

TRKR_HITSET

DST size

Node Tree under TopNode TOP

TOP (PHCompositeNode)/
DST (PHCompositeNode)/
GL1 (PHCompositeNode)/
GL1RAWHIT (IO,Gl1Packetv3)
TPC (PHCompositeNode)/

TPCRAWHIT_00_0 (IO, **TpcRawHitContainerv3**)
TPCRAWHIT_00_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_01_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_01_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_02_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_02_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_03_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_03_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_04_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_04_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_05_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_05_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_06_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_06_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_07_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_07_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_08_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_08_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_09_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_09_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_10_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_10_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_11_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_11_1 (IO, TpcRawHitContainerv3)

TPCRAWHIT_12_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_12_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_13_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_13_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_14_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_14_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_15_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_15_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_16_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_16_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_17_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_17_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_18_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_18_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_19_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_19_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_20_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_20_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_21_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_21_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_22_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_22_1 (IO, TpcRawHitContainerv3)
TPCRAWHIT_23_0 (IO, TpcRawHitContainerv3)
TPCRAWHIT_23_1 (IO, TpcRawHitContainerv3)

Sync (IO, SyncObjectv1)
EventHeader (IO, EventHeaderv1)
MICROMEGAS (PHCompositeNode)/
MICROMEGASRAWHIT (IO, MicromegasRawHitContainerv3)
INTT (PHCompositeNode)/
INTTRAWHIT_0 (IO, InttRawHitContainerv2)
INTTRAWHIT_1 (IO, InttRawHitContainerv2)
INTTRAWHIT_2 (IO, InttRawHitContainerv2)
INTTRAWHIT_3 (IO, InttRawHitContainerv2)
INTTRAWHIT_4 (IO, InttRawHitContainerv2)
INTTRAWHIT_5 (IO, InttRawHitContainerv2)
INTTRAWHIT_6 (IO, InttRawHitContainerv2)
INTTRAWHIT_7 (IO, InttRawHitContainerv2)
MVTX (PHCompositeNode)/
MVTXRAWEVTHEADER_0 (IO, MvtxRawEvtHeaderv2)
MVTXRAWHIT_0 (IO, MvtxRawHitContainerv1)
MVTXRAWEVTHEADER_1 (IO, MvtxRawEvtHeaderv2)
MVTXRAWHIT_1 (IO, MvtxRawHitContainerv1)
MVTXRAWEVTHEADER_2 (IO, MvtxRawEvtHeaderv2)
MVTXRAWHIT_2 (IO, MvtxRawHitContainerv1)
MVTXRAWEVTHEADER_3 (IO, MvtxRawEvtHeaderv2)
MVTXRAWHIT_3 (IO, MvtxRawHitContainerv1)
MVTXRAWEVTHEADER_4 (IO, MvtxRawEvtHeaderv2)
MVTXRAWHIT_4 (IO, MvtxRawHitContainerv1)
MVTXRAWEVTHEADER_5 (IO, MvtxRawEvtHeaderv2)
MVTXRAWHIT_5 (IO, MvtxRawHitContainerv1)
MVTXEVENTHEADER (IO, MvtxEventInfov3)

alignmentTransformationContainer (PHDataNode)
alignmentTransformationContainerTransient (PHDataNode)
TRKR (PHCompositeNode)/
TRKR_MVTXHITSETHELPER (IO, TrkrHitSetContMvtxHelperv1)
TRKR_HITSET (IO, TrkrHitSetContainerv1)
LaserEventInfo (IO, LaserEventInfov2)
INMODULETRACKS (IO, InModuleTrackContainerv1)
RUN (PHCompositeNode)/
RunHeader (IO, RunHeaderv1)
Flags (IO, FlagSavev1)
CdbUrl (IO, CdbUrlSavev1)
RECO_TRACKING_GEOMETRY (PHCompositeNode)/
CYLINDERGEOM_MVTX (IO, PHG4CylinderGeomContainer)
CYLINDERGEOM_INTT (IO, PHG4CylinderGeomContainer)
TPCGEOMCONTAINER (IO, PHG4TpcGeomContainer)
CYLINDERGEOM_MICROMEGAS_FULL (IO, PHG4CylinderGeomContainer)
GEOMETRY_IO (IO, PHGeomIOTGeo)
FIELD_CONFIG (IO, PHFieldConfigv2)
PAR (PHCompositeNode)/
GEOMETRY (PHDataNode)
SVTX (PHCompositeNode)/
ActsGeometry (PHDataNode)
FIELD_MAP (PHDataNode)

