†Meeting Agenda: 25.10.2024

https://indico.cern.ch/event/1471655/

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- **open actions + name of responsible(s) marked in RED (e.g. DT-DPG …)**
- **completed actions + name of responsible(s) marked in GREEN (e.g. DT-DPG …)**

Topics for discussion:

- Data-taking summary for 2024 pp collisions and readiness for the coming pb-pb data-taking of the different detectors
- Detectors Offline & Muon Doc 3 #1 shifts status
- Feedback sent by the muons subsystem to RC about the List of DPG tasks for post LS3 structure
- Open talks within your DPGs that require personpower
- ML and Auto-DQM
- Muon - Alignment
- Background studies

Reports

DT-DPG:

- The only data taking issue to report is the, well known, severe LV problem from the weekend of Sep 22nd (e-log)
- Approval-wise things are proceeding as planned:
    - Trend Monitoring Results (Giulio, RC Approval last Friday)
    - BX MisID studies (Oliver, GMM Approval last Monday)
- The latest and greatest DT tTrigs for 2024 entered (at the last minute) the GlobalTag for reRECO of Summer2024 data – *Nevertheless the AlCa domain is a front where expertise is slowly being lost (this isn't to blame the present DT calibration team, it is simply "a fact").*
- The commissioning of AutoDQM by DOC#1s and RC proceeds *(interleaved with more pressing RC duties)*
- Concerning open tasks, we typically update every year the following TWIKI *(to be fully honest, this year we didn't but simply because we had fresh manpower working on trend-monitoring, AutoDQM, Automation Fwk and BX mis-ID, so we*

prioritized actual progress on those tasks over opening new development branches)

CSC-DPG:

- No issues with running, really.
- The crash in Prompt from CSC DQM from a corrupted event a few weeks ago was trapped by CSC Unpacker expert. Obviously a rare occurrence since it has never happened before!
- A couple of weeks ago half of CSC DQM - CSCOfflineMonitor - was removed from Express. It turns out it was incorrectly embedded in Muon POG DQM sequence and Muon POG do not use Express so wanted to remove their unused DQM. CSC has now been decoupled from at least that part of Muon POG and new sequence is to be deployed at Tier-0 today: Muon POG DQM out, but CSCOfflineMonitor remains as we need. (I think there's still an unwanted coupling of CSC into Muon POG DQM for Cosmic sequences.)
- In low PU fill, CSC efficiency of ME2/1 ring chambers improved to level of other inner rings, as expected when OOS errors are low:
  Run 386753 Express: https://tinyurl.com/23m5qy7k
  Typical run, run 386704: https://tinyurl.com/23o2zmmp
- Today I was informed "e-group cms-eos-dpg-muon-cleaners which is administrated by you expires in 30 day(s)". However. When I checked it seemed to have no expiration date. CERN Service Desk explained: somebody else had removed the expiration - Dima K. earlier today! I'm not sure I understand the member list. [Carlo explained admins are all muon dpg conveners. Members are those who actually needed to use the muon dpgo eos space.]

RPC-DPG:

- Data-taking in 2024 went with no big problems, a report on RPC Early 2024 Performance can be seen here
- New HV working points were applied to the RPC chambers starting on Run 386679. We are performing studies to see its impact. A preliminary results can be seen here
- 2024 HV scan study is going faster this time, we had a report recently and we are using an ML algorithm to select the good fits (the slowest step)
- The main RPC tasks under the RPC-DPG sent to RC:
  - Offline analysis tool maintenance
  - RPC efficiency with tag and probe method
  - RPC offline background studies, RPC online rates, and Noise tool
  - RPC HV scan analysis
  - CMSSW release validation
  - RPC DQM maintenance
  - Data Manager shift
  - Geometry maintenance
  - Phase2 software development (Simulation, Digitization, Emulation for iRPC, Clusterisation and Local Reconstruction)

GEM-DPG:

Geometry and alignment updates included in the global tag for data.

- Synchronizes geometry and alignment to include demonstrator at start of run 3 and new GE2/1 start of this years collisions (for rereco), 140X_dataRun3_v16
- Masked strips to be included in the tag
- Prompt: should have new alignment+geometry for HI. ….already in queue..
- made PR for adding GE21 rechit occup. to online DQM

MUON ALIGNMENT:

- Additional point of 2025 Muon Alignment Plan:
    - **The current muon alignment position errors (APEs) reflect the maximum misalignment from the Run 2 dataset, which mitigated the impact of misalignment during data-taking. We did not observe a significant drop in trigger efficiency due to muon system misalignment with these APEs.**
- 2024 Prompt Tags for HI Data-Taking:
    - The muon alignment is based on the new tracker alignment algorithm, LAPACK.
- 2022, 2023, and 2024 ReReco Tags:
    - These tags are in the new GT queue. The 2022, 2023, and 2024 MC tags are based on the 2023 tracker alignment tag.
- All new muon alignment tags are based on the new tracker alignment algorithm, LAPACK.

RADSIM AND BKG STUDIES: (report from Piet):

- **Discussions ongoing with BRIL for more precise implementation of DT MB4 shields**
    - Need especially correct density of the materials and hydrogen content, other items are less relevant. Some datasheets have been sent to them, some further cross checks are ongoing between DT and BRIL contacts (Piet, Daniele, Mimmo)
    - In this process we found out that the GEANT geometry still contains one sector where there is Stainless Steel shielding, this was valid during 2018, but removed in LS2. Sergio will update the shielding in GEANT4 / CMSSW … high priority for 14.2 deadline in November
- **We had Muon Background Meeting Oct 23rd**
    - Reports from all subsystems, on various topics
        - DT: use of ZMu Ntuples to make background in function of time
        - RPC: verification Online/Offline background measurements in 2024, 2015

        - GEM: investigating Fill-to-Fill differences in background (change in FE settings that can affect background?)
        - CSC: Data/MC: Run2-Run3 increase: 80-100% in data, only 20% in FLUKA
    - Request Gabriella to have a presentation at a GMM in November
        - Likely possible data Nov 25rd
        - Same day also Peter Kicsny from BRIL will make presentation on Fluka work
    - Request Gabriella: prepare legacy plots for background in 2024
        - Can be done for DT, RPC, GEM → Piet will make list of plots
        - CSC background measurement with offline data still question mark, depends on availability of Vladimir Palchik … he might start working on that in november ….
    - Move to / Start using Muon Ntuples for ZeroBias
        - Discussion with Carlo, likely we will have to include Fill number in Ntuples
        - Piet will start producing some Ntuples based on the ZeroBias on disk
            - Analysts can then start adapting their code and run on these home-produced NTuples
        - Thereafter we need to move to the AUTOMATION Framework (from ECAL)
            - Would need someone from Muon to keep an eye on the workflow
        - Piet & Carlo need to make a slide for GMM with list of work and priority
            - This should not be restricted to background only …

MUON ML:

- AutoDQM, LS anomaly detection, and RPC auto-workflow reports in bi-weekly meetings
    - https://indico.cern.ch/event/1462750/#8-ml-for-muons-with-ls-granula
    - https://indico.cern.ch/event/1454462/#4-ml-in-rpc
- Continued developments primarily from Caio on AutoDQM for DT
    - Has addressed most feedback from Carlo et. al. at this point
- Planning to port AutoDQM GUI to “Streamlit” Python package / platform
    - Example of L1T DQM GUI here: https://l1dqmdemo-dev.app.cern.ch/
    - More lightweight code, much easier to maintain, develop, extend, etc.
    - e.g. AutoDQM-style anomaly detection for efficiency plots already implemented: https://gitlab.cern.ch/cms-tsg/steam/l1tstreamlitdemo
    - Good year-end shutdown for Caio and new members joining (e.g. Kirill Skovpen)
- Still waiting to hear back whether “official” Muon review of latest AutoDQM paper draft has started (has been some weeks)

DQM CERTIFICATION AND DATA AVAILABILITY:

Common ntuple

DOC3

Muon data certification (DOC3#1) is running smoothly.

Since last muon DPGO meeting (beginning of Sept), all data was certified as GOOD by muon sub-detectors, except for:

- run 386047, 386071 (~288 pb-1) : during which DTs were excluded - due to the LV problem occurred on Sept 22 (elog)

ZmuSkim

MONTE CARLO and GEOMETRY

…

AOB?

†Meeting Agenda: 06.09.2024

https://indico.cern.ch/event/1452883/

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- **completed actions + name of responsible(s) marked in GREEN (e.g. DT-DPG …)**

Topics for discussion:

- DPG approval plans for the upcoming conferences
- Detectors Offline & Muon Doc 3 #1 shifts status
- DPGO Agenda for the incoming Muon Week in September
- Data-taking status of the different detector
- ML and Auto-DQM
- Muon - Alignment
- Background studies

Reports

DT-DPG:

- Main data taking issue connected with 3 contiguous sectors that switched off because of a turbine issue (also reported by Caterina later). Other than that, no significant issues.

- We plan DPS approval for:
    - DT Slice Test (Ignacio, Pre Approval at DT Wednesday)
    - Trend Monitoring Results (Giulio, Pre Approval at DT Wednesday)
    - BX MisID studies (Oliver, Pre Approval to be scheduled)

  Only the first one is being performed in view of a conference. In case, as a community, we are putting too much pressure on RC for approvals, we can proceed slowly with the others.

- AutoDQM for DOC#1 is almost shifter-ready. Our RC (Archie knows well) are experimenting with it.

CSC-DPG:

- Data taking is going smoothly.
- Texas A&M implemented small changes in the CSC Trigger Primitives emulator to improve agreement with the firmware: see PR #45829 and presentation at the CSC weekly meeting on Aug 28.
- A crash was observed in the CSC DQM, probably due to a corrupted event: see PR #45797. Invited the CSC DQM/unpacker expert to take a look.

RPC-DPG:

- RPC2024 Sep9-13 (next week)
- There are ongoing discussions on differences between actual RPC geometry (Endcap) at P5 vs CMSSW. Moving RPC in CMSSW makes overlap with other components such as CSCs. Follow-ups are needed/ongoing.

GEM-DPG:

Recent Approvals:

- GIF++ test beam from Felice in the last GMM
- HV Current vs Background rate (GMM on Monday)

Recent DPS were approved and should now have public CDS links

  - "Performance and quality control of the first CMS GE2/1 muon production chambers" CMS-DP-2024-075 https://cds.cern.ch/record/2908777?ln=en
  - "Validation and performance results of the first CMS GEM GE2/1 muon production chambers" CMS-DP-2024-074 https://cds.cern.ch/record/2908776?ln=en
  - "GEM performance results with 2024 data" CMS-DP-2024-073 https://cds.cern.ch/record/2908775?ln=en
- Waiting for DPS number
  - ME0 Timing Resolution

Papers in preparation:

- Efficiency studies for GE11 (DN-24-003)
- Bending Angle Study

Update to the global tags for the inverted GE2/1 chamber issue

  - Alca agreed last week to update the geometry in the tags. This should happen soon

Last Thursday on 8/30/2024 CSC coordinated with EMTF to do a test using the CSC+GEM updated slope (Bending Aglen) at pt5.

MUON ALIGNMENT:

Muon alignment status (Run3 ReReco campaigns)

Data

- All sub-systems are updated for 2022 and 2023
- Physics validation results look fine including high-pT muons
- 2024 alignment is ongoing

MC

- Tracker alignment: the same tag for 2023 and 2024
- New LAPACK algorithm results to resolve a weak mode issue
- DT and CSC have been updated with the new tracker geometry and GEM is ongoing
- We will update the 2024 GT first with the fixed 2024 GEM geometry

RADSIM AND BKG STUDIES: (report from Piet):

MUON ML:

- Planned presentation by Federica Simone et. al. in next Thursday's AutoDQM meeting on ML-based monitoring of muon detector occupancy with LS granularity
    - https://indico.cern.ch/event/1454462/#8-ml-for-muons-with-ls-granula
- Based on feedback from Carlo, Caio implemented flagging of empty DT histograms
    - https://cmsweb-testbed.cern.ch/dqm/autodqm/plots/Online/DT_DOC1/00038xxxx/0003836xx/383631_383669_383712/00038xxxx/0003840xx/384035
      I believe the DT_DOC1 pages are being actively used by shifters / experts
- AutoDQM paper entering review by the MCPB (Muon Community Publications Board?)
    - Will present author list for approval in the Sept. 20 Muon IB meeting
    - https://indico.cern.ch/event/1451515/
- *Question from GMM : should try to coordinate other muon ML activities with AutoDQM, e.g. LS-granularity monitoring, ML-based RPC chamber efficiency and HV adjustment (DPG)*
- *Plan summary report in Muon Week (Sept. 23 - 27, DPGO session 24th afternoon)*
    - *https://indico.cern.ch/event/1446338/#b-578335-dpgo*

DQM CERTIFICATION AND DATA AVAILABILITY:

Common ntuple

Ntuples being produced centrally (tested using DT TnP).

Ongoing activities:

- Test CSC TnP (recently pinged Matt, with little success)
- Synchronize GEM code (pinged Camilla and Laurent, with little success)
- Eliza, from RPC, will help with the common submission tool. Will send her some instructions next week.

