Switch to CMSSW_11_1_0_pre3 - new version - Part 1

Step3 from the release (trackingOnly):

> cmsrel CMSSW_11_1_0_pre3

> cd CMSSW_11_1_0_pre3/src/ && cmsenv

> runTheMatrix.py -w upgrade -n | grep 2026 | grep trackingOnly | grep 14TeV

> runTheMatrix.py -w upgrade -l 23234.1 > 23234.1.log & (geometry: D49)

Reconstruction and validation done with:

cmsRun step3_RAW2DIGI_RECO_VALIDATION_DQM.py

Switch to CMSSW_11_1_0_pre3 - new version- Part 2

→ /afs/cern.ch/work/h/hyarar/public/Phase2/MC_Tracking/MC_Tracking_CMSSW_11_1_0_pre3 or https://github.com/hevjinyarar/CMS_HLT_Phase2_Tracking

Release generated script with cleaned up cff files & paths

Version 2) Release generated script with new paths plugged in
############
step3_RAW2DIGI_RECO_VALIDATION_DQM.py
needs:
- step2.root
- extras_cmssw_11_1_cff.py (extra modules needed)
- raw2digi_step_cff.py
- MC_Tracking_v0_cmssw_11_1_cff.py / MC_Tracking_v1_cmssw_11_1_cff.py / MC_Tracking_v2_cmssw_11_1_cff.py
- MC_prevalidation_v0_cmssw_11_1_cff.py / MC_prevalidation_v1_cmssw_11_1_cff.py / MC_prevalidation_v2_cmssw_11_1_cff.py
- MC_Dqmoffline_step_v0_cff.py / MC_Dqmoffline_step_v1_cff.py / MC_Dqmoffline_step_v2_cff.py

hltPhase2Xxx modules

```
process.load('raw2digi_step_cff')
process.load('MC_Tracking_v2_cff')
process.load('MC_Vertexing_cff')
process.load('MC_prevalidation_cff')
process.load('MC_Dqmoffline_cff')
```

See next slide for technical changes

```
process.load('Configuration.Geometry.GeometryExtended2026D49Reco_cff')
process.load('Configuration.StandardSequences.MagneticField_cff')
process.load('Configuration.StandardSequences.RawToDigi_cff')
process.load('Configuration.StandardSequences.Reconstruction_cff')
process.load('Configuration.StandardSequences.Validation_cff')
process.load('DQMServices.Core.DQMStoreNonLegacy_cff')
process.load('DQMOffline.Configuration.DQMOfflineMC_cff')
process.load('Configuration.StandardSequences.FrontierConditions_GlobalTag_cff')
```

No need to comment out all modules are imported now

```
process.schedule = cms.Schedule( *[process.raw2digi_step,
process.MC_Tracking_v2, MC_Vertexing, process.MC_prevalidation
,process.MC_validation, process.MC_Dqmoffline,
process.DQMoutput_step])
```

Remarks

- **GT: auto:phase2_realistic_T15**
- **Underperforming pixel CPE issue, for now we are using CPEGeneric instead of CPETemplate → see next slide**

Switch to CMSSW_11_1_0_pre3 - new version- Part 3

For Pixel CPE : In step3_RAW2DIGI_RECO_VALIDATION_DQM.py enforce:

```
###### PixelCPE issue
process.TrackProducer.TTRHBuilder = "WithTrackAngle"
process.PixelCPEGenericESProducer.UseErrorsFromTemplates = False
process.PixelCPEGenericESProducer.LoadTemplatesFromDB = False
process.PixelCPEGenericESProducer.TruncatePixelCharge = False
process.PixelCPEGenericESProducer.IrradiationBiasCorrection = False
process.PixelCPEGenericESProducer.DoCosmics = False
process.PixelCPEGenericESProducer.Upgrade = cms.bool(True)
######
```

Some technical changes:

- Cleaner
- Modules which are non-modified are imported from release
- Tracking modules have hltPhase2 prefix
- MultiTrackSelector (obsolete) → TrackCutClassifier

