



CMS WGM 180

More info: EB summary

<https://indico.cern.ch/event/299534/>

Thanks to the Coordinators and PMs for the slides with the highlights



To be noted:

Approval of Detector Performance Plots:

- Plots discussed and approved by the corresponding DPG / POG
- Approval session in Run Coordination
- Plots appended to WGM agenda after the Run Coordination meeting for approval by the Collaboration
- Approved plots have to be posted to the corresponding twiki page including relevant explanations.



Technical Coordination

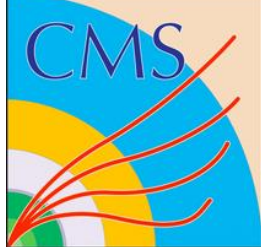
Work at PT5 proceeding very well - faster than anticipated:

- On the -z-end:
 - all ME1/1 chambers are installed ! Congratulation for the extreme effort !!
 - pushback system have been installed on YE3
 - YE4 wedge installation proceeding well, disk will be complete by mid of next week
- On the +z-end:
 - HO installations and work on the DT-mini-crates are finished.
 - remaining work: on the barrel RPCs (gas leak search and HV), re-installation of the thermal shields and the MABs on YE+1, some survey.
 - by the end of the week YB+1 should be closed and locked.

If completion of work proceeds with same speed

→ ~10 days ahead of schedule

→ use the gained time for unforeseen, but necessary fixes ☺



Tracker

- **Tracker Going WENT Cold**

- Strips commissioning ongoing at -15C

- Strips operation $T = -15C$ up to LS2
 - Less thermal stress (thermal cycles)
 - NO penalty due to radiation
- Started to recover some modules

- **Strips in AGR going down to $T = -15C$**

- **Fix for CAEN OPC (communication) identified**

- Strips HV ON on DCS blade systems now faster than 2012

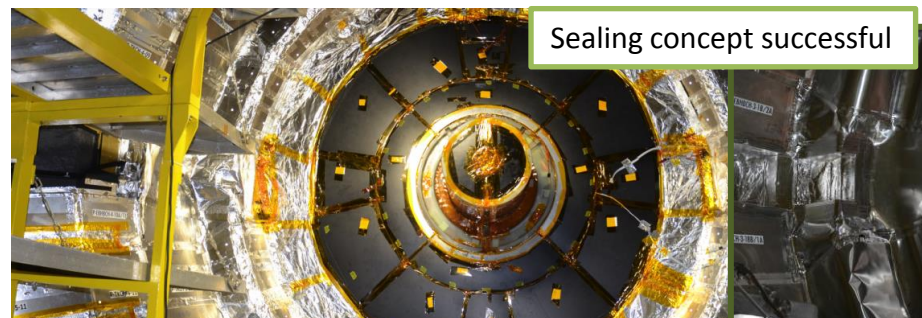
- **Pixels Phase I -- chips**

- Internal review of ROC & TBM done Friday 28.03.2014

- ROC PSIdigv2.1: excellent behavior (small issue under investigation)
- TBM prototype tested and irradiated. New version: improved radiation tolerance and all problems fixed → submitted

- New DC-DC chip FEAST2 proven robust against SEUs
→ ready to go for production

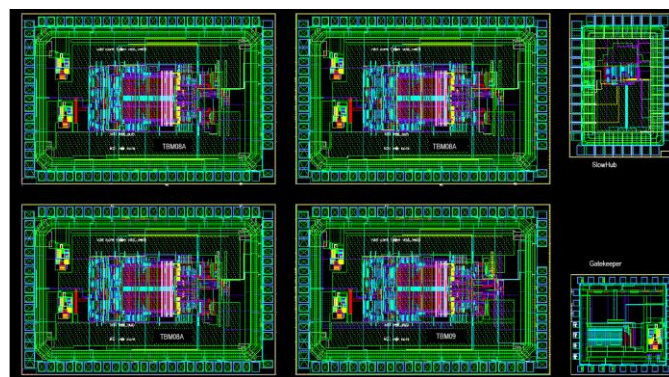
- An additional over-voltage protection has been implemented