I am not worried for now, but I might ask for help, closer to the Muon Week in gathering feedback.

DOC3

Muon data certification (DOC3#1) is running smoothly.

Since last muon DPGO meeting (end July), all the data were certified as GOOD by muon sub-detectors, except for:

- run 384031-384036 (~355 pb^{-1}) : marked as BAD (or EXCLUDED) by DT (and RPC) - due to a turbine failure on Aug 3 (elog)
- run 384930 (7 pb^{-1}) : CSC were EXCLUDED, due to an issue with a chamber preventing them to join the global run on Aug 23 (elog)

ZmuSkim

MONTE CARLO and GEOMETRY

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AOB?

†Meeting Agenda: 26.07.2024

https://indico.cern.ch/event/1441136/

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Topics for discussion:

- DPG approval plans for the upcoming summer conferences
- Detectors Offline & Muon Doc 3 #1 shifts status
- Common Muon Ntuples
    - Last bugfix for central workflow (addressing a stupid "keep statement issue") is included in recent releases, so I've asked to trigger central production again.
    - I've pinged people who have "open tasks" on ntuples (from CSC and GEM)
- DPG agenda for Muon Week
- Auto-DQM status
- Muon - Alignment
- Background studies

Reports

DT-DPG:

Approvals:
We have finalised a set of results for ICHEP:

- a new public DPS: **CMS DP-2024/062** ("DT performance in 2024 and some comparisons with the past), some plots of which were included in Gabriella's contribution
  (see also public twiki)
- the status of "Novel data analysis and detector monitoring tools" for DTs, that was presented by Carlo (DPS in progress (?))
- the status of DT upgrade activities that was included in Archie's talk

For the near future we plan to approve results from BX misID studies and trend monitoring. Anyhow we are not targeting any specific conference, it is just about making new work publicly available.

An **update on DT background studies** was presented at the background meeting on July 17, about new results on background decay.

The POA workflow was ported to CMSSW_14_0_11

Shifts: we are in the middle of a 2 week DOC2 uncovered period (Carlo/Francesca dealing with shifts), then we have another 1 uncovered week in August. September is covered. Then we have 3 uncovered weeks later in the year.

CSC-DPG:

- The end-of-Jun (2024, 31 fb^-1) LCT and segment efficiency plots that were specially approved by upper CMS management for LHCC and ICHEP have now been formally approved via Run Coordination and attachment to last week's WGM agenda. Released as a DPS:
  CMS DP-2024/069, with public twiki page
  https://twiki.cern.ch/twiki/bin/view/CMSPublic/CSCDPGPublic240701
- Data taking going smoothly. CSC no longer issues re-sync or hard-reset requests - exist just with those issued by Tracker (re-sync per LS) and TCDS (hr).
- A VME crate lost firmware 2 days ago which reduced T&P efficiency in ME+4/1 and +4/2 from ~100% to 80% in three runs 383629, 383630, 383631. (To recognize this: 1) T&P efficiency plots in DQM showed ME4 efficiency reduced; 2) AutoDQM identified one 60 deg sector missing rechits.)
- Courtesy of Ian W. we discovered CSC local reco config in HLT did not match offline. It's now been updated to match offline, as we alway intended. Most important missing feature was restriction of anode times to be close to BX0 when matching strip clusters to build rechits. Improves L3 outside-in efficiency in 2024 by 1-2%!

RPC-DPG:

- Recent RPC-DPG plots approved on RC meeting:
  - 2022 High Voltage scan studies for RPCs
  - RPC performance with early 2024 data
- To be approved soon:
  - RPC background Plots
  - RPC performance in Run 3 using the tag-and-probe method

GEM-DPG:

- New plots in pre-approval (waiting on v2 to move on)
  - ME0 Timing Resolution note, not for upcoming conference but later in the year, so not on urgent timescale
- Recent approvals, most available on GEMDPGPublic twiki, chasing up the last ones
  - Measurements of pT Dependent Bending Angles in the CMS GE1/1-ME1/1 System - **CMS-DP-2024/047** https://cds.cern.ch/record/2904360
  - The history of GEM foil short circuit generation and healing (2021-2023) - **CMS DP-2024/050**: https://cds.cern.ch/record/2904363
  - Flower events in the GE1/1 detector - **CMS DP-2024/051**: https://cds.cern.ch/record/2904364
  - GEM performance results with 2024 data - **CMS DP-2024/073**
  - Validation and performance results of the first CMS GEM GE2/1 muon production chambers - **CMS DP-2024/074**
- Results cover bending angle studies, HV scan eff. results, GE2/1 results from 904 and first from P5, and detector-related studies
- Updating DQM to include trigger primitive plots
- RPCMON changes to FEDRAW going through next week

- Background rate update presented last week with rates from 2022, 23, 24 in consistent analysis
    - Still seeing higher rates for 2024 vs previous years, we are still investigating this (and also checking rates after HV scan)
- Discussion ongoing in GEM about GE2/1 installation plans for 24/25 shutdown, nothing firm now, but we will almost certainly require a geometry update for next year

MUON ALIGNMENT:

- ReReco 2022 and 2023
- 2022: two IOVs
    - IOV1: 355100—357900 (8.37/fb)
    - IOV2: 359569—362760 (27.64/fb)
- 2023: two IOVs
    - IOV1: 366727—369694 (19.66/fb)
    - IOV2: 369927—371225 (9.61/fb)
- DP-2024-047 - GE11-ME11 BA in 2024. See Gabriella's ICHEP 2024 slide, below.
- GE21-ME21 alignment in progress.

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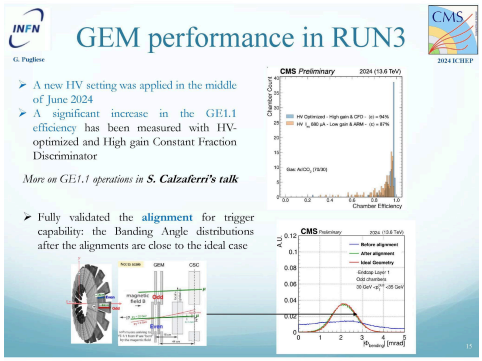
<td> 
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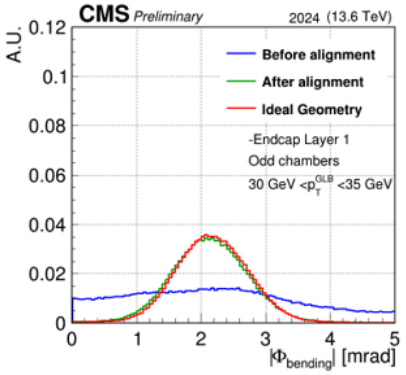
<td> 
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<td colspan="2">Left: Gabriella's ICHEP 2024 slide on GE11-ME11 alignment (bending angles). Right: Validation of alignment for trigger capability using 2024 era D data. The BA distributions after the alignments (green) are close to the ideal case (red).</td>
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</table>

RADSIM AND BKG STUDIES: (report from Piet):

MUON ML:

- Finally nearing completion on AutoDQM performance paper on 2022 data
- Update on AutoDQM for DT monitoring from Caio Daumann

- https://drive.google.com/file/d/1TmhTfJTVAKVEZeXSqfp7t9IIOS1GhCZN

DQM CERTIFICATION AND DATA AVAILABILITY:

Common ntuple

DOC3

ZmuSkim

MONTE CARLO and GEOMETRY

…
AOB?

†Meeting Agenda: 07.06.2024

https://indico.cern.ch/event/1424384/

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Topics for discussion:

- DPG approval plans for the upcoming summer conferences

- Detectors Offline & Muon Doc 3 #1 shifts status
- Common Muon Ntuples
- DPG agenda for Muon Week
- Auto-DQM status
- Muon - Alignment
- Background studies

Reports

DT-DPG:

- New calibration DB was released to Prompt from run 311340, to Express and HLT, from run 311385: it improves timing and residuals in the chambers that had delays adjusted to minimize BX mis-id
- Background studies were finalized on 2024 data (see slides): offline results agree well with trends of currents: main news is the good effect of the forward shield installed during YETS
- BX mis-id analysis was extensively applied to 2024 data (see slides): differences with 2023 are only related to changes in the space distribution of active RPC chambers

Plot approvals:

- We had pre-approval of the "usual" Run-3 performance plots during Wednesday's DT meeting, those include: active channels, hit efficiency, segment efficiency, trigger efficiency and bkg measurement
- We plan to have some pre approval out of new analyses (or tools) in the coming couple of weeks, those may include: BX mis-ID [1], trend monitoring, automation, etc …
- **Question:** do we have a "map" of the available slots for approval, at GMM and at RC?

[1] Results were already presented within DT (see above) sìjust need to prepare DPS-like slides

CSC-DPG:

- Cathode calibration plots approved (last Saturday), but they're not particularly useful for showing as part of general performance. I set up a twiki page, and submitted a DPS note. Awaiting 'approval'. Does anyone know WHO does that? Teruki - It was Andrea Massironi (last year).
- We have 2024C segment and lct efficiency plots which were submitted to Gabriella for possible use for LHCC. I see they chose the segment efficiency plot so I guess that's formally 'approved'. We can go through the standard rigmarole for the lct efficiencies too.
- I'd like to see CSC spatial resolutions for 2024 but don't know if we'll get them from our Russian colleagues.

RPC-DPG:

- We would like to approve:
    - The performance plots for 2024 - this plots are ready
    - HV scan results for 2022 - we will have a pre-approval next week in the RPC General meeting
    - The historic plots (with the HV scan results) - we will have a pre-approval next week in the RPC General meeting
- I think we can go to approval for all this plots in 2 weeks

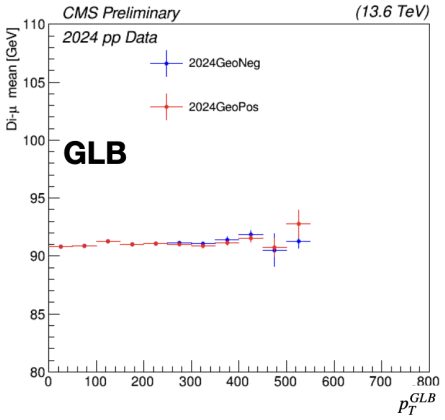
GEM-DPG:

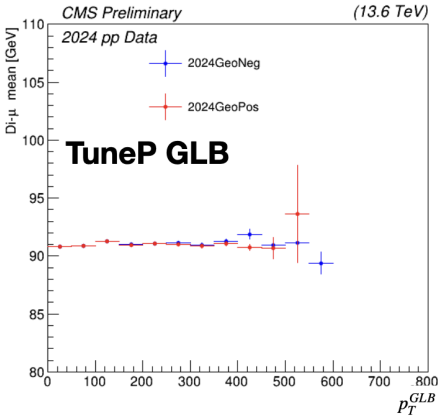
- Plot approvals done in DPG for:
    - Short circuit study with GE1/1 detectors (installed at P5), GMM Monday, for ICHEP
    - GE2/1 production chamber studies (cosmic ray stand study with 1 efficiency plot using P5 data), requested Muon Approval, for iWoRiD conference (June 30 start)
- We had preliminary bending angle plots with new alignment and 2024 data, alignment team plans to finalize and present next week, for ICHEP approval
- RPCMON stream update going through, will change to using only FEDRAWs
    - This month change to FEDRAWs+current collections, move to only FEDRAW early August
- We have an issue with the channel mapping for the new GE2/1 chambers due to a miscommunication in convention of where the strip numbering starts from
    - Will need to update, Yechan has produced a new map, need to talk to AlcaDB for update, current results with GE21 use a hack to put the rechits in the correct position

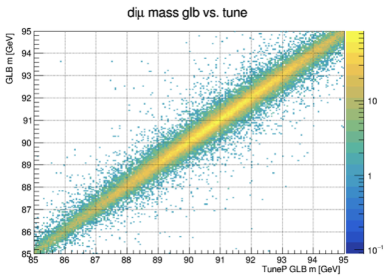
MUON ALIGNMENT:

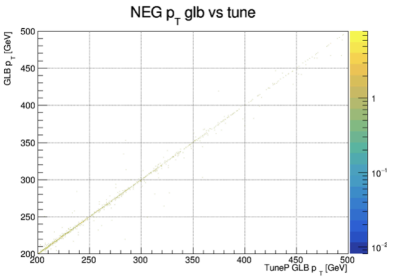
- Last time the muon POG requested to check tuneP track. We have added the tuneP track to calculate the dimuon mass and the result looks like similar to the global muon track. -> we will check the distributions at phi plots in bins of eta.

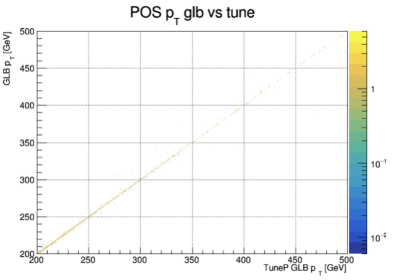
TuneP











-
- The top two plots show the dimuon mass by positive and negative probe pT (left: global track, right: tuneP track). Above 500 GeV pT are statistically limited, so the dimuon mass fitting is unstable.
- The bottom three plots show the comparison of the global track and tuneP track.
- The 1st plot shows the dimuon mass distribution and strong correlation. We can't see any particular pattern for the tuneP track.
- The 2nd and 3rd plots show the positive and negative muon pT comparison between the global track and tuneP track. They also show a strong correlation up to 500 GeV.

