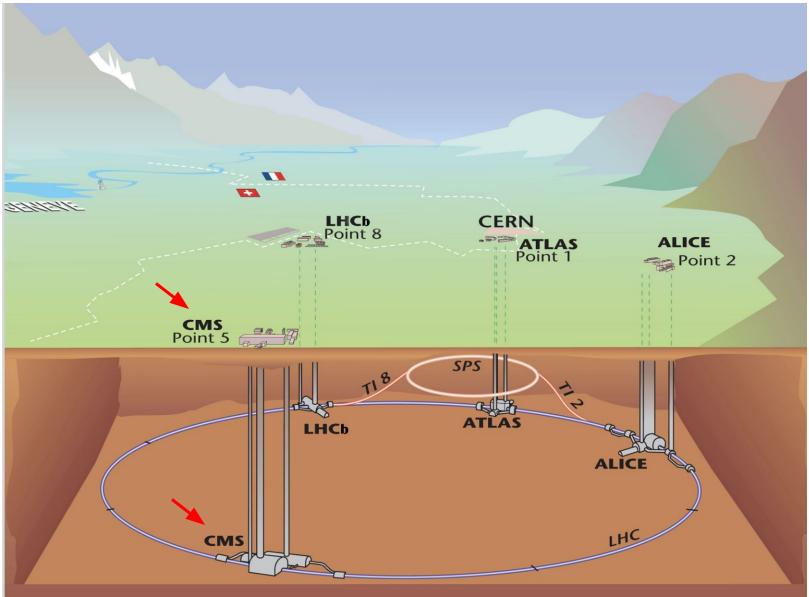




Physics Performance and Datasets(PPD) Coordination area and DQM-DC Group

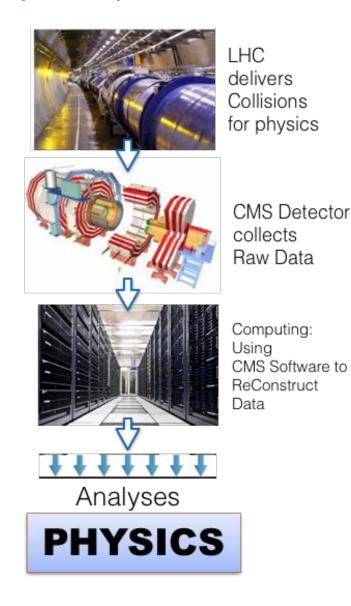


CERN, LHC and Experiments





LHC and CMS Experiment From P5 (online) \rightarrow offline \rightarrow Physics





• The go between for what happens at the "P5 Data Taking" and what happens in "Computing/Physics".

• Lives in the both online/offline world

- Online is dealing with RAW data and dealing with information coming off the detector
 - Collect high quality data as efficient as possible
- Offline is dealing with:
 - (re)processing of data and producing simulated events
 - Certification of the processed data
- For both online/offine
 - Provide alignment/calibration constants
 - Validate software used by HLT/DQM/T0 and more
- To accomplish above there are 4 groups:
 - Data Quality Monitoring & Data Certification (DQM & DC)
 - Physics Data & Monte Carlo Validation (PdmV)
 - Alignment Calibration & Database (AlCaDB)
 - Particle Flow (PF) shared with PC





(DQM-DC)

Data Quality Monitoring & Data Certification Group

https://twiki.cern.ch/twiki/bin/view/CMS/DQM

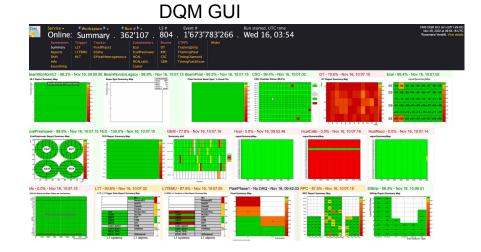
DQM-DC group is responsible for

- the online data quality monitoring operation, including the 24/7 DQM shift operation
- Develp/maintain/support the DQM tools' (CMSSW(DQM part), DQM GUI, RunRegistry, DQM², HDQM,)
- Coordinating/Delivering the central Data Certification

DQM Tools: DQM Gui, Run Registry (RR)

DQM GUI is a tool to display DQM plots produced by RECO (or any CMSSW workflow). Run Registry is a tool to book-keep Data Quality information. They are used both in online and offline environment

- Online: process events selected by HLT to display variables in the control room w/ very low latency
 - Live monitoring of detector performance during data taking (DQM GUI, RR)
- Offline: process all events while they are simulated or reconstructed and fill diagnostic plots for detailed monitoring of the performance
 - Data certification (DQM GUI, RR)
 - Validation+verification (DQM GUI)



Run Registry (RR)

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Data Certification (DC)

<u>Certification of data</u> carries out by teams of experts in detector & physics objects. The central DC team coordinate the certification experts and produce JSON files (indicating "good data" for physics analyses)

