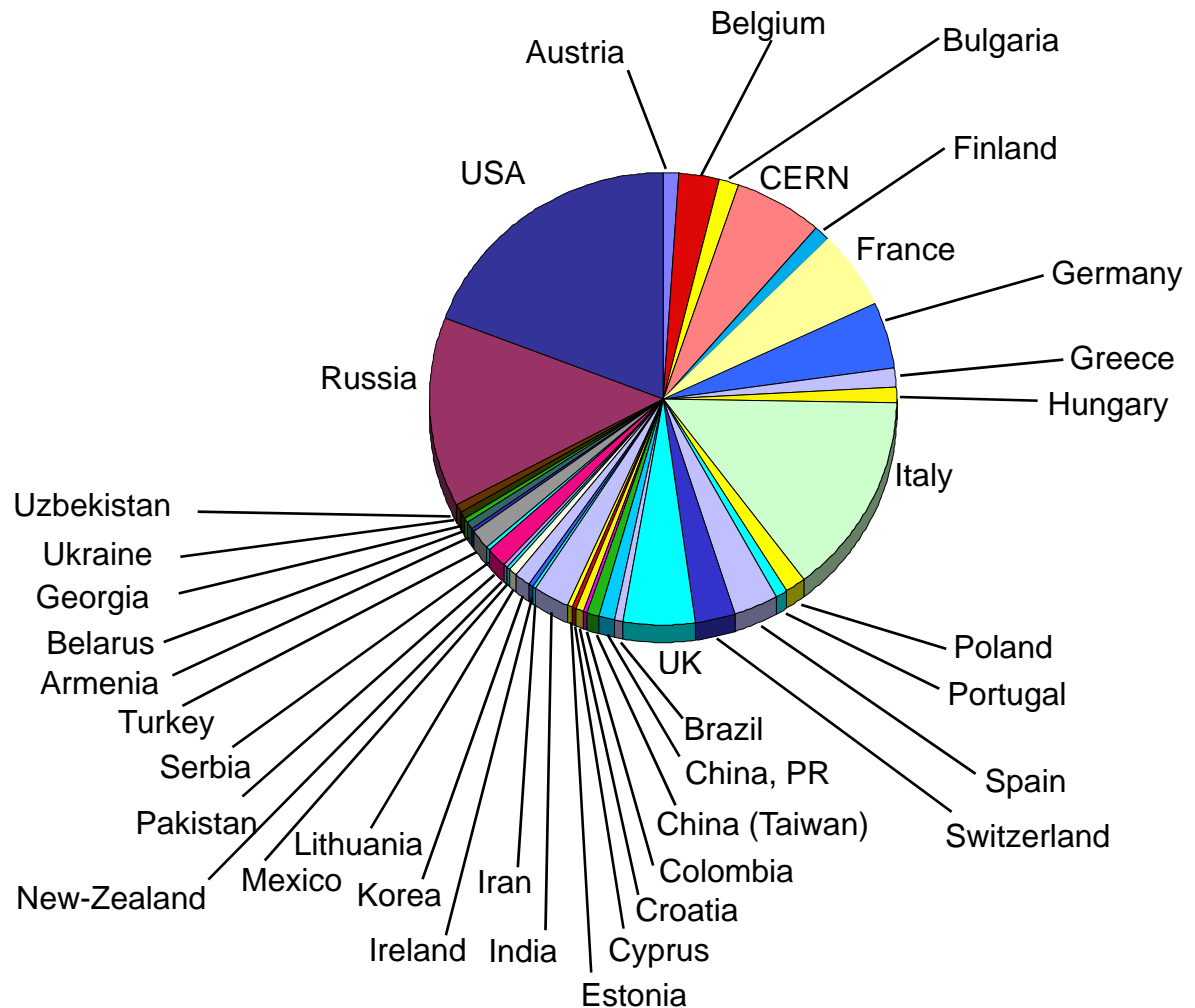
The CMS Collaboration



	Number of Laboratories
Member States	60
Non-Member States	67
USA	49
Total	176

	Nr of Scientific Authors
Member States	1091
Non-Member States	503
USA	723
Total	2317

