

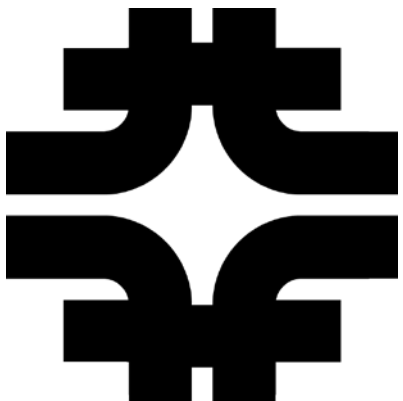
CMS and LHC Report

All Experimenters' Meeting

Kevin Pedro

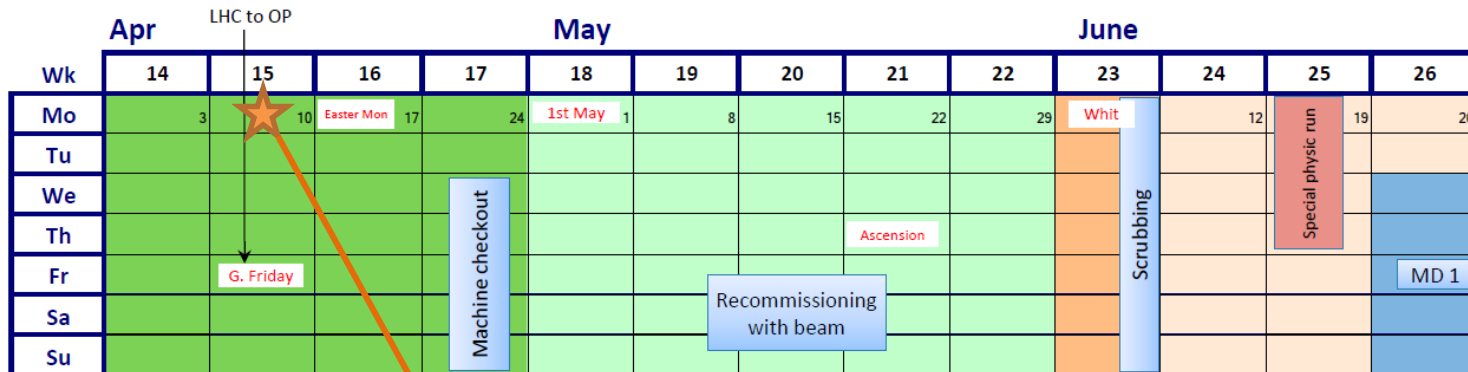
(FNAL)

April 10, 2017

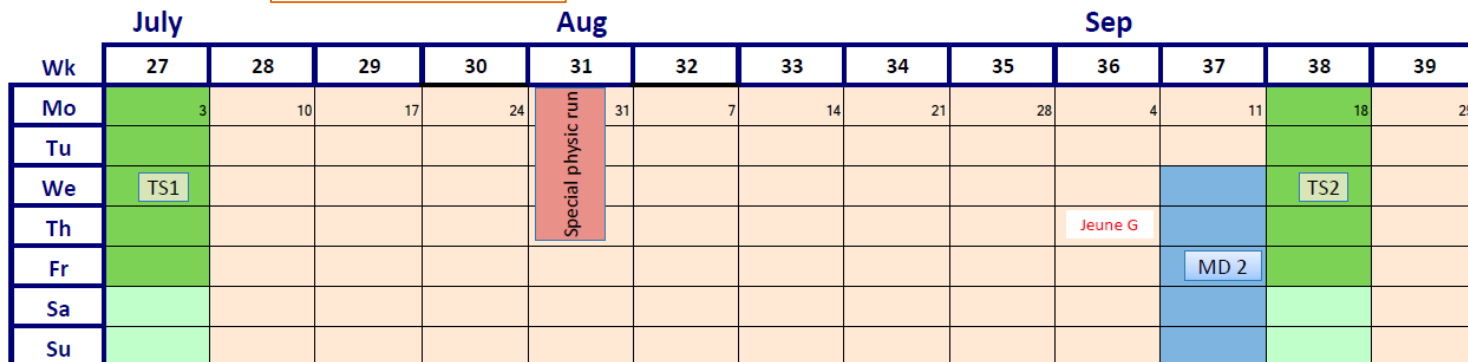


LHC Schedule

- Run2 (2017-2018): $\sqrt{s} = 13 \text{ TeV}$, Run3: $\sqrt{s} = 14 \text{ TeV}$
- 2017: expect 49 fb⁻¹ delivered (vs. 41 fb⁻¹ in 2016)
 - Baseline $L = 1.7 \times 10^{34} / \text{cm}^2 / \text{s}$, $\langle \mu \rangle = 51$ (pileup)
 - Pushed $L = 1.9 \times 10^{34} / \text{cm}^2 / \text{s}$, $\langle \mu \rangle = 56$ (pileup)
 - No heavy ion collisions