RADSIM AND BKG STUDIES: (report from Piet):

MUON ML:

DQM CERTIFICATION AND DATA AVAILABILITY:

Common ntuple

- Common muon DPG nano flavour test samples being produced using CMSSW_14_0_7 (still, I have to test them)

- I also ntuplised the ZMu skim from Run2023B, C and D (the full 2023 Golden JSON) using CMSSW_14_0_X

- Documentation updated (and visible from the whole group, thanks Mauricio!) https://gitlab.cern.ch/cms-muon-dpgo/muntuples-crab-submission

- Questions:
    - Can I perform some cleaning of old stuff?
    - Merging:
        - Producing files of ~ fixed size
        - Becoming available here: /eos/cms/store/group/dpg_muon/MuonDPGNtuples/ntuples/14_0_X/
    - **Do we still need a private setup?**
        - **Can I still rely on help from somebody else?**

- I would **give a talk** at GMM, and **approve some validation plots** once the above points are clarified (I need it for ICHEP).

DOC3

- Data Certification is running smoothly, status report during last GMM (June 3rd)

ZmuSkim

MONTE CARLO and GEOMETRY:

…

AOB?

†Meeting Agenda: 17.05.2024

https://indico.cern.ch/event/1417416/

Colour/text coding:

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- **completed actions + name of responsible(s) marked in GREEN (e.g. DT-DPG …)**

Topics for discussion:

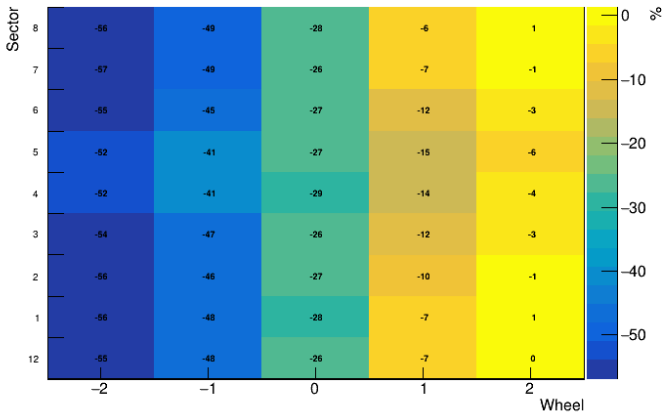
- DPG performance results with 2024 data to be presented for the LHCC open/close sessions on 29th May

- Proposal to include 1000 fb-1 aging for the muon detectors, to be discussed in Sim meeting on May 24th
- Detectors Offline & Muon Doc 3 #1 shifts status
- Plans to use Common muon Ntuples
- Auto-DQM status
- Status of Muon - Alignment

Reports

DT-DPG:

- The effect on the background of the new forward shielding installed during YETS on the negative side, was preliminarily checked using the trends of currents vs Inst. Lumi. The drop reaches 60% in one MB4 of YB-2.
  See these slides for details.
  The offline results on MB4 hit rates are in fair agreement with those figures:.



- After applying (before the start of the collision run) "fine delays" to individual DT chambers, only based on the RPC pattern of working and not working chambers, the fine trigger synchronization was checked offline: only very few adjustments turned out to be necessary. See these slides for details.
- The calibration workflow was also applied to check the pedestals (tTrig) to be applied for *offline* reconstruction (see these slides): an update of the calibration db is being released.

- Work is in progress on autoDQM: we plan to use it for the daily checks performed by DT DOC and (at a second time) for data certification (DOC3). A dedicated collaborator is acting as interface between the DT online team and the autoDQM expert to develop and tune the algos. (Details here)

- Performance studies: some preliminary results were shown at the CMS week:
  Hit efficiency plots , **BX mis-ID** studies , **TnP segment efficiency**
  We are redoing them using ZMu skims and more starts.

Thanks to our RPC colleagues for having provided updated information!
Offline background analysis is also in progress.

- Status of monitoring tools:
  - Some upgrades were applied to the **DQM**:
    - Central Online DQM:
      - layouts of theta trigger plots were added;
      - new noise plots were fully commissioned;
      - minor fixes/visualization improvements were implemented.
    - the private DT DQM was migrated to CMSSW_14_0_6;
  - Reworking the hit efficiency computation within the **Prompt Offline Analysis,** in order to allow it even in the presence of one fully inefficient layer.

- Simulation of **aging at 1000/fb**: we only expect a few% drop of hit efficiency in MB1s of external wheels, but we think the effort to represent it in Phase 2 MC could actually be worthwhile.

CSC-DPG:

- Some plots related to csc cathode calibration and conditions data to be made public so they can be used in a poster for LHCP (Israr)
- Should have local efficiencies from T&P in 2024C for Monday (Matt)
- Not sure if it's useful to include rechit distributions, event displays I already produced
- Misha measured CSC online background rates: for ME-4/2, background reduced by a factor ~1.6 (compared with linear extrapolation of 2022 measurements at 1.1x10^34 to 1.9x10^34 where 2024 measurements were made).
  (See https://indico.cern.ch/event/1414202/)

RPC-DPG:

- Performance results for 2024 data: we are working on the plots, the first version was presented in the last RPC-DPG meeting and some comments were already implemented. See the plots here. I'm not sure if we will have it ready for approval next week.
- Aging studies at GIF++ show that the RPC chambers performance and parameters are stable up to 97% of the expected integrated charge at HL-LHC and up to the highest background rate expected at HL-LHC (600 Hz/cm2). No evidence of any aging effect has been observed so far. Therefore, the current RPC system is capable of reliable operation in the HL-LHC phase. -> see the paper
  - I'm not sure if we have much to include here…
- Plans to use common muon Ntuples: we have work ongoing to migrate our offline analysis, the student is now at CERN working in other activities. I (Mauricio) have his code and will proceed with the next steps.

GEM-DPG:

- Geometry recently updated to include the 2 new GE2/1 chambers, but it seems that they are inverted compared to what is required for good residuals
    - GEM chambers invert between odd and even (readout board away from or closer to IP), the current chambers look to require the opposite inversion to whats expected. Still investigating what to do, if it really is inverted, may introduce this in the alignment
    - DQM plots updated to include the new chambers occupancy and statuses
- Initial offline efficiency plots looks to have poor stats, need to investigate if its an analysis issue, so in progress
- Initial background rate plot looks to have larger rates, also still under investigation
- HV scan is ongoing (should finish next week), the RC team was going to try to prepare some plots of efficiency vs HV
- GEM trigger team asking to include additional trigger-related Digis in the RPCMON stream
    - https://its.cern.ch/jira/browse/CMSHLT-3195
    - They are unpacked from the CSC FEDRAWs, the proposal is to remove CSC digis and store the FEDs directly, I'm testing this now, but it would require RPCMON analysers to unpack CSC and run the segment
    - Also plan to add some plots to the DQM for trigger team to monitor the GEM-CSC trigger
- For ageing: we expect no detector effects and < 1 % dead channels due to ageing in first 10 years of operation, so for 1000 fb-1 should have very minimal ageing effects
    - Still waiting for answer on effect of short circuits

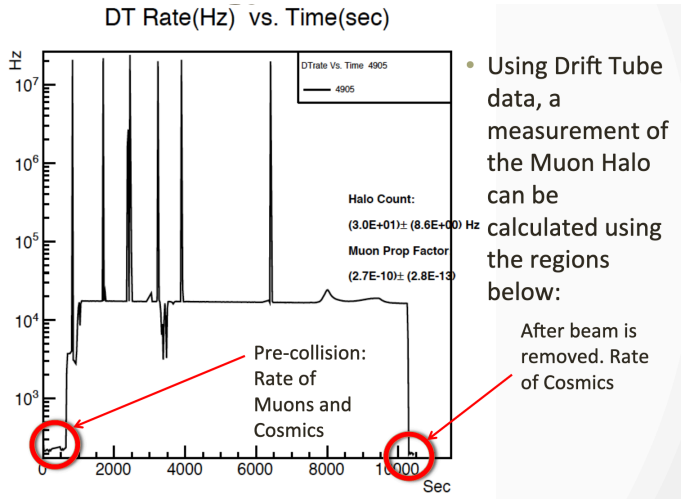
MUON ALIGNMENT:

- The 2024 muon alignment has been conducted with about 3/fb of dataset.
- All subsystems show minimal residuals after the alignment.
- The physics validation results look fine, especially the dimuon mass distribution by eta, which shows improvement in the high eta region.
- The new tags have been appended to online GTs on May 14th.

RADSIM AND BKG STUDIES: (report from Piet):

- Interesting news from BRIL (RadSim meeting : https://indico.cern.ch/event/1414458/):
    - (1) They implemented a more precise geometry of the changes in the beampipe (beam collars etc) and they observed in simulations the increase in rate for ME11. They will release public plots of the ratio soon. There is a new version of the Phase-1 (Run-2 and Run-3) geometry 5.4.XY and a new Phase-2 geometry 6.3.XY. Data will be released soon on the Radsim Tool
    - (2) They implemented the New Forward Shielding (NFS) and see also there interesting effects that are in line with what we expect and observe

- Request from BRIL:
    - Need to provide ~20-30 measurements to implement the DT shields in the BRIL geometry. Piet & Sergio are in contact with Daniele and with Mimmo Dattola to finally get these numbers (first request dates back to May 2023).
- 2024 Background: Meeting planned for May 29th at 15:00
    - Subdetectors are looking into background measurements
        - DT: Currents (Daniele)
        - DT: Offline Rates (Francesca & Piet)
        - CSC Online Rates: Misha with TMB dumps
        - CSC Offline Rates: not sure whether Misha & Vladimir working on it?
        - GEM: Offline Rates Piet & Jeewon work started
        - RPC Online Rates (LB counts): Horacio starting to look at it now
        - RPC Offline Rates: Leonardo & Francesco (Naples) starting to look now
    - Some individual detector results posted above under subdetector reports
- Run-2 Background paper: feedback received from EPJ C journal. Mostly minor comments. All referee comments on the twiki page:
    - https://twiki.cern.ch/twiki/bin/view/CMS/MuonBackgroundPaper
    - Question on use of dE/dx to identify bkg particles → only CSC can do dE/dx
    - Question on occurrence of noise burst & their cleaning in detectors
        - DT & CSC likely fine … need statement from RPC
    - We would some statement the rate of Machine Induced Background (MIB):
        - Investigating BHM (Beam Halo Monitor) data … difficult … need Timber to access beam halo background number sent from CMS (BRIL) to LHC
        - Investigating DT data … DTLumi (accessible through brilcalc) has shown in the past some interesting plots:



        - Reference: https://indico.cern.ch/event/559478/contributions/2257660/attachments/1315879/1971253/MuonHalo2.pdf
        - CSC? I remember in 2010 work was done on Beam Halo triggers with horizontal segments in the endcaps … Tim can you elucidate if there is something ready to use in CMSSW?

MUON ML:

DQM CERTIFICATION AND DATA AVAILABILITY:

Common ntuple

- A fix for central MUODPG NANO production was prepared, based on the results from inspection of data from the first central production attempt (JIRA ticket).
- It is included in CMSSW_14_0_7 (being built in this moment)

- I also ntuplised the ZMu skim from Run2023C and D (27.3 fb^-1, 98% of the 2023 statistics in Golden JSON) using CMSSW_14_0_X

- Documentation was also updated: https://gitlab.cern.ch/cms-muon-dpgo/muntuples-crab-submission

- Questions:
    - Can I perform some cleaning of old stuff?
    - What about merging?
        - Produce files of ~ fixed size (always valid)
        - Group by fill or run (possible only in prompt)
    - Do we still need a private setup?
    - Can I still rely on help from somebody else?

- I would be happy to **give a talk** at GMM, and **approve some validation plots** once above points are clarified

DOC3

- Central muon DOC3 DC started last week(end), no issue so far.

ZmuSkim

MONTE CARLO and GEOMETRY:

…

AOB?

†Meeting Agenda: 12.04.2024

https://indico.cern.ch/event/1405230/

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Topics for discussion:

- DPG performance results to be presented for the RC plenary during CMS week and the plans for the upcoming Summer conferences
- Feedback to be provided for Phase-2 software milestones
- Detectors Offline & Muon Doc 3 #1 shifts status
- Plans to use Common muon Ntuples
- Auto-DQM status
- Status of Muon - Alignment

Reports

DT-DPG:

- **Organization:**
  - Updated organogram of tasks and responsibilities.
  - New collaborators for auto-DQM (Caio Daumann) and Background studies (Chinmay Seth).
  - Problematic situation of offline (DOC2) shifts:
    - ~10 vacant weeks (3 of which from next week!)
    - We have to cover November too.