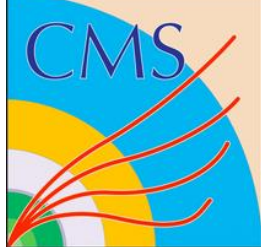
Sealing concept successful

Several hundred new RH and T sensors –inside and outside

- * Cooling bundle repair successful
 - + heater wires
 - + flushing
 - + T sensor



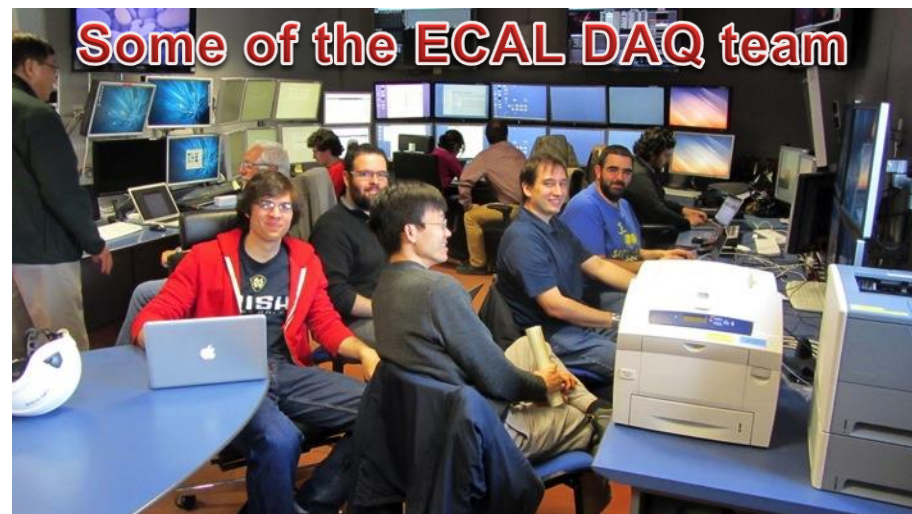
TBM reticle

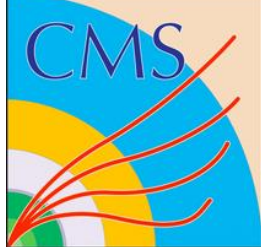


ECAL



- One ECAL Endcap (EE+) and both halves of the barrel (EB+, EB-) will be operated in the Global Run this week
 - Many tests of upgraded DAQ hardware (incl. oSLBs), firmware and software
- Second (redundant) solid-state 447nm blue laser (“DP2-447”) installed and commissioned at P5
 - Will be used during part of the Global Run for monitoring crystal transparency





HCAL

- **HO commissioning :**

- All SiPMs installed in entire HO
- Commissioning ongoing, sign-off before Easter break
- Full HO in the AGR → providing new coincidence muon trigger (~ 100 Hz)

- **HF commissioning & integration:**

- HV HF + connected to new CAEN power supplies
- Start taking full HFP+ data.
- HF+ calibration with Co-60 source: 22nd-29th April
 - Establish absolute energy scale of “new” HF
 - Relative calibration of individual HF towers
- integration test at FNAL to check for HF Front-End and Back-End prototypes :
new QIE10 chip, new CCM, uTCA crate with uHTRs





CSC highlights this week

- New ME4/2 muon station: completely commissioned!
- ME1/1 muon station refurbishment:
 - Positive endcap already commissioned
 - Negative endcap finished ahead of schedule !
- Operations:
 - Everything except ME1/1 is included in the AGR, only small problems being ironed out
 - HV trips last week just at the time of switching the gas purifier column are being investigated. May be a “feature” that has been masked in the past by higher trip thresholds.