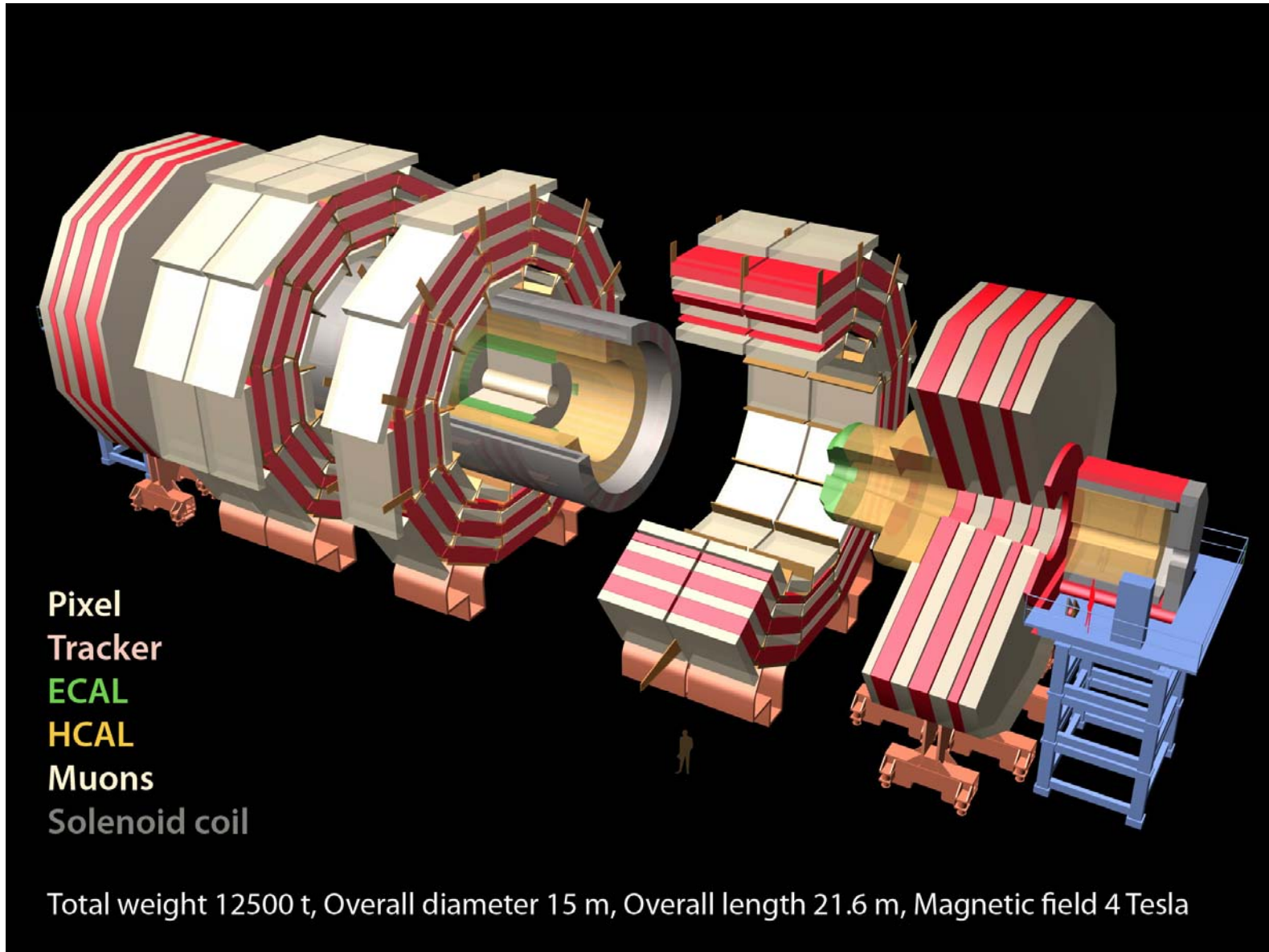
Associated Institutes	
Number of Scientists	62
Number of Laboratories	9