Some technical changes since cmssw_11_0_pre6 (found by a comment search cmssw_11_1) :

- MC_prevalidation_cff:
  - All MTV modules EDAnalyzer → EDProducer
  - For all RecoTrackViewRefSelector add “invertRapidityCut = cms.bool(False)
  - Parameter “cores” assigned for each MTV to “highPtJetsForTrk” or “highPtJets”
  - maxPhi = 3.2 , minPhi = -3.2 for all GPSelector in each MTV

Switch to CMSSW_11_1_0_pre3 - Part 1

Step3 from the release (trackingOnly):

> cmsrel CMSSW_11_1_0_pre3

> cd CMSSW_11_1_0_pre3/src/ && cmsenv

> runTheMatrix.py -w upgrade -n | grep 2026 | grep trackingOnly | grep 14TeV

> runTheMatrix.py -w upgrade -l 23234.1 > 23234.1.log & (geometry: D49)

Reconstruction and validation done with:
cmsRun step3_RAW2DIGI_RECO_VALIDATION_DQM.py

Switch to CMSSW_11_1_0_pre3 - Part 2

→ /afs/cern.ch/work/h/hyarar/public/Phase2/MC_Tracking/MC_Tracking_CMSSW_11_1_0_pre3 or https://github.com/hevjinyarar/CMS_HLT_Phase2_Tracking

Release generated script with cleaned up cff files & paths

Version 2) Release generated script with new paths plugged in
#############
step3_RAW2DIGI_RECO_VALIDATION_DQM.py
needs:
- step2.root
- extras_cmssw_11_1_cff.py (extra modules needed)
- raw2digi_step_cff.py
- MC_Tracking_v0_cmssw_11_1_cff.py / MC_Tracking_v1_cmssw_11_1_cff.py / MC_Tracking_v2_cmssw_11_1_cff.py
- MC_prevalidation_v0_cmssw_11_1_cff.py / MC_prevalidation_v1_cmssw_11_1_cff.py / MC_prevalidation_v2_cmssw_11_1_cff.py
- MC_Dqmoffline_step_v0_cff.py / MC_Dqmoffline_step_v1_cff.py / MC_Dqmoffline_step_v2_cff.py

example

```
process.load('raw2digi_step_cff')
process.load('MC_Tracking_v2_cmssw_11_1_cff')
process.load('MC_prevalidation_v2_cmssw_11_1_cff')
process.load('MC_Dqmoffline_v2_cff')
```

See next slide for technical changes

Extra needed modules

```
process.load("extras_cmssw_11_1_cff")
process.load('Configuration.Geometry.GeometryExtended2026D49Reco_cff')
process.load('Configuration.StandardSequences.MagneticField_cff')
#process.load('Configuration.StandardSequences.RawToDigi_cff')
#process.load('Configuration.StandardSequences.Reconstruction_cff')
#process.load('Configuration.StandardSequences.Validation_cff')
#process.load('DQMServices.Core.DQMStoreNonLegacy_cff')
#process.load('DQMOffline.Configuration.DQMOfflineMC_cff')
process.load('Configuration.StandardSequences.FrontierConditions_GlobalTag_cff')
```

commented out

```
process.schedule = cms.Schedule(
*[process.raw2digi_step,process.MC_Tracking_v2,
process.MC_prevalidation_v2,process.MC_validation_v2,
process.MC_Dqmoffline_v2, process.DQMoutput_step])
```

Remarks

- **GT: auto:phase2_realistic_T15**
- **Underperforming pixel CPE issue, for now we are using CPEGeneric instead of CPETemplate → see next slide**

