

## 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 (Do we have MC samples?)
```

## 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](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\_Dqmooffline\_step\_v0\_cff.py / MC\_Dqmooffline\_step\_v1\_cff.py / MC\_Dqmooffline\_step\_v2\_cff.py

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

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_Dqmooffline_v2_cff')
```

See next slide for technical changes

```
process.schedule = cms.Schedule(
*[process.raw2digi_step, process.MC_Tracking_v2,
process.MC_prevalidation_v2, process.MC_validation_v2,
process.MC_Dqmooffline_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**

**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

example

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\_Dqmooffline\_step\_v0\_cff.py / MC\_Dqmooffline\_step\_v1\_cff.py / MC\_Dqmooffline\_step\_v2\_cff.py

Extra needed modules

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

```
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('DQMOOffline.Configuration.DQMOOfflineMC_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_Dqmooffline_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

example

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\_Dqmooffline\_v0\_cff.py / MC\_Dqmooffline\_v1\_cff.py / MC\_Dqmooffline\_v2\_cff.py

```
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_Dqmooffline_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('DQMOOffline.Configuration.DQMOOfflineMC_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_Dqmooffline_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\_Dqmooffline\_step\_v0\_cff.py / MC\_Dqmooffline\_step\_v1\_cff.py / MC\_Dqmooffline\_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\_Dqmooffline\_step\_v0\_cff.py / MC\_Dqmooffline\_step\_v1\_cff.py / MC\_Dqmooffline\_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_Dqmooffline_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_Dqmooffline_v2, process.DQMoutput_step])
```

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