

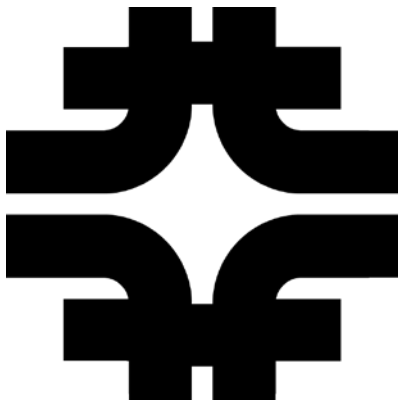
CMS and LHC Report

All Experimenters' Meeting

Kevin Pedro

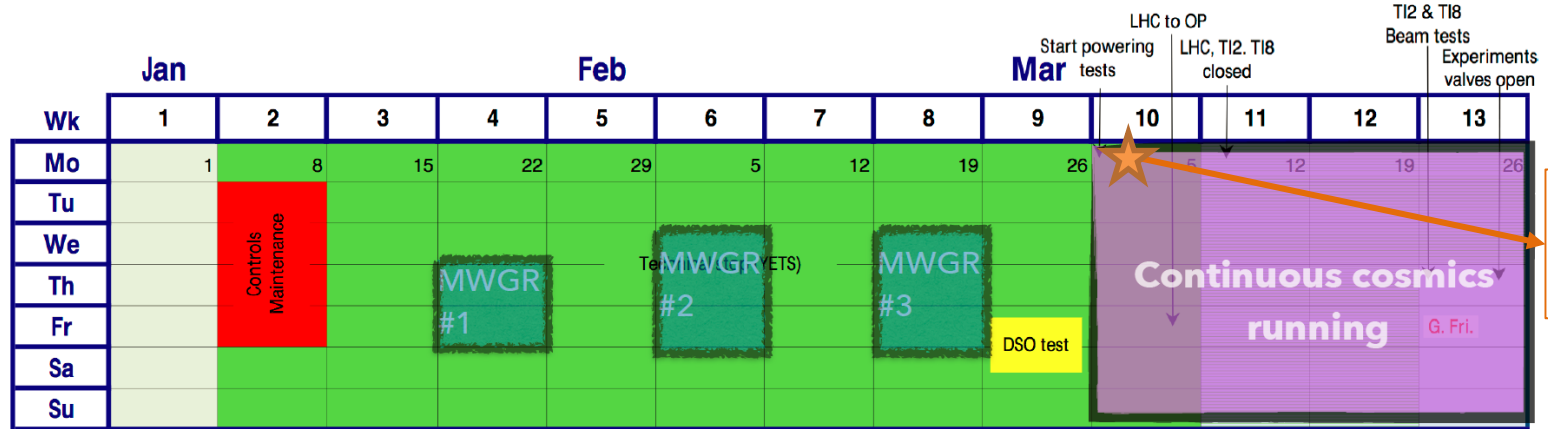
(FNAL)