UPGRADES – Upcoming Event

Second ECFA HL-LHC Experiments Workshop

Will be held in Aix-les-Bains Oct. 21-23

Draft Program includes:

- more focus on theory & physics performance
- address progress of R&D identified at the first workshop

Proposal to form **new Preparatory Groups** across the experiments to organize the sessions (see previous preparatory groups in the backup slide)



Opening	
Accelerator Update	Current status and plans; injectors and LHC upgrades (invited talks)
Experiment Requirements	Upgrade design and motivation for R&D topics (invited talks)
PG1: Physics session	Physics goals and performance reach theory talks
R&D sessions	
PG2: Solid state tracking devices	Tracker+HGCAL
PG3: Scintillating devices	Calorimeter(CMS)+Tracking (LHCb)
Liquid noble gas	Invited talk (ATLAS)
Large area fast timing detectors	Invited talk
PG4: Gaseous detector systems	Muons+TPC+Calorimeters
PG5: Electronics systems ASIC - HDI - HBW links - Powering Scheme - Power Supply - Modular electronics & xTCA	All systems
PG6: Mechanics and Cooling	All systems
PG7: Trigger, Online and Offline Computing	All systems
PG8: Accelerator and experiment interface, activation and mitigation	accelerator experiment interface and activation
Conclusion (1/2 presentations)	



Run Coordination

- Experiments Input to LHC Beam Operations Workshop
 - taking place in 2-6 June in Evian
 - discussion in the LHC Physics Coordination Meeting on 14th of April
 - statements on bunch spacing, pileup limitations, leveling, beam energy, bunch length, non-colliding bunches, special runs (van der Meer scans, low lumi runs, ...)
 - XC meeting on Friday 11 April for defining the CMS input
- The April Global Run (AGR) started Monday 7 April:
 - The first order of business for all subsystems was to recover from the power/cooling cut which occurred Sunday evening...
 - ALL sub-systems take part (no pixels – is on surface)
 - Presently:
 - tune the system for smooth data taking: iron out the hiccups from the various sub-systems
 - new HO muon trigger: cross checking fiber mapping with DT signals
 - Tracker going down to -15C again for first data taking at this temperature
 - To be done:
 - Commission the legacy Calo trigger with the new ECAL connection to RCT via optical links (oSLB to oRM)



Offline Coordination news

- Status of CMSSW Releases
 - Development release: CMSSW_7_1_0
 - Open for new developments until 28 April.
 - Currently complete the **pre6** release which will include the final geometry for 2015. Changes include improved (or new) models of:
 - Cavern
 - Beam pipe, tracker material, pilot blades for forward pixel
 - PLT, BHM, BCM1F
 - CASTOR
 - Release for validation of new Geant4 version (4.10):
CMSSW_7_1_0_pre4_GEANT4
 - Production release: CMSSW_7_0_0 cycle for CSA DIGI-RECO, global run
 - **CMSSW_7_0_3_patch2** is current release (primarily for AGR)
 - Latest SLHC release: **CMSSW_6_2_0_SLHC10**
 - To be used for first round of GEN-SIM samples for TP once validated
 - First release with good tracking performance out to $\eta=3.8$ at high pileup



Computing

Heavy-Ion re-reco running

- ◆ Computing efforts in clone workflows to maximize chances to finish in time for Quark Matter
 - many thanks to CompOps, the Dynamic Resource provisioning team
 - very good support from CERN-IT
- ◆ most promising solution is the one running on HLT + CERN AI resources, now ~30% complete

DBS-2 switch-off test was on April 7th

- ◆ Intention is to keep it off and use DBS-3 from now on
- ◆ In preparation, CRAB_2_10_5 was released last week. It uses DBS3 by default.
- ◆ This works out of the box for CMSSW $\geq 4_4_x$: for the few users who cannot update their CMSSW version, a workaround is documented here
 - <https://twiki.cern.ch/twiki/bin/view/CMS/DBS2toDBS3instructionsForCRABUsers>

Migration to **CVMFS** at CERN will take place on April 14th (CERN Virtual Maschine File System)

- ◆ the CMS environment at CERN, lxplus and lxbatch machines, will be changed to read the CMS software from CVMFS instead from AFS. The change is expected to be transparent.
- ◆ Until further notice, all CMSSW installations in AFS remain as they are and will also be updated

Progress on **CRAB-3** tests

- ◆ Developers and Integration teams managed to reach the full scale
 - >20k running jobs and ~200k jobs in a day) as from the planning
- ◆ Next step: engage power users from Physics. Crucial to involve them in the CRAB3 testing, early enough before CSA14.



