

Lines of interest:

[Merging](#)

[Iso cone](#)

Loading the processor:

```
CKFTracking          INFO Parameter values for: CKFTracking of type
ACTSSeededCKFTrackingProc
CKFTracking          INFO new processor 0x3ac4ac20
CKFTracking          INFO init
[ MESSAGE "CKFTracking"]
[ MESSAGE "CKFTracking"] ---- CKFTracking - parameters:
[ MESSAGE "CKFTracking"]   CKF_Chi2CutOff: 10
[ MESSAGE "CKFTracking"]   CKF_NumMeasurementsCutOff: 1
[ MESSAGE "CKFTracking"]   CaloFace_Radius: 1857
[ MESSAGE "CKFTracking"]   CaloFace_Z: 2307
[ MESSAGE "CKFTracking"]   DetectorSchema: MAIA_v0
[ MESSAGE "CKFTracking"]   InitialTrackError_Lambda: 0.0174533
[ MESSAGE "CKFTracking"]   InitialTrackError_Phi: 0.0174533
[ MESSAGE "CKFTracking"]   InitialTrackError_Pos: 0.01
[ MESSAGE "CKFTracking"]   InitialTrackError_RelP: 0.25
[ MESSAGE "CKFTracking"]   MatFile:
/opt/spack/opt/spack/linux-almalinux9-x86_64/gcc-11.5.0/actstracking-1.3.1-twq2l2ff2s1
tn6clmolkgeq4a4vopetc/share/ACTSTracking/data/MAIA_v0_material.json
[ MESSAGE "CKFTracking"]   PropagateBackward: false
[ MESSAGE "CKFTracking"]   RunCKF: true
[ MESSAGE "CKFTracking"]   SeedCollectionName: SeedTracks
[ MESSAGE "CKFTracking"]   SeedFinding_CollisionRegion: 6
[ MESSAGE "CKFTracking"]   SeedFinding_DeltaRMax: 80
[ MESSAGE "CKFTracking"]   SeedFinding_DeltaRMaxBottom: 0
[ MESSAGE "CKFTracking"]   SeedFinding_DeltaRMaxTop: 0
[ MESSAGE "CKFTracking"]   SeedFinding_DeltaRMin: 5
[ MESSAGE "CKFTracking"]   SeedFinding_DeltaRMinBottom: 0
[ MESSAGE "CKFTracking"]   SeedFinding_DeltaRMinTop: 0
[ MESSAGE "CKFTracking"]   SeedFinding_ImpactMax: 3
[ MESSAGE "CKFTracking"]   SeedFinding_MinPt: 500
[ MESSAGE "CKFTracking"]   SeedFinding_RMax: 150
[ MESSAGE "CKFTracking"]   SeedFinding_RadLengthPerSeed: 0.1
[ MESSAGE "CKFTracking"]   SeedFinding_SigmaScattering: 50
[ MESSAGE "CKFTracking"]   SeedFinding_ZMax: 600
[ MESSAGE "CKFTracking"]   SeedFinding_phiBottomBinLen: 1
[ MESSAGE "CKFTracking"]   SeedFinding_phiTopBinLen: 1
[ MESSAGE "CKFTracking"]   SeedFinding_zBinEdges:
[ MESSAGE "CKFTracking"]   SeedFinding_zBottomBinLen: 1
[ MESSAGE "CKFTracking"]   SeedFinding_zTopBinLen: 1
[ MESSAGE "CKFTracking"]   SeedingLayers: 13 2 13 6 13 10 13 14 14 2 14 6 14 8 14 10
15 2 15 6 15 10 15 14 8 2 17 2 18 2
[ MESSAGE "CKFTracking"]   TGeoDescFile:
/opt/spack/opt/spack/linux-almalinux9-x86_64/gcc-11.5.0/actstracking-1.3.1-twq2l2ff2s1
tn6clmolkgeq4a4vopetc/share/ACTSTracking/data/MAIA_v0.json
```

```

[ MESSAGE "CKFTracking"]   TGeoFile:
/opt/spack/opt/spack/linux-almalinux9-x86_64/gcc-11.5.0/actstracking-1.3.1-twq2l2ff2sl
tn6clmolkgeq4a4vopetc/share/ACTSTracking/data/MAIA_v0.root
[ MESSAGE "CKFTracking"]   TrackCollectionName:  AllTracks
[ MESSAGE "CKFTracking"]   TrackerHitCollectionNames:  VBTrackerHitsConed
IBTrackerHitsConed OBTrackerHitsConed VETrackerHitsConed IETrackerHitsConed
OETrackerHitsConed
[ MESSAGE "CKFTracking"] -----
[ MESSAGE "CKFTracking"] -----
[ MESSAGE "CKFTracking"]   -- Building magnetic field
[ MESSAGE "CKFTracking"]   -- Building tracking detector
TGeoManager::Im...   INFO Reading geometry from file:
/opt/spack/opt/spack/linux-almalinux9-x86_64/gcc-11.5.0/actstracking-1.3.1-twq2l2ff2sl
tn6clmolkgeq4a4vopetc/share/ACTSTracking/data/MAIA_v0.root
TGeoManager::Cl...   INFO Geometry loaded from file...
TGeoManager::Se...   INFO Top volume is world_volume. Master volume is world_volume
TGeoManager::Vo...   INFO Voxelizing...
TGeoManager::Co...   INFO max level = 5, max placements = 27552
TGeoManager::Cl...   INFO 1593493 nodes/ 254 volume UID's in Detector Geometry
TGeoManager::Cl...   INFO -----modeler ready-----
TGeoMatrix::dtor WARNING Registered matrix ID was removed
TGeoMatrix::dtor WARNING Registered matrix ID was removed
TGeoMatrix::dtor WARNING Registered matrix ID was removed
TGeoMatrix::dtor WARNING Registered matrix ID was removed
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TGeoMatrix::dtor WARNING Registered matrix ID was removed
[ MESSAGE "CKFTracking"] -----
CKFTracking          INFO Init processor

