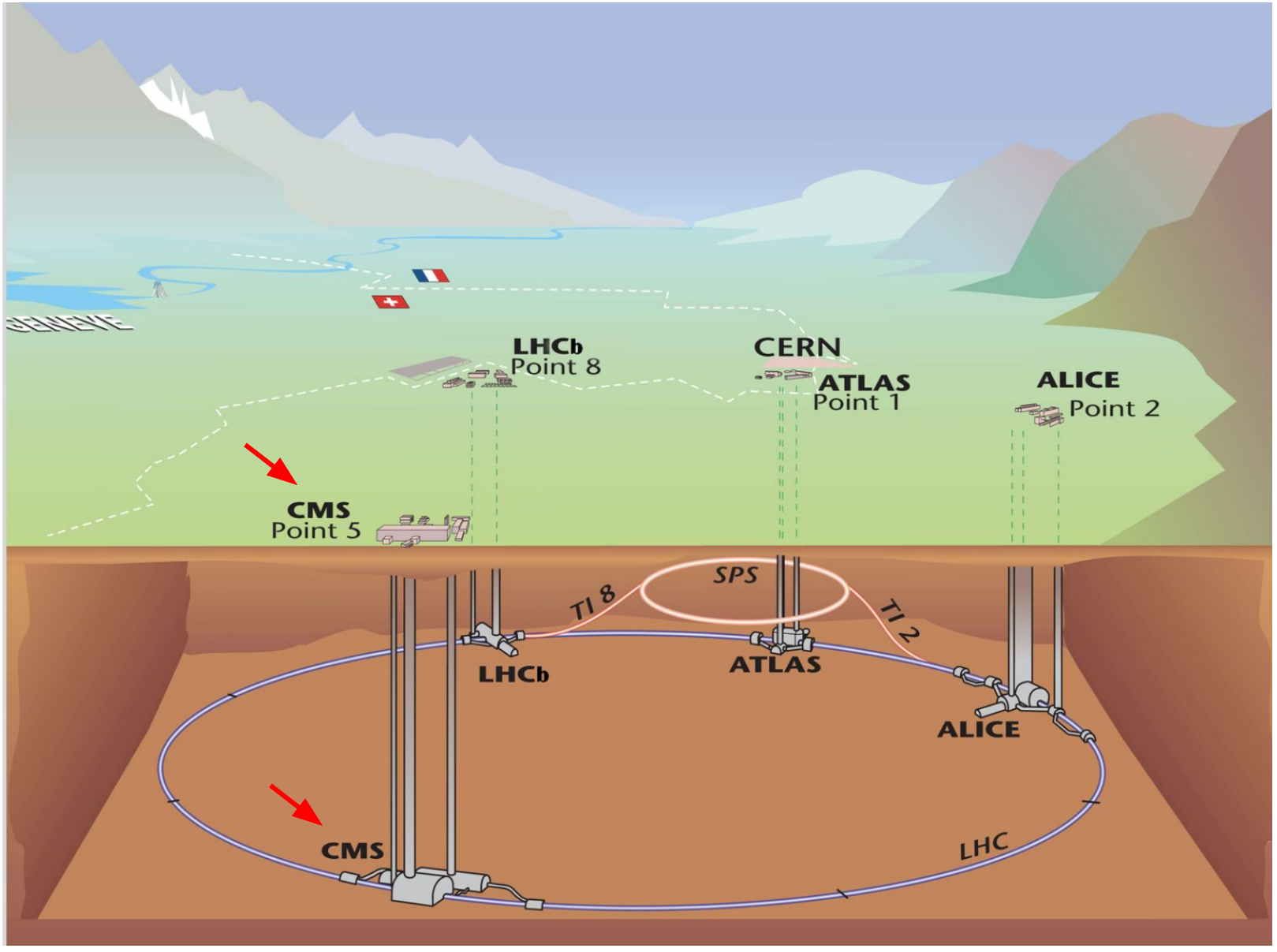
Physics Performance and Datasets(PPD)

