



CMS/LHC Status Report

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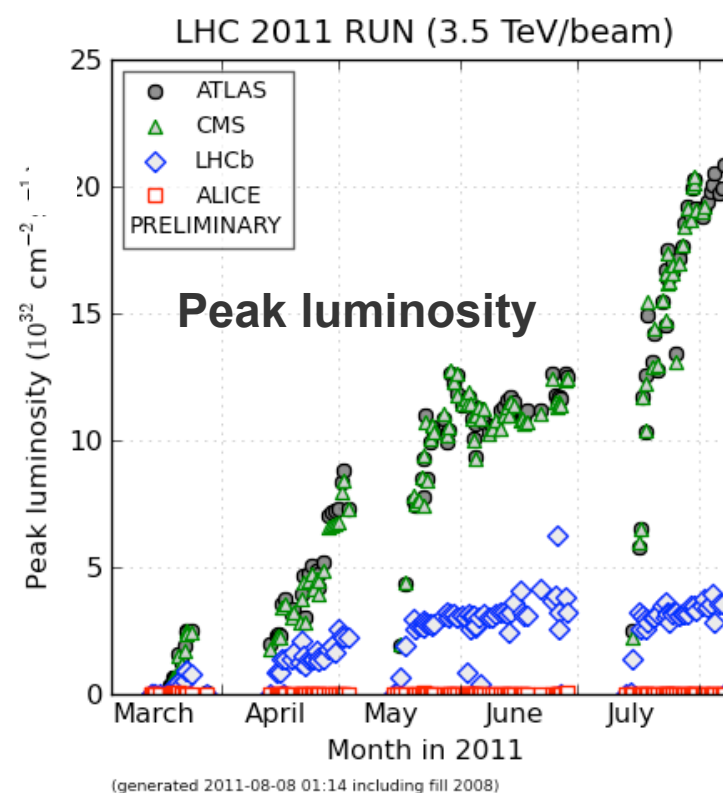
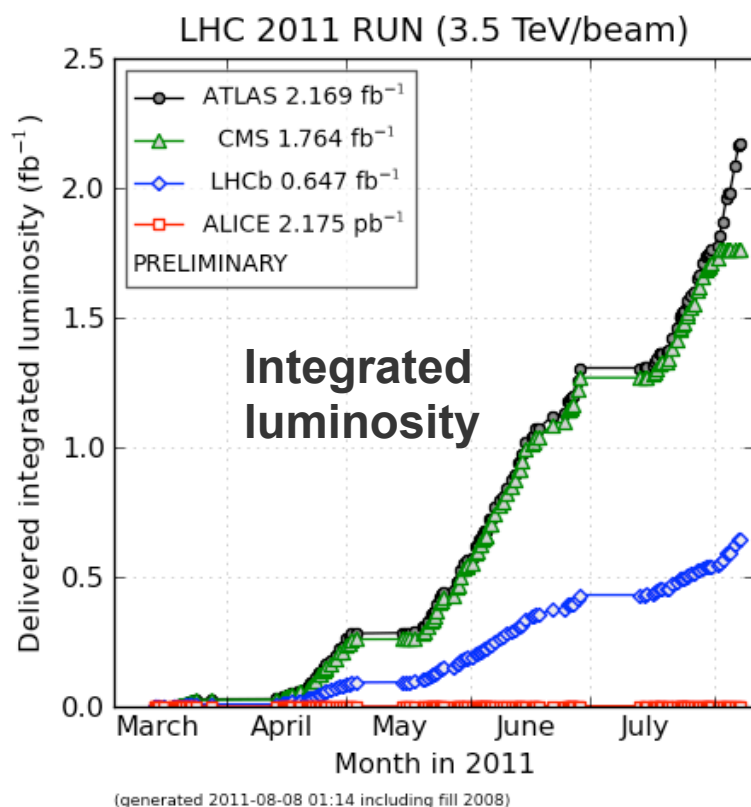
- ☑ LHC sets new world record luminosity: $2.09 \times 10^{33} \text{ cm}^{-2}\text{s}^{-1}$
- ☑ Marching gradually to collect 2 fb^{-1} integrated lumi
- ☑ Broke several new grounds after analyzing 1 fb^{-1} data