```

Running the processor:

```

===== WARNING =====
static method CellIDDecoder::setDefaultEncoding
does nothing anymore. Use the constructor to
specify your encoding string !!
=====
<-----DumpPfosMonitoringAlgorithm----->
Total RECO PFO Energy = 156.87
Pfo EPfoTrack ( mc) C R Mom ( mc) Eclust tclust chi L fC fP fN
-211 148.14 -211 ( 0) 1 1 148.14 ( 0.00) 128.41 0.17 -2.70 0.00 0.00 1.00 tTrack = 0.01 <-- confusion : 128.41 GeV
Pfo EPfo Eclust tclust fC fP fN Layers sStart sDisc
22 3.23 3.92 0.03 0.00 0.00 1.00 1- 18 0.00 0.33
22 2.32 2.82 0.05 0.00 0.00 1.00 1- 25 0.00 0.56
22 1.86 2.26 0.09 0.00 0.00 1.00 1- 15 0.00 0.76
2112 0.81 0.54 0.89 0.00 0.00 1.00 52- 53 -99.00 -99.00
2112 0.51 0.51 0.44 0.00 0.00 1.00 1- 5 0.00 0.46
Generated as track gamma hadron

```

```

Reco as track : 0.00 0.00 128.41
Reco as gamma : 0.00 0.00 8.99
Reco as hadron: 0.00 0.00 1.05
Generated as track gamma hadron
Reco as track : 0.00 0.00 92.75
Reco as gamma : 0.00 0.00 6.49
Reco as hadron: 0.00 0.00 0.76
Unconfused energy : 0.00 8.99 1.05 : 10.04
Confused energy : 128.41 0.00 0.00 : 128.41