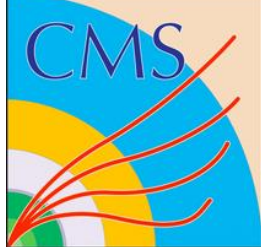
PC News

Approvals in the last two weeks

EXO-13-008: search for heavy right-handed neutrinos. A final state with a pair of jets coming from the WR accompanied by two leptons is looked for in both electrons and muons channels. Limits in the neutrino-WR mass plane are set as well as for σ_{BR} . Right-handed W up to 3 TeV are excluded at 95% CL. A 2.5σ excess around 2.1 TeV in the electron channel is observed.

HIG-13-032: search for heavy resonances decaying to two higgses. Final states with a pair of b-quarks and a pair of photons are selected. Extradimension models predict the existence of such resonances with cross sections reachable at the LHC. Incidentally, this is also the **most sensitive signature to Higgs self-coupling**. Using the Radion interpretation model, masses up to 0.97 TeV are excluded at 95% CL for a Radion scale $\Lambda_R = 1$ TeV.

HIG-13-001: the legacy $H \rightarrow \gamma\gamma$ was fully approved two weeks ago and the ARC just gave green light for CWR on the latest version of the documentation.



PC News

CSA14 preparation

Physics coordination meeting on April 7th was fully dedicated to the discussion on the physics exercise for CSA14.

The baseline exercises as outlined during the Physics Week have been discussed:

- common bkg: studies needed to assess the quality of our major bkg simulations, Most active groups: GEN, SMP, FSQ and TOP
- high pt leptons and special reco configuration (especially for $d\epsilon/dx$ studies): this mostly pertains the EXO group. The samples to be studied are high mass Z', W' and special long-lived, fractional charge new physics scenario
- low pt tracking, conversions (BPH, SMP)
- lepton + jet covering lepton isolation, fakes and efficiency + btag performance (TOP, HIG, SUS, SMP)
- new PU mitigation technique in jets (Puppi, PU jet id, MVA MET): most of the groups interested
- boosted topologies: B2G
- photon performance: HIG, SUS
- di-lepton studies: TOP
- miniAOD testing

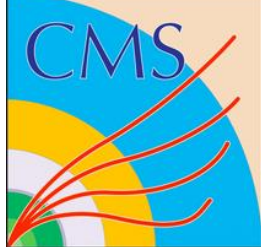
Commitments from various groups are starting to materialize. More details in:

<https://indico.cern.ch/event/293682/>



Publications Status

- **Published**
 - **EXO-11-006**, **ERRATUM JHEP**, Search for anomalous t-tbar production in the highly-boosted all-hadronic final state, *J. High Energy Phys.*03 (2014) 132
 - **TOP-11-017**, **EPJC**, Measurement of the top-quark mass in all-jets t-tbar events in pp collisions at $\sqrt{s}=7$ TeV, *Eur. Phys. J. C* 74 (2014) 2758
- **Submitted**
 - **TOP-12-038**, **JHEP**, Measurement of the t-channel single top-quark production cross sections and the CKM matrix element V_{tb} in pp collisions at $\sqrt{s} = 8$ TeV, 28/03/2014
 - **HIG-13-030**, **EPJC**, Search for Invisible decays of a Higgs boson in the VBF and ZH channels at $\sqrt{s} = 7$ and 8 TeV, 05/04/2014
- **CWR**
 - **BPH-11-021**, **JHEP**, Measurement of Prompt Double J/psi Production in pp Collisions at $\sqrt{s} = 7$ TeV, end=08/04/2014
 - **EXO-13-003**, **PRL**, Search for excited quarks in the gamma+jet final state in proton-proton collisions at $\sqrt{s} = 8$ TeV, end=11/04/2014
 - **EXO-12-025**, **PLB**, Search for new resonances decaying to WZ using the trilepton channel in pp collisions at $\sqrt{s} = 8$ TeV, end=14/04/2014



Speaker's corner

Talks without nominations – your help is needed!

DIS 2014, XXII Internat. WS on Deep-Inelastic Scatt. and Rel. Subj., April 28 – May 2, Warsaw:

Parallel talks: “Measurements of the top-quark properties ... at CMS”,

“Measurements of photon and diphoton production processes at ATLAS and CMS”

Pheno 2014, 2014 Phenomenology Symposium, May 5-7, Pittsburgh:

Organizers would accommodate a handful more last-minute CMS contributions!