Switch to CMSSW_11_1_0_pre3 - Part 3

For Pixel CPE : In step3_RAW2DIGI_RECO_VALIDATION_DQM.py enforce:

```
###### PixelCPE issue
process.TrackProducer.TTRHBuilder = "WithTrackAngle"
process.PixelCPEGenericESProducer.UseErrorsFromTemplates = False
process.PixelCPEGenericESProducer.LoadTemplatesFromDB = False
process.PixelCPEGenericESProducer.TruncatePixelCharge = False
process.PixelCPEGenericESProducer.IrradiationBiasCorrection = False
process.PixelCPEGenericESProducer.DoCosmics = False
process.PixelCPEGenericESProducer.Upgrade = cms.bool(True)
######
```

Some technical changes since cmssw_11_0_pre6 (found by a comment search cmssw_11_1) :

- extras_cmssw_11_1_cff:
  - Modules templates, templates2
  - PixelCPEGenericESProducer, hltESPPixelCPEGeneric, hltESPPixelCPETemplateReco.
- MC_prevalidation_cmssw_11_1_cff:
  - All MTV modules EDAnalyzer → EDProducer
  - For all RecoTrackViewRefSelector add “invertRapidityCut = cms.bool(False)
  - Parameter “cores” assigned for each MTV to “highPtJetsForTrk” or “highPtJets”
  - maxPhi = 3.2 , minPhi = -3.2 for all GPSelector in each MTV

Switch to CMSSW_11_0_0_pre6 - Part 1

Step3 from the release (trackingOnly):

> cmsrel CMSSW_11_0_0_pre6

> cd CMSSW_11_0_0_pre6/src/ && cmsenv

> runTheMatrix.py -w upgrade -n | grep 2026 | grep trackingOnly | grep 14TeV (need step2.root)

> runTheMatrix.py -w upgrade -l 20434.1 > 20434.1.log &

Reconstruction and validation done with:
cmsRun step3_RAW2DIGI_RECO_VALIDATION_DQM.py (running over step2.root, do we have MC samples?)

Switch to CMSSW_11_0_0_pre6 - Part 2

→ /afs/cern.ch/work/h/hyarar/public/Phase2/MC_Tracking/MC_Tracking_CMSSW_11_0_pre6

Release generated script with cleaned up cff files & paths

Version 2) Release generated script with new paths plugged in
############
step3_RAW2DIGI_RECO_VALIDATION_DQM.py

needs:
- step2.root
- extras_cmssw_11_0_cff.py (extra modules needed)
- raw2digi_step_cff.py
- MC_Tracking_v0_cmssw_11_0_cff.py / MC_Tracking_v1_cmssw_11_0_cff.py / MC_Tracking_v2_cmssw_11_0_cff.py
- MC_prevalidation_v0_cff.py / MC_prevalidation_v1_cff.py / MC_prevalidation_v2_cff.py
- MC_Dqmoffline_step_v0_cff.py / MC_Dqmoffline_step_v1_cff.py / MC_Dqmoffline_step_v2_cff.py

example

```
process.load('raw2digi_step_cff')
process.load('MC_Tracking_v2_cmssw_11_0_cff')
process.load('MC_prevalidation_v2_cff')
process.load('MC_Dqmoffline_v2_cff')
```

slight changes in the new release, like a parameter called seedAs5DHit is needed for TrajectoryBuilders (all changes can be found with a comment search #cmssw_11_0)

Extra needed modules

```
process.load("extras_cmssw_11_0_cff")
process.load('Configuration.Geometry.GeometryExtended2026D41Reco_cff')
process.load('Configuration.StandardSequences.MagneticField_cff')
#process.load('Configuration.StandardSequences.RawToDigi_cff')
#process.load('Configuration.StandardSequences.Reconstruction_cff')
#process.load('Configuration.StandardSequences.Validation_cff')
#process.load('DQMServices.Core.DQMStoreNonLegacy_cff')
#process.load('DQMOffline.Configuration.DQMOfflineMC_cff')
process.load('Configuration.StandardSequences.FrontierConditions_GlobalTag_cff')
```

commented out

```
process.schedule = cms.Schedule(
*[process.raw2digi_step,process.MC_Tracking_v2,
process.MC_prevalidation_v2,process.MC_validation_v2,
process.MC_Dqmoffline_v2, process.DQMoutput_step])
```