```

```

#-----
#           FastJet release 3.4.2
#           M. Cacciari, G.P. Salam and G. Soyez
#   A software package for jet finding and analysis at colliders
#           http://fastjet.fr
#
# Please cite EPJC72(2012)1896 [arXiv:1111.6097] if you use this package
# for scientific work and optionally PLB641(2006)57 [hep-ph/0512210].
#
# FastJet is provided without warranty under the GNU GPL v2 or higher.
# It uses T. Chan's closest pair algorithm, S. Fortune's Voronoi code
# and 3rd party plugin jet algorithms. See COPYING file for details.
#-----

```

```

[ WARNING "TruthValenciaJetProcessor"] Not enough elements in the input collection to create 2 jets.
[ MESSAGE "EventNumber"] ===== Run :    0 Event:    1
[ MESSAGE "VXDBarrelConer"] 0 hits added to the collections: VBTrackerHitsConed, VertexBarrelCollectionConed,
VBTrackerHitsRelationsConed
[ MESSAGE "VXDEndcapConer"] 8 hits added to the collections: VETrackerHitsConed, VertexEndcapCollectionConed,
VETrackerHitsRelationsConed
[ MESSAGE "InnerPlanarConer"] 1 hits added to the collections: IBTrackerHitsConed, InnerTrackerBarrelCollectionConed,
IBTrackerHitsRelationsConed
[ MESSAGE "InnerEndcapConer"] 5 hits added to the collections: IETrackerHitsConed,
InnerTrackerEndcapCollectionConed, IETrackerHitsRelationsConed
[ MESSAGE "OuterPlanarConer"] 0 hits added to the collections: OBTTrackerHitsConed,
OuterTrackerBarrelCollectionConed, OBTTrackerHitsRelationsConed
[ MESSAGE "OuterEndcapConer"] 2 hits added to the collections: OETrackerHitsConed,
OuterTrackerEndcapCollectionConed, OETrackerHitsRelationsConed
CKFTracking      FATAL Standard std::exception is caught in sysExecute
CKFTracking      ERROR Global to local transformation did not succeed.
EventLoopMgr     FATAL .executeEvent(): Standard std::exception thrown by CKFTracking
EventLoopMgr     ERROR Global to local transformation did not succeed.
EventLoopMgr     WARNING Execution of algorithm CKFTracking failed
TrackDeduper     ERROR There was an exception while processing TrackDeduper: Lcio::DataNotAvailableException:
LCEventImpl::getCollection: collection not in event:AllTracks
TrackDeduper     ERROR Maximum number of errors ( 'ErrorMax':1) reached.
EventLoopMgr     WARNING Execution of algorithm TrackDeduper failed
[ WARNING "DDMarlinPandora"] Failed to extract track collection: SiTracks_Refitted, Lcio::DataNotAvailableException:
LCEventImpl::getCollection: collection not in event:SiTracks_Refitted
===== WARNING =====
static method CellIDDecoder::setDefaultEncoding
does nothing anymore. Use the constructor to
specify your encoding string !!
=====
[ MESSAGE "DDMarlinPandora"] Failed to extract ecal calo hit collection: EcalBarrelCollectionSel,
Lcio::DataNotAvailableException: LCEventImpl::getCollection: collection not in event:EcalBarrelCollectionSel
[ MESSAGE "DDMarlinPandora"] Failed to extract hcal calo hit collection: HcalBarrelCollectionConed,
Lcio::DataNotAvailableException: LCEventImpl::getCollection: collection not in event:HcalBarrelCollectionConed
<-----DumpPfosMonitoringAlgorithm----->

```

Total RECO PFO Energy = 7.84

Pfo	EPfo	Eclust	tclust	fC	fP	fN	Layers	sStart	sDisc
2112	7.84	5.20	0.01	0.00	0.00	1.00	5-130	23.50	3.08

Generated as track gamma hadron

Reco as track : 0.00 0.00 0.00

Reco as gamma : 0.00 0.00 0.00

Reco as hadron: 0.00 0.00 5.20

Generated as track gamma hadron

Reco as track : 0.00 0.00 0.00

Reco as gamma : 0.00 0.00 0.00

Reco as hadron: 0.00 0.00 100.00

Unconfused energy : 0.00 0.00 5.20 : 5.20

Confused energy : 0.00 0.00 0.00 : 0.00

[WARNING "ValenciaJetProcessor"] Not enough elements in the input collection to create 2 jets.