- The impact on muon reconstruction of the **faulty chamber** YB-2/Sec8/MB1 (which was not properly reconnected to the gas line at the end of YETS) was assessed by simulation, using a private tool of DT's. The impact was found to be small and not worth being represented in the MC (see presentation here).

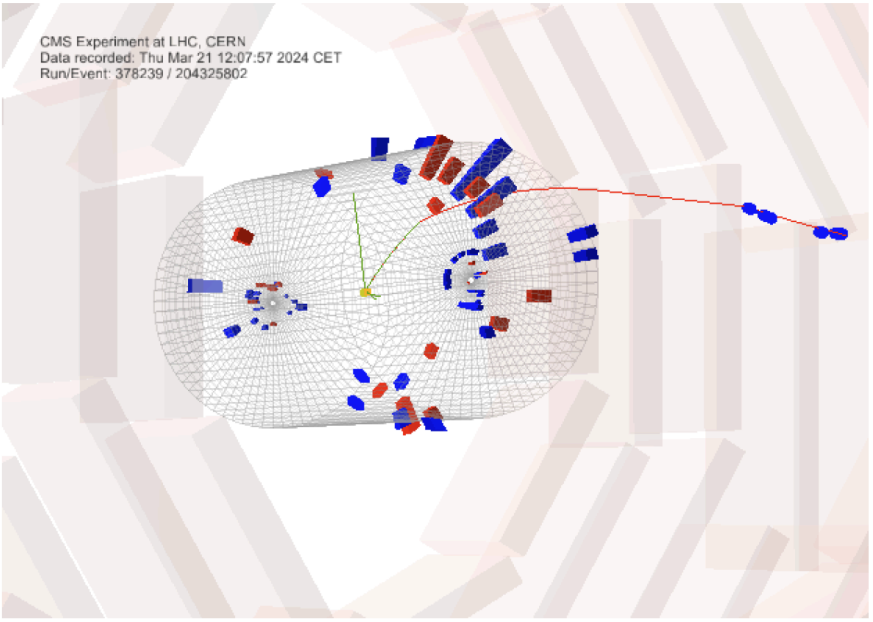
- First **HV scan** of 2024 was performed successfully (see results here): no hints of efficiency loss with cosmic data, within "physiological" variations of atmospheric pressure etc.

- DT efficiency was also evaluated with **CRAFT data**: 99.6% average active channels per chamber, 97.2% average hit efficiency per chamber.

- **Online DQM**
  - DT private flavor was migrated to the new machines and ported in CMSSW_14_0_1.
  - A new noise plot was added to central DQM for P5 shifter: it behaved well so far with cosmics and low lumi, to be commissioned with high lumi. Documentation here.

- The **Prompt Offline Analysis** was ported to CMSSW_14_0_X with the addition of new plots (mostly for trigger). It is running on lxplus8.

- **First collision events** were observed at injection energy: see some of them here



- The **Calibration workflow** was fully updated and documented

- Updates to **DT trigger timing** due to update in the status of active RPCs were deployed, for the first time, *before collision data-taking* (thanks RPC colleagues!).
- **Calibration for offline** will be checked straight away (updated only if necessary).

- Discussion is ongoing on the proposal to add **aging effects (1000/fb)** to standard Phase 2 simulations (IF, WHAT, HOW).

CSC-DPG:

- pp collisions so far look ok. A bit tricky to follow because of the offline DQM issue. Only some runs seem to be available (still) in either the main offline gui or the temporary one they set up
- I'll supply rechits, segment times, event displays for Muon RC presentation next week. Two Z candidates:
    - https://cernbox.cern.ch/s/U8RqPu91Ul5tS8J
    - https://cernbox.cern.ch/s/aZjwC4dq2LYE5mQ
- Phase 2 software is all ok for CSC (I made an entry in the Phase 2 Software Days google doc):
    - CSC geometry already implemented - doesn't change from run3.
    - CSC digitization already implemented - no significant changes from run3. Includes DIGI2RAW. (Current digitization doesn't work with exotic charged particles, but no development effort is available for that.)
    - Premixing is fine as is: CSC (like all Muon detectors) has simhits mixed on signal, and then digitization, which is the 'right' way to do premixing (Cannot mix CSC digis in any sensible way.)
- I also commented that CSC cannot do HLT validation because CSC DQM is excluded (and always has been despite my pleas).

RPC-DPG:

- DPG performance results: We'll provide efficiency for the first pp collisions. Apart from the problematic YB+1, the system works fine and results look okay.
- Feedback for phase2 sw (draft)
    - We have a phase2 geometry defined for a long time, however recently we spotted some differences in the realistic chamber positions (as for the recently installed chambers). We have people already working to have the correct chamber positions in the software.
    - The new DIGI collection is going to be merged into the official release soon. The current DIGI collection will be updated for phase2, we will use a flag (probably an era modifier) to identify the phase2 scenario.
    - Electronics are defined, the data format is defined and the packer/unpacker is under development.
- Boris is available to give a report on RPC phase2 sw in the GMM when is needed
- For Common Muon Ntuples, we will probably have a working version of the offline efficiency analysis running over the ntuples

GEM-DPG:

- DPG Performance: Some initial plots from recent collision runs. Primarily efficiency for vfat looks okay
- Feed for phase-2 sw(draft): Need to change the geometry of the ME0 (trapezoid to final designed trapezoid+rectangle)

- Status of Muon - Alignment: CMSALCA-260 this is for updating the global tag with new geometry with the GE2/1 production chambers. Some study is underway to understand change in resolution (https://tinyurl.com/25pr9vng)
- AutoDQM: Implementing/testing DOC1 plots.

MUON ALIGNMENT:

- We will upload new muon alignment tags in mid May.
    - End of April, we can start muon alignment with about 2/fb.
    - 1 week for the alignment and another 1 week for the validations.
- We have tested CMSSW_14_0_X with the 2024 data for the release test.

RADSIM AND BKG STUDIES:

MUON ML:

DQM CERTIFICATION AND DATA AVAILABILITY:

Common ntuple

- At present automated production of custom NANO ntuples at Tier-0 is not possible (technically different POG/DPG NANO flavors would be saved in a single file)
- PPD will produce custom NANO using PdmV production workflows (see details in PPD coordination news, slide 10)

DOC3

- Prepared a draft calendar for the muon DOC3 DC shifts (attached to the agenda)
    - For the moment, covered all the weeks till mid Nov
    - If this looks fine to you, I'll share it with shifters and open the registrations on the shift tool
    - Only 3 out of 12 candidate shifters have already covered this kind of shifts in the past: do you think a new tutorial is necessary?

ZmuSkim

MONTE CARLO and GEOMETRY:

…

AOB?

†Meeting Agenda: 16.02.2024

https://indico.cern.ch/event/1381953/

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Topics for discussion:

- RC workshop : Topics to be covered
    - Muon DPG talk (20'):
    - - Any need of PCL
    - - Review of actions in the first months from data taking and special needs
    - - Status of detector at the beginning of 2024 (e.g. % active channels)
    - - DQM, Validation, Certification plans
    - - Plans for Alignment, Calibration & Conditions
    - - Do you have any projection in terms of ageing?
    - - Special run configuration (isolated bunch, low pu, 900 GeV fill)
- DPG Approval Procedure
    - DPS (slides format) are reviewed and approved by RC/PPD/TSG if coming from DPG/POG/HLT, respectively, and are signed by the full Collaboration.
    - Upgrade results (e.g. test beams/lab results) should also follow the procedure explained in point 1, e.g. results from HGCAL and MDT DPGs should be approved by RC.
    - Projects (including Upgrade) can alternatively use CMS Notes (full-text format) or papers to publish results. CMS Notes can have limited author lists.

Reports

DT-DPG:

- Preparing for 2024 data-taking.
    - Porting Prompt Offline Analysis to CMSSW_14

    - Porting main rootple-based offline analyses to the format of Muon-rootples
    - (Painfully) trying to fill the offline shift schedule
- PR 43963 was sent to plug in the release latest updates of DT calibration workflow
- Caio Daumann (Aachen) was recruited to follow the autoDQM activity for DT
- Cosmic HV scan in progress: data already recorded for the requested HV points and 20mV FE threshold. We would like to add the same set of HV points with 30mV threshold (more sensitive + matching conditions before 2018), and 0T.
- New hardware problems to be dealt with software-wise: two DT chambers (YB–2/S8/MB1 and YB-2/S12MB3), not receiving gas and no longer accessible, are expected not to provide data throughout this year. Discussing:
    - How to evaluate the impact on global trigger and reco efficiency
    - How to account the faults in the Montecarlo
    - How to deal with the faults in muon reco

CSC-DPG:

- New CFEB (strip) calibration is being released - pedestals, gains, crosstalk. Some issue with noisematrix so reverted to existing values (only used in simulation).
- Anode Time calibration (rechits and then segments) looks good for 2022. Checking with 2023 now.
- CSC not convinced that Muon Alignment 'layer misalignments' are realistic - not seen when studying position resolution, and perhaps could be a result of some otherwise uncorrected rotation of entire chamber.
- We're trying to get clarification of statement in PPD announcement of XC Meeting on 23 Feb: "We need to hear from the MUO DPG (CSC) if it is possible to do the same with the CSC issue (in 2022) that led to some adjustments on the SF work done by the MUO POG;" We have no idea what this is about.
    - *Added after the meeting:* Federica tells me this is the issue of inefficiency in inner rings ME2,3,4/1 due to out-of-sync errors in the CSC readout at high rates, arising from mismatched phase1 & phase2 electronics, which then leads to some loss of Muon reco (and Id) efficiency. It seems PPD just added CSC to the list of detectors expected to provide some simulation ("to do the same" in the statement above) of whatever issues they have for the 2022-2023 re-simulation. Seems like a difficult task at CSC level :)

RPC-DPG:

- Working on the 2023 data offline analysis ongoing
- Preparing results from the HV scan with 2022 data for approval
- Working on offline analysis migration to common ntuple
- Planning to do the PR of phase2 updates soon
- Planning to update on the status of all these during the next DPG meeting in beginning of March

GEM-DPG:

- 2 GE2/1 production chambers installed

    - Sunanda prepared the geometry, PR for main and backports going through, then a tag will be prepared; also GEMGeometryBuilder being updated
    - Channel mapping needs to be updated, we have this ready, requesting a slot in acladb meeting to approve this in a tag
- We met with alcadb a few times about adding an o2o workflow for strip masking
    - Important for L1 trigger, will also be applied to the readout
    - Detector team thinks regular updates will be necessary initially, want to propagate quickly to HLT/offline also
    - Alcadb is happy for us to include this, we are working on the implementation, they put us in contact with other groups who implemented o2o for ecal
- Plan to have an HV scan with pp collisions, will request RPC monitor stream to be increased during this time
- For RPC monitor stream, the L1 GEM-CSC trigger implementers asked if we could add L1 information to the stream for some studies, need to get back in touch to see what exactly they need to add, and how big it would be

MUON ALIGNMENT:

- 2022 and 2023 re-reco is ongoing.
- For the 2024 data taking, we can start it after taking a stable beam with 2/fb and expect to update the new condition before the end of April.

RADSIM AND BKG STUDIES:

MUON ML:

Still waiting for comments on AutoDQM paper! (Got one set from Plamen Iaydjiev)
https://cms.cern.ch/iCMS/user/noteinfo?cmsnoteid=CMS%20DN-2023/024

We've made some progress on implementing new sets of **Doc1 (Online)** plots in AutoDQM, mostly following what people put in the spreadsheet:
docs.google.com/spreadsheets/d/1Bvqx-pq5qsOyRwjamzMN-_x0quZtbzxFqGzRokp6ysM

You can see some examples from 2023 here for DT, RPC, CSC, and GEM:
Home : https://cmsweb-testbed.cern.ch/dqm/autodqm
DT
https://cmsweb-testbed.cern.ch/dqm/autodqm/plots/Online/DT/00037xxxx/0003707xx/370775_370774_370772_370753_370749_370725_370717_370580/00037xxxx/0003707xx/370776
RPC https://cmsweb-testbed.cern.ch/…/RPC/…/370775_…_370580/00037xxxx/…/370776
CSC https://cmsweb-testbed.cern.ch/…/CSC/…/370775_…_370580/00037xxxx/…/370776
GEM https://cmsweb-testbed.cern.ch/…/GEM/…/370775_…_370580/00037xxxx/…/370776

I think the CSC plot selection is more or less good; for RPC I added some on top of what was initially written; and for DT and GEM, I did not implement the large numbers of very low-level

plots yet. I'd like to follow up with the experts and potential developers / reviewers / users of the new AutoDQM pages to determine a couple of things:

1) What plots should we consider adding / removing relative to what's currently deployed?
2) Should we run and/or test on other datasets besides "Online"?
3) Who can help out with running some basic tests to see the anomaly score distributions for the chosen histograms?
 * This is important for deciding what histograms and tests to include in the final version, so we don't have too many "noisy" plots.
 * We have code all set up that we can share!
4) Who can help out with training ML algorithms for the chosen histograms?
 * Again, we can share tools and instructions!
5) Who is interested in seeing additional features (even better if you can help develop the code!), e.g. pass-throughs of efficiency and summary map plots.