All Experimenters' Meeting, August 8, 2011

LHC/CMS performance so far in 2011



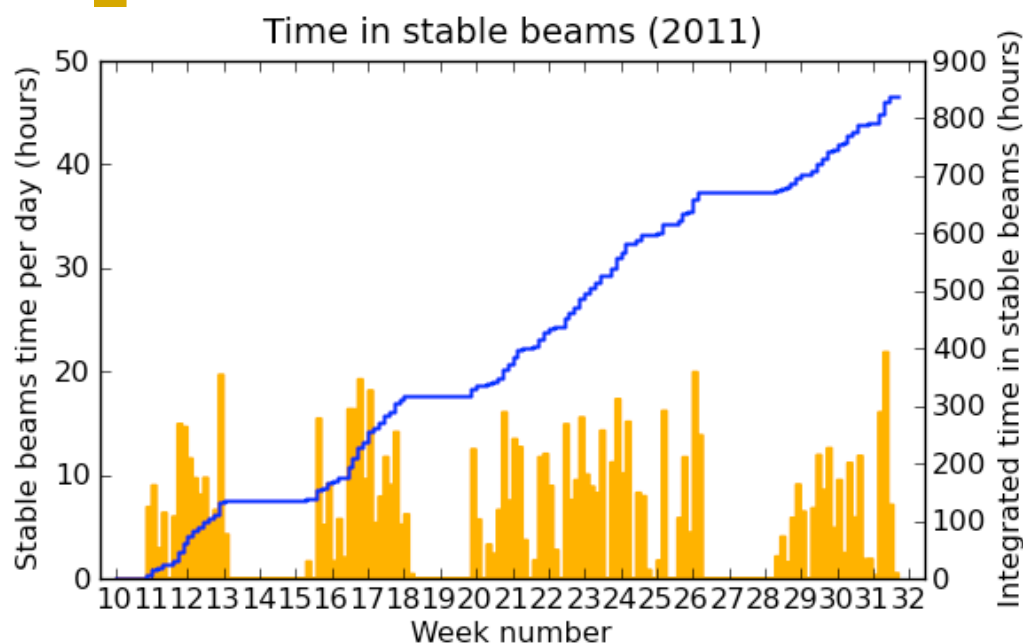
- LHC delivered luminosity: $\sim 2 \text{ fb}^{-1}$
 - CMS recorded 1.9 fb^{-1}
 - Overall data taking efficiency $\sim 91\%$



Peak luminosity $2.09 \times 10^{33} \text{ cm}^{-2} \text{ s}^{-1}$

Now Record

Slowly getting back to normal beam time



LHC was struggling after the technical stop

-Variety of issues

- Kickers misfiring
- Cryogenics
- Single Event Upsets (SEUs)
- About 30% intensity related issues