[WARNING "TruthValenciaJetProcessor"] Not enough elements in the input collection to create 2 jets.

EventLoopMgr ERROR Error processing event loop.

EventLoopMgr ERROR Terminating event processing loop due to errors

EventLoopMgr ERROR Terminating event processing loop due to errors

ApplicationMgr INFO Application Manager Stopped successfully

MyAIDAProcessor INFO Finalising Output_REC

[MESSAGE4 "Output_REC"]

[MESSAGE4 "Output_REC"] LCIOOutputProcessor::end() Output_REC: 2 events in 0 runs written to file

/afs/hep.wisc.edu/home/kianian/future_collider/digi_reco_output.slcio

[MESSAGE4 "Output_REC"]

EventNumber INFO Finalising TruthValenciaJetProcessor

[MESSAGE "TruthValenciaJetProcessor"] Found jets: 0 (0 per event) - Skipped Empty events:0 - Skipped Events after max nr of iterations reached: 0 - Skipped Search for Fixed Nr Jets (due to insufficient nr of particles):2

InitDD4hep INFO Finalising TruthFastJetProcessor

[MESSAGE "TruthFastJetProcessor"] Found jets: 2 (1 per event) - Skipped Empty events:0 - Skipped Events after max nr of iterations reached: 0 - Skipped Search for Fixed Nr Jets (due to insufficient nr of particles):0

VXDBarrelDigitiser INFO Finalising TrueMCintoRecoForJets

VXDEndcapDigitiser INFO Finalising ValenciaJetProcessor

[MESSAGE "ValenciaJetProcessor"] Found jets: 2 (1 per event) - Skipped Empty events:0 - Skipped Events after max nr of iterations reached: 0 - Skipped Search for Fixed Nr Jets (due to insufficient nr of particles):1

InnerPlanarDigi... INFO Finalising FastJetProcessor

[MESSAGE "FastJetProcessor"] Found jets: 1 (0.5 per event) - Skipped Empty events:0 - Skipped Events after max nr of iterations reached: 0 - Skipped Search for Fixed Nr Jets (due to insufficient nr of particles):0