TpcRawHitv3 vs TrkrHitSet

TpcRawHitv3 (raw) stores, per hit (TpcRawHitv3):

- bco (uint64), packetid (int32), fee (uint16), channel (uint16), type (uint16), checksumerror, parityerror
- m_adcData: a vector<pair<uint16_t, vector<uint16_t>>> — i.e. **waveforms as (start_time, ADC_samples) pairs**, but only non-zero samples (zero-suppressed at the source). The SAMPA chip already applies zero suppression before data leaves the FEE.

TrkrHitSet / TrkrHit (hitset) stores hits organized by TrkrDefs::hitsetkey. For the TPC, a TrkrHit stores an ADC value per (pad, time bin) coordinate within a HitSet

- The HitSet stores all **ADC samples in a map indexed by TpcDefs::hitkey**, which encodes (pad_row, pad, time_bin) — meaning it unpacks and stores every time bin within a found waveform, not as a compact waveform vector but as individual map entries.
- Each map entry in ROOT carries significant overhead (a `std::map<hitkey, TrkrHit*` serialized via ROOT dictionary).

Au+Au 75405 (beginning of the store)

```
# run segment hitset_size_bytes raw_total_size_bytes n_raw_files
75405 0 00000 28053513417 27GB 17509985179 17GB 63
75405 1 00001 28180563394 27GB 17618473115 17GB 63
75405 2 00002 28094592599 27GB 17555975139 17GB 63
75405 3 00003 27809593625 26GB 17438080210 17GB 63
75405 4 00004 28558171526 27GB 17864017926 17GB 63
75405 5 00005 28276850941 27GB 17645640145 17GB 63
75405 6 00006 28326576956 27GB 17726153369 17GB 63
75405 7 00007 28122511630 27GB 17631322480 17GB 63
75405 8 00008 28555693296 27GB 17859180415 17GB 63
75405 9 00009 27962521744 27GB 17441529407 17GB 63
```

TRKR_HITSET is larger then RawHit

```
# totals
# processed_segments 10
# total_hitset_size_bytes 281940589128
# total_raw_size_bytes 176290357385
# total_raw_files 630
# average_hitset_size_per_segment_bytes 28194058912
# average_raw_size_per_segment_bytes 17629035738
```

p+p 79513

```
# run segment hitset_size_bytes raw_total_size_bytes n_raw_files
79513 0 00000 7496254953 7.0GB 5432718727 5.1GB 63
79513 1 00001 7433010688 7.0GB 5397244579 5.1GB 63
79513 2 00002 7509786103 7.0GB 5445218368 5.1GB 63
79513 3 00003 7480116321 7.0GB 5428083421 5.1GB 63
79513 4 00004 7496663317 7.0GB 5446498442 5.1GB 63
79513 5 00005 7485219532 7.0GB 5426120253 5.1GB 63
79513 6 00006 7500661126 7.0GB 5443898463 5.1GB 63
79513 7 00007 7486668752 7.0GB 5438175395 5.1GB 63
79513 8 00008 7495130293 7.0GB 5440142773 5.1GB 63
79513 9 00009 7469803353 7.0GB 5415554795 5.1GB 63
```

TRKR_HITSET is larger then RawHit!

```
# totals
# processed_segments 10
# total_hitset_size_bytes 74853314438
# total_raw_size_bytes 54313655216
# total_raw_files 630
# average_hitset_size_per_segment_bytes 7485331443
# average_raw_size_per_segment_bytes 5431365521
```