If you are interested in participating in the discussion for #1 and #2, or you can help with #3 - 5 (or you have a student who can), **please put your name in the "contact / developer" field** at the top of the relevant muon detector tab in the spreadsheet:
docs.google.com/spreadsheets/d/1Bvqx-pq5qsOyRwjamzMN-_x0quZtbzxFqGzRokp6ysM

I'll try to start following up with folks from each of the detector systems by early next week.

DQM CERTIFICATION AND DATA AVAILABILITY:

Common ntuple

[Carlo]

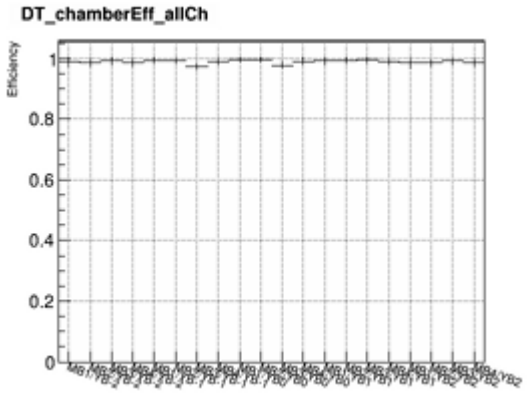
- PR 43734: remove support for int8 branches in NANO
  - all our quantities which were int8 are now int16 (7% size increase)
  - re-ntuplised Muon0 / Run2023Dv1 as reference for studies
- Also prepared a script to automatise merging of high numbers of ntuples
- Will ping cross-POG to trigger a discussion about *where* to include the ntuplization of ZMu into central workflows

TnP for DQM

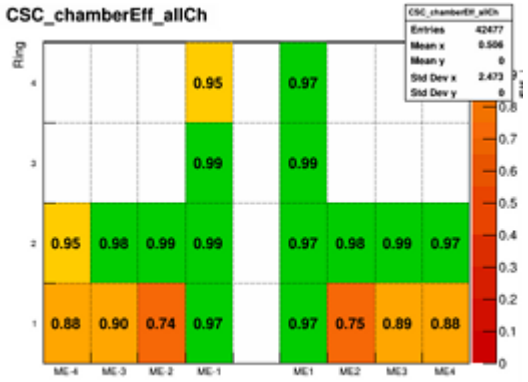
[Caterina]

- Which DQM TnP histograms do we want to move to the “Layout” folder, to be used by DOC3 DC shifters?
-

(FRC) For the DT’s this one is a good summary:



(we can discuss whether to add individual wheels with chamber by chamber info)



DOC3

[Caterina]

- If you agree, I will create a “Muon DOC3 DC candidacy form” to collect the shifters availability for 2024 (here is the 2023 one) -> we could announce it during the next GMM. We need to decide the time window (months) during which we want to have muon DOC3 shifters
    - stable collisions with enough colliding bunches (>1200) are expected starting from ~April 25, and the data taking will end on Oct 28 (with HI).
    - We could have shifters from the beginning of May till mid November? (considering a delay, as for 2023, between the DC call and the end of the data taking).

ZmuSkim

MONTE CARLO and GEOMETRY:

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AOB?

†Meeting Agenda: 14.12.2023

https://indico.cern.ch/event/1353975/

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Topics for discussion:

Reports

DT-DPG:

CSC-DPG:

RPC-DPG:

GEM-DPG:

MUON ALIGNMENT:

RADSIM AND BKG STUDIES:

MUON ML:

DQM CERTIFICATION AND DATA AVAILABILITY:

Common ntuple

TnP for DQM

…

DOC3

ZmuSkim

MONTE CARLO and GEOMETRY:

…

AOB?

†Meeting Agenda: 17.11.2023

https://indico.cern.ch/event/1348014/

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- **completed actions + name of responsible(s) marked in GREEN (e.g. DT-DPG …)**

Topics for discussion:

1. Approval steps for Upgrade plots
2. Offline DQM plots based on Tag & Probe
3. Muon Alignment plans, status of GEM alignment note/paper
4. Zmumu Skim and common Muon Ntuples
5. DPG contribution in PPD workshop
6. DPG plans for 2024 Run 3
7. Auto DQM status and paper publication plans

Reports:

DT-DPG:

- New public results:

DT performance:

CMS DP-2023/033 -- Background in the CMS Drift Tubes and detector ageing monitoring: Run 3 to Run 2 comparison

CMS DP-2023/049 -- Drift Tube Performance in 2023

Conference reports:

CMS CR-2023/229 -- The OBDT-theta board time digitization for the theta view of Drift Tubes chambers (Javier Sastro Alvaro at Twepp)

CMS CR-2023/242 -- 40MHz Trigger-less readout of the CMS Drift Tube muon detector (Matteo Migliorini at IPRD)

CMS CR-2023/288 -- Radiation Hardness and Quality Validation of the On-Detector Electronics for the CMS Drift Tubes Upgrade (Antonio Bergnoli at IPRD)

TWIKI only:

Results of DT Longevity studies (public but no note as yet)

- Updated chamber-by-chamber delays and corresponding calibration constants were released in July: corrections were applied to limit prefiring probability in chambers where RPC is switched off. (Unfortunately only little pp data was recorded with such optimized conditions)
- A new analysis devoted to monitoring trigger prefiring was developed and applied on 2023 data (to be reused throughout Run 3)
- HV scan was performed with cosmics in July and data analyzed, to minotaur aging at P5 (no hints observed so far)
- One test collision run with reduced HV (3350 V) in one layer of 3 DT chambers was recorded and analysed: no unexpected problems. We could take more next year to check for efficiency loss in the presence of background
- Some warning received by DOC3 shifter for HI certification: different muon pT spectrum causes sub-optimal plots: instructions updated
- DT plot suite for data certification updated with the addition of two trigger plots
- DT rootples produced from 2023 ZMu skim: final performance analysis in progress.

CSC-DPG:

- Interesting that HLT are investigating compressing RAW data. Does anyone know any details of what they're hoping to achieve?
- We have finally obtained CSC spatial resolution measurements for 2023. They're fine in that they agree reasonably with what we expect. But we don't precisely understand the values w.r.t HV and gas mix yet - need to review all that.
- Once more had to explain to Muon POG that Tracker Muons can have some inefficiency in the CSC region because of the CSC readout requirements: we require a Trigger Primitive in a chamber, in coincidence with a CMS L1 Trigger (not nec. Muon) before reading out. Since electronics can fail, we might not obtain a TP and then we would not read out a chamber and hence could not reconstruct a segment there. This will be a small - very small because of the redundancy of multiple stations - inefficiency, but must be there.

RPC-DPG:

GEM-DPG:

- In next year's data, our RC team want to update the masked channels in CondDB regularly (used in the clusterizer). Do other DPGs have experience with updated time varying db objects? How often, by what route? The RC team is proposing to use the O2O mechanism, which seems quite heavy. Do other groups use this?

MUON ALIGNMENT:

- CSC layer-level alignment is ongoing
- We found the misalignment of the CSC layer

- We expect the CSC layer-level alignment to improve the GEM-CSC alignment and bending angle for the trigger

RADSIM AND BKG STUDIES:

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MUON ML:

DQM CERTIFICATION AND DATA AVAILABILITY:

Common ntuple

- Reiterated with cross-POG on PR: #43065
- Added muon workflows to runTheMatrix.py

TnP for DQM

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DOC3

- Last DC call for HI this week: all good except runs 375607-375631 marked as BAD by CSC because of the Maraton issue (18 chambers off) for ME+1.
    - Also seen by muon POG in phi distributions for different muon ID (Medium, Loose, Soft, …) : DQM link
    -

ZmuSkim

- Few slides in the agenda

MONTE CARLO and GEOMETRY:

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AOB?

†Meeting Agenda: 25.08.2023

https://indico.cern.ch/event/1318314/

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Topics for discussion:

8. New Muon DPGO Representative - discussion
9. AOB
    a. https://twiki.cern.ch/twiki/bin/view/CMS/RunCoorDPG_PlotApprovals
    b.

Reports:

DT-DPG:

CSC-DPG:

RPC-DPG:

GEM-DPG:

MUON ALIGNMENT:

- 2023 muon alignment
    - Update alignment with Era D if there are large displacements
    - Check pp reference runs
- 2022 end-of-year alignment
    - Waiting for the tracker alignment update

RADSIM AND BKG STUDIES:

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MUON ML:

- 4 weeks ago gave AutoDQM tutorial for Muon Doc3
    - https://indico.cern.ch/event/1310545/#5-autodqm-for-muon-dc-hands-on
- Hoping for more follow-up on list of best histograms to include in Muon Doc3 workspace

    - https://github.com/AutoDQM/AutoDQM/blob/add_muondoc3/config/Muon_DOC3.json
    - At this point can only test occupancy histograms (with Poisson statistics)
        - For efficiency plots, can use numerator plot, for example - still sensitive to variations in efficiency
    - Once plot list is finalized, can train ML anomaly-detection algos
- Performing "meta-studies" on 2022 data showing strong performance of both statistical tests (chi2, max pull) and ML algos (PCA, AutoEncoder) in flagging "bad" runs
    - https://indico.cern.ch/event/1318438/#2-autodqm-paper-and-performanc

DQM CERTIFICATION AND DATA AVAILABILITY:

Common ntuple

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TnP for DQM

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DOC3

MONTE CARLO and GEOMETRY:

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AOB?

†Meeting Agenda: 30.05.2023

https://indico.cern.ch/event/1301827/

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Topics for discussion:

10. Common Muon Ntuple - discussion:
    - **Last presentation at cross-POG workshop**
    - Produced ntuples out of (some) Run2023C ZMu skim, validation ongoing:
        - DT: added one missing variable, tested TnP analysis
        - CSC: debugging one bug (occurring sporadically) that stops jobs
        - RPC: started validating variables, need to add propagated DT/CSC segments
        - GEM: must cross-check propagation of muon to second GEM layer
    - Plan:
        - Fix above (minor) issues: **can be done by mid July**?
        - Second PR (+ backport to 13_0_X)
        - **Attempt central production at T0 close to end of 2023 run** (bold)
    - For discussion:
        - We need ntuple analysers to start using them and provide feedback, **can DPG conveners ensure that this starts happening**?
        - **Should we establish some type of milestone** (e.g. approve some ntuple-based results by this fall)?
        - Do we need **any sort of tutorial**?
        - We have set up an EOS area to run on ZMuSkim, ExpressPhysics, Prompt (GEM) ntuple production, **should agree about how to use this area**.
11. Muon DPGO EPR tasks
12. Muon DPGO report at GMM - on 10th of July (TBC)?

Reports:

DT-DPG:

Since last DPGO meeting:

- New DPS CMS DP-2023/033 (twiki) on effect of Alberto's shields on Run3 background in the DTs
- Successful development and test of automation workflow for DT analyses (Carlo)

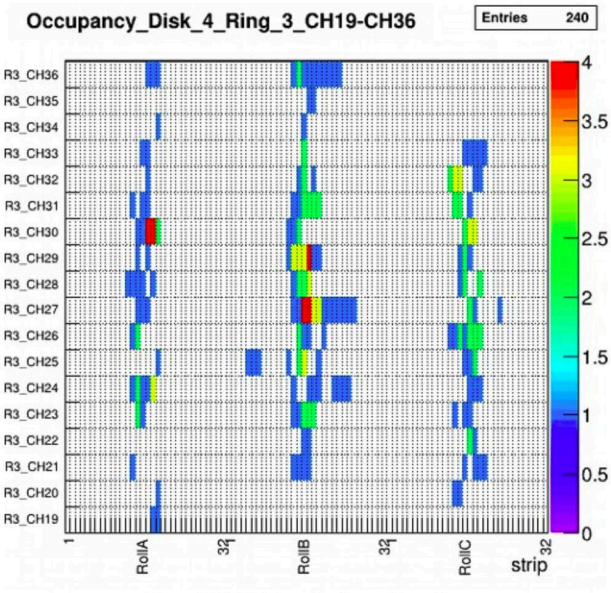
- New chamber delays applied to damp prefiring rates where RPC BX-id is not available and to adjust timing in YB2/S1 where another Slice Test was installed (change of cable length). Calibration constants being checked and adjusted accordingly, if necessary (O1-2 ns).
- We are planning a deep check of efficiency at P5 to monitor possible ageing: this will require running for 1 Fill or so, with reduced HV on a few single layers.
- A strategy for quick routine checks of background variations was discussed and agreed

CSC-DPG:

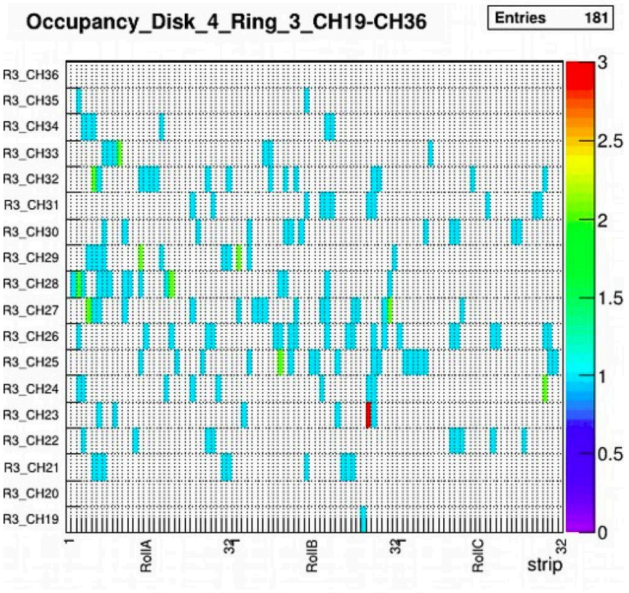
Need to get some lumisection-granularity in DQM. How are other Muon groups handling this? It is not at all clear to me how this works.

