Tracker DPG News

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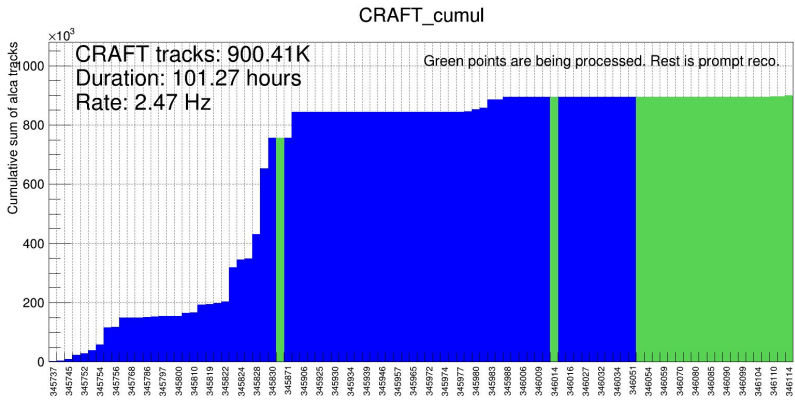
Tracker DPG - Tracking POG General Meeting
CERN, 26 October, 2021

Open position (URGENT)

- The is an open position for the **L3 conveners for the TRK POG @ HLT**
  - The main tasks are:
    - The finalization and prompt monitoring of the tracking at HLT for Run3;
    - Coordinate (and guarantee) the tracking at HLT validation task;
    - Improve the online vs offline performance comparison;
    - Support other POGs and PAGs development;
    - Support the development for Phase 2;
    - Take care of the Tracker needs in terms of trigger requests etc.
  - The appointment will be for an initial period of one year, with the possibility of renewal for a second year on mutual agreement;
  - This position accounts for 2 EPRs, but the needed developments often provide extra EPRs;
  - More details can be found at the hypernews (Announcement)
  - **Nominations should be sent to cms-pog-conveners-tracking@cern.ch**

News from operations

- **Magnet:**
  - Stable at 3.8T
  - Goes to 0T on Monday
- **Pixel detector**:
  - Mostly staying in local in protected STANDBY because of the beam commissioning
  - Joining global CRAFT runs whenever allowed by the beam mode (plot)
- **Strip detector**
  - NEW Leak rate
    - slightly reduced after closing certain loops
    - Investigating other hypotheses
  - power supply boards
    - one changed last week, one more to be change at the next opportunity.
  - 11 FEDs excluded (closed cooling loops) + FED 434 excluded yesterday.
- **Expecting beams already on Wednesday**
  - NEW Two days in advance w.r.t. original plan

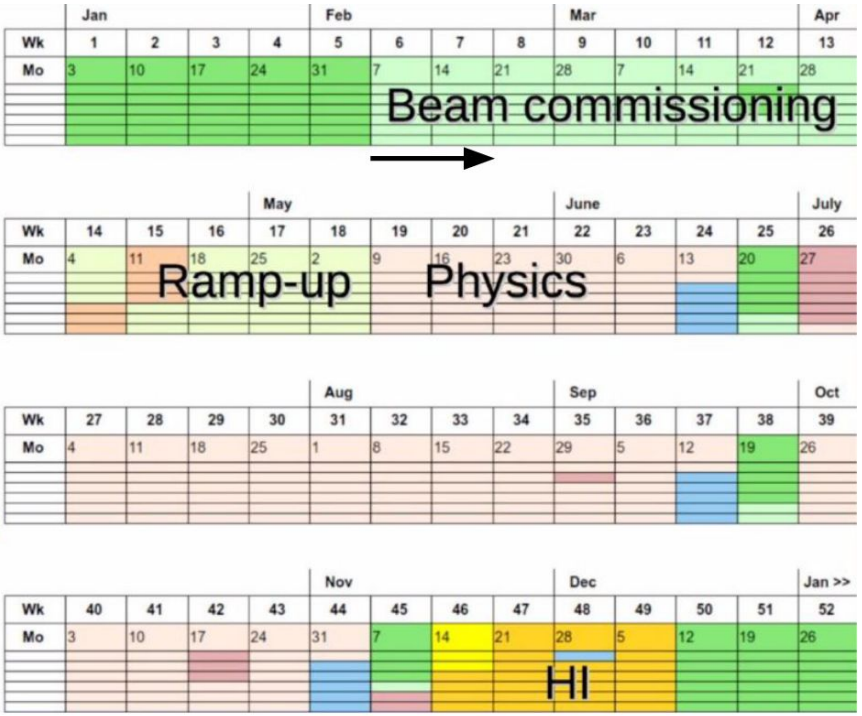


Towards Run3 data-taking

- **“CRAFT”**
  - Since last Thursday,
- **Beam Test:**
  - **Machine checkout** 15 - 20 October
  - **Stable beams** ~~29, 30, 31~~ *27, 28, 29, 30 (31?)* October
    - If magnet can not operate at 3.8T, 0T field option adopted (no intermediate value)

NEW

- **Extended Global Run** period (~10 days)
  - Replacing planned MWGRs in October and November
  - Dates to be specified
- **CRAFT**: 24 Jan - 21 Feb
- ***pp* collisions**
  - 7 Mar: first beams
  - April: ramp-up/first collisions
  - May: physics running



Pilot Test Beam

- Beam parameters
  - See table
  - 3 circulating bunches (2 colliding in CMS)
- New triggers introduced:
  - JIRA-CMSHLT-2169
  - JIRA-CMSHLT-2170
  - JIRA-CMSHLT-2173
  - JIRA-CMSHLT-2188

Fill length	**4-6 hours**
Number of fills with SB	**2-3**
Energy	**900 GeV**
beta*	**11m**
emittance	**3.5um**
Proton per bunch	**1.1 x 10^11**
Instantaneous Luminosity	**2.7 x 10^28 cm-2s-1**
Integrated Luminosity (20h)	**2 nb-1**
Collision rate	**2 - 2.5 kHz**
Beam spot (σ_x, σ_y)	**0.2-0.25 mm**
Beam spot (σ_z)	**55-60 mm**

From Run Coordination News

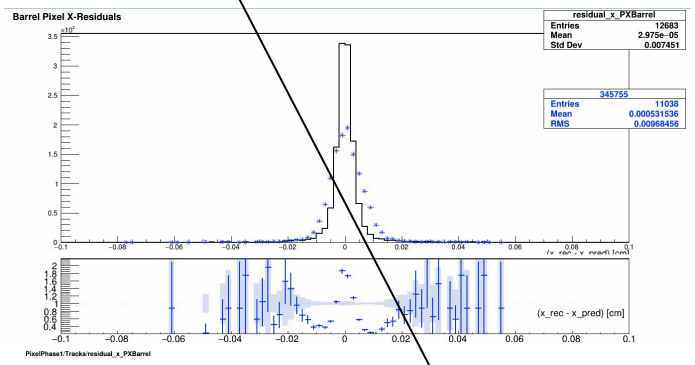
Beam Test readiness

Pilot Test Beam

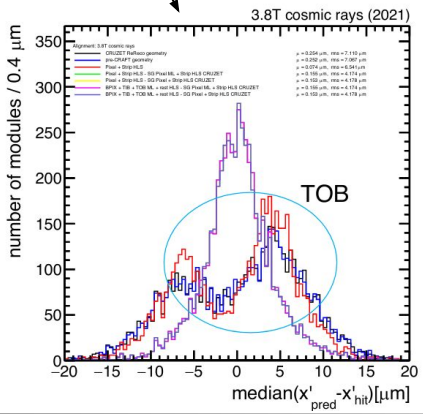
- Update trigger bits
  - ALCARECOs (Gdoc)
    - `HLT_*PixelClusters*` and `HLT_L1ETT*` ***added to*** `SiStripCalMinBias`, `SiStripCalZeroBias`, `SiPixelCalZeroBias`, TkAlMinBias
  - Offline DQM (HN)
    - `HLT_*PixelClusters*` and `HLT_L1ETT*` ***added to*** `SiStrip_HLT` and `Tracking_HLT`
    - `L1_ETT` **added to** `SiStrip_L1`
  - Online DQM
    - PR to be made today

Pilot Test Beam

- With 800k tracks, the alignment group has provided new conditions
  - Sign-off at AlCaDB (talk)
  - Tags: `TrackerAlignment_CRAFT21_v0` (announcement, deployment)
  - Full-track validation (announcement, JIRA)
  - Fixes double-peak structure in TOB DMRs
    - Probably related to the fact that we aligned TOB as ML with CRUZET data
    - Further investigations ongoing



- Reconstruction strategy for beam test data
  - Standard Prompt
    - Delay of 48h as in Run-2
    - Just validate PCL (produced but not deployed)
  - Immediate ReReco (< 1 week)
    - Up to one week of delay
    - Refine alignment to ML in pixel
  - 121X ReReco (~mid November)
    - Rerun alignment if new CPE



DQM & Data Certification

- DQM restarted the TkOffline shifts for data quality monitoring and data certification this week
- Schedule for the upcoming weeks:
  - 11-17 Oct: FNAL
  - 18-24 Oct: FNAL
  - **25-31 Oct: Saha**
  - 1-7 Nov: DESY

- The Tracker DQM team has organized three tutorials on the Data Certification procedure:
  - A tutorial on Certification Helper, June 25th link
  - A tutorial on Tracker Data Certification process, July 2nd, link
  - Tracker DQM shift practice session, July 9th, link
    The recordings of all tutorials are available and are uploaded to the corresponding indico agendas;
- In case you have missed the tutorials, please go through the recorded videos:
  - In case of any doubt, please contact Tracker DQM conveners cms-trk-dqm-conveners@cern.ch.