March 5, 2018

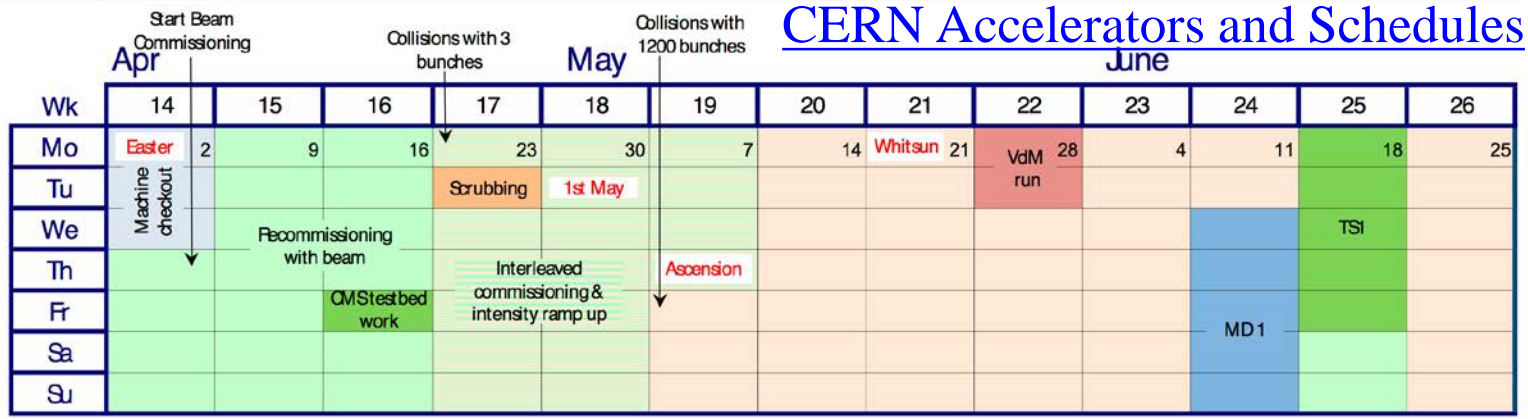


LHC & CMS Schedule

- **MWGRs** (Mid-Week Global Runs) have concluded after 3 successful runs
- **CRUZET** (Cosming **R**unning at **Z**ero Tesla) beginning w/ daily feedback
- Next will come **CRAFT** (Cosmic **R**unning At **F**our Tesla)
 - Limited time period before beam commissioning and pp run