2317 Scientific Authors
38 Countries
176 Institutions

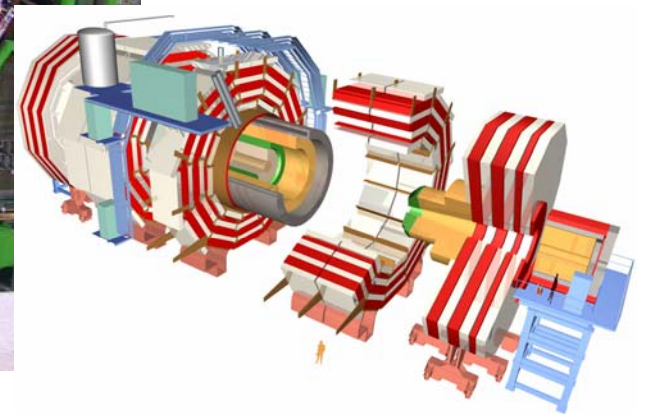
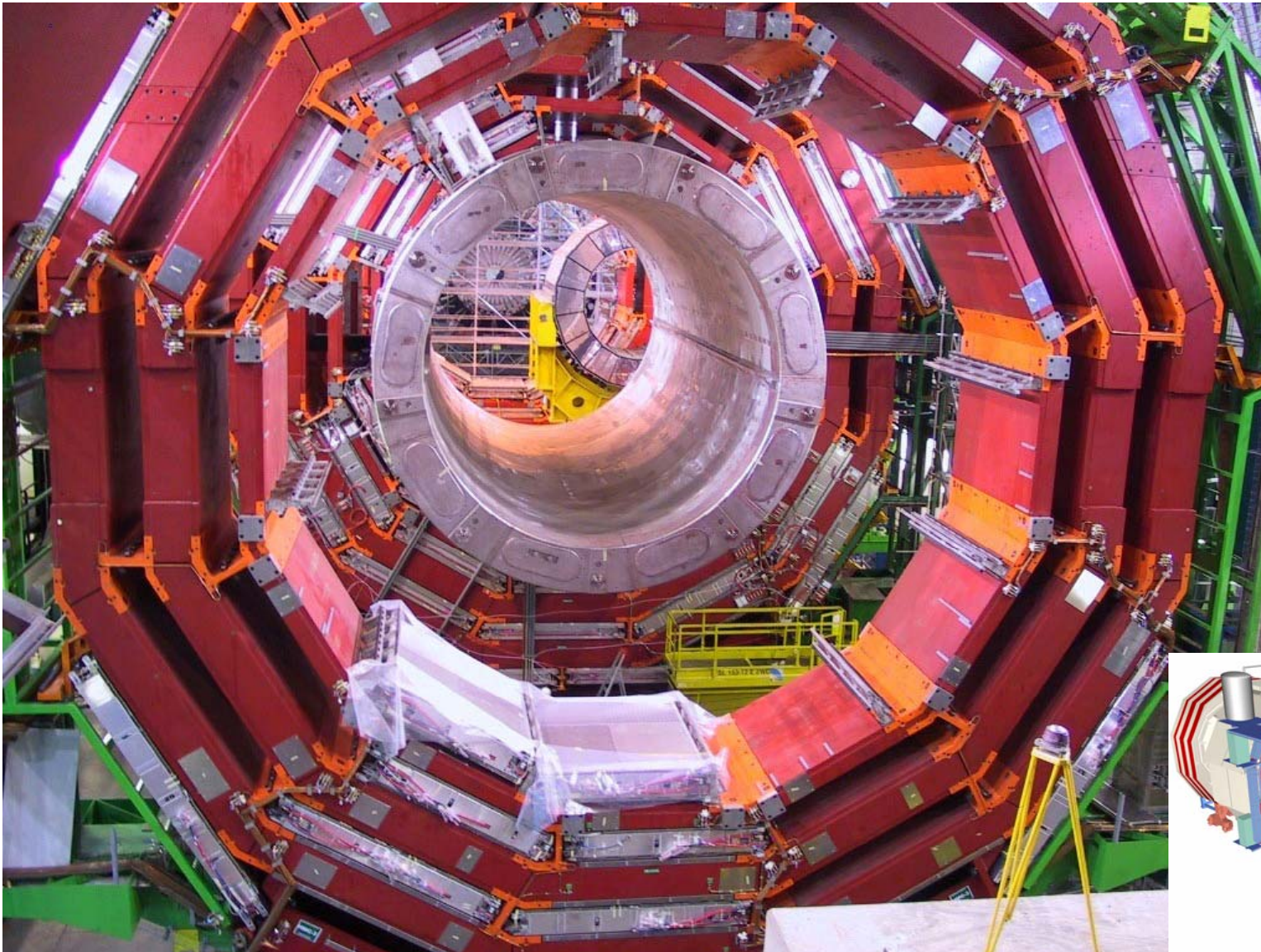