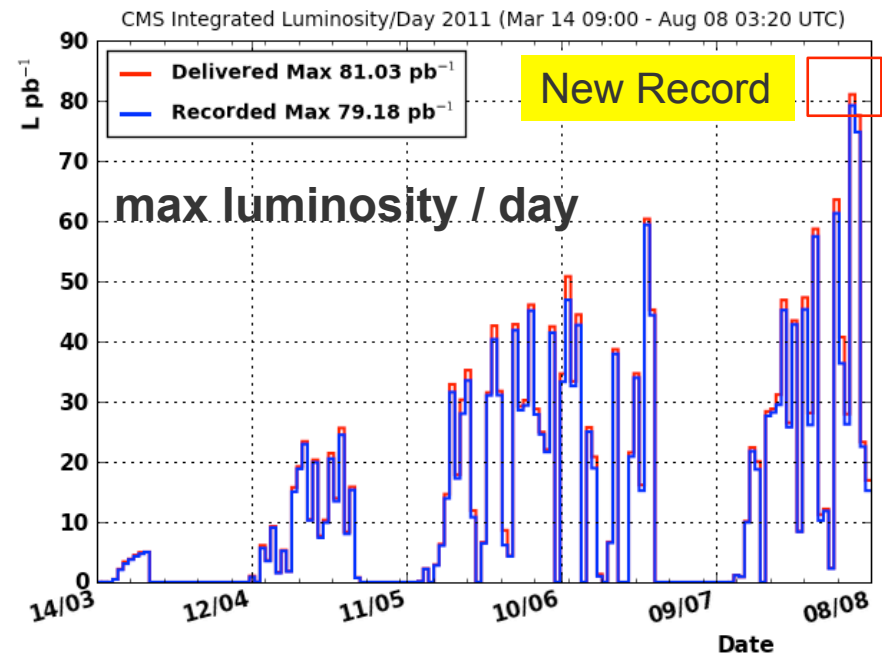
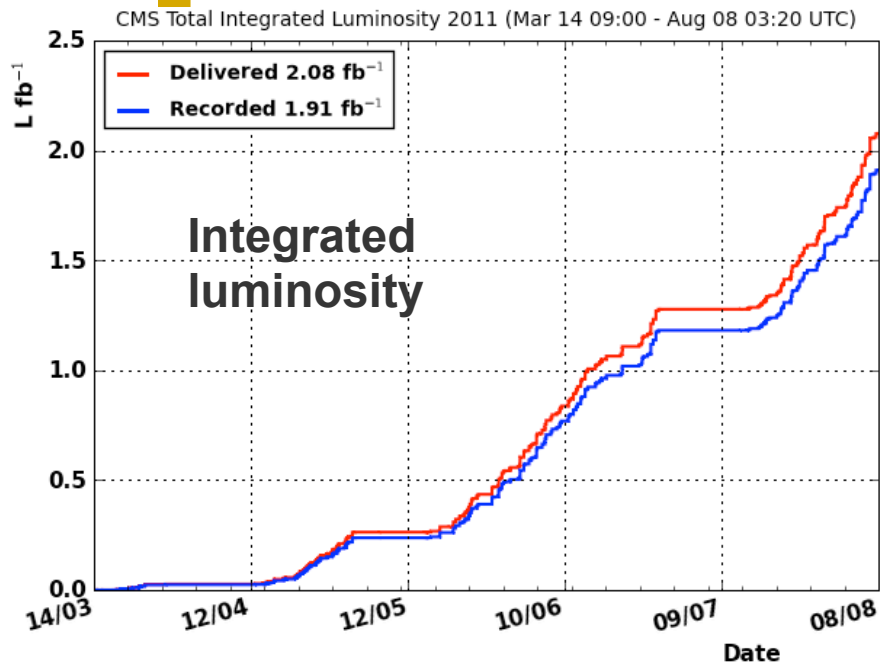
But found stable operating point
Was able to go $L = 2E33 / \text{cm}^2/\text{s}$

August 24th will have a run with $\langle \text{PU} \rangle \sim 50$

- Collide just one or two pairs of bunches
- Trigger and readout planning underway now

to stress test the system and prepare for 2012

CMS performance



- Instantaneous peak luminosity breaks a new record this week!
- $2.09 \text{E}33 \text{ cm}^{-2}\text{s}^{-1}$
- Monday (July 29)–Friday (August 5): 230 pb^{-1} , the week before: 206 pb^{-1}
- Some data fraction collected with incomplete detector

Breaking news: On Saturday night set new record for daily luminosity: 94.67 pb^{-1}

CMS operations



◆ Cooling problems 02-03 Aug:

-part1: 21:15-1:40; reason: emergency cooling pump stop; probably due to dew point

- sequence of events to be clarified (power phase glitch, chiller problem, human error...)

-part2: 1:55-5:40; reason: related to chilled water temp.(under investigation)

- chiller water temperature problem (might have been due to power phase glitch 01:55)

◆ Decision: save the Magnet cooling by turning OFF as many systems as necessary

-Part3: series of cooling failures on 3Aug 11:45 – 15:00

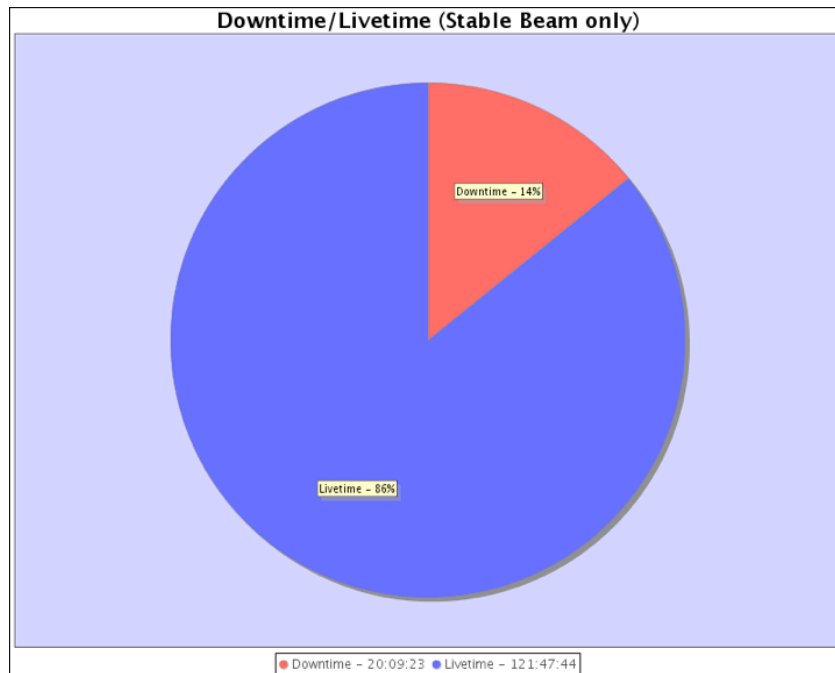
Some immediate improvements (lessons learnt): Minimize recovery time from power failure, prioritize which HV to switch off when needed due to cooling (e.g., give priority to magnet cooling), improve communication btw shifters & experts.