Release schedule reminder: 11_2_X

- **11_2_X**, release for the migration to DD4HEP and DPG developments for Run-3: schedule twiki
  - Latest releases built:
    - **CMSSW_11_2_0** (Announcement, Dec 17th, 2020)
    - **CMSSW_11_2_1** (Announcement, Jan 30th, 2021)
    - **CMSSW_11_2_1_patch2** (Announcement, Feb 5th 2021)
      - Used for MWGR #1
    - **CMSSW_11_2_2** (Announcement, Feb 17th, 2021)
    - **CMSSW_11_2_2_patch1** (Announcement, Feb 19th, 2021)
    - **CMSSW_11_2_3** (Announcement, Mar 5th, 2021)
    - **CMSSW_11_2_4** (Announcement, Apr 8th, 2021)
    - **CMSSW_11_2_4_patch1** (Announcement, May 19th, 2021)
    - **CMSSW_11_2_4_patch2** (Announcement, June 3rd, 2021)
      - #33905 from @mmusich: do not print SiStrip O2O passwords in clear [11.2.X]
    - **CMSSW_11_2_4_patch3** (Announcement, June 6th, 2021)
      - #33949 from @quinnanm: do not print SiStrip O2O passwords in dbParams_
    - **CMSSW_11_2_4_patch4** (Announcement, June 23rd, 2021)
    - **CMSSW_11_2_5** (Announcement, Aug 6th, 2021)
      - #34346 from @mmusich: fix definition override in RecoTrackerP5_cff.py [11.2.X]
    - **CMSSW_11_2_5_patch1** (Announcement, Oct 10th, 2021)

Release schedule reminder: 11_3_X

- **11_3_X** next production branch: schedule twiki
  - Open on Nov 30th (Announcement)
    - The production architecture is slc7_amd64_gcc900
  - Recently produced pre-releases:
    - **CMSSW_11_3_0_pre4** (Announcement, Mar 5th, 2021)
    - **CMSSW_11_3_0_pre5** (Announcement, Mar 23rd, 2021)
    - **CMSSW_11_3_0_pre6** (Announcement, Apr 15th, 2021)
    - **CMSSW_11_3_0** (Announcement, May 7th, 2021)
    - **CMSSW_11_3_0_patch1** (Announcement, May 11th, 2021)
    - **CMSSW_11_3_1** (Announcement, May 28th, 2021)
    - **CMSSW_11_3_1_patch1** (Announcement, June 2nd, 2021)
    - **CMSSW_11_3_2** (Announcement, June 8th, 2021)
    - **CMSSW_11_3_3** (Announcement, June 23rd, 2021)
    - **CMSSW_11_3_4** (Announcement, Aug 5th, 2021)
    - **CMSSW_11_3_4_patch1** (Announcement, Aug 5th, 2021)
      - #35026 from @TomasKello: [11_3_x]Fix on compile issues with DMR, MTS and GC validation scripts
      - #34994 from @CMSTrackerDPG: [11_3_X] TkDQM:Fix tracker maps for run3
      - #34990 from @mteroerd: Validation plots for APE and bug fixes: Backport of #34828
      - #34950 from @fwyzard: Fix uploading the EventSetup conditions to multiple CUDA devices [11.3.x]
      - #34946 from @mmusich: [11.3.X] migrate AlignmentProducer to event consumes
      - #34937 from @mmusich: [11.3.X] do not produce NaNs in SiPixelActionExecutor
      - #34925 from @smorovic: (DAQ) input source - minimum starting lumisection (113X - backport) reconstruction
      - #34878 from @mmusich: [11.3.X] Miscellaneous fixes to Alignment/OfflineValidation all-in-one tool

Release schedule reminder: 12_0_X

- **12_0_X** current development branch: schedule twiki
  - Large scale test of DD4HEP, Stable DPG code, PF calib. sample, L1 Trigger (w/o LLP)
    - **Expected to be used in the LHC beam test scheduled in October**
  - Schedule:
    - **CMSSW_12_0_0_pre1** (Announcement, Mar 5th, 2021)
    - **CMSSW_12_0_0_pre2:** (Announcement, May 27th, 2021)
    - **CMSSW_12_0_0_pre3:** (Announcement, June 18th, 2021)
    - **CMSSW_12_0_0_pre4**: (Announcement, July 9th, 2021)
    - **CMSSW_12_0_0_pre5**: (Announcement, July 29th, 2021)
      - #34296 from @sroychow: Validation: migrate packages for esConsumes
      - #34662 from @CMSTrackerDPG: Reserve one bit for the flag in pixel digi packing - bugfix for PR #34509
      - #34654 from @hyunyong: Fix issues #34648
    - **CMSSW_12_0_0_pre6**: (Announcement, Aug 5th, 2021)
      - CMSSW_12_0_0_pre5 was bugged, and useless for validations
    - **CMSSW_12_0_0**: (Announcement, Sep 3rd, 2021)
      - #35025 from @TomasKello: [12_0_X]Fix on compilation issues with DMR, GC and MTS validation scripts
      - #35007 from @mteroerd: Validation plots for APE and bug fixes: Backport of #34828
      - #34947 from @mmusich: [12.0.X] migrate AlignmentProducer to event consumes alca
      - #34936 from @mmusich: [12.0.X] do not produce NaNs in SiPixelActionExecutor

Release schedule reminder: 12_0_X

- **12_0_X** current development branch: schedule twiki
  - Schedule (continued):
    - **CMSSW_12_0_1**: (Announcement, Sep 13th, 2021)
      - #35198 from @srimanob: [Backport] Add fake alignment to tracker geometry test
    - **CMSSW_12_0_2**: (Announcement, Oct 2nd, 2021)
      - #35478 from @tvami: [120X] Revert GTs to use older geometry tags to be consistent w ongoing MC campaign
      - #35397 from @mmusich: fix offline BS swap for express Run3 [12_0_X]
      - #35379 from @mmusich: fix SiPixelCalCosmics for Run3: logical mistake in DetStatus [12_0_X]
      - #35354 from @mmusich: TrackToTrackComparisonHists: use correct handle to check if vertex collection is present [12.0.X] dqm
      - @czangela: [Backport 12_0_X] Fix for SiPixelRecHitFromCUDA crash during online GPU tests
      - #35306 from @pieterdavid: [12_0_X] Add SiStripCalCosmics ALCANANO
    - **CMSSW_12_0_2_patch1**: (Announcement, Oct 6th, 2021)
    - **CMSSW_12_0_2_patch2**: (Announcement, Oct 16th, 2021)
      - #35653 from @mmusich: [12.0.X] add onlineBeamSpotESProducer to BeamSpot_cfi: fix general Online BS swap case `alca reconstructiont`
      - #35571 from @fwyzard: Make the CUDA/SoA pixel clusterizer use the same thresholds as the legacy module [12.0.x] `hlt`
      - #35567 from @fwyzard: Add a workaround for AlCa paths to the Patatrack customisation [12.0.x] `hlt`
      - #35490 from @pieterdavid: [12_0_X] SiStripCalCosmicsNano ALCANANO: produce NANOEDMAOD `alca operations`