We are here



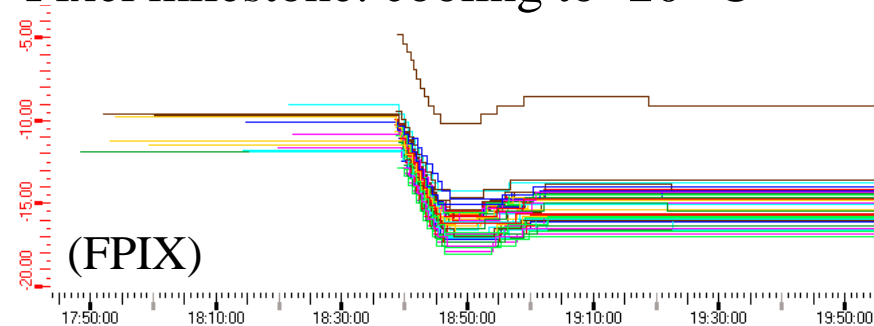
CMS Status

- 2017 installations completed, all systems are go!
- Major efforts from Fermilab on forward pixel, HF, and HE

GO/NOGO 27 March

System status 27 March	Stat
Pixel Barrel & forward	GO
BCM/PLT	GO
HCAL HE & HF	GO
ME1/1	GO
GE1/1 demonstrator	GO
Muon routine maintenance	GO
Alignment	GO
Heavy Movement	GO
Survey	GO

- Pixel milestone: cooling to $-20\text{ }^{\circ}\text{C}$



- CMS detector is now closed
- When it was still open:

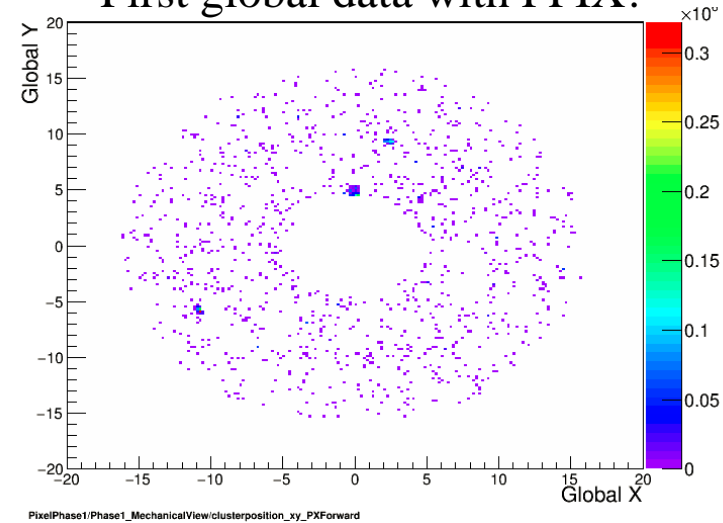
Decided to keep HE
single readout box
(RBX) upgrade



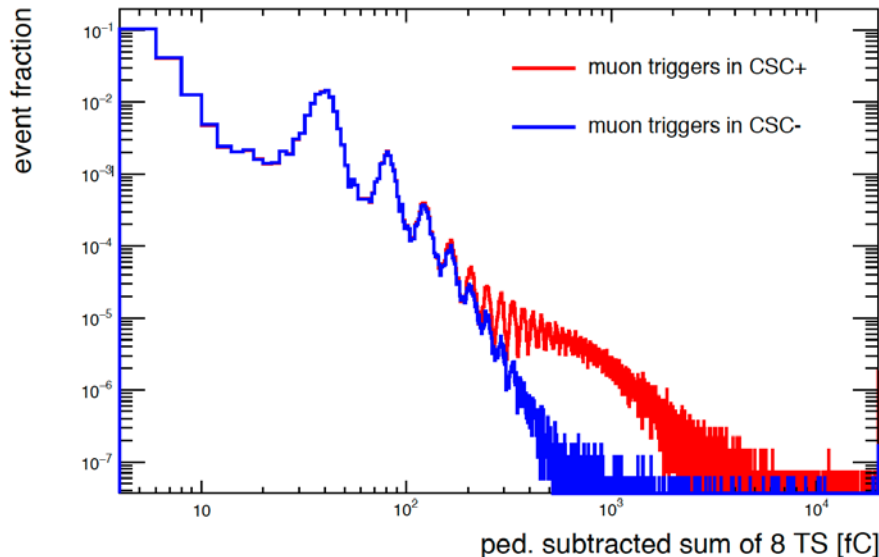
CMS Commissioning

- **MWGRs** (Mid-Week **G**lobal **R**uns) have concluded after 3 successful runs
- **CRUZET** (Cosming **R**unning at **Z**ero Tesla) has begun w/ daily feedback
- Next will come **CRAFT** (Cosmic **R**unning At **F**our Tesla)
- **FPIX** (Forward Pixel) has joined global runs
- **BPIX** (Barrel Pixel) will join ASAP