RPC-DPG:

RPC RE+-4 missing rechits - Fixed in 2023D experimental data since Run 369374
Should give effect also in the DQM Efficiency plots once we have the Muon stream back
Fix for MC is expected soon



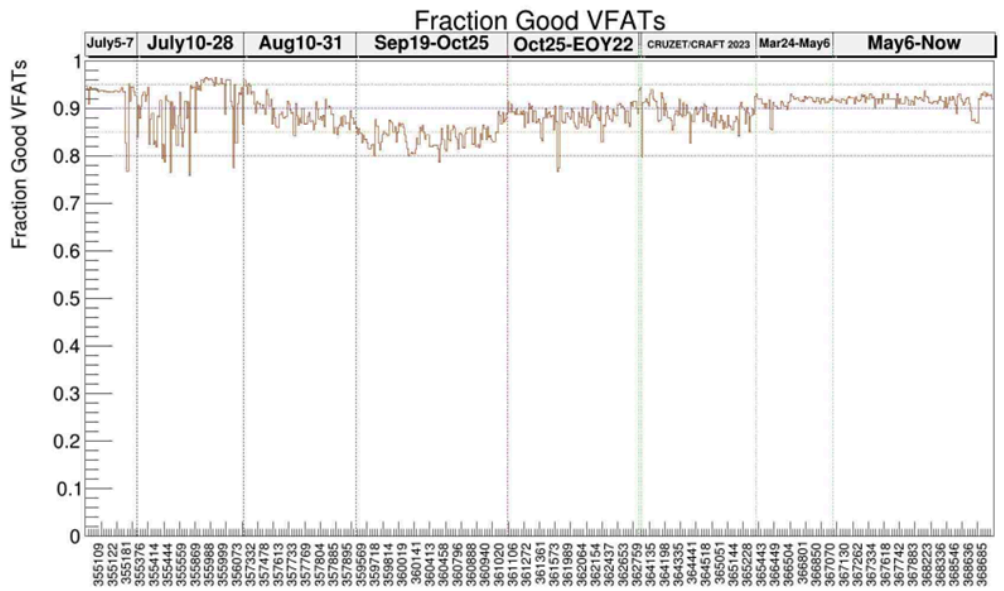
Run 367044 – before the fix
CosmicsPromptReco - DQM
Wrong occupancy distribution



Run 369389 – after the fix
StreamExpressCosmics - DQM
Uniform occupancy distribution as expected

GEM-DPG:

- ***DOC2***



Stable …

- ***RPCmonitor – offline code is ready for HV scan. DQM code in progress***
  - *Muon rate: ~1.6M STA muons on each GE1/1 endcap with pT > 20 GeV in Run 367661 (unprescaled, high rate) at 109 pb-1 ⇒ 44.4 k muons / chamber / endcap*
  - *100 pb-1 is good enough for 6 HV scans.*
  - *We contact people (CMS RC) when we need to take a high rate run..*

MUON ALIGNMENT:

- Alignment check and update after TS1
- Rereco (offline) alignment

RADSIM AND BKG STUDIES:

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MUON ML:

… to set a time for a tutorial and hands-on session

DQM CERTIFICATION AND DATA AVAILABILITY:

Common ntuple

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TnP for DQM

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DOC3

- All muon DOC3 shifts for 2023 are assigned
  - Shawn took the first 2 weeks of August which were the last uncovered ones

MONTE CARLO and GEOMETRY:

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AOB?

†Meeting Agenda: 05.05.2023

https://indico.cern.ch/event/1281956/

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Topics for discussion:

13. Data taking - any common issues
    a. Release and data validation - follow up the validation jamboree
14. Data certification readiness
    a. If no shifter in the summer - certification per subsystems
15. Plots for Muon approval
16. Muon week in Bari - DPGO session agenda
    https://indico.cern.ch/event/1254150/timetable/?view=standard#day-2023-06-05
    05.06 Monday, 15:00 - 18:30 (3h minutes)
    Chair of the session - Caterina

1. Welcome and brief summary of the DPG work and DC - 20 minutes
2. 2. Common muon ntupples - next steps 20 minutes
3. 3. Update on the outcome from the Automation Hackathon 20 minutes
4. coffee break 20 minutes
5. 4. Detector performance results - report on the latest results + plot for approval (optional) (60 minutes)
   DT 15 minutes
   CSC 15 minutes
   GEM 15 minutes
   RPC 15 minutes

10 min break

17. Muon alignment report 20 minutes
18. AutoDQM?

Reports:

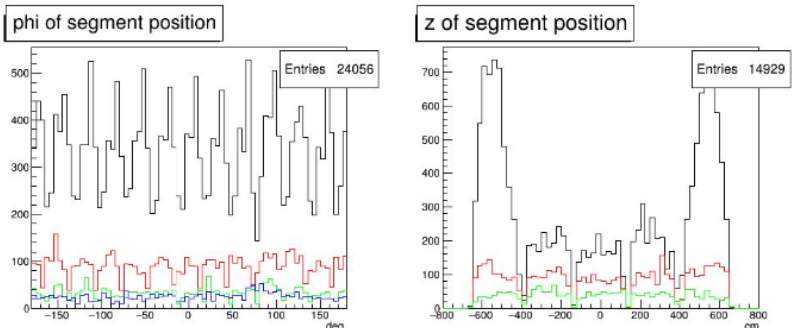
DT-DPG:

- Studies of local trigger performance
    - A workflow was developed to monitor the trigger pre-firing probability. With 2022D data (ZMu skim) it was found to range from ~2% (chambers with RPC info available) to ~9% (chambers with no working RPC). Pre-firing probability is being mitigated with fine tuning of delays.
    - Preliminary results on local trigger performance in 2022 show average efficiencies ranging from 92% to 97% for the 4 stations. Efficiency is worse in chambers with no RPC info available.

- A DPS is being prepared with comparison of background observed in Run 3 (2022) and Run 2 (2018) and also including results of ageing monitoring at P5 (HV scans): targeting O&M this Monday (May 8)

- The schedule of DT offline shifts (DT-DOC#2) is finally almost covered (just two vacant weeks until end of October)

- With increasing luminosity nice muons have started to appear in the muon barrel since last week



CSC-DPG:

-Data taking seems smooth. Inner rings 2,3,4/1 still very inefficient and a lot of work is going into trying to fix that (from CSC Operations). Rechit and segment times shifted to -1BX in inner rings too (CSC Operations also working on that.)

-An issue is that rechit distributions in Muon0 and Muon1 are very inhomogeneous - may be the contribution of the HMT. I am doing DC based on ZeroBias (which are, as usual, homogenous and symmetric.)

-Matt Herndon would like to get some of his local efficiency plots from 2022 approved. We need to decide which it would be useful to approve.

RPC-DPG:

We restarted the daily offline analysis. The RPC offline shifts are covered to the end of May.

The summary of offline results are summarized on the dedicated page.

We want to start some basic analysis with the common n-tupple, starting with a simple validation analysis.

GEM-DPG:

- In the previous week, No loss of Lum due to GEM at Lum(OMS) ~ 0.8 fb-1. %goodVFAT >~ 90% (stable).
    - 680 uA (3b - 398b) → 670 uA (398b - 986b). See https://indico.cern.ch/event/1281806/#306-report-on-data-certificati
    - 4 May at 11:30 GVA: the HV working point is again returned to 680 uA current divider. Later today LHC will have fill with 1200 bunches.

MUON ALIGNMENT:

- we are working on Run2023B (~1/fb)

RADSIM AND BKG STUDIES:

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MUON ML:

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DQM CERTIFICATION AND DATA AVAILABILITY:

Common ntuple

Last update at xPOG went fine. They will discuss at the ORP on Tuesday about the responsibilities for the DPGAnalysis/MuonTools package that we are creating (will be likely assigned to xPOG).
The package with examples:
https://gitlab.cern.ch/cms-muon-dpgo/MuonDPGNtuple_Examples
Should now be visible by anybody with a CERN account.

TnP for DQM

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DOC3

MONTE CARLO and GEOMETRY:

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AOB?

†Meeting Agenda: 21.04.2023

https://indico.cern.ch/event/1278500/

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Topics for discussion:

19. Data taking readiness
    a. Waiting for 13.6 TeV

Muons expressed interest in having a lower prescale for

- "HLT_ExpressMuon" with a target rate ~7 Hz (we asked for > 20-25 Hz) (jira ticket)
- "HLT_Mu17_TrkIsoVVL_Mu8_TrkIsoVVL_DZ_Mass3p8", target rate ~1 Hz
  - in the Express Stream during the ramp up in order to have a reasonable number of muons even when the number of colliding bunches is quite low.
- RPCMonitor stream (for RPC and GEM)
  - ~100 Hz (if possible) after the discussion with HLT DOC (thanks to Daniele Trochino)

20. Data certification readiness
    a. If no shifter in the summer - certification per subsystems
21. GMM on Monday
    a. Very preliminary draft - link

Reports:

DT-DPG:

We will participate in the PPD Automation Hackathon.
Overall data looks good, but we are mostly using cosmics still, with 900 GeV data we check essentially occupancy.

CSC-DPG:

Data in CRAFT and collisions running look ok. Very very little in collisions so far: 450 GeV x450 stable beams and 6.8 TeV x 6.8 unstable beams

RPC-DPG:

Still problem with RE+-4 geometry

GEM-DPG:

- GEM will operate at lower HV and monitor trips during LHC ramping up the luminosity. Then gradually increase HV to nominal value.
- (new to GEM)
    - GEM DOC2 offline shifts: “running” - weekly report at GEM RC meeting
    - GEM TnP: “ready” - codes in 13_0_pre3. Setting-up for the DQM tests
    - GEM autoDQM: the GEM package in the central framework. Waiting for good data (reference). Monitoring (i) occupancy and (ii) CLS in the first phase.
- GE2/1 in 2023: We have one demonstrator at phi = 16 at the positive endcap. By default. GE2/1 digis are created, but not rechits. If GE2/1 rechits would have been made, then it would be used in the muon object (reconstruction).

MUON ALIGNMENT:

- Ready for 2023 data-taking:
    - CMSSW_13_0_X tested
    - ME1/1 alignment issue: TBMA requires at least 5 layer hits but some CSC chambers have less than 5 layers → Manually check and fix
- Plan
    - Before the physics run (mid. of May), we plan to update the muon alignment for the trigger

RADSIM AND BKG STUDIES:

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MUON ML:

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DQM CERTIFICATION AND DATA AVAILABILITY:

Common ntuple

- PR #38226 updated including all comments right before Easter (waiting for xPOG feedback)
- First version of private production workflow deployed and running
  BASE area: /eos/cms/store/group/dpg_muon/MuonDPGNtuples
    - Documentation and scripts to be improved but they work
    - Exercised workflow on ExpressPhysics from 900 GeV run:
      /eos/cms/store/group/dpg_muon/MuonDPGNtuples/validation/
      MuDPGNtuple_nanoAOD_Run2033A_Express_900GeV_20230419.root

TnP for DQM

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DOC3

MONTE CARLO and GEOMETRY:

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AOB?