Release schedule reminder: 12_1_0

- **12_1_X** current development branch: schedule twiki
  - Further test of DD4HEP; Using PF calibrations, derive PV, Egamma ID, extended PFElectrons, EGM regressions (above can also be done with 12_0_0 by backporting relevant PRs), and PUPPI Tune
  - Schedule for pre-release deadlines
    - **CMSSW_12_1_X opening and pre1** (Announcement, Jul 30th, 2021)
    - **CMSSW_12_1_1_pre2**: (Announcement, Aug 27th, 2021)
    - **CMSSW_12_1_0_pre3**: (Announcement, Sep 16th, 2021)
      - #35271 from @mmusich: complete esConsumes migration of Alignment/CommonAlignmentProducer alca
      - #35266 from @mmusich: Alignment/OfflineValidation improvements from CRUZET'21 data analysis alca dqm
      - #35265 from @mmusich: modernize SiStripDetInfoFileWriter
      - #35254 from @mmusich: modernize Alignment/TrackerAlignment
      - #35244 from @mmusich: Miscellaneous graphical payload inspector fixes
      - #35106 from @mmusich: Modernize Configuration/Skimming and DPGAnalysis/Skims
      - #34966 from @CMSTrackerDPG: TkDQM: Fix tracker maps for run3
      - #34882 from @czangela: Follow up to PR review of CPEFast to better reproduce Generic and #34400

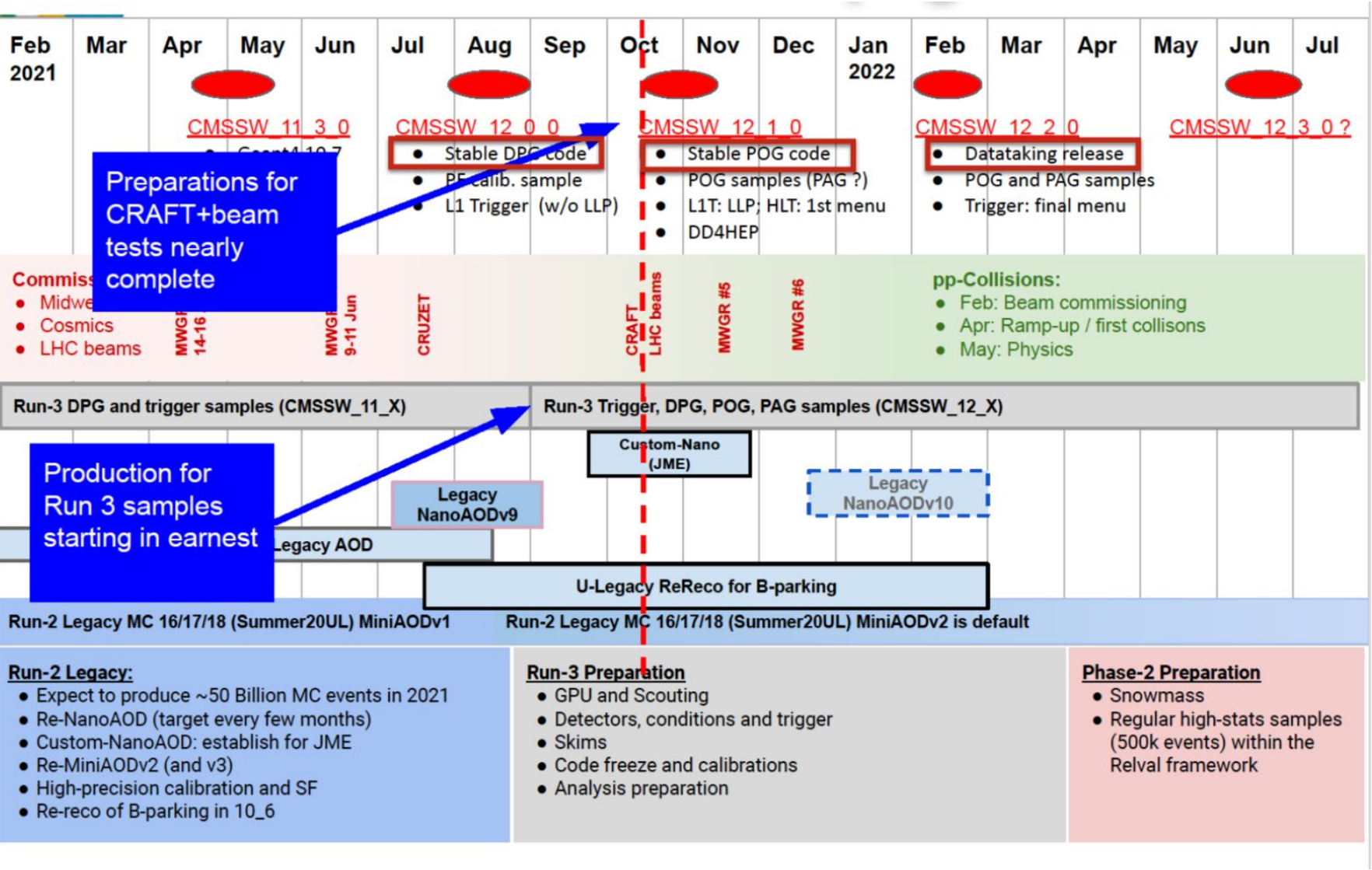
Release schedule reminder: 12_1_0

- **12_1_X** current development branch: schedule twiki
  - Schedule for pre-release deadlines (continued)
    - **CMSSW_12_1_0_pre4**: (Announcement, 7 Oct, 2021)
      - #35525 from @VinInn: make gpu Pixel Cluster Charge Cut consistent with legacy cpu version
      - #35483 from @pieterdavid: SiStripCalCosmicsNano ALCANANO: produce NANOEDMAOD
      - #35473 from @VinInn: remove runtime recursion from find_ntuplets in Patatrack
      - #35457 from @trackreco: Enable mkFit in InitialStepPreSplitting,InitialStep,HighPtTripletStep,DetachedQuadStep tracking iterations for phase1 pixel era, except for HI and special 2017 tracking eras
      - #35421 from @tvami: Modernize SiPixel CPE object code in CondTools/SiPixel
      - #35415 from @mmusich: modernize CondTools/SiStrip
      - #35401 from @mmusich: Migrate away from deprecated edm::EDAnalyzer API in CalibTrackerand in modules inheriting from ConditionDBWriter
      - #35381 from @mmusich: Migrating away from deprecated edm::EDAnalyzer API in CalibTracker/SiStripLorentzAngle
      - #35375 from @CMSTrackerDPG: Migrating away from deprecated edm::EDAnalyzer API in CalibTracker/SiPixelESProducers
      - #34884 from @czangela: Common digi packing for CPU and GPU implementations
    - **CMSSW_12_1_0_pre5**: (last open prerelease)
    - **CMSSW_12_1_0:** Built by 1st Nov.
      - Delay of ~2 weeks expected

Tracking - PRs for 12_1_X

- Important PRs Integration of mkFit:
  - Make mkFit 4+2 iterations default https://github.com/cms-sw/cmssw/pull/35660
  - Update mkFit for 12_1_0_pre5: https://github.com/cms-sw/cmssw/pull/35652
  - Update mkFit JSON files for CMSSW_12_1_0_pre5: https://github.com/cms-data/RecoTracker-MkFit/pull/6
  - Update mkFit to V3.4.0-0: https://github.com/cms-sw/cmsdist/pull/7387
- Integration of DNN high purity selection (for mkFit tracks):
  - Upload new DNN trainings to cms-data: https://github.com/cms-data/RecoTracker-FinalTrackSelectors/pull/10
  - Activation of the DNN selection in lieu of BDT (for the same iterations as mkFit):
    - https://github.com/cms-sw/cmssw/pull/35686
- Noteworthy PR for the beam test:
  - add onlineBeamSpotESProducer to BeamSpot_cfi: fix general Online BS swap case
    - https://github.com/cms-sw/cmssw/pull/35639 (mandatory fix to make Express in ppRun3 collisions to work
    - its backport (yet to be updated): https://github.com/cms-sw/cmssw/pull/35653

Releases/campaigns 2021/2022



Changes in DB Output Service

- Fix of memory leak requires action from all subsytems (Talk)
  - Subsystem experts should update their code by 1 December / 12_2_X
  - Use references rather than pointers
    - `writeOne,createNewIOV,appendSinceTime => (T* payload)`
      - will be replaced by
    - `writeOneIOV,createOneIOV,appendOneIOV => (T& payload)`

Tracker DPG Subgroup Reports

- We have introduced a **regular report** from different DPG subgroups at the DPG meeting:
  - **Goal:** follow better the progress on the developments;
  - The report should cover the progress on the different tasks foreseen during LS2;
  - Report from one group at each DPG meeting;
  - **If you cannot make a report please let us know in advance**

- Today there will a report from “Material Budget and Geometry”:
  - Tentative schedule for topical updates in upcoming weeks:
    - **2 Nov**: Tracker DQM group
    - **9 Nov**: Phase-2 Simulation
    - **16 Nov**: Pixel local reconstruction and calibration
    - **23 Nov**: Tracker Alignment
    - **30 Nov**: Strip local reconstruction and calibration
    - **7 Dec**: Material Budget and Geometry