InnerEndcapPlan... INFO Finalising DDMarlinPandora

----- DumpPfosMonitoringAlgorithm : Summary -----

Confusion matrix summary

Generated as track gamma hadron

Reco as track : 0.00 0.00 128.41

Reco as gamma : 0.00 0.00 8.99

Reco as hadron: 0.00 0.00 6.25

Confusion covariance

photon/neutral reconstructed as charged mean : 46.37

rms : 46.37

charged reconstructed as neutral/photon mean : 0.00

rms : 0.00

Covariance : 0.00

Correlation coefficient : -nan

Rms total confusion : -nan

Rms net confusion : -nan

Generated as track gamma hadron

Reco as track : 0.00 0.00 89.39

```

Reco as gamma : 0.00 0.00 6.26
Reco as hadron: 0.00 0.00 4.35
Well constructed PFOs summary
  Unconfused energy : 0.00 8.99 6.25 : 15.24
  Confused energy : 128.41 0.00 0.00 : 128.41
Particle ID Summary (Neutral/Photon Separation)
  Correctly IDed Photon Energy Fraction : 0.00
  Correctly IDed Neutral Energy Fraction : 1.00
[ MESSAGE "DDMarlinPandora"] DDPandoraPFANewProcessor - End
OuterPlanarDigi... INFO Finalising MyDDSimpleMuonDigi
OuterEndcapPlan... INFO Finalising MyEcalEndcapSelector
VXDBarrelConer    INFO Finalising MyEcalBarrelSelector
VXDEndcapConer    INFO Finalising MyHcalEndcapConer
InnerPlanarConer  INFO Finalising MyHcalBarrelConer
InnerEndcapConer  INFO Finalising MyEcalEndcapConer
OuterPlanarConer  INFO Finalising MyEcalBarrelConer
OuterEndcapConer  INFO Finalising MyHcalEndcapReco
CKFTracking       INFO Finalising MyHcalEndcapDigi
TrackDeduper      INFO Finalising MyHcalBarrelReco
MyTrackTruth      INFO Finalising MyEcalEndcapReco
MyEcalBarrelDigi  INFO Finalising MyEcalEndcapDigi
MyEcalBarrelReco  INFO Finalising MyEcalBarrelReco
MyEcalEndcapDigi  INFO Finalising MyEcalBarrelDigi
MyEcalEndcapReco  INFO Finalising MyTrackTruth
MyHcalBarrelDigi  INFO Finalising Refit
MyHcalBarrelReco  INFO Finalising TrackDeduper
MyHcalEndcapDigi  INFO Finalising CKFTracking
MyHcalEndcapReco  INFO Finalising OuterEndcapConer
FilterConeHits::end() OuterEndcapConer processed 2 events in 0 runs
MyEcalBarrelConer INFO Finalising OuterPlanarConer
FilterConeHits::end() OuterPlanarConer processed 2 events in 0 runs
MyEcalEndcapConer INFO Finalising InnerEndcapConer
FilterConeHits::end() InnerEndcapConer processed 2 events in 0 runs
MyHcalBarrelConer INFO Finalising InnerPlanarConer
FilterConeHits::end() InnerPlanarConer processed 2 events in 0 runs
MyHcalEndcapConer INFO Finalising VXDEndcapConer
FilterConeHits::end() VXDEndcapConer processed 2 events in 0 runs
MyEcalBarrelSel... INFO Finalising VXDBarrelConer
FilterConeHits::end() VXDBarrelConer processed 2 events in 0 runs
MyEcalEndcapSel... INFO Finalising OuterEndcapPlanarDigiProcessor
[ MESSAGE "OuterEndcapPlanarDigiProcessor"] end() OuterEndcapPlanarDigiProcessor processed 2 events in 0 runs
MyDDSimpleMuonDigi INFO Finalising OuterPlanarDigiProcessor
[ MESSAGE "OuterPlanarDigiProcessor"] end() OuterPlanarDigiProcessor processed 2 events in 0 runs
DDMarlinPandora    INFO Finalising InnerEndcapPlanarDigiProcessor
[ MESSAGE "InnerEndcapPlanarDigiProcessor"] end() InnerEndcapPlanarDigiProcessor processed 2 events in 0 runs
FastJetProcessor    INFO Finalising InnerPlanarDigiProcessor
[ MESSAGE "InnerPlanarDigiProcessor"] end() InnerPlanarDigiProcessor processed 2 events in 0 runs
ValenciaJetProc...  INFO Finalising VXDEndcapDigitiser
[ MESSAGE "VXDEndcapDigitiser"] end() VXDEndcapDigitiser processed 2 events in 0 runs
TrueMCintoRecoF...  INFO Finalising VXDBarrelDigitiser
[ MESSAGE "VXDBarrelDigitiser"] end() VXDBarrelDigitiser processed 2 events in 0 runs
TruthFastJetPro...  INFO Finalising InitDD4hep
TruthValenciaJe...  INFO Finalising EventNumber
[ MESSAGE "EventNumber"] Statusmonitor::end() EventNumber processed 2 events in 0 runs
Output_REC          INFO Finalising MyAIDAProcessor
ApplicationMgr       INFO Application Manager Finalized successfully
ApplicationMgr       ERROR Application Manager Terminated with error code 6

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