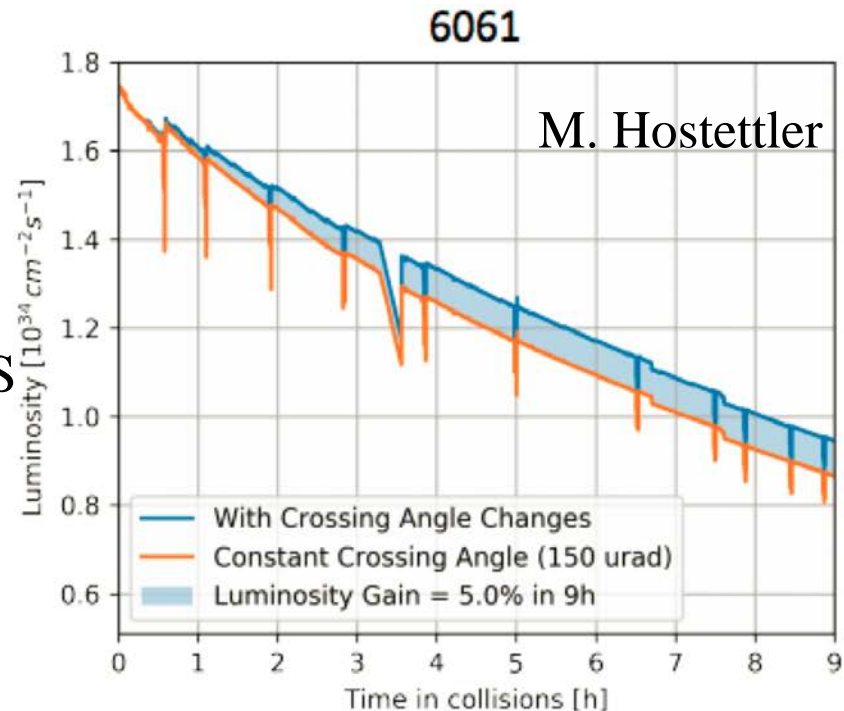
We are here



LHC Status

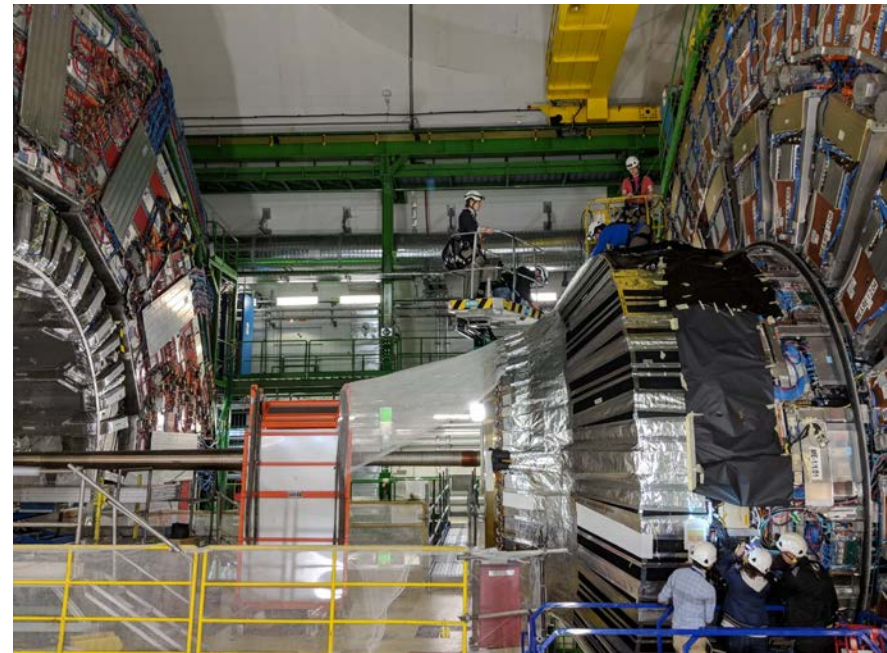
- 2018 beam startup:
 - **BCMS** (**B**atch **C**ompression **M**erging and **S**plitting)
 - 2556 bunches, $\beta^* = 30$ cm, $L = 2.0 \times 10^{34}/\text{cm}^2/\text{s}$, $\langle \mu \rangle = 50$ (pileup)
 - Crossing angle anti-leveling (now continuous)
 - $\beta^* = 27-25$ cm at end of fill, 5% lumi gain
 - Expect to deliver up to 70 fb^{-1} !!!

- Special runs:
 - Van der Meer scan
 - $\beta^* = 90$ m, high lumi for CMS-TOTEM
 - Low energy, high β^* for TOTEM, ATLAS
 - Low pileup reference
 - High pileup test
 - Pb-Pb collisions (end of year)
 - $\sqrt{s_{\text{NN}}} = 5.02 \text{ TeV}$, expect $1.2-1.8 \text{ nb}^{-1}$



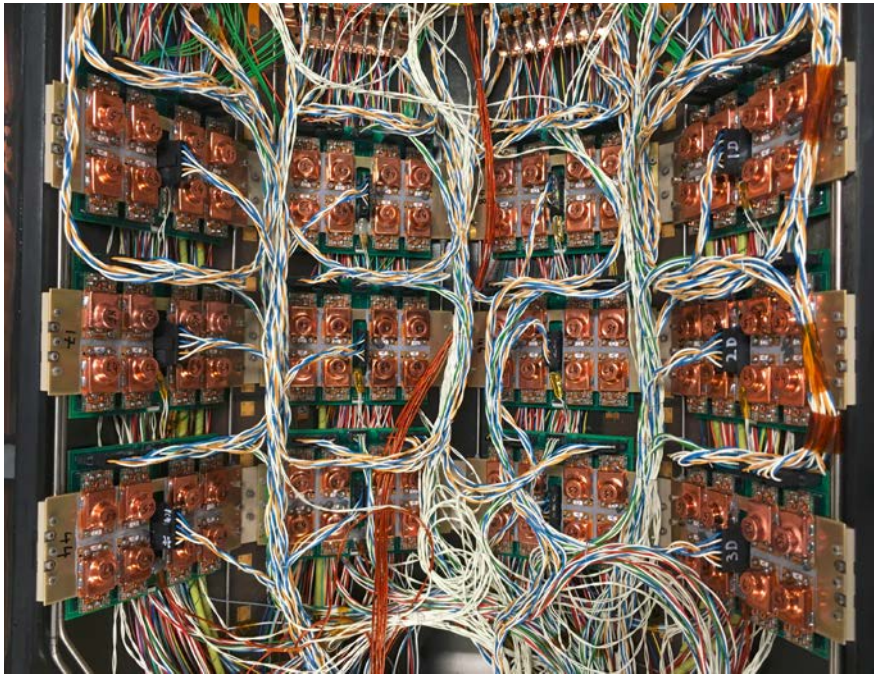
CMS Status: HCAL

- HCAL Endcap upgrade fully installed!
 - SiPMs + increased depth segmentation + QIE11 readout
 - Lower noise, higher gain, TDC info, eliminates signal loss from HPD aging
 - Radioactive sourcing campaign completed, high quality data being analyzed
-
- HCAL Barrel upgrade: LS2 (2019)
 - Production procurement underway, testing starts in April