EPRs 2021

- **Deadline for the 2021 EPR pledges was set to July 31st**
  - 237.00 out of 289 EPR months pledged **(82%)**
  - **If you have not done so, please pledge asap**
  - The Tracker EPR needs for 2021 are here
    - There is "container" tasks in the EPR tool, one per L3 coordination area (same as last year)
  - Tracker DPG Tasks for 2021 are collected in this twiki page
    - Before pledging please contact DPG subgroup conveners or in case of Institutional Responsibility (more details can be found in SP report, link) contact us (+ DPG subgroup convener)

TaskName	Work Needed	Work+Shifts Pledged	Fraction Pledged	Pledges Accepted	Fraction Accepted
Work on Data Quality Monitoring (task)	54.00	30.50	0.56	0.00	0.00
Work on Pixel Local Reconstruction, simulation and calibration (task)	71.00	60.50	0.85	56.50	0.80
Work on Geometry and Material Budget (task)	18.00	8.00	0.44	0.00	0.00
Work on Alignment (IR) (task)	41.00	41.00	1.00	29.00	0.71
Work on Alignment (task)	54.00	53.50	0.99	53.50	0.99
Strip Local Reconstruction, simulation and calibration (IR) (task)	8.00	8.00			
Work on Strip Local Reconstruction, simulation and calibration (task)	43.00	35.50			

NO NEWS SINCE LAST UPDATE

Status of performance Papers

- Alignment performance paper:
  - **"Strategies and Performance of the silicon tracker alignment in Run 2":**
    - CADI line: TRK-20-001
    - Review hypernews at: hn-cms-TRK-20-001@cern.ch
    - Final reading took place on Monday 18 Oct, 3 PM
      - In general, it went rather smoothly
      - They insisted to add the "13 TeV" on the figures just "because it is CMS style"
      - ~~They also insisted on having a HEP data record~~

- Strip performance paper:
  - **"Operation and Performance of the CMS Silicon StripTracker with pp collisions at the CERN LHC":**
    - CADI line is open: TRK-20-002
    - Review hypernews at: hn-cms-TRK-20-002@cern.ch
    - Pre-approval at a DPG/POG meeting on Jan 2th 2021: link
    - First Author-ARC meeting organized on May 20th 2021

Meeting schedule

- Currently, TkDPG and RC meeting take place at the same time
  - We are considering to swap Tuesday's and Wednesday's meeting
  - In that case, the TkDPG meeting would start at 2 PM
    - Possibly postponed to 3 PM in case we have few presentations (case by case)
  - Not before 2022

Save the date

- **Upcoming detector-related conferences:**
  - **VCI2022:** 16th Vienna Conference on Instrumentation,
    - Feb 21-25 2022, Vienna (Austria)
  - **IML2022**, 5th Inter-experiment Machine Learning Workshop
    - Mar 28th - April 1st 2022, CERN

BACKUP SLIDES

Beam Test Readiness review

- Beam Test Readiness Review took place on 8 Oct (link)
  - Report on the DPG readiness foreseen (link)
  - Questions that were addressed:
    - Readiness for prompt data analysis
    - Status of DQM (timing analysis)
    - Status of alignment and possible CRAFT input
    - Status of preparation to derive pixel position
    - Shift coverage (plan for shifts)
- Running at 6.8T most likely

Run 3: LHC Beam Energy

- So far 3 sectors reached 7 TeV
  - Two more close to 6.8 TeV

From Run Coordination News

- Bringing all sectors to 7 TeV might expose to the risk to additional faults when doing the thermal cycle
  - This would have consequences: likely loss of the Beam Test in fall and delay of Run 3 start

- It was proposed by the accelerator directorate to reduce training target from 7 TeV to 6.8 TeV for now
  - That's above experiments threshold for Run 3 energy change (6.75 TeV)
  - A risk assessment for going to 7 TeV is going to be carried out

- Bottom line: expect 13.6 TeV or more, known ~ mid September.
  - **CMS decided to for now, to continue to use 14 TeV for all Run-3 MC productions.**

NO NEWS SINCE LAST UPDATE

CMSSW Python3 migration

- Since 1st Jan 2020, there is no support for Python2
  - No new bug reports, fixes, or changes...
- CMSSW software stack migrated to python3
  - From **CMSSW_12_0_0_pre5 and onward** there will only be python3 support.
  - All the python2 packages and cmsRun support for python2 have been removed.
- For old release cycles (11.3 and earlier), the software development team will keep the python2 stack available but might not be able to provide any bug fixes for external python packages.

CRUZET Data Certification

- DQM restarted the TkOffline shifts for data certification with the start of CRUZET data taking
  - It will be carried out at the several remote centers
  - Schedule for the CRUZET:
    - July 12th:Pisa
    - July 19th: SAHA-Kolkata
    - July 26th : IPHC - Strasbourg
    - August 2nd: DESY
    - August 9th: FNAL
- The Tracker DQM team has organized three tutorials on the Data Certification procedure:
  - A tutorial on Certification Helper, June 25th link
  - A tutorial on Tracker Data Certification process, July 2nd, link
  - Tracker DQM shift practice session, July 9th, link
    The recordings of all tutorials are available and are uploaded to the corresponding indico agendas;
- In case you have missed the tutorials, please go through the recorded videos:
  - In case of any doubt, please contact Tracker DQM conveners cms-trk-dqm-conveners@cern.ch.

EPRs 2021

- **The Tracker EPR needs for 2021 have been inserted to the EPR tool: https://icms.cern.ch/epr/showProjectTasks/168**
  - There is “container” tasks in the EPR tool, one per L3 coordination area (same as last year)
    - If you are interested in any task, please contact DPG subgroup conveners
      - **Tracker DPG Tasks for 2021 are collected** in this twiki page
- **Last year CMS introduced Institutional Responsibility** (more details can be found in SP report, link)
  - IR from 2020 automatically ported to EPR tool:
    - **Please contact us (+ DPG subgroup conveners) if your group would like to take an institute responsibility:**
      - Please indicate the list of tasks that you are interested in.

TaskName	Work Needed	Fraction Pledged
Work on Data Quality Monitoring (task)	54.00	0.21
Work on Pixel Local Reconstruction, simulation and calibration (task)	71.00	0.65
Work on Geometry and Material Budget (task)	18.00	0.11
Work on Alignment (IR) (task)	41.00	1.00
Work on Alignment (task)	54.00	0.92
Strip Local Reconstruction, simulation and calibration (IR) (task)	8.00	1.00
Work on Strip Local Reconstruction, simulation and calibration (task)	43.00	0.72

- Only **65.6%** of tasks pledge:
  - **If you have not done so, please pledge asap**

Road to Run 3 at a glance

- From RC meeting news (13/07/2021)

Tracker Offline Shift Coverage needed here!

	2021						2022		
Month	July	August	September	October	November	December	January	February	April
Activity	CRUZET	CRUZET	Magnet commiss.	CRAFT + Beam Test	MWGR#5		CRAFT	CRAFT + First beams	Ramp-up / collisions
When	Jul 12 ...	... Aug 13		2 + 2 weeks			end of month	full month	go go CMS
Data taking	Yes (24/7)	Yes (24/7)		Yes (24/7)	Yes (~ 3 days)		Yes (24/7)	Yes (24/7)	Yes (24/7)

- **MWGR** = Mid Week Global Runs : 3 days of Cosmic Run data taking sometimes accompanied few days before or after by short global runs sending data to Tier0
- Cosmic RUn at Zero Tesla (**CRUZET**) : July 12 - Aug 13 (week 28-29-30-31-32), 24/7 operation
- Cosmic RAy data at ~Four Tesla (**CRAFT**): schedule to be finalized (it depends on the duration of CMS magnet commissioning which will start on Aug15), but typically from beginning of October till middle October (start of the Beam test), 24/7 operation
- **Beam Test**. Low intensity and low energy beam test planned by LHC: 2 weeks end of October (week 42-43)
- To stay updated, subscribe to the **CMS run coordination calendar**: 7k62poafqid4t49oakia0rp4ug@group.calendar.google.com

PCL Commissioning

- PCL commissioning plans discussed at the AlCaDB meeting, indico link
  - Information is collected at the PCL twiki page
- Tier-0 replay on 2018 collision data planned
  - Details collected at this Hypernews
    - Test of all available PCL workflows
    - First test will be done with Run 324841 collected in 2018D
      - Express configuration at: Twiki
      - Prompt configuration at: Twiki
    - No MRH will be exercised for this replay.
      - The needed update for MRH and its monitoring will be addressed after setup the 2018 data replay
    - **DPGs are expected to check the output of the replay and make sure the outputs are expected**

- Ongoing developments in several Tracker DPG groups (to be tested at a later time):
  - Pixel LA @ PCL
  - High granularity PCL alignment
  - Strip hit efficiency from DQM