The CMS Detector





Surface Hall in 2006



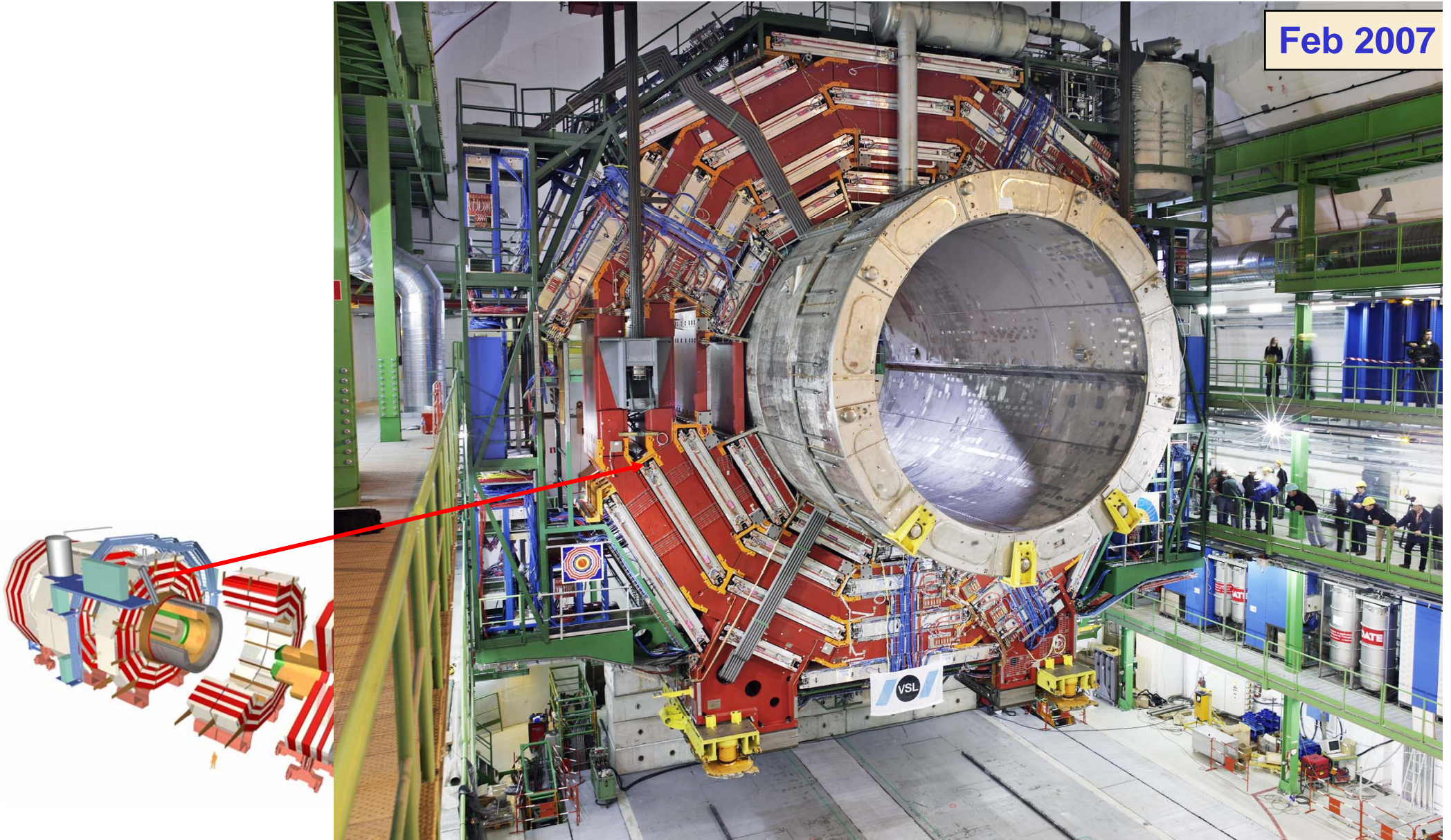
T. Virdee, GridFest



Lowering CMS (Nov06-Jan08)