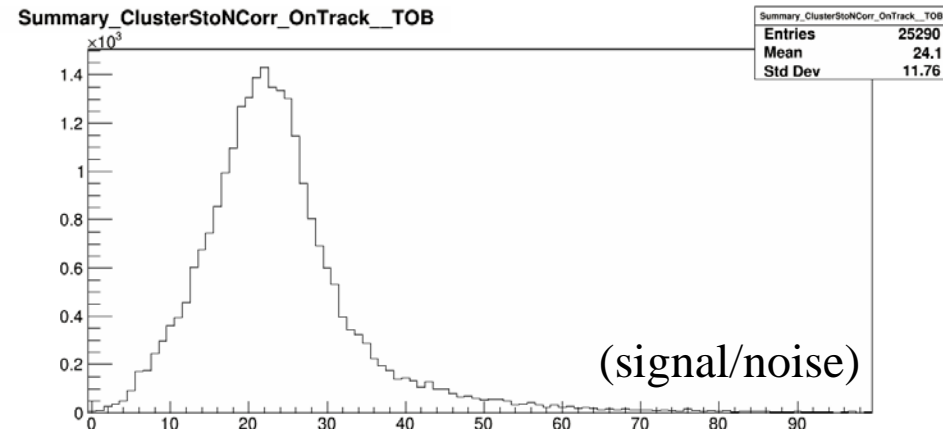
First global data with FPIX!



HE upgrade can see muons!

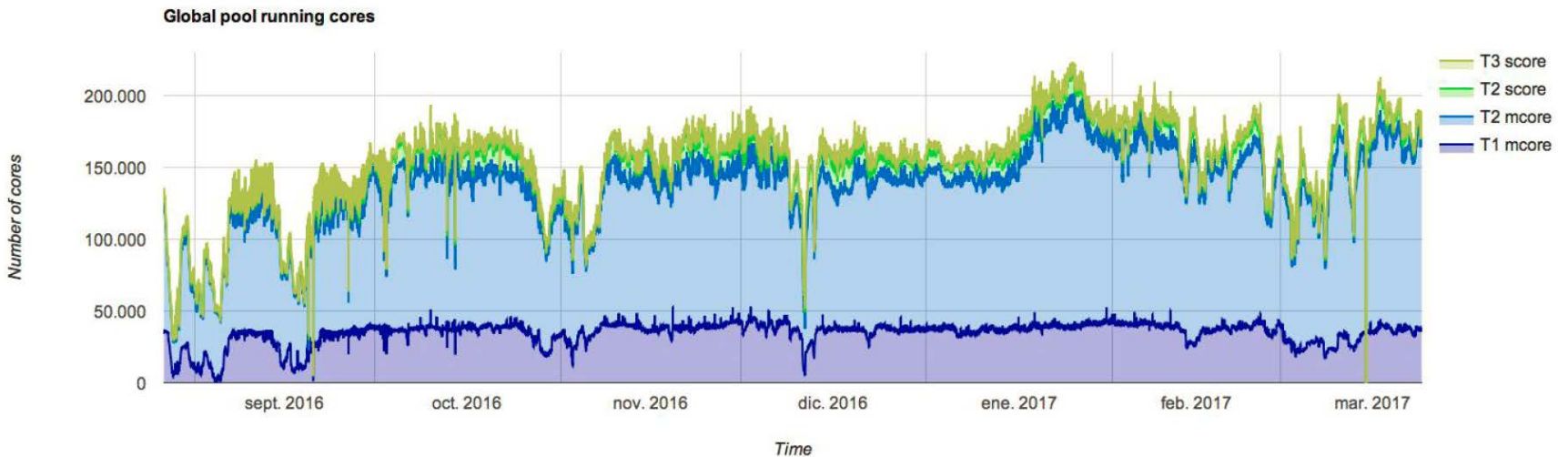
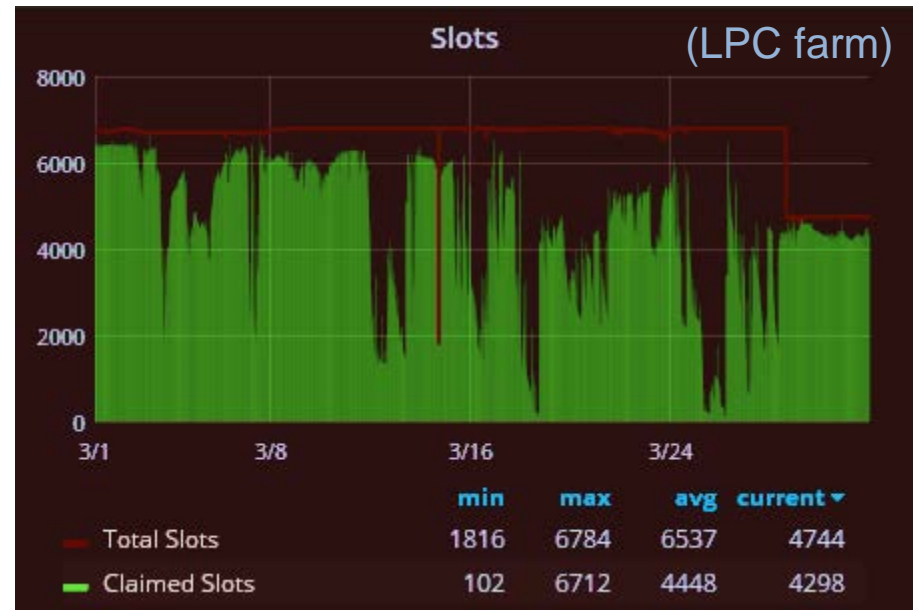