NO NEWS SINCE LAST UPDATE

Central Data Certification of CRUZET/CRAFT

- CMS plans to perform the central Data Certification (DC) for the upcoming CRUZET/CRAFT cosmic runs:
  - **Dates of CRUZET**: 12th July - 14th August 2021, (CRAFT to follow)
  - **Motivation**: the certified data may be useful for Alignment/Calibration, etc., but also, since we have not done the data certification process of ongoing Prompt Reco data for quite a while, it will be an important exercise to re-commission the whole DC workflow/process to prepare for Run 3.
  - **The DC Process**: Similar to before. The central DC team will prepare a run list, and ask subsystem certification experts to certify. The results will be recorded in Run Registry and resultant JSON files will be created
  - **Data for DC:** Basically all the CRUZET/CRAFT cosmic runs, but maybe not the data from the first week of CRUZET (detector status is likely unstable at the beginning
- The certification will be carried in Remote Centers
  - Schedule for CRUZET (link)
    - 12th July: Pisa
    - 19th July: SAHA-Kolkata
    - 26th July: Strasbourg
    - 2nd August: DESY
    - 9th August: FNAL

AFS migration

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- Reminder:
  - It was originally announced that AFS to be gone in **Q1 of 2021**
    - according to this document http://cds.cern.ch/record/2750122/files/ AFS is alive and kicking. (Thanks to Vincenzo for pointing it!)
    - Quoting from the conclusions:
      "The working group did not identify an urgent need to change the current home directory approach based on AFS. The working group hence recommends to plan for a longer term activity to look into an AFS replacement technology including all concerned stakeholders. **The approach should be revisited later on, maybe at the end of Run-3**"

- There was an update on at the JIRA ticket concerning the move of the web services from AFS to EOS:
  - It concerns the site http://cern.ch/test-stripcalibvalidation
    - AFS Path: /afs/cern.ch/cms/tracker/sistrvalidation/WWW/

- **Conclude that while AFS-based home directory won't be decomissioned, it is still needed to migrate to eos all afs-based sites / services.**

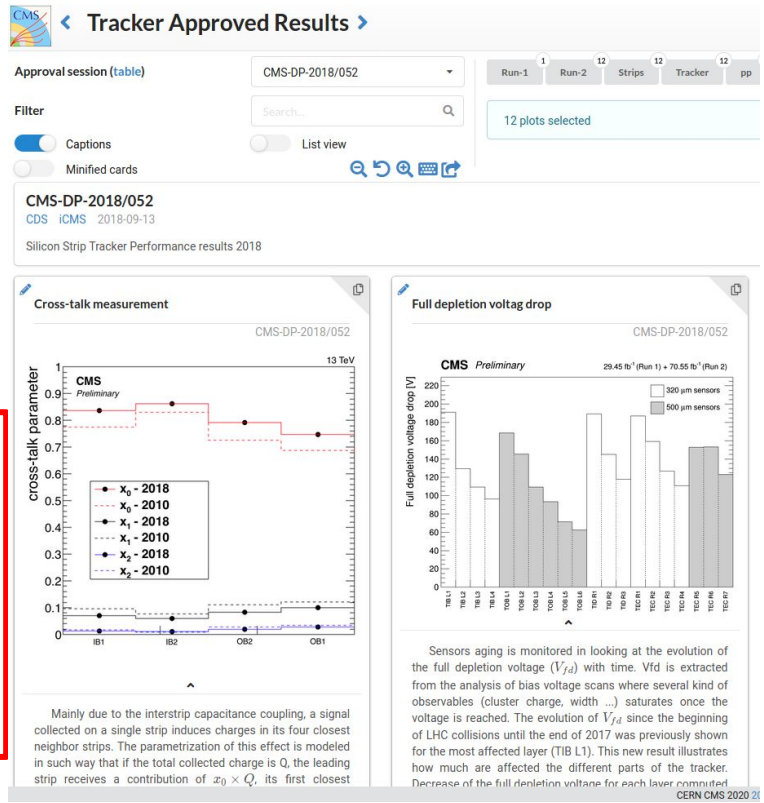
Tracker Public Plots Webpage

- A new (temporary) Tracker Public plots webpage based on the technology developed by the ECAL group is available at link.
  - The website has been renamed to https://cmsdpgplots.web.cern.ch/
  - Underlying gitlab repo can be found at link;
  - The instructions on how to push new plots can be found in the README file in the repository.
  - The plots should be organized in subfolders in the content folder, by name of the corresponding DP note.

- One needs to provide:
  - **plot in png format**;
  - **plot in pdf format**;
  - **metadata file in yaml** for the plot (to include the caption and the tag)
  - **metadata file in yaml** for the DP sub-folder

- Plots have been downloaded by A. Patil
  - Available at **/afs/cern.ch/user/a/apatil/public**
  - Available at CERNBOX!

- **L3 conveners: please move the plots from the Tracker public twiki asap!**



Run 2 ALCARECO on tape

- As announced here, there are a few ALCARECO datasets targeted for being deleted from disk:
  - A copy of them will still be available on tape, but when retrieving them expect delays due to stageout time.
- AlCa/DB is asking the subsystems to let them know if there are any that should be kept on disk:
  - Otherwise it will be sent to tape on Friday, June 25th.
- The full list is available here: google spreasheet

If you are using these Run 2 datasets for e.g. commissioning new developments (PCL, etc.) or a support for recreating plots for commissioning papers, please mark them directly in the spreadsheet!

Follow-ups to ongoing S/W migrations

- Migration to use esConsumes:
  - The CMS framework team needs help with completing the migration of all CMSSW code to the new ESConsumes registration mechanism (announcement), to fully profit of the ability of the framework to run ESProducers concurrently;
    - instructions on how to do that are in gitHub issue: #31061
    - You can find a very detailed presentation about this in today's talk from Core S/W group at the PPD workshop.
    - Corresponding Tracker DPG L3s please find a suitable candidate to perform the migrations;
  - Plans from Core group below:

- Level of enforcement on new or modified code will increase
  - Soon: warn in PR test summary messages
  - 12_1_0_pre1: PR test fails
- For existing code
  - By 12_1_0: runTheMatrix clean, issue LogError at runtime if non-migrated EDModule is used
  - By 12_2_0: all IB tests clean, throw exception at runtime if non-migrated EDModule is used
  - By 13_0_0: deprecated API will be removed
    - Anything not migrated by that time would be easy to think as "dead code"

Fermilab

Follow-ups on ongoing S/W migrations

- Legacy modules in RelVal workflows:
  - Preventing (efficient) usage of concurrent LumiSection processing:
    - gitHub issue #25090
  - Few EDModules already migrated in the past:
    - e.g. PR: #29798 and #29825, #32012, (#31487 still requires work)
  - Phase-0 DQM modules (**SiPixelRawDataErrorSource, SiPixelDigiSource**) first migrated at #32805
    - Follow-up still open at #32875
  - Plans from Core group below:

- AlCa:
  - ALCA step: `AlcaBeamSpotProducer`, `AlignmentProducerAsAnalyzer`, `AlignmentProducerAsAnalyzer`, `MillePedeFileConverter`, `AlcaPCCProducer`
  - RECO step: `AlcaPCCProducer`
  - At minimum `AlcaPCCProducer` needs to be migrated
  - Question on ALCA step: will ALCA step ever process more than one LuminosityBlock per job?
    - If not, a simple way forward would be to set `numberOfConcurrentLuminosityBlocks=1` for ALCA step
      - With the risk of this choice coming to haunt us in the future when assumptions change
- Need to prevent such modules being added to production workflows in the future

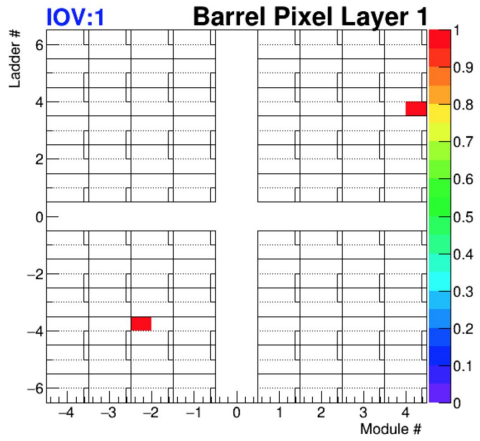
Fermilab

News on Pixel Installation

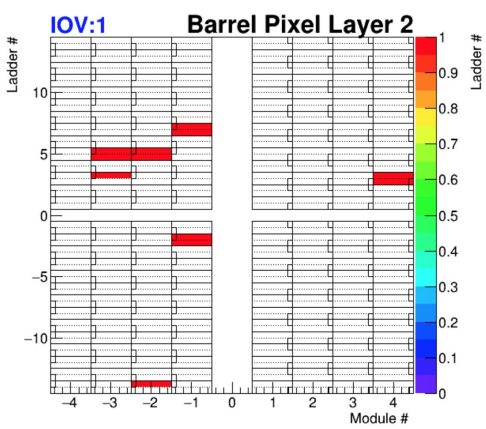
- **Pixel Installation readiness review** took place yesterday link
- **FPix:** The BmO is being re-tested as a precaution following the earlier replacement of a damaged filter board.
- **BPix:** no news since last week
  - Bad components summarised below