- **Golden**: require all sub-detectors/POGs to be "GOOD"
- **Muon-only**: no requirements on calorimeters
- **DCS-only**: require only tracker to be read-out & powered
- The format of file is in JSON format
 - Weekly for PromptReco
 - After each major reprocessing

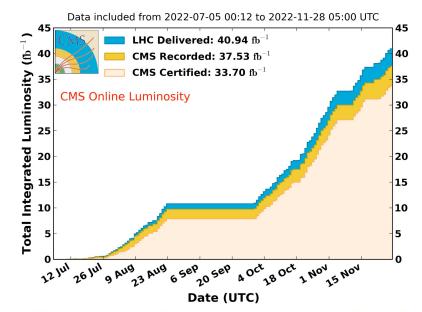
Ongoing development work:

- NanoDQMiO (Is by Is certification)
- ML based monitoring/certification
- Completing New GUI

Recent <u>DQM-DC Tutorial</u> About JSON files, & NanoDQMIO

Golden JSON from the complete 2022 PP Data

CMS Integrated Luminosity, pp, 2022, $\sqrt{s}=$ 13.6 TeV

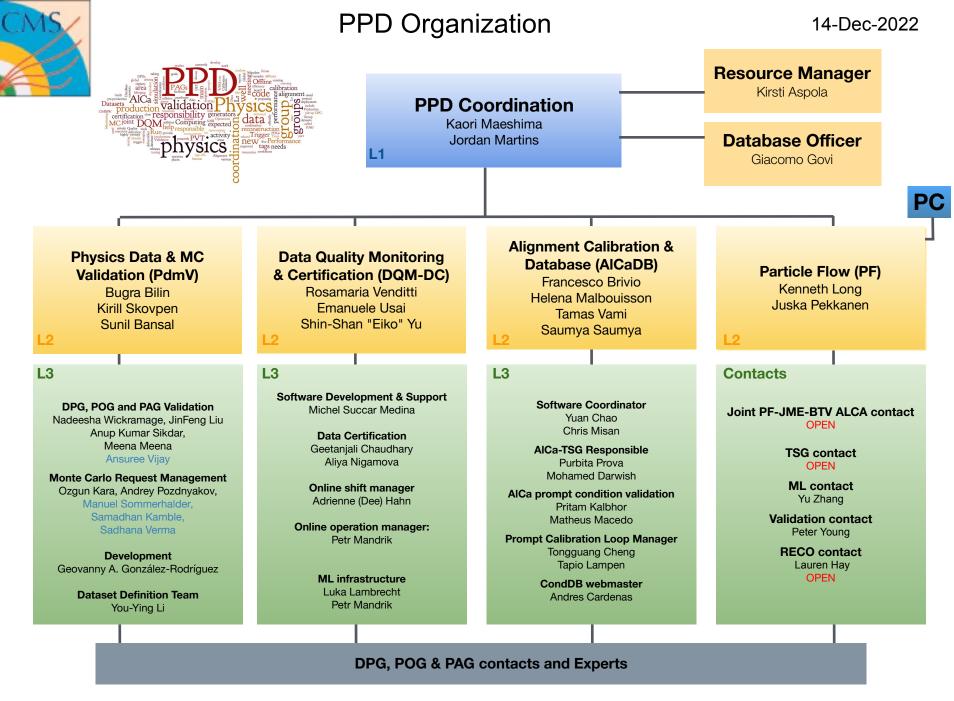


{"273158": [[1, 1279]], "273302": [[1, 45 "273408": [[1, 6]], "273409": [[1, 309]], 113], [115, 412]], "273448": [[1, 391]], "273493": [[1, 233]], "273494": [[1, 192] [[1, 173]], "273725": [[83, 252], [254, 2 "274159": [[1, 43]], "274160": [[1, 207]] "274240": [[1, 40], [42, 82]], "274241": Run Range of lumisection

DC Results: [Run2] [Run3]

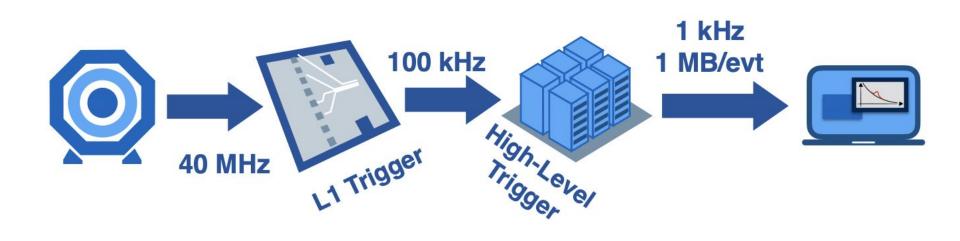


Additional slides





Data from P5 to Offline



Trigger rate and overlap between PDs