CMS Status: Pixel

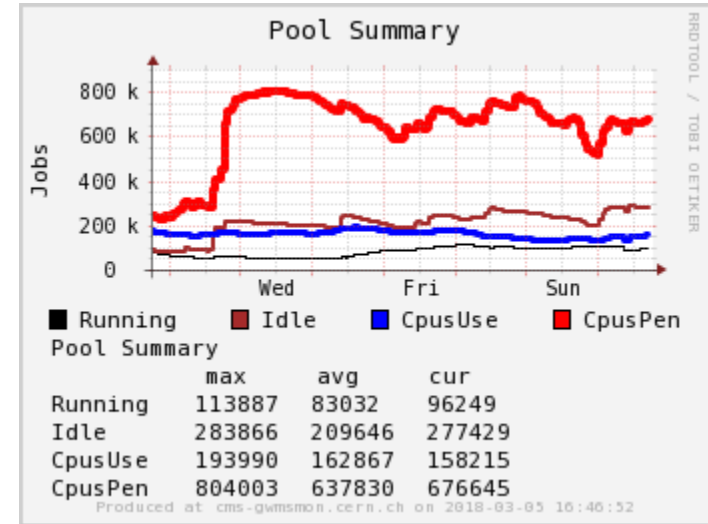
- Reminder: ~5% of DCDC converters failed in 2017
- Post-extraction: ~30% have anomalous IV curves
- Replaced *all* DCDC converters (1184 units)
- New units can operate at 9V (lower)
- Several other minor repairs on both barrel and forward pixels



- Working well post-reinsertion: est. ~97% active channels
 - Commissioning ongoing
 - Will be removed again in LS2 to install new beampipe, replace barrel layer 1 w/ improved readout chip and TBM
- Opportunity for permanent DCDC solution & more repairs

Physics, Computing, etc.

- Aiming to approve at least 20 new results for Moriond (2016 and 2017 datasets)
- 735 publications submitted by CMS in 8 years – 120 in the past year
- Ongoing processing for Monte Carlo and data:
 - First MC for 2018 detector
 - More MC for 2017 analyses
 - Legacy reprocessing for 2016 and 2017 (unified format)
 - New “nano” format – 1 kb/event, aim to serve ~50% of analyses (“mini” format is 45 kb/event, full analysis format is 450 kb/event)
 - Continuing Phase 2 upgrade studies
- New CMS spokesperson elected: Roberto Carlin (INFN)
 - He will succeed Joel Butler, starting in September 2018
 - Many thanks to Joel (in advance) for two very productive years!









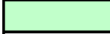

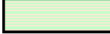


Backup

LHC Schedule Cont.