	# of ROCs (%)				
	L1	L2	L3	L4	Total
Disabled	8 (0.5)	96 (2.7)	32 (0.3)	32 (0.4)	168 (0.9)
Enabled (unstable)		8 (0.5)	72(1.3)	40 (0.5)	120 (0.6)

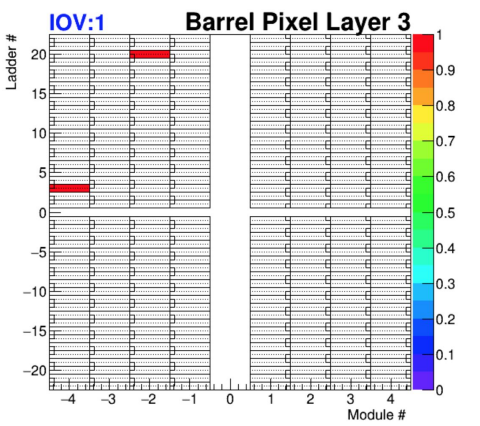
Layer 1



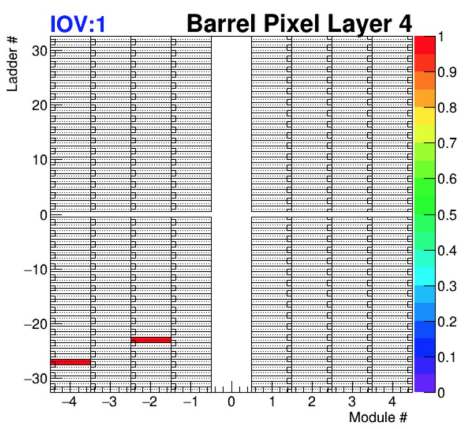
Layer 2



Layer 3

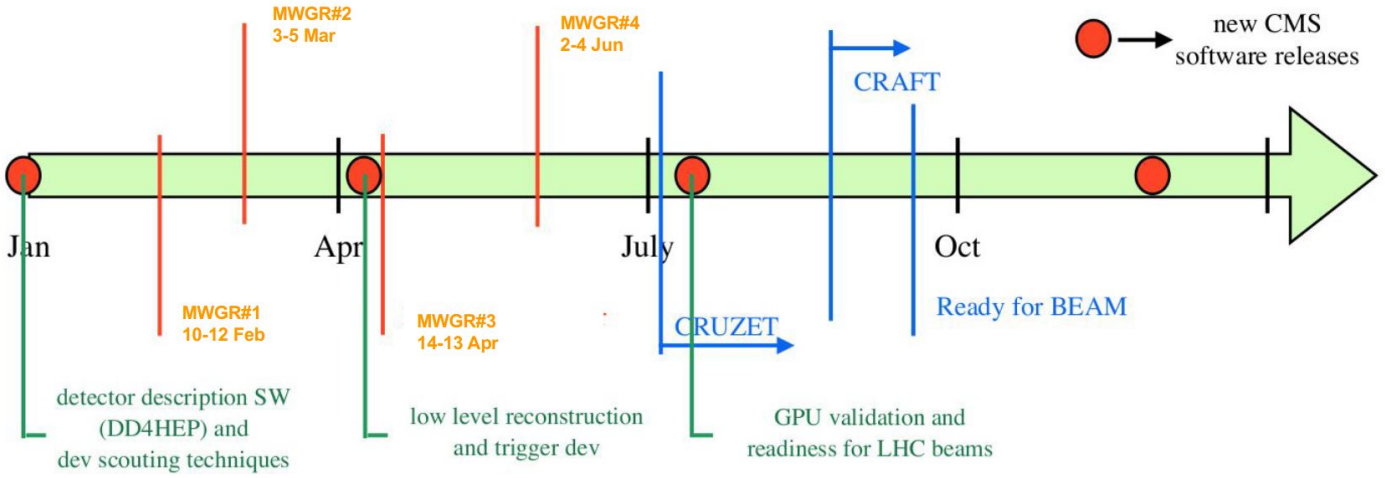


Layer 4



LS2 Endgame and start or Run 3

- More details at the Tk Plenary meeting introduction slides
- Reminder:
  - Meetings on October 23rd and **March 15th** w/ CERN management & all LHC experiments;



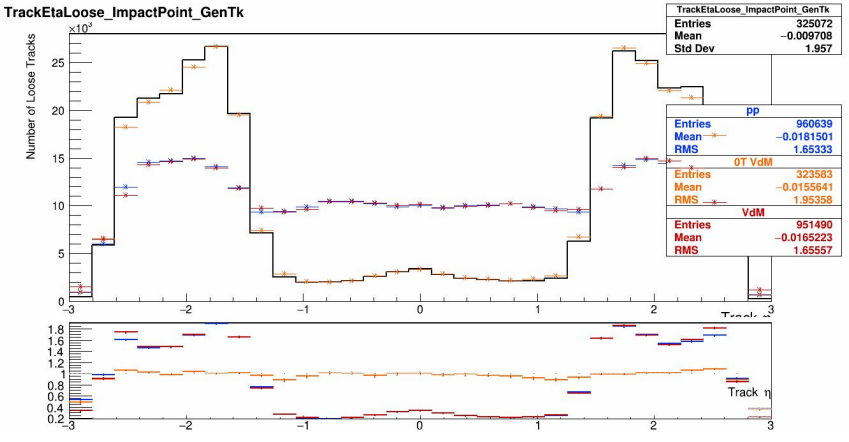
- Baseline plan still foresees:
  - Beam Test around W39/40 in 2021 (CMS RFB: September 27th)
    - CMS maintains interest in collisions (if possible with Stable Beams)
  - Experimental caverns closed on Feb 1st 2022
  - ATLAS installs both NSW
  - CMS forward shielding modification
  - Short EYETS in 2023/24 for LS3 preparation
  - **Situation will be reviewed again on June 7th**

NO NEWS SINCE LAST UPDATE

LHC Beam Test in 2021

NO NEWS SINCE LAST UPDATE

- Expectations for the LHC Beam Test:
  - Few bunches (3?) with very limited intensity (pilot)
  - Inst Lumi around few 10^{28}
  - Collision rate of 1-2 kHz
  - Collisions at SPS injection energy, $\sqrt{s}$ = 900 GeV
  - Duration: 12-16h, distributed over several days to give experiments contingency to fix problems if needed
  - CMS Magnet Status will depend on status of its commissioning (not excluded but not guaranteed either):
    - B = 0T should be considered as an option.
- Four samples have produced to estimate statistics and performance of the BeamSpot measurement during the LHC beam test, JIRA ticket :
  - 0T and pp-like beamspot width
  - 3.8 and pp-like beamspot width
  - 0T and Vdm-like beamspot width
  - 3.8 and Vdm-like beamspot width
- The Phase-1 0T tracking has problems in seeding (CA)
  - Part of the inefficiency recovered by switching bending correction to False
    - However, still low efficiency in Barrel
  - See more about the fix in Mia's slides: link
- Update on the Offline Measurement of Beam Spot will be presented at the meeting today, link

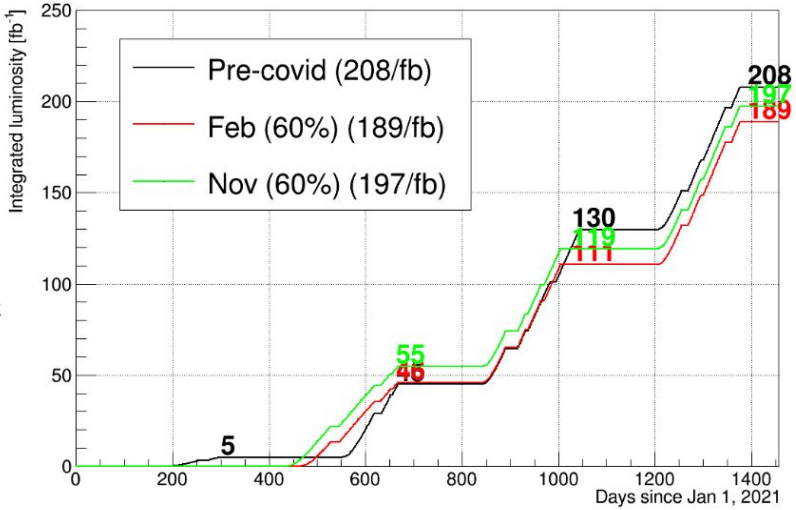


Time dependent MC

- PPD is starting preparations for next round of tests of run-dependent MC
  - Announced at AlCa/DB meeting (link to news), further discussed at the last CMS Week (link)
    - Detailed discussion at the AlCaDB meeting last week, link:
    - Open issues and concerns are collected in this document;
  - Goal is to:
    - test computing workflow with several subsystems participating;
    - discover possible technical or physics-related pitfalls before further tests;
  - The interested subsystems (ECAL, Tk, HCAL, others?) are to provide run-dependent tags for the upcoming round of tests:
    - Recommendations:
      - Use existing ECAL IOVs (2018 MC) also for other subsystems (TBD?), description in this presentation, example of IOV structure of tags
  - Remarks:
    - Details for Run-3 will be discussed later (e.g. number of IOVs per year);
    - Premixing will not be time-dependent;
    - To be studied later: can pile-up and vertex distribution be made configurable from the DB?