Coordination area

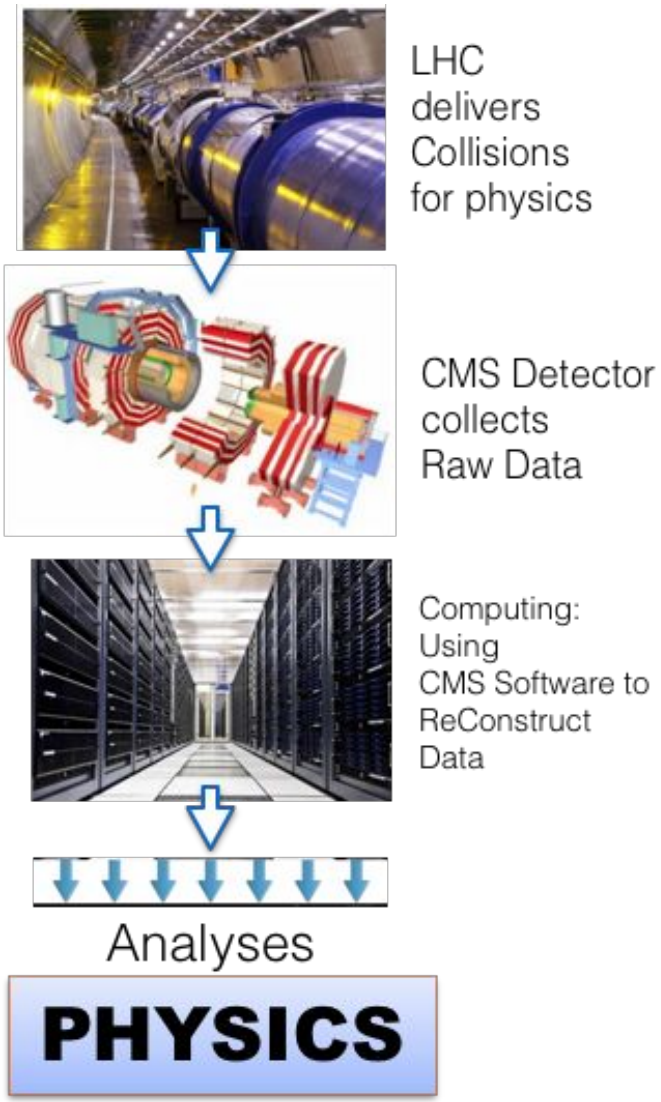
and

DQM-DC Group

CERN, LHC and Experiments

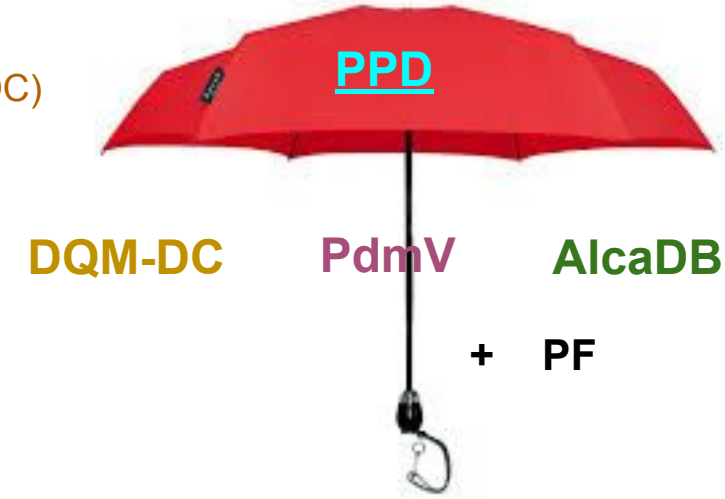


LHC and CMS Experiment
From P5 (online) → offline → Physics



What is PPD?

- 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, DQM^2, HDQM, ….)
- Coordinating/Delivering the central Data Certification

DQM Tools: DQM Gui, Run Registry (RR)

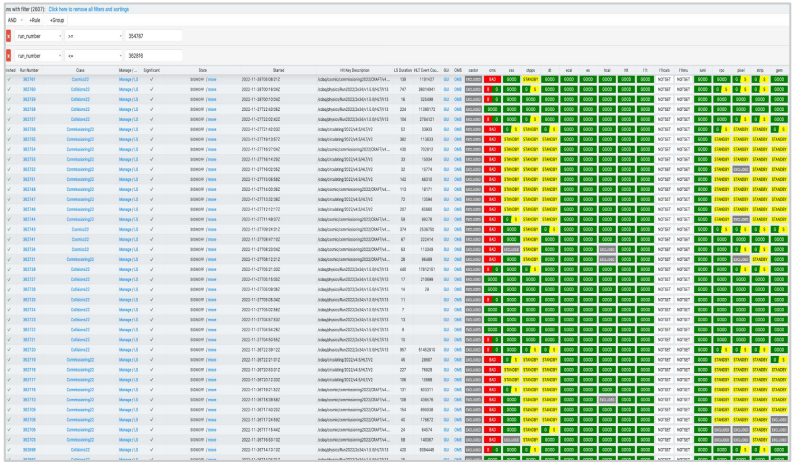
DQM GUI is a tool to display DQM plots produced by RECO (or any CMSSW workflow). Run Registry is a tool to book-keep Data Quality information. They are used both in online and offline environment

- **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)

DQM GUI

Run Registry (RR)



Data Certification (DC)