CMS: summary of last two weeks



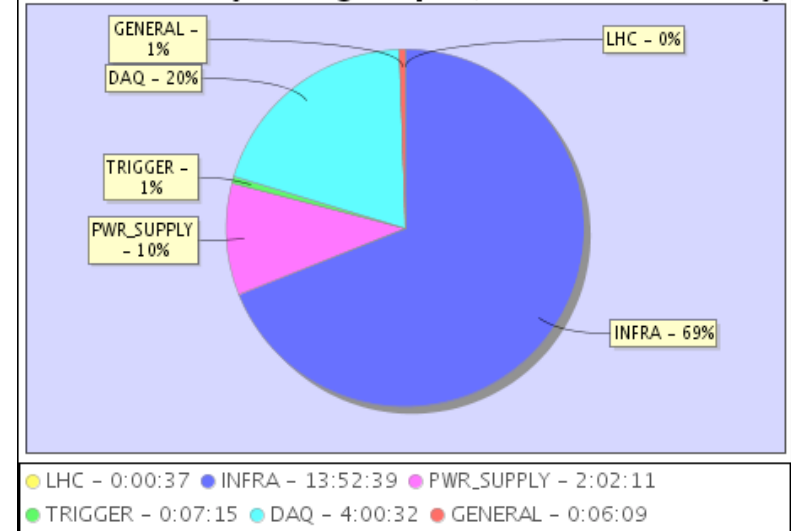
Provided by the USCMS effort

Cooling problem reduced efficiency

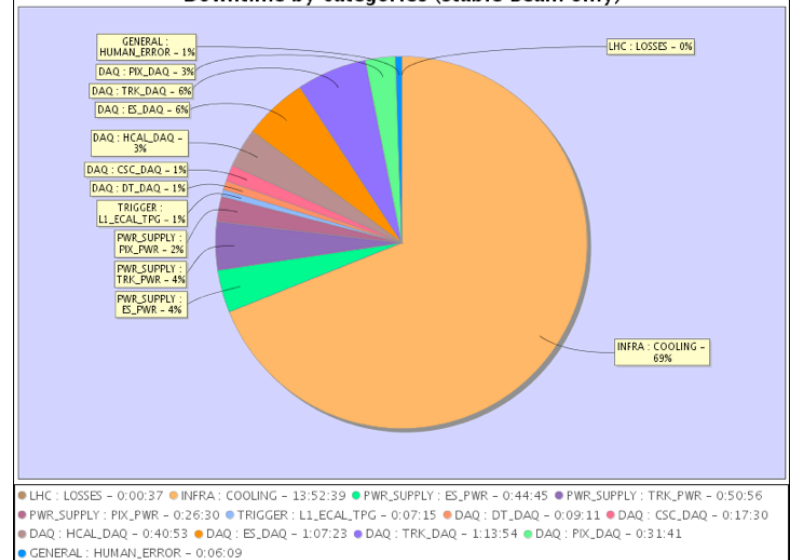


Average data collection efficiency has been > 91% throughout the year

Downtime by cat. groups (Stable Beam only)



Downtime by categories (Stable Beam only)