Updated prognosis for Run3 start-up

- **Current 2021 baseline CMS schedule**
  - No physics run in 2021;
    - Mid Week Global Runs every 4/6 weeks for the first part of the year
    - **June/July CRUZET**: 24/7 cosmic data taking without magnetic field
    - **mid Aug/mid Sept CRAFT**: 24/7 cosmic data taking with B=3.8T (in parallel with the magnet test)
  - Potentially a large pp run in 2022;
    - Targeting O(50/fb);
    - Similar PU as in 2018;
  - No changes so far in LS3 and Run 4 schedule;



NO NEWS SINCE LAST UPDATE

- **On Oct 23rd there was a meeting on LHC schedule:**
  - No actual change to the LS2 / Run 3 schedule
    - Feb 1st, 2022 maintained as the end data of LS;
  - Beam test in 2021 around **week 39-40 in 2021**:
    - CMS maintains interest in collisions (if possible with Stable Beams)
      - Implications for measurement of Run 3 BeamSpot relative to pixel det.
  - Situation will be reviewed in week of March 15th 2021:
    - One ingredient: LHCb is severely affected by the travel restrictions;
    - They should be ready by Feb '22 assuming travels restrictions (mostly from UK- NL) released before ~March '21

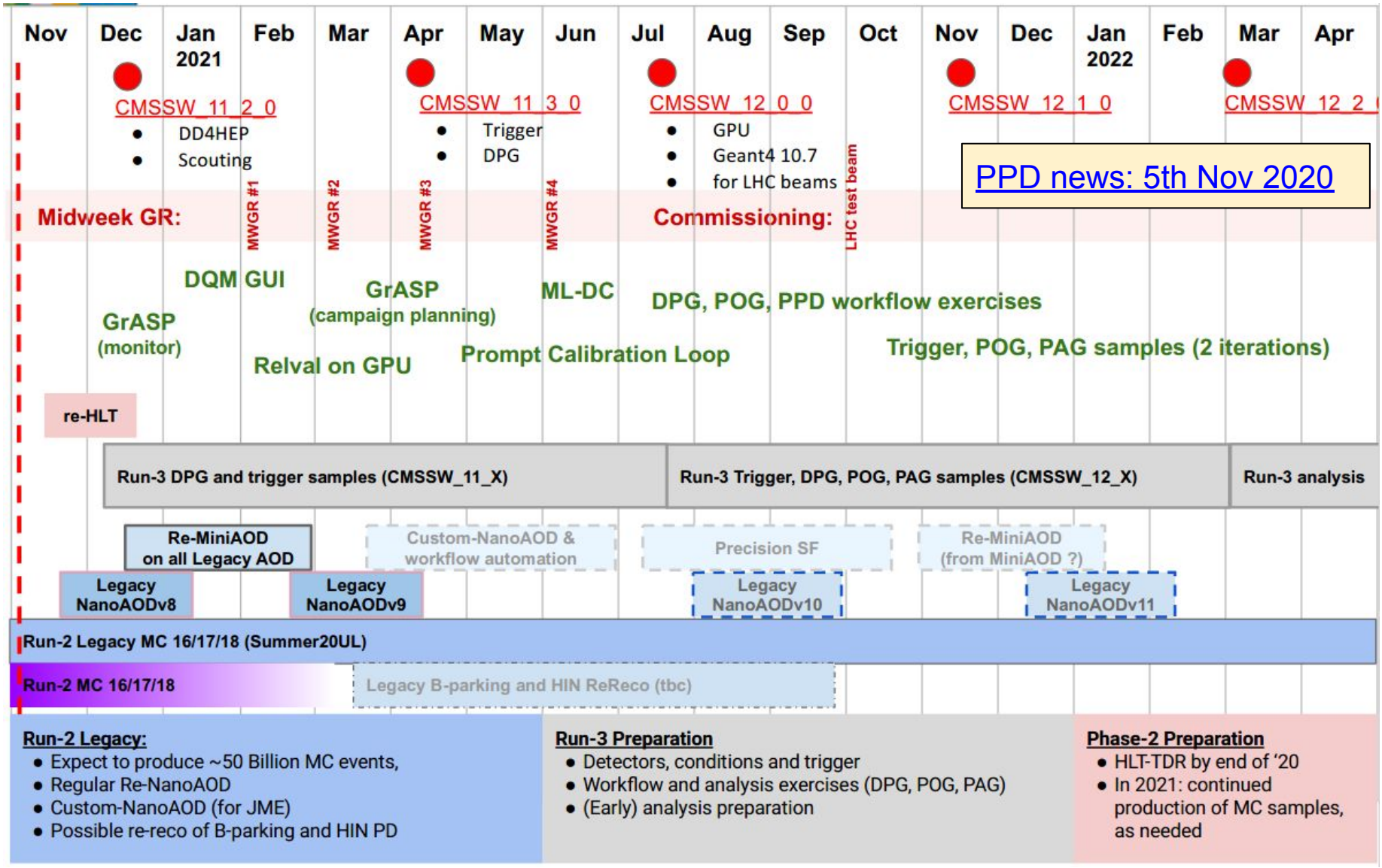
Release schedule longer term plans

- **Longer term plans:**
  - XC: Releases and Production towards CMSSW_11_2 and beyond held on June 12th, June 26th and Oct 30th

NO NEWS SINCE LAST UPDATE

- **Proposal**:
  - **CMSSW_11_2_0 (Jan 2021)**
    - DPGs to test new geometry (DD4HEP) and update aging scenarios.
  - **CMSSW_11_3_0 (Apr 2021)**
    - DPG + POG developments for Run 3 that miss 11.2
    - Test of subsystem code developments in production releases (mostly using MWGR and commissioning runs in 2021)
  - **CMSSW_12_0_0 (July 2021)**
    - LHC beams Sep/Oct 21 → target release in July to avoid vacation month August
    - GPU HLT integration and validation infrastructure
  - **CMSSW_12_1_0 (Nov 2021)**
    - Trigger, POG and PAG samples (1st iteration): samples for POG calibrations (implying DPG local reco and calibrations frozen).
  - **CMSSW_12_2_0 (March 2022)**
    - Trigger, POG and PAG samples (2nd iteration)

PPD Gantt chart for 2021 production



Open Tasks In Tracker DPG

- List of open tasks in slides in backup
  - **Please check carefully the list open tasks let us know if you are interested or there is someone in your group that could take over one of these task!**
  - In particular we are looking to fill the following position:
    - **A dedicated Tracker / TSG contact**
      - This task is becoming increasingly important towards Run3 / Phase-2 developments.