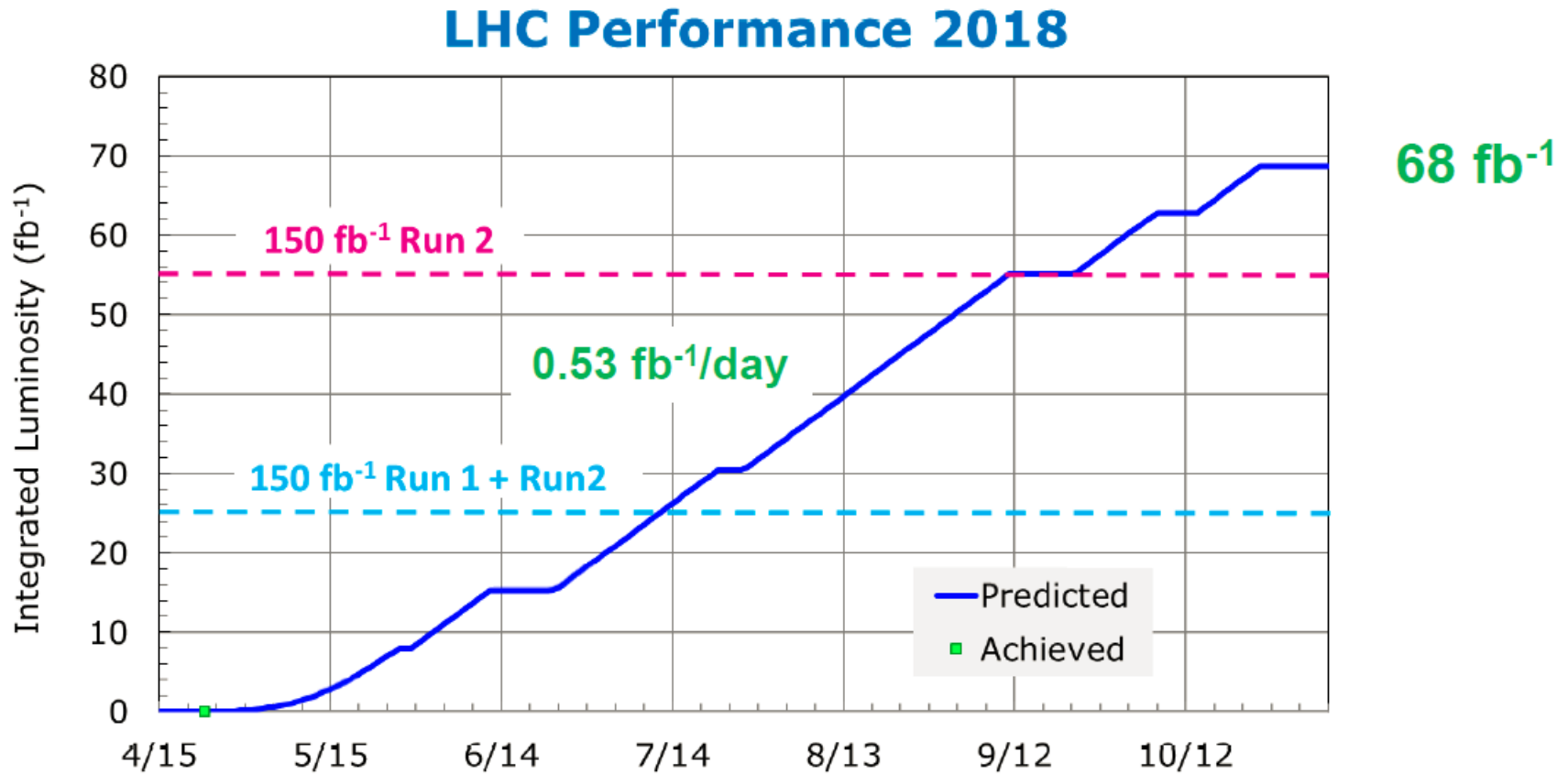
	July			Aug				Sep					
Wk	27	28	29	30	31	32	33	34	35	36	37	38	39
Mo	2	9	16	23	30	6	13	20	27	3	10	17	24
Tu				MD 2									
We												TS2	
Th										Jeune G.			
Fr											MD 3		
Sa													
Su													

CERN Accelerators and Schedules

	Oct			Nov				Dec					
Wk	40	41	42	43	44	45	46	47	48	49	50	51	52
Mo	1	8	15	22	29	5	12	19	26	3	10	17	Xmas 24
Tu					MD 4	Ion setting up		MD 5					
We		Special physics run								Powering Tests Magnet Training			
Th					TS3						Long Shutdown 2		
Fr							LHC Pb- Pb Ion run						
Sa				MD 4									
Su													

- | | | | |
|---|---|---|--|
|  | Technical Stop |  | Special physics runs (indicative - schedule to be established) |
|  | Powering tests |  | Machine development |
|  | Machine check out |  | Scrubbing (indicative - dates to be established) |
|  | Recomissioning with beam |  | Pb - Pb Ion physics run |
|  | Interleaved commissioning & intensity ramp up |  | Pb Ion Setting up |
|  | Proton physics run | | LINAC 3 Pb oven re-fill |

LHC Performance 2018



Prediction from Chamonix