Feb 2007





Prior to Closure





CMS Closed & Ready for First Beam

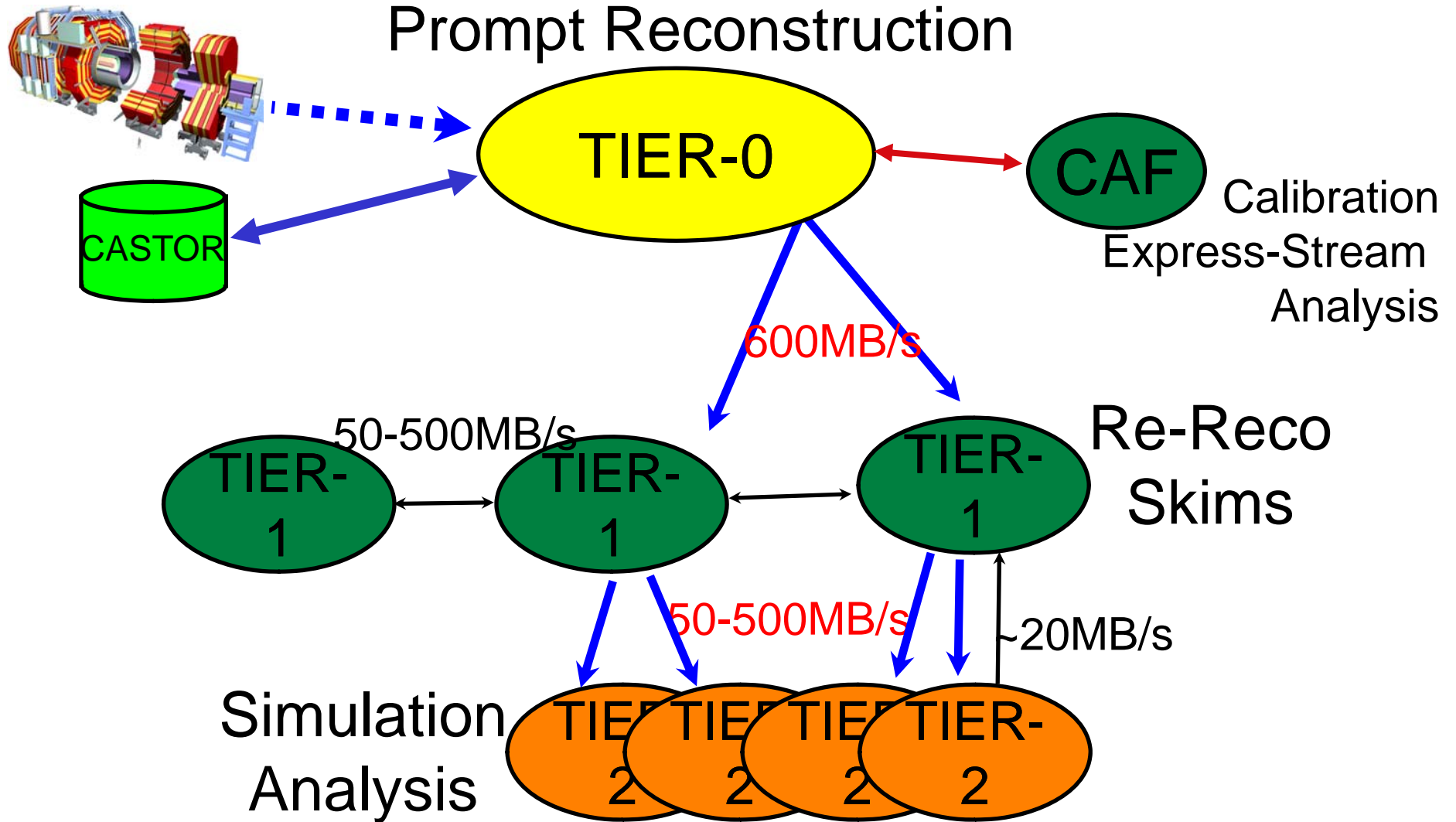


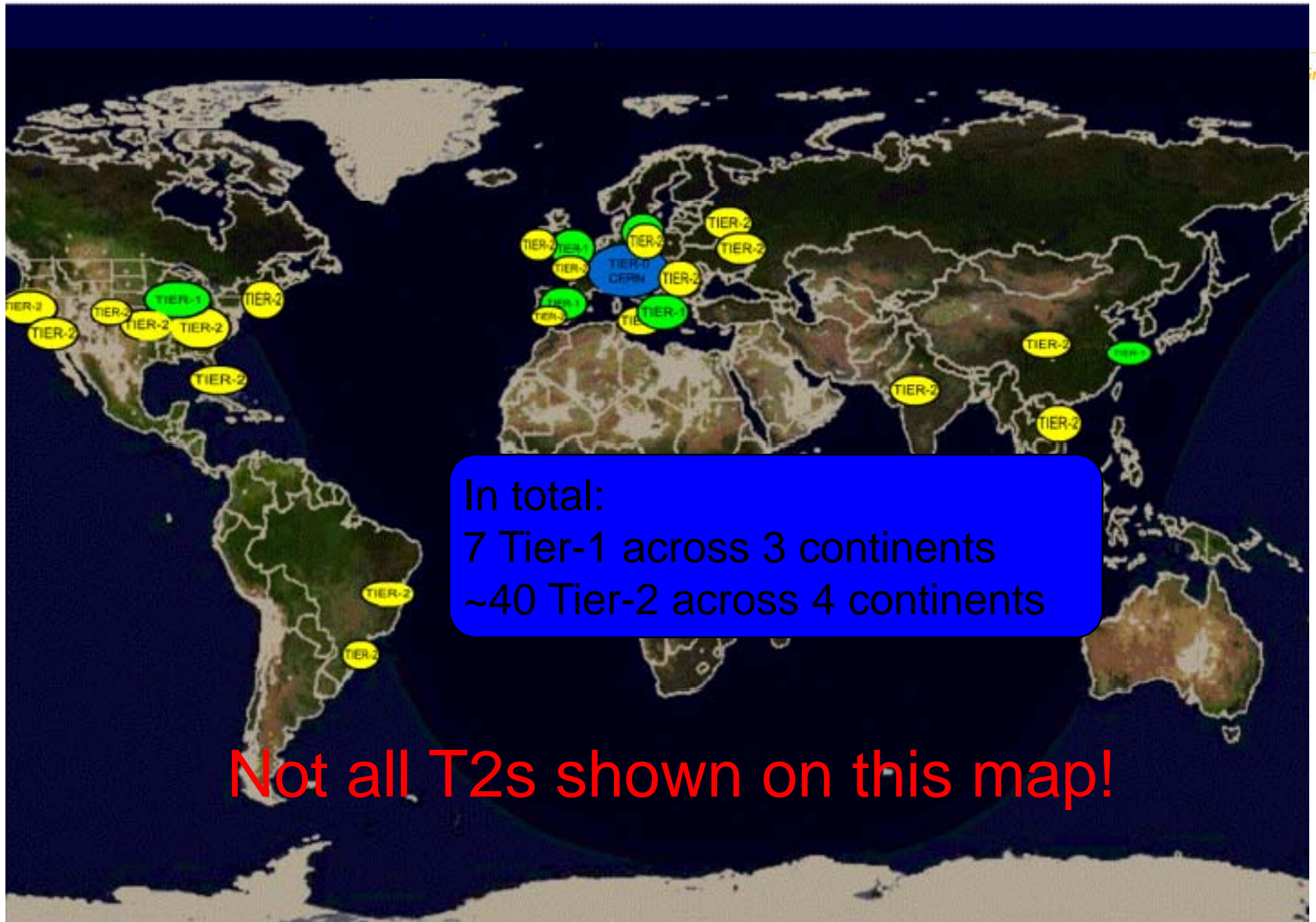
3 Sept 2008





CMS Exercising the Grid (May08)





In total:
7 Tier-1 across 3 continents
~40 Tier-2 across 4 continents

Not all T2s shown on this map!



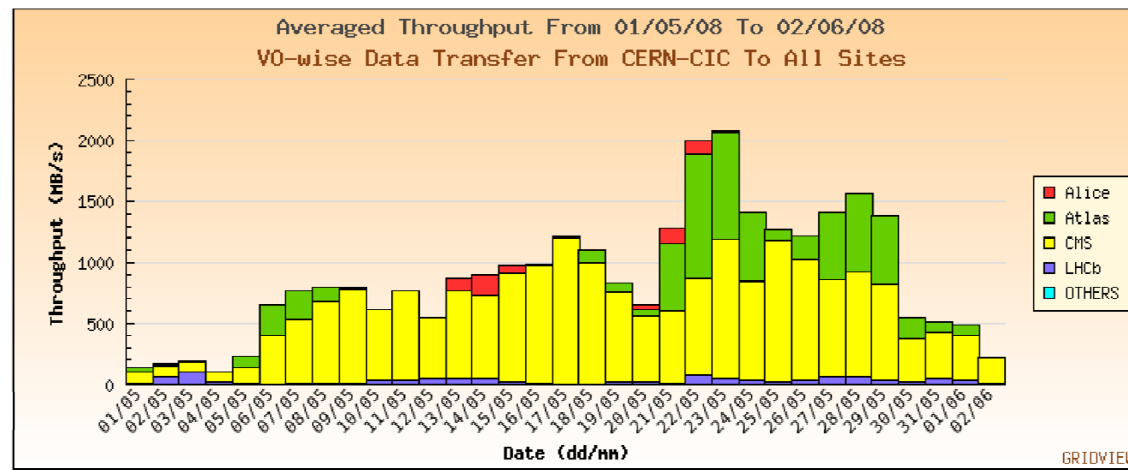
Computing Challenge in May 2008



Exercised first 3 months of data taking with 2 luminosity scenarios

Some observations:

- Stress tested the computing and analysis infrastructure with real and artificial load expected in 2008
- Demonstrated all key use case performances of T0, CAF, T1, T2 infrastructure
- Data export CERN-T1 > 600MB/s
- Re-reconstruction and skimming run at all T1 sites
- Demonstrated calibration & alignment workflows
- Physics analysis jobs successfully run at 60 sites