Strip tracker has awakened!



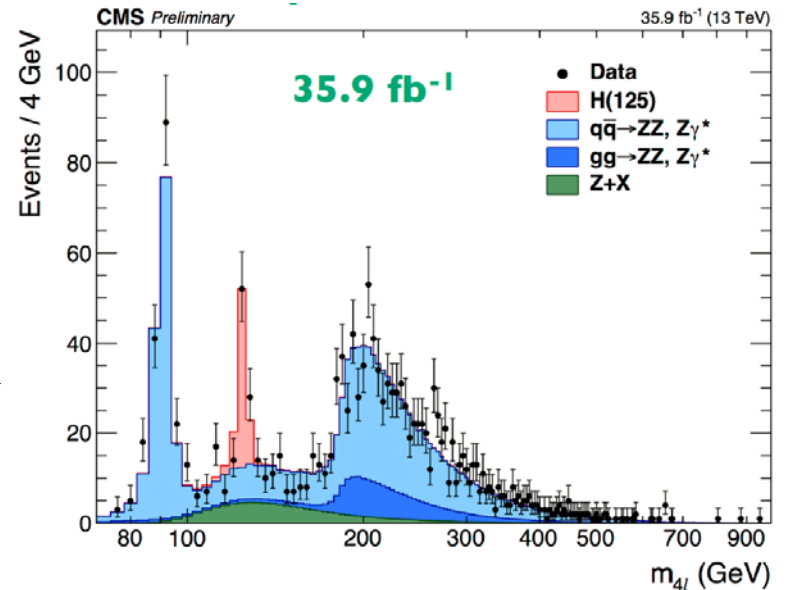
CMS Computing

- User analysis demand starts to drop off post-Moriond
- ~2000 worker nodes returned to Tier1 for central production
- Global pool peaked at 220K cores in January (included HLT farm)
- No dip during winter holidays/CERN closure – important for Moriond results



Summary

- CMS upgrades during 2017 **EYETS** (**Extended Year-End Technical Stop**):
 - All installations finished on time, w/ significant contributions from **Fermilab**: Barrel Pixel, **Forward Pixel**, **HF**, **HE (single RBX)**, GEM demonstrator
 - Cosmic runs for global commissioning (CRUZET) have started
- Matthias Kasemann elected CB chair (former FNAL Computing Division Head)
- Data and MC processing:
 - Preparing for legacy re-reconstruction of 2016 data (36 fb^{-1})
 - First round of 2017 samples injected soon
 - Upcoming Phase2 TDRs: L1 trigger, Muon + Barrel Calorimeter, High Granularity Calorimeter, Timing Detector (just approved by CMS management!)
- Strong showing at Moriond with 38 results approved, including:
 - Higgs, SUSY, Exotica & other BSM, top, Standard Model, flavor physics, light-by-light scattering



$$m_H = 125.26 \pm 0.20 \text{ (stat)} \pm 0.08 \text{ (syst)} \text{ GeV}$$