†Meeting Agenda: 24.03.2023

https://indico.cern.ch/event/1269198/

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Topics for discussion:

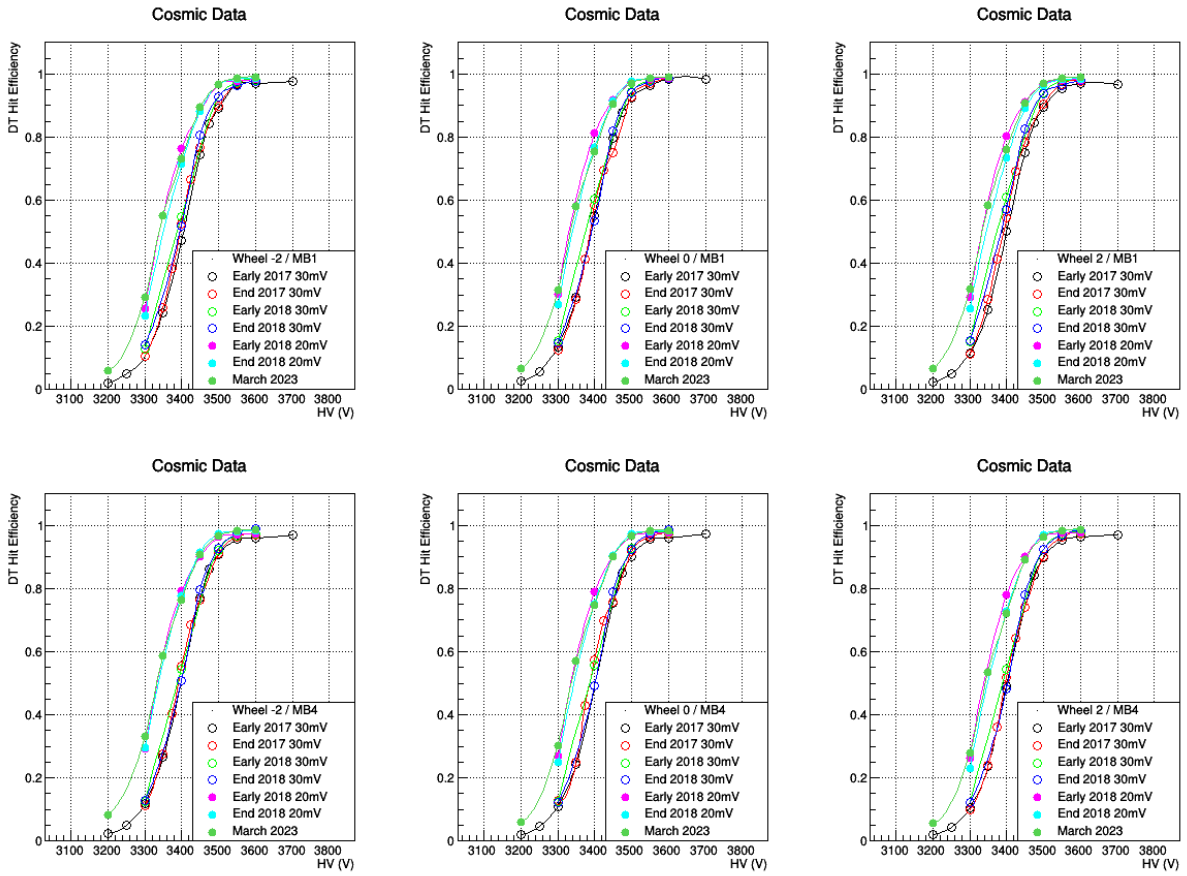
22. Possible MC improvements in the detector simulation
    a. https://docs.google.com/document/d/1i1WYvcHf-mghafcA-KmZRdOAJk342ddcK2s4l6mMG1Q/edit?usp=sharing
    b.
23. Data certification readiness
24. Data availability - please, scroll down to report from Caterina

Reports:

DT-DPG:

- Detector performing very well during CRUZET and CRAFT (since yesterday an HV problem affects 3 sectors in the central wheel → updated short term DQM instructions)
- An HV scan with 8 HV points was done to monitor efficiency through time (ageing). Preliminary results look comforting
- The Prompt Offline Analysis code was ported (and is working) in CMSSW_13_0_0
- We still lack offline shifters (CRUZET was entirely covered by Francesca and CRAFT by Carlo)
- Waiting for the updated “map” of working RPC chambers before re-optimizing the local trigger fine synchronization.

HV SCAN: COMPARISON OF 2023 RESULTS WITH PREVIOUS YEARS



CSC-DPG:

- CRUZET and CRAFT look fine
- I made a very long entry in the Run Coord google doc on Simulation - this is of course just about the digitization part of simulation. I believe the GEANT4 part of the simulation is presumably fine, and the CSC geometry description used by GEANT4 is as realistic as we can make it.

RPC-DPG:

… The Prompt Offline Analysis code was ported (and is working) in CMSSW_13_0_0 and also the plugins were updated to the actual type requested by CMSSW managers (before more than a year). The code is about to be tested with recent data and the shifter's instructions will be updated accordingly.

GEM-DPG:

- TnP: PR for the GEM has been made to master and backported to 13_0_X for testing by the DQM team (we are checking with the DQM experts about the schedule for updating),
- AutoDQM: Ready to be launched on the central site as GEM is included in AutoDQM test-bed website (https://cmsweb-testbed.cern.ch/dqm/autodqm/). All plots are to be monitored by GEM DOC2 (offline) shifters.

- PRF-21-001 (Run3 detector) … Proposed a “new subsection” on (i) development of ME1/1-segment back-propagation and (ii) measurements of bending angles (Z → mumu events in 2022) to Kevin Black (GEM editor).
    - **5.4.8 Preliminary Commissioning Results**
        - Test beam at the CERN H4
        - 2021 CRUZET/CRAFT
    - **5.4.9 First measurements of pT dependent bending angles (NEW) …** 3 paragraphs, 3 figures (have to be approved by GMM → CMS RC → WGM later), 2 references. An example of the figure is below.

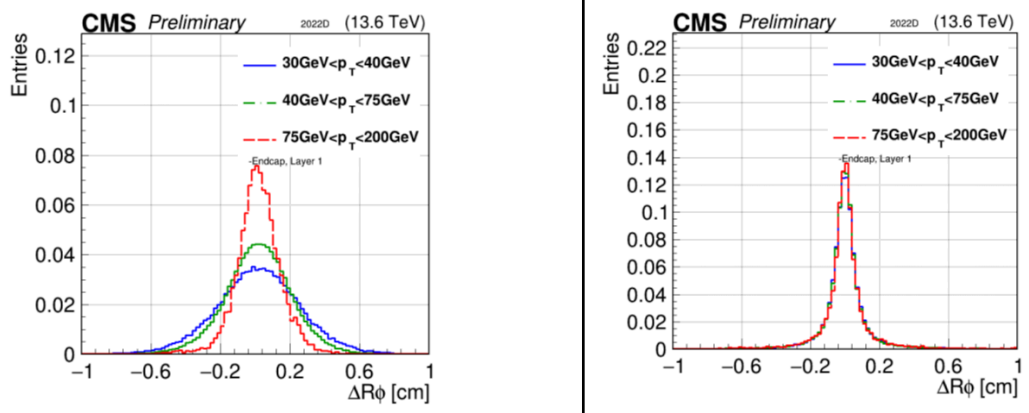
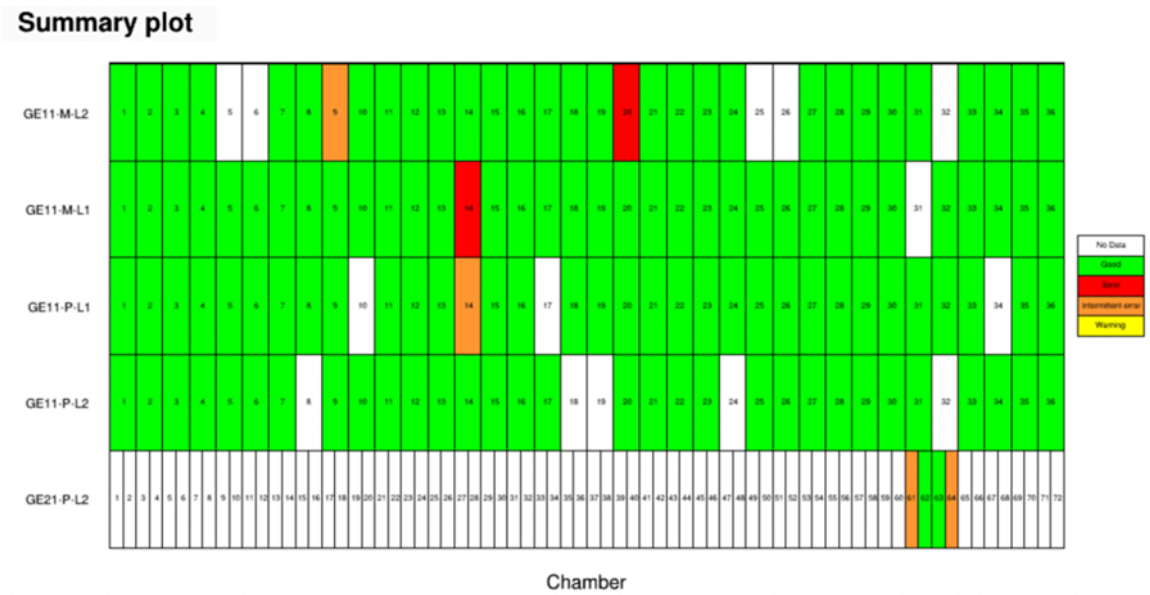


Fig. 2: Distributions of residual (RdPhi) between GEM hits with propagated positions from tracker track (left) and ME1/1 segment (right) for muons (pT> 30 GeV) in a sample of Z events in 13.6-TeV pp collisions in 2022. The ME1/1 segment propagation provides an accurate and momentum independent alignment.

- Online DQM summary plot for Run 364997 (11 hr cosmic run).



Online DQM summary plot for Run 364997 (11 hr cosmic run). Note: “GE21-P-L2” demonstrator (4 modules = 4 rectangular boxes) is placed in the Layer-1 position in 2023.

MUON ALIGNMENT:

- Test the latest CMSSW for TBMA
- ME1/1 layer-level alignment with the 2022 dataset
- GEM-CSC bending angle study

RADSIM AND BKG STUDIES:

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MUON ML:

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DQM CERTIFICATION AND DATA AVAILABILITY:

Status of skim check?

[Caterina]
-> Regarding rate of the **HLT_ExpressMuons**:

- Do we want to ask for a reduction in prescale during the ramp up?

-> FYI, the L1 prescales of "L1_SingleMu5/7" seeds have been increased for 2023: CMSLITDPG-992

- I don't think this will affect the rate of **HLT_ExpressMuons** or **RPC monitoring Stream**
    - HLT_ExpressMuons is made up of OR of HLT_IsoMu{20,24,27}
    - RPC monitoring Stream is seeded by {L1_SingleMu5 OR L1_SingleMu7 OR L1_SingleMu18 OR L1_SingleMu20 OR L1_SingleMu22 OR L1_SingleMu25}

Otherwise, we can ask for a reduction of the prescale at HLT level.

Common ntuple

25. Working to provide a common CMSSW_13_0_1 setup to be used for initial commissioning
    a. Francesco/Federica are looking into automating the job submission scripts
    b. I am providing a first 13_0_X working version
        i. All parts that were proposed to be migrated to "central" nanoAOD modules were migrated
        ii. Some quantities are now produced both with the old and the new code, must test that old/new version are identical before removing old code
    c. We are meeting later today to review the progress

TnP for DQM

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DOC3

Seven people registered gave their availability for the muon DOC3 DC shifts for this year

- Indico: https://indico.cern.ch/event/1253837/
- First shift - middle of May
- To send the tutorial with video records to the shifters, to give time to them to try and after than to organize a Q&A session during some of the next of the next GMM (or DPGO)

MONTE CARLO and GEOMETRY:

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AOB?

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†Meeting Agenda: 10.02.2023

https://indico.cern.ch/event/1253159/

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Topics for discussion:

26. **08.Feb** Wed Status report on the common **muon NanoAOD ntuple at Cross-POG, Carlo**
    a. https://indico.cern.ch/event/1237819/timetable/?view=standard (action items here)
    b. GitHub PR link
    c. Apart from the Cross-Pog meeting, we have to discuss our readiness to use the ntuple and to migrate the analyses, etc.
    d. Other recent progresses (beyond integration)
        i. F. Ivone: analysis examples in python
        ii. F. Simone: add general information that we need

27. **20 - 21 Feb** (Monday - Tuesday) **AlCaDB Workshop**
    a. Muon subsystems reports on Monday afternoon (after the coffee break)
    b. https://indico.cern.ch/event/1241375/

28. **1-3 March** (Wednesday - Friday) **CMS Run Coordination and DPG Workshop 2023**
    https://indico.cern.ch/event/1237819/
    From Andrea: We would like to ask you one talk (30') to cover the Muon DPG status.
    In particular, we would like that your talk cover the following points:
    - Any need of PCL
    - Skim needs
    - Review of actions in the first months from data taking and special needs
    - Status of detector at the beginning of 2023 (e.g. % active channels)
    - Residual developments in CMSSW for Run 3, plans for software (simulation, digitizer, local reco ,..) for Run3
    - DQM, Validation, Certification plans
    - Plans for Alignment, Calibration & Conditions
    - Do you have any projection in terms of ageing, in particular in view of high PU?
    - Do you have any needs in terms of MC samples?
    - Special run configuration (isolated bunch, low pu, 900 GeV fill)

    Feel free to extend this list and propose other topics.
    Please let us know the name of the speaker.

29. **9-10 0.3** (Thursday - Friday) **Phase-2 Software Days**, announced in the plenary Offline and Computing report (slide 9) - link
    a. How we are going to organize our report!
    b. How are the Phase2 upg sw organized per subsystems? Are they shared with Upgrade offices?
    c. Some possible questions:
        i. When can you be ready with the final RAW format? Are there obstacles which prevent you from delivering it in 2023?
        ii. What is the status of the Phase-2 reconstruction in your POG/DPG? Are you facing any obstacles?
        iii. What prevents you from developing code and transforming the existing one in a version which is accelerator friendly, i.e. expressed through Alpaka?
        iv. Are the Phase-2 objectives for software expressed clearly enough for you to allow planning?