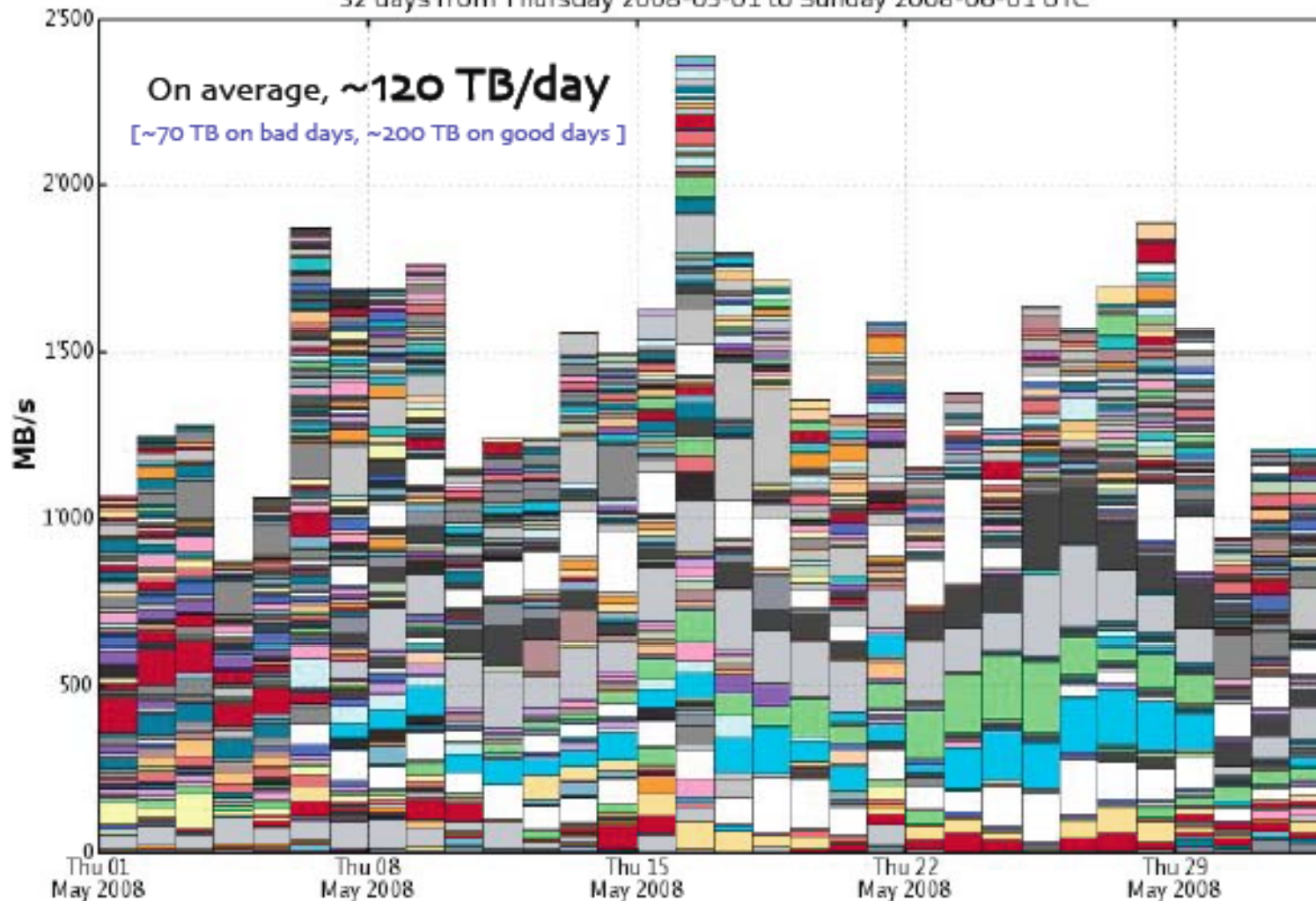
Tier *i* to Tier *j* Transfers



Daily CMS PhEDEx transfer rate, Debug + Production

By site links for non-tape storage only
32 days from Thursday 2008-05-01 to Sunday 2008-06-01 UTC

Impressive list of
few hundreds of links...