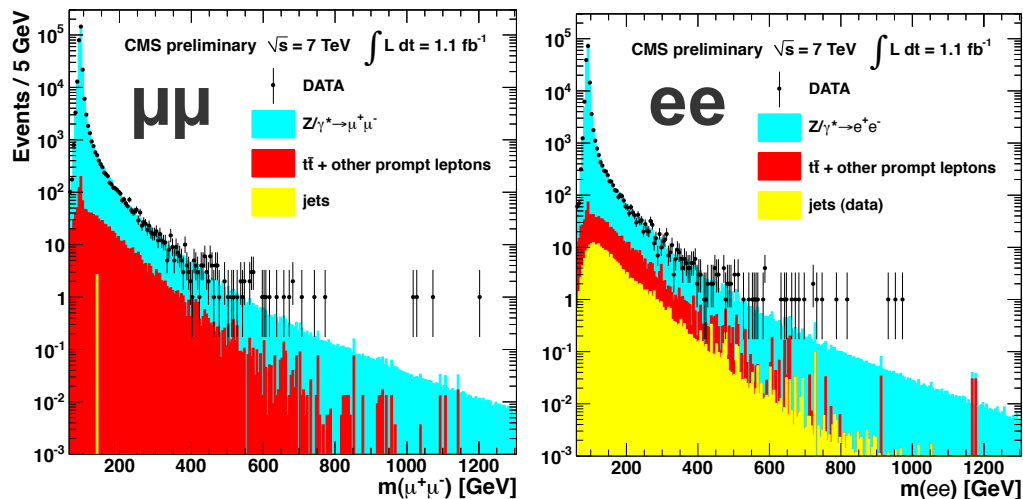


Physics: broke several new grounds with 1 fb^{-1}



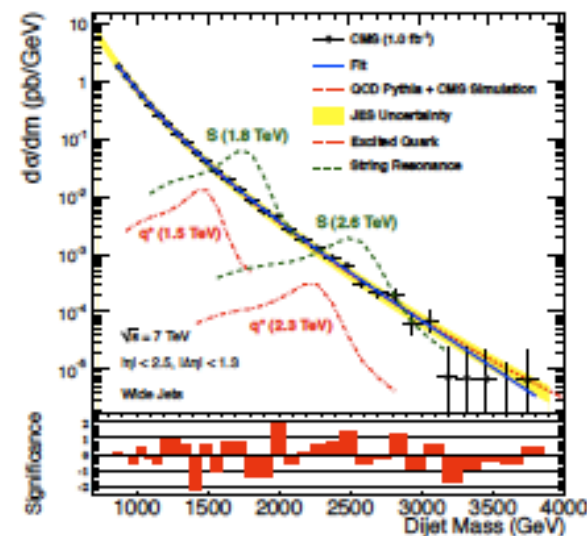
A few results of my choice

Di-lepton resonance search

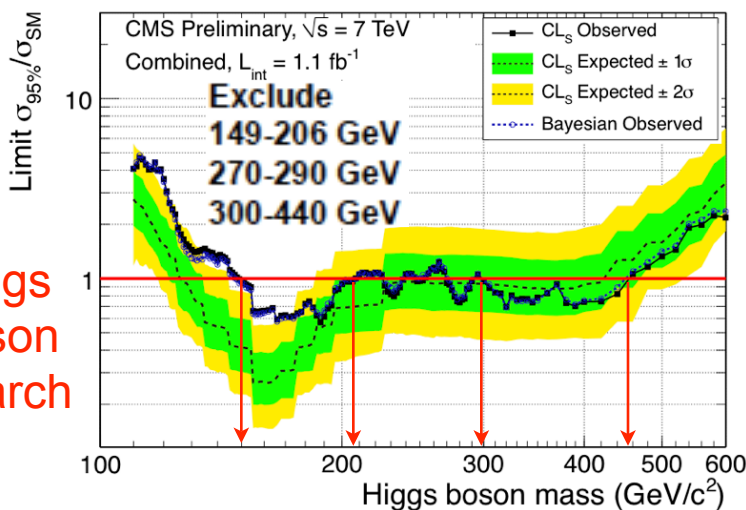


Exclude SM Z' up to 2 TeV, super-string inspired Z' up to 1.6 TeV, Randall-Sundrum KK graviton up to 1.8 TeV

Di-jet resonance search



Model	Excluded Mass (TeV)	
	Observed	Expected
String Resonances	4.00	3.90
E_g Diquarks	3.52	3.28
Excited Quarks	2.49	2.68
Axigluons/Colorons	2.47	2.66
W' Bosons	1.51	1.40



Higgs boson search

Milestone

CMS has just submitted 100th paper for publication in peer reviewed journals!

Exclude dijet resonances in a large class of models up to very high mass

BACKUP SLIDES