30. **Add GEM data to RPCMonitor Strea**m - presentation to **TSG group (Ian Watson)**, jira ticket
31. Manpower for offline background analysis in CSC (Hualin is not available because preparing several applications for permanent position.

Reports:

DT-DPG:

- Offline DT rates and hit efficiency were compared in Fill 8456 (peak PU=75) and Fill 8149 (peak PU=46) in order to spot any problems in view of increasing PU in 2023.
    - No significant effects were observed
- DT Prompt Offline Analysis is running in CMSSW_12_6_3 on MWGR#1 data
    - (good data so far! Run 363427)
- Trying to fill the DT Doc2 (offline) shift schedule (< 50% so far)

CSC-DPG:

- CSC looks fine in Express DQM for last night's MWGR - rechits in all stations https://tinyurl.com/2b3huujk

RPC-DPG:

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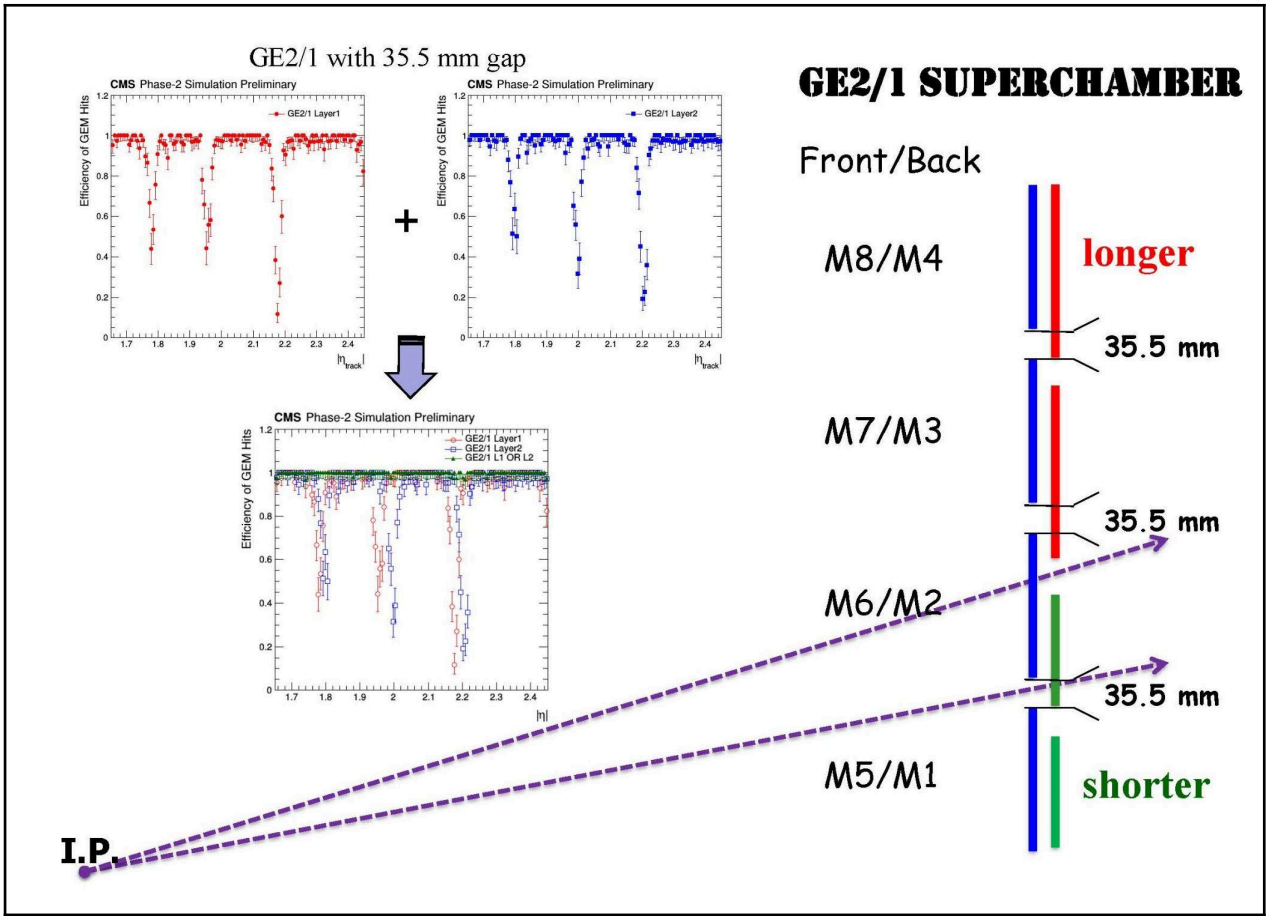
GEM-DPG:

- **GE2/1 demonstrator in 2023: Layer 1 (was Layer 2 in 2022).**
    - Geometry change in CMSSW is planned.



Schematic drawing of GE2/1 detector Layer 1 ("front") and Layer 2 ("back"). Modules 1~4 (red and green) were at the Layer-2 position in 2022. The same modules after refurbished at 904 are placed at the Layer-1 position at P5 for the 2023 operation.

- **RPC monitor stream for the GEM detector in 2023**:
    - Two changes: (a) increase the eta cut from the L1 muon trigger from 1.9 to 2.4 and (b) add the GEM rechits and status objects into the RPCMON data stream.
    - The data size is increased by about 33% (2022 data) mostly due to (a).
    - We presented this to TSG [1] and they will implement the changes for us in the HLT, which can be followed on the JIRA ticket [2].

[1] https://indico.cern.ch/event/1245151/#36-adding-gem-into-rpc-monitor

[2] https://its.cern.ch/jira/browse/CMSHLT-2605

MUON ALIGNMENT:

- GEM-CSC bending angle
    - Despite the alignment, a few chambers still exhibit incorrect bending angle distributions
    - We are working on this issue with some misalignment scenarios

RADSIM AND BKG STUDIES:

- *In contact with Sophie Mallows - from now on 1 radsim results&requests meeting/month*
    - *Implementation of detailed ME1/1 geometry: in advanced state; expect results at next radsim meeting*
    - *Listed up work items for 2023:*
        - *Correct implementation of DT shielding in MB4 (currently bugged)*
        - *implement correct geometry in the barrel: 2 RPC layers in first 2 stations; RB3 and RB4 inside w.r.t. DT chambers*
        - *Trial to have scorings only in gaseous volume (not for webtool but for offline analysis and estimate of HitRates out of the particle fluxes provide)*
- *Problem with data downloading from BRIL Radsim website - reported by daniele, confirmed by Piet, no action taken yet*

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MUON ML:

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DQM CERTIFICATION AND DATA AVAILABILITY:

- We've just (14:30) received email from DC group about the HLT split of Muon into Muon1 and Muon2. Even event numbers to Muon1, odd to Muon2. They ask if this is an issue for Muon DC, and if we'd need the datasets merged later (for DQM, I think they mean).
- For CSC this isn't an issue but we would want both Muon1 and Muon2 processed through CSC DQM. CSC does not need the datasets merged, I think.

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Common ntuple

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TnP for DQM

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DOC3

I’ve prepared a draft of the call for the muon DOC3 DC shifters (the dates used are only a placeholder)

- Indico: https://indico.cern.ch/event/1253837/

Let me know whether you have comments/suggestions!

MONTE CARLO and GEOMETRY:

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AOB?

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†Meeting Agenda: 20.01.2023

https://indico.cern.ch/event/1244564/

Colour/text coding:

- please underline the part of the report that you want to discuss or that requires explicit feedback.
- please add text to bullets with … if you want to report something specific on a given topic
- **open actions + name of responsible(s) marked in RED (e.g. DT-DPG …)**
- **completed actions + name of responsible(s) marked in GREEN (e.g. DT-DPG …)**

Topics for discussion:

32. Proposal for a new trigger office or sub-task - internal discussion and our understanding
    a. Trigger upgrade office with two coordinators - barrel + endcap with a focus on the upgrade and integration activities
    b. Run3 - trigger primitives performance under muon dpgo: If a cross coordination is needed we can invite the trigger office to the first part of our Muon DPGO meeting, like we do with Muon POG..
33. Any constraints on the DPG work, caused by the 904 ongoing repairment activities?
    a. No, we do not expect
34. Plans for the common Muon DPGO activities in 2023
    a. Run3 Performance paper/DPS
        i. Muon dpgo public results - page
    b. Approved results - better organization
35. Common RPC+GEM AlCa stream - an extend of the existing RPCMonitor stream
36. Data availability check - a “new” common task
    a. To check the availability of express data and the event content, the trigger menu, the rates are the same - Caterina
37. Plans for next Muon DOC3 DC shifts
    a. With the start of physics runs - 15.May - 15. November.
    b. To send a call for shifters in the beginning of February
        i. Depending on the subscribed people, we can organize a tutorial.

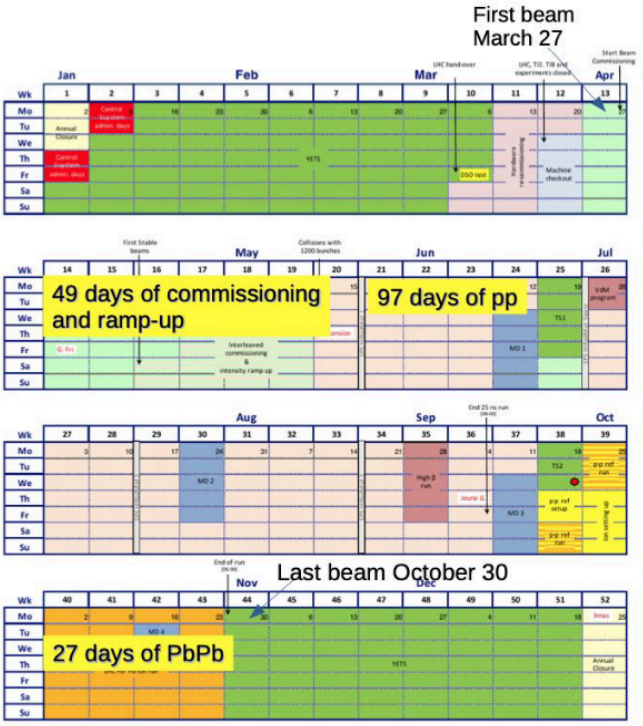
Schedule for 2023

2023 is a short year for pp physics due to early YETS and extended ion run:

- ~13.5 weeks of pp physics
- ~4 weeks of ion physics
  + ~1 week of pp reference run

Dates to keep in mind:

- First beam in 2023 on March 27th
- First Stable Beams on April 22nd
- Start of physics run on May 15th
- Last day of pp physics: September 12th
- Start of pp reference run on September 21st
- Start of ion physics on October 2nd
- Last day of beam in 2023: October 30th



Reports:

DT-DPG:

- DT background rate was checked in Fill 8456 with peak PU = 75:
  - both prompt and delayed components seem to be compatible with Fill 8149 (PU=46)
  - Efficiency should also be checked.

- The DT aging simulation is being revised with the aim to get limits on worst scenario to expect at the end of HL-LHC in terms of muon reconstruction efficiency

- A “pre-call” was issued for DT offline shifts (DT DOC2)

CSC-DPG:

- The hadronic-shower-in-muon-system people have added CSC and DT rechits to AOD. This seems to be accepted temporarily so they can make further studies from AOD. I’m a bit nervous that they’ll build some complex analysis on rechits, when that’s not really merited, since the reco of rechits (and segments) has not been designed for showering environments. [But Slava says they’re just trying to make the data available, rather than developing more complex algorithms, so it seems fine to me to add rechits.]

RECO Conveners ‘asked’ for ‘reduced rechits’ (as ECAL does) in which most of the rechit information is dropped, so adding rechits leads to only a minimal increase in the AOD size (Adding muon rechits seems to increase size by ~1%, I believe, but they consider this ‘too much’.) I am not happy to support ‘reduced CSC rechits’.

RPC-DPG:

restart of the activities - first meeting next week

GEM-DPG:

- **Improvement of GEM monitoring:** GEM DPG is investigating the possibility of GEM hits being included in the RPCMonitor stream or (a) GEM efficiency studies and (b) monitoring of VFAT status.
- **Restart of Full scale analysis of GE1/1 efficiency** with 2022 ReRECO samples, “**Flower event**” analysis
- **GEM-CSC bending angle (BA): implementing and testing ME2/1 back-propagation on GE2/1 demonstrator** (should be put back in P5) for alignment and BA study using 2023 data
- **Adding GEM Trigger Primitive plots to the GEM DQM**

MUON ALIGNMENT:

- Preparing new run
- How to use HW alignment information to improve TBMA

RADSIM AND BKG STUDIES:

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MUON ML:

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DQM CERTIFICATION AND DATA AVAILABILITY:

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Common ntuple

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TnP for DQM

- Fix GEM edge calculation for TrackerMuon PR made https://github.com/cms-sw/cmssw/pull/40554
- Will make a PR to add GEM to common TnP after this goes through

DOC3

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MONTE CARLO and GEOMETRY:

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AOB?

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