Certification of data 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*

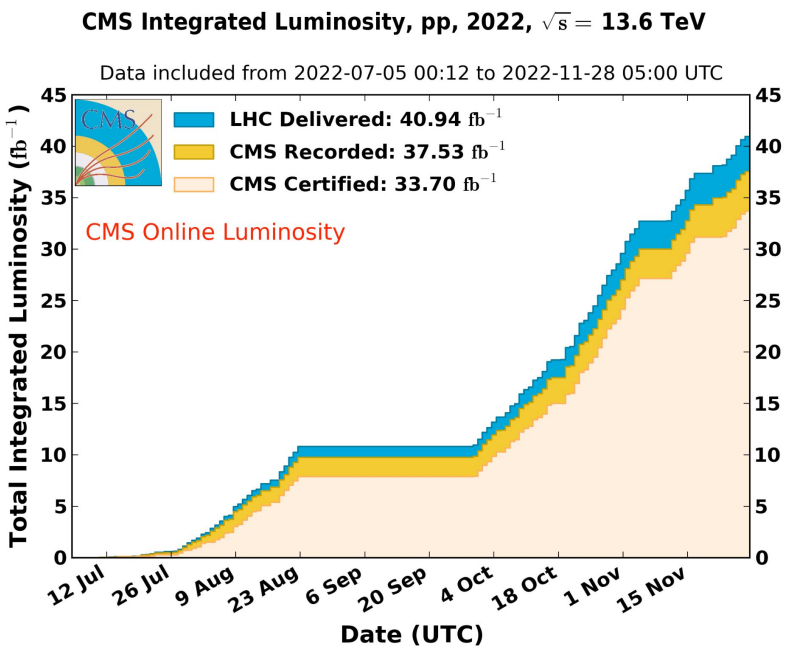
- Weekly for PromptReco
- After each major reprocessing

Ongoing development work:

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

Recent DQM-DC Tutorial
About JSON files, & NanoDQMIO

Golden JSON from the complete 2022 PP Data

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"274240": [[1, 40], [42, 82]], "274241":
```


Run

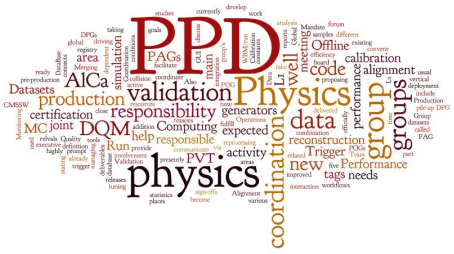
Range of lumisection

DC Results: [Run2] [Run3]

Additional slides

PPD Organization

14-Dec-2022



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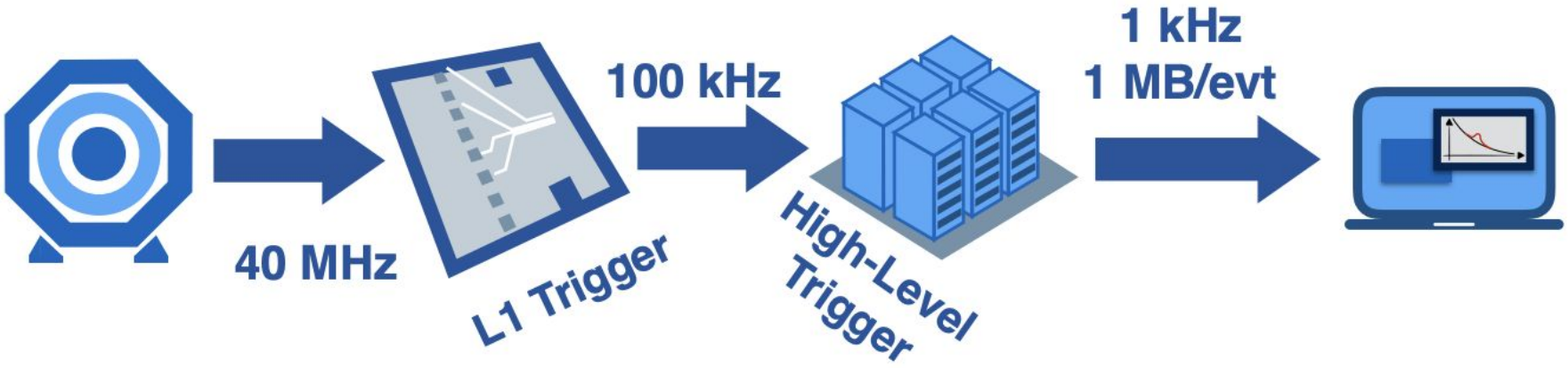
DPG, POG & PAG contacts and Experts

Data from P5 to Offline



Trigger rate and overlap between PDs