Switch to CMSSW_10_6_0_patch2 - Part 1

Step3 from the release (trackingOnly):

> cmsrel CMSSW_10_6_0_patch2

> cd CMSSW_10_6_0_patch2/src/ && cmsenv

> cmsDriver.py step3 --conditions auto:phase2_realistic -n 10 --era Phase2C8_timing --eventcontent DQM --runUnscheduled -s RAW2DIGI,RECO,VALIDATION:@trackingValidation,DQM:@trackingOnlyDQM --datatier DQMIO --geometry Extended2023D41 --filein file:step2.root --fileout file:step3_inDQM.root --mc --no_exec (to get only the step3 file and not the rest, we have MC_samples)

Reconstruction and validation done with:

cmsRun step3_RAW2DIGI_RECO_VALIDATION_DQM_MC.py

Switch to CMSSW_10_6_0_patch2 - Part 2

→ /afs/cern.ch/work/h/hyarar/public/Phase2/MC_Tracking/MC_Tracking_CMSSW_10_6_0_patch2

Release generated script with cleaned up cff files & paths

Version 2) Release generated script with new paths plugged in
#############
step3_RAW2DIGI_RECO_VALIDATION_DQM_MC.py

needs:
- input_TTbar_PhaseIITDRSpring19DR-NoPU_106X_upgrade2023_realistic_v3_cff.py
- input_TTbar_PhaseIITDRSpring19DR-PU200_106X_upgrade2023_realistic_v3_cff.py
- extras.py (extra modules needed)
- raw2digi_step_cff.py
- MC_Tracking_v0_cmssw_10_6_cff.py / MC_Tracking_v1_cmssw_10_6_cff.py / MC_Tracking_v2_cmssw_10_6_cff.py
- MC_prevalidation_v0_cmssw_10_6_cff.py / MC_prevalidation_v1_cmssw_10_6_cff.py / MC_prevalidation_v2_cmssw_10_6_cff.py (all cleaned)
- MC_Dqmoffline_v0_cff.py / MC_Dqmoffline_v1_cff.py / MC_Dqmoffline_v2_cff.py

example

```
process.load('raw2digi_step_cff')
process.load('MC_Tracking_v2_cmssw_10_6_cff')
process.load('MC_prevalidation_v2_cmssw_10_6_cff')
process.load('MC_Dqmoffline_v2_cff')
```

slight changes in the new release, like offlineBeamSpot is in the cms.Path after local reco (all changes can be found with a comment search #cmssw_10_6)

```
process.load("extras")
process.load('Configuration.Geometry.GeometryExtended2023D41Reco_cff')
process.load('Configuration.StandardSequences.MagneticField_cff')
#process.load('Configuration.StandardSequences.RawToDigi_cff')
#process.load('Configuration.StandardSequences.Reconstruction_cff')
#process.load('Configuration.StandardSequences.Validation_cff')
#process.load('DQMServices.Core.DQMStoreNonLegacy_cff')
#process.load('DQMOffline.Configuration.DQMOfflineMC_cff')
process.load('Configuration.StandardSequences.FrontierConditions_GlobalTag_cff')
```

commented out

```
process.schedule = cms.Schedule(
*[process.raw2digi_step,process.MC_Tracking_v2,
process.MC_prevalidation_v2,process.MC_validation_v2,
process.MC_Dqmoffline_v2, process.DQMoutput_step])
```

Development start in CMSSW_10_4_0_mtd5 - Part 1

Step3 from the release:

> cmsrel CMSSW_10_4_0_mtd5

> cd CMSSW_10_4_0_mtd5/src/ && cmsenv

> runTheMatrix.py -w upgrade -n | grep 2023 | grep trackingOnly

> runTheMatrix.py -w upgrade -l 21224.1 --dryRun

Reconstruction and validation done with:
cmsRun step3_RAW2DIGI_RECO_VALIDATION_DQM.py