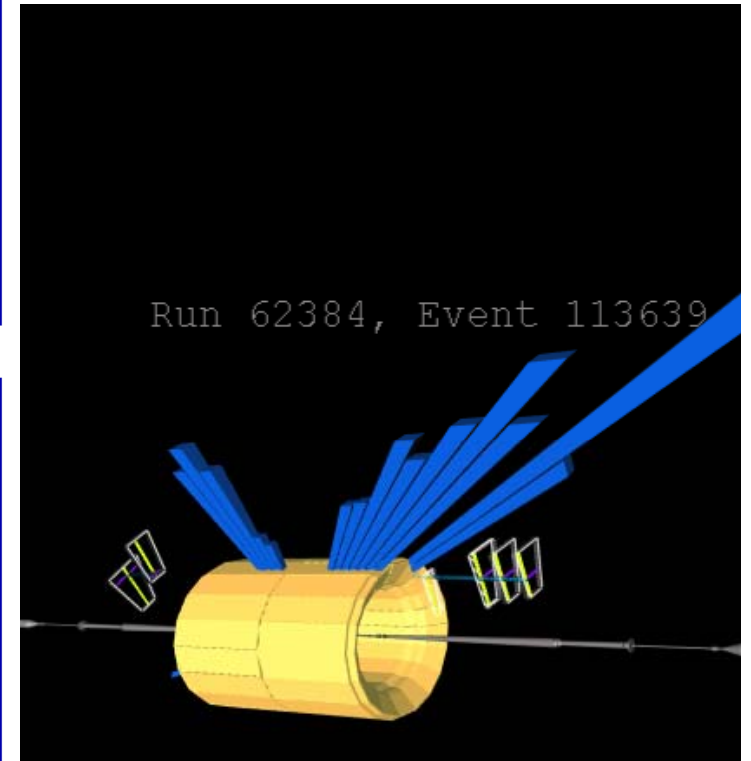
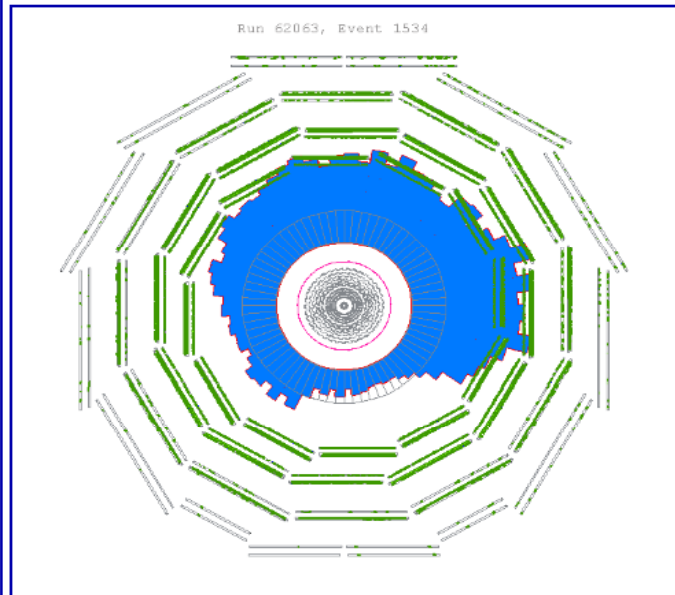
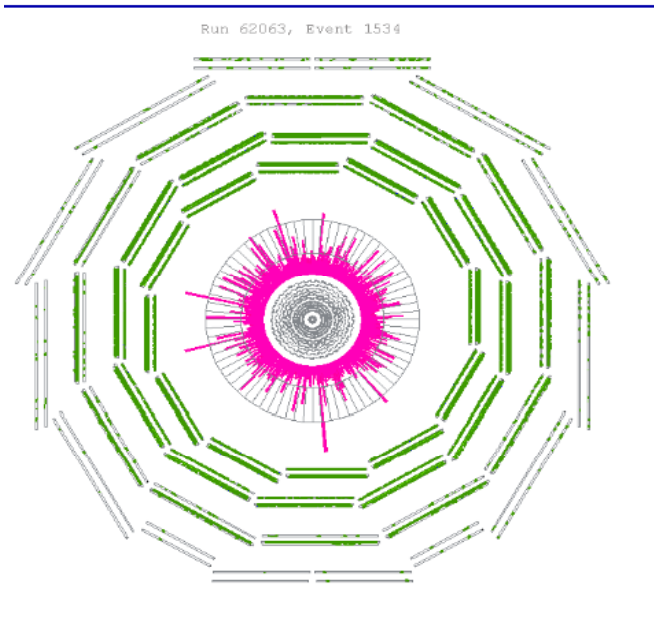
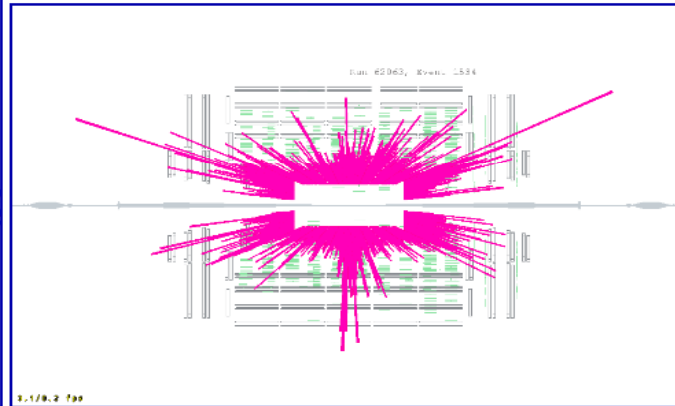
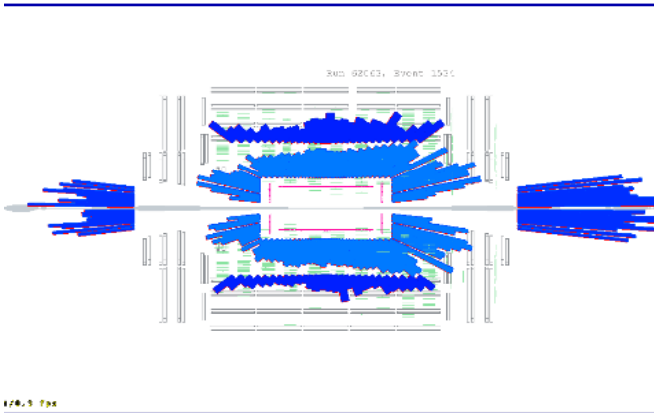




First Beam and Events



$\sim 2 \cdot 10^9$ protons on collimator ~ 150 m upstream of CMS
ECAL- pink; HB,HE - light blue; HO,HF - dark blue; Muon DT - green; Tracker Off





Distributed Operations Centres



CMS Remote Operations Centre at Fermilab

CMS Experiment Control Room



**High definition permanently-running video links
between operations centres**

CMS Centre at CERN: monitoring, computing operations, analysis

Remote operation centres at FNAL and DESY routinely participate in data monitoring



Summary



The talents, efforts and resources of thousands have been required to build a powerful CMS detector for LHC startup.

After almost 20 years of design and construction CMS started taking data with LHC beams.

All indications are that sub-detectors, online, software, computing and analysis systems are performing well.

CMS became a running experiment !