Public results approval

- Recent approvals:
  - Approval of Run 2 Tracker Alignment Performance Results
    - Approved on Friday, July 10th, 2020 (link)
    - Formally approved by CMS: CMS-DP-2020/038
  - Pixel Bad components PCL effect on tracking
    - Approved on Friday, September 4th, 2020 (link)
    - Formally approved by CMS: CMS-DP-2020/044
  - Strip APV simulation performance plots
    - Approved on Friday, September 4th, 2020 (link)
    - Formally approved by CMS: CMS-DP-2020/045
  - Approval of Track impact parameter resolution in the 2017 dataset with the CMS Pixel Phase1 detector with tracks pseudorapidity up to 3.0
    - Approved on Thursday, October 8th, 2020 (link)
    - Formally approved by CMS: CMS-DP-2020-049
- Upcoming approvals:
  - Comparison of Run2 Legacy Data/MC performance by P. Palit:
    - Pre-approval last week at the DPG meeting (link)

- Please let us know asap if any plots should be approved to organise the pre-approval/approval sessions in time.
  - **Note that about three weeks are needed !**

Release schedule longer term plans

- **Longer term plans:**
  - XC: Releases and Production towards CMSSW_11_2 and beyond held on June 12th and June 26th
- **Proposal**:
  - Nov 2020: **CMSSW_11_2_0**: Detector & DPG commissioning / HLT studies
    - Possible CMSSW_11_3_0 for more developments: timescale Feb '21
    - Run-3 MC production: ~1B events/campaign
  - May 2021: **CMSSW_12_0_0**: Physics exercise
    - 14 TeV samples Run-3 MC production: ~4B events
    - DPG, POG, PAG (in preparation of 2017/2018 we did ~1B events)
    - L1 / HLT preparation
    - HIN production
  - Oct 2021: **CMSSW_12_1_0**: Physics preparation, processing of 2021 data:
    - Run-3 MC, Presumably 14 TeV (energy known or possible reweighting)
    - Mostly for 2022 analysis preparation;
    - x-check on physics objects;
  - Well into 2022: Physics Production (using known 2022 data conditions):
    - Run-3 MC production
    - Physics-grade MC used for analysis
    - POG requests for object study first, then main SM background starts

Issue with Phase-2 Tracker conditions

- An issue concerning the Inner Tracker bad components was found in the samples produced for the HLT TDR;
  - Discussed in details at the last Phase-2 simulation meeting and last AlCa/DB meeting;
  - Problem is going to be corrected in the next CMSSW 11_2_X pre-release (pre-6) and backported to CMSSW_11_1_X;
  - We've also requested dedicated RelVals in pre-5 with the bugfix in order to disentangle with other pre-6 developments [link to JIRA];
- As a follow-up we'd like to review in details the content of the conditions for Phase-2:
  - Effort started here;
  - More changes are foreseen down the line, new conditions are needed;
- Need to improve the Phase-2 validation procedure:
  - More plots will be added to the Phase-2 MultiTrackValidator (MTV) setup for validator scrutiny;
  - Detailed monitoring of Cluster / Rechit quantities in DQM is **becoming urgent**.

DD4HEP migrations in CMSSW

- CMS detector description tool (DD) is being replaced by the community supported DD4hep tool:
  - ✓ Several alignment-related packages migrated and the changes validated (indico link)
    - Code (co)-owned by the TK in **`Alignment`** (addressed at #29952) and **`SimTracker`** (addressed in several PRs) subsystems.
  - ✗ Observed several issues in the Simulation / Reconstruction chain due to Tracker (**this is currently a blocker!**):
    - Full report at gitHub issue #31143
  - ✗ Partially related to the migration: several test configurations belonging to Tracker need to be cleaned up from referencing discontinued configuration fragments
    - Full report at gitHub issue #31113
- A. Vargas is addressing the issues, but we need to inject more manpower on these items: please contact us urgently if you can help!
- Changes to framework classes need to be carefully validated before signing-off on the updates:
  - **Targeting completion for CMSSW_11_2_0**

Open tasks in the DPG

- We are looking for the following positions:
  - **A dedicated TRK/HLT contact** (currently held ad interim by M. Tosi + DPG conveners)
    - This task is becoming increasingly important towards Run3 / Phase-2 developments.
- **Tracker DQM:**
  - Implementing tracking efficiency in DQM.
  - Reviewing binning for Run 3.
  - ML based studies
- **Pixel local reconstruction and calibration:**
  - Pixel simulation contact (1 EPR)
  - Pixel Digitizer Maintenance and Devolopment (2 EPR)
    - Solve the issue with a time dependent MC premixing
  - Charge reweighting developments (3 EPR)
  - Web-page development for the pixel monitoring
- **Strip local reconstruction and calibration:**
  - GPU developments: 5 EPR, 2 people
  - Strip digitizer maintenance and developments: 1 EPR, 1 person
- **Please let us know if you are interested or there is someone in your group that could take over one of these task!**

Open tasks in the DPG - continues

- **Strips local reconstruction and calibration:**
  - GPU developments: 5 EPR, 2 people
  - Strip digitizer maintenance and developments: 1 EPR, 1 person

- **Please let us know if you are interested or there is someone in your group that could take over one of these task!**

CMSSW_11_1: GPU-CPU Validation

- **Proposals from PPD:**
  - **Dedicated discussion is foreseen at the last DQM general meeting: agenda**
    - Tracker DQM represented by S. Chowdhury
- CPU - GPU **bin-by-bin** validation
  - Start with preN (CPU only) vs preN (CPU + GPU) using same RAW
  - Run full RECO sequences with mixing of CPU and GPU like in production
  - Compare results
- CPU - GPU **event-by-event** validation
  - PPD is looking into possibility to run all GPU compatible modules twice in the same job, once at GPU and once at CPU and store the results into separate collections
    - 1 std DQM module pick up the output from CPU + GPU
    - A second instance of the std DQM module produces the 2nd collection with the same quantities obtained using CPU-only
    - An extra DQM module (to be developed) picks up the two collections and fills histograms of event-by-event differences

Replacement of SCAL FED into offline s/w

- **Reminder**: several pieces of offline s/w need to be migrated due to the replacement of the SCAL FED for Run-3.
  - Details in this presentation shown at Lyon's RC workshop
  - List of offline consumers in this document.
- Started discussion in 2019 with RECO conveners at RECO/AT meeting
  - see presentation from M. Tosi: here.
- For Tracker DPG the effort affects mostly:
  - ✓ Strip local reco (see CMSTRACK-166) ⇒ PR: #29116 **[MERGED]**
  - ✓ All `ALCARECO` producers (Alignment, Strips, Pixel) because of DCS bits testing for Tracker partitions HV on ⇒ PR: #29198 **[MERGED]**
  - ✓ Migration of Tracking Offline DQM modules, Replace **LumiScaler** with **OnlineMetaData** for Run3 ⇒ PR: #29810 **[MERGED]**
  - Strip calibration packages (will be migrated once rest is done)
- Starting from MWGR #1, **SCAL FED is out of data-taking**
  - Several pieces of our offline software are **NOT** working as intended;
- All use-cases need to be migrated in the offline software either by using `TCDSRecord` or the `OnlineMetaDataDigis`.
- **Targeting completion for CMSSW_11_2_0**

Issue with Pixel Cluster Repair CPE

- Full report available at PPD general meeting of Sep 24th
- There is a "feature" in the code entered in the CMSSW used in the UL processing of 2017 and 2018 datasets for both data and MC that affects the χ^2 and tails of the d_{xy} and its error of tracks with high p_T
  - in particular in dense environments like high p_T jets (slides)
  - minor impact on relevant quantities confirmed by BTV and JME (checks are ongoing)
- The source is a bug in the pixel cluster repair CPE local error (#22458 via #26263) code and the handling of the pixel split cluster.
  - Not spotted during the validation because the high pT QCD sample was not part of the validation relval and because we are missing the DQM code for monitoring the pixel cluster splitting
  - The fix has been found and tested (slides)
    - The bugfix PR #31469 expected to enter 11_2_0_pre7
- A dedicated set of relval samples and feedback of relevant parties would be useful to check the impact and the effects (JIRA ticket)

Miscellanea News

- Management training for L2s and L3s held on Monday, 3rd August 14:00-16:00
  - Link to the agenda: https://indico.cern.ch/event/939156/
- New management training event is foreseen on Friday 11th September at 16:00
  - Link to the agenda: https://indico.cern.ch/event/949462
- AlCaReco Computing Resource Estimates 2022:
  - O&C has to make first request for offline storage & CPU resources for 2022
    - XC meeting this Friday 24th July to collect information
  - PPD is looking at resource needs for AlcaReco:
    - Turns out there is overhead in terms of resource usage from TK DPG:
    - Proposal for reduction:
      - the **`SiPixelCalSingleMuon`** to be split and two clones created:
        - one called *_Loose* (with looser selection cuts) which runs prescaled of a factor X (TBD): targeted to cluster properties measurements;
        - one called *_Tight* which runs on all events without prescales, but with tight cuts, targeted to efficiency measurements;
      - the TkAlMinBias on JetHT (which was exercised in the UL preparation) will be heavily prescaled (factor 5 at least).

Pilot Test Beam Input

- Pilot beam is now scheduled for October 18th-31st
- Preliminary Schedule:
  - 3 days for final machine check-out
  - 6-7 days of machine setup
  - 3-4 days of collisions, aperture measurements, machine tests
- Expect few (2-3) periods of stable beam collisions
  - 3 nominal bunches (10^{11} ppb), 2 colliding in each experiment
  - < 1 shift per period, i.e. 4-6 hours
  - Interleaved with machine tests
  - Injection energy only
- Machine will hold a planning day in early September
  - Collecting any further input/requests from experiments before then

From Run Coordination News

NO NEWS SINCE LAST UPDATE