Development start from CMSSW_10_4_0_mtd5 - Part 2

→ /afs/cern.ch/work/h/hyarar/public/Phase2/MC_Tracking/MC_Tracking_CMSSW_10_4_0_mtd5

VERSION 1 - use step3_performance/timing_modular.py

README.txt
Version 1) Cleaned up from the release generated script
############
step3_performance_modular.py #performance studies
needs:

-input_TTbar_PhaseIIMTDTDRAutumn18DR-noPU_103X_upgrade2023_realistic_v2-v1_cff.py
-input_TTbar_PhaseIIMTDTDRAutumn18DR-PU200_103X_upgrade2023_realistic_v2-v1_cff.py
- raw2digi_step_cff.py
- MC_Tracking_v0_cff.py / MC_Tracking_v1_cff.py / MC_Tracking_v2_cff.py
- MC_prevalidation_v0_cff.py / MC_prevalidation_v1_cff.py / MC_prevalidation_v2_cff.py (all cleaned)
- MC_Dqmoffline_step_v0_cff.py / MC_Dqmoffline_step_v1_cff.py / MC_Dqmoffline_step_v2_cff.py

#############
step3_timing_modular.py #timing studies

needs:
- input_TTbar_PhaseIIMTDTDRAutumn18DR-noPU_103X_upgrade2023_realistic_v2-v1_cff.py (input sample list)
- input_TTbar_PhaseIIMTDTDRAutumn18DR-PU200_103X_upgrade2023_realistic_v2-v1_cff.py
- raw2digi_step_cff.py
- MC_Tracking_v0_cff.py / MC_Tracking_v1_cff.py / MC_Tracking_v2_cff.py

Development start from CMSSW_10_4_0_mtd5 - Part 3

→ /afs/cern.ch/work/h/hyarar/public/Phase2/MC_Tracking/MC_Tracking_CMSSW_10_4_0_mtd5

VERSION 2 - release generated script with cleaned up cff files & paths

README.txt
Version 2) Release generated script with new paths plugged in
#############
step3_RAW2DIGI_RECO_VALIDATION_DQM.py

needs:
- input_TTbar_PhaseIIMTDTDRAutumn18DR-noPU_103X_upgrade2023_realistic_v2-v1_cff.py (input sample list) or step2.root
- input_TTbar_PhaseIIMTDTDRAutumn18DR-PU200_103X_upgrade2023_realistic_v2-v1_cff.py
- extras.py (extra modules from step3_performance_modular.py)
- raw2digi_step_cff.py
- MC_Tracking_v0_cff.py / MC_Tracking_v1_cff.py / MC_Tracking_v2_cff.py
- MC_prevalidation_v0_cff.py / MC_prevalidation_v1_cff.py / MC_prevalidation_v2_cff.py
- MC_Dqmoffline_step_v0_cff.py / MC_Dqmoffline_step_v1_cff.py / MC_Dqmoffline_step_v2_cff.py

example

```
process.load('raw2digi_step_cff')
process.load('MC_Tracking_v2_cff')
process.load('MC_prevalidation_v2_cff')
process.load('MC_Dqmoffline_v2_cff')
```

```
process.load("extras")
process.load('Configuration.Geometry.GeometryExtended2023D21Reco_cff')
process.load('Configuration.StandardSequences.MagneticField_cff')
#process.load('Configuration.StandardSequences.RawToDigi_cff')
#process.load('Configuration.StandardSequences.Reconstruction_cff')
#process.load('Configuration.StandardSequences.Validation_cff')
#process.load('DQMOffline.Configuration.DQMOfflineMC_cff')
process.load('Configuration.StandardSequences.FrontierConditions_GlobalTag_cff')
```

commented out

```
process.schedule = cms.Schedule(
*[process.raw2digi_step,process.MC_Tracking_v2,
process.MC_prevalidation_v2,process.MC_validation_v2,
process.MC_Dqmoffline_v2, process.DQMoutput_step])
```

process=cms.Process("RECO") ----> process = cms.Process("RECOHLT") #or anything else, otherwise complains