LHCP 2014, Large Hadron Collider Physics Conference, June 2-7, New York City:

Parallel talk: “Searches for New Physics in Multijet Final States”

Also seeking ~ 30 (possibly more) posters – so far 1 (!!!) has been suggested!

Dark 2014, Dark Interactions, Perspectives from Theory and Experiment, June 11-13, BNL:

Plenary talk: “Search for Hidden Valleys at CMS”

Protvino XXX, XXXth International Workshop on High Energy Physics, June 23-27, Protvino:

Plenary talks: “Phenomena in heavy ion collisions”,

“Standard Model physics results from ATLAS and CMS”, “Top-quark physics”

Vietnam 2014, Rencontres du Vietnam – Flavour Physics, Jul 27 – Aug 2, Quy Nhon:

Plenary talks: “Production and decays of heavy flavours at CMS”,

“CMS upgrade plans and prospects in flavour physics”

Quy-Nhon 2014, Rencontres du Vietnam – Physics at LHC and beyond, Aug 10-17, Quy Nhon:

Plenary talk: “The strong coupling constant and PDFs”



More Information

First ECFA HL-LHC experiments workshop preparatory groups:

- **PG1:** Physics goals and performance reach
 - CERN Theory: **G.Salam, A. Weiller**
 - ALICE: Peter Braun Munzinger, Andrea Dainese
 - ATLAS: **Leandro Nisati**, Pippa Wells, Bill Murray
 - CMS: **Chris Hill**, Markus Klute, Isabell Melzer-Pellmann
 - LHCb: Tim Gershon, Guy Wilkinson
- **PG2:** Tracking devices and associated electronics and readout
 - ALICE: Vito Manzari, Werner Riegler
 - ATLAS: **Ingrid Gregor**, Didier Ferrere, Craig Buttar
 - CMS: **Duccio Abbaneo**, Francois Vasey, Stefano Mersi
 - LHCb: Massimiliano Ferro-Luzzi
- **PG3:** Calorimetry and associated electronics and readout
 - ALICE: David Silvermyr
 - ATLAS: **Francesco Lanni**, Alberto Valero
 - CMS: **Marcello Mannelli**, Dave Barney, Pawel. De Barbaro
 - LHCb: Frederic Machefert
- **PG4:** Muon Systems and associated electronics and readout
 - ALICE: Pascal Dupieux
 - ATLAS: **Christoph Amelung**, Oliver Kortner, Stefano Veneziano
 - CMS: **Marcello Abbrescia**, Kerstin Hoepfner, Alexei Safonov
 - LHCb: Alessandro Cardini
- **PG5:** Trigger/DAQ/Offline/Computing
 - ALICE: Pierre Vande Vyvre, Thorsten Kollegger, Predrag Buncic
 - ATLAS: **David Rousseau**, Benedetto Gorini, Nikos Konstantinidis
 - CMS: **Wesley Smith**, Christoph Schwick, Ian Fisk, Peter Elmer
 - LHCb: Renaud Legac, Niko Neufeld
- **PG6:** Electronics and read-out systems
 - ALICE: Alex Kluge
 - ATLAS: **Philippe Farthouat**, Maurice Garcia-Sciveres, Tony Weidberg
 - CMS: **Magnus Hansen**, Jorgen Christiansen
 - LHCb: Ken Wyllie
- **PG7:** Long Shutdown constraints and radiation and activation effects
 - ALICE: Werner Riegler
 - ATLAS: **Olga Beltramello**, Beniamino Di Girolamo
 - CMS: **Wolfram Zeuner**, Christoph Schaefer
 - LHCb: Rolf Lindner
- **PG8:** Accelerator and Experiment interface
 - CERN Accelerator: L. Rossi, O. Bruning
 - ALICE: Hannes Wessels
 - ATLAS: **Christoph Rembser**, Beniamino Di Girolamo, Antonio Sbrizzi
 - CMS: **Maria Chamizo Llatas**, Wolfram Zeuner
 - LHCb: Burkhard Schmidt