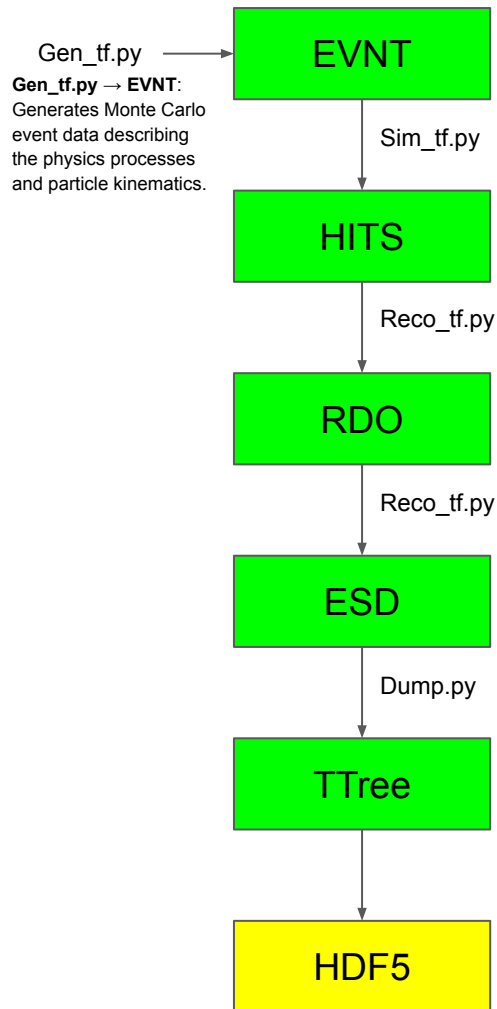


Dataset Simulation Progress

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Aug 15, 2025



- **Sim_tf.py** → **HITS**: Simulates particle interactions with the detector geometry, producing simulated detector hit information.
- **Reco_tf.py** → **RDO**: Converts simulated hits into raw detector output format, mimicking real data readout.
- **Reco_tf.py** → **ESD**: Reconstructs high-level physics objects (tracks, clusters, etc.) from raw detector data.
- **Dump.py** → **TTree**: Extracts and organizes reconstructed event information into ROOT TTree format for analysis.
- **TTree** → **HDF5**: Converts the ROOT tree data into an HDF5 file for machine learning and further processing.

Progress

- Went through all GEANT4 Simulation processes for Calorimeter data.
- Used a typical Run3 tag to generate several samples.
- Dump the ESD file to readable root file with customization.

Upon to solve

- Correct geometry tag for simpler dataset.
- Optimize efficiency (time)
- Determine the appropriate size and where to do it.

Dataset

s4430

view / edit

Clone Tag

History

URL

Flat

| | |
|--------------------|---|
| productionStep | simul |
| tagType | s |
| tagNumber | 4430 |
| groupName | AthSimulation |
| cacheName | 24.0.42 |
| baseRelease | AthSimulation_24.0.42 |
| transformationName | Sim_tf.py |
| description | MC23e with Calibration Hits |
| created | 2024-10-31 15:16:56 |
| createdBy | cyoung |
| modified | 2024-10-31 15:16:56 |
| modifiedBy | cyoung |
| transformation | Sim_tf.py |
| SWReleaseCache | AthSimulation_24.0.42 |
| CA | "all:True" |
| conditionsTag | "default:OFLCOND-MC23-SDR-RUN3-04" |
| geometryVersion | "default:ATLAS-R3S-2021-03-02-00" |
| multithreaded | True |
| postInclude | "default:PyJobTransforms.UseFrontier" |
| preInclude | "EVNTtoHITS:Campaigns.MC23eSimulationMultipleIOCalibrationHits" |
| simulator | FullG4MT_QS |

r16198

view / edit

Clone Tag

History

URL

Flat

| | |
|-------------------------------|--|
| productionStep | recon |
| tagType | r |
| tagNumber | 16198 |
| groupName | Athena |
| cacheName | 24.0.52.4 |
| baseRelease | Athena_24.0.52 |
| transformationName | Reco_tf.py |
| description | MC23e with Calibration Hits in ESD without pile-up |
| created | 2024-11-20 17:45:30 |
| createdBy | cyoung |
| modified | 2024-11-20 17:45:30 |
| modifiedBy | cyoung |
| transformation | Reco_tf.py |
| SWReleaseCache | Athena_24.0.52.4 |
| CA | "all:True" |
| autoConfiguration | everything |
| conditionsTag | "default:OFLCOND-MC23-SDR-RUN3-05-03" |
| deleteIntermediateOutputfiles | True |
| geometryVersion | "default:ATLAS-R3S-2021-03-02-00" |
| multithreaded | True |
| postExec | content |
| postInclude | "default:PyJobTransforms.UseFrontier" |
| preInclude | "all:Campaigns.MC23e" |
| steering | "doRDO_TRIG" "doTRIGtoALL" |

```

root [15] t->Print()
*****
*Tree :cells      : CaloCells from ESD (per-event vectors) *
*Entries :      5 : Total =      15018840 bytes File Size =   5802140 *
*Baskets :      1 : Basket Size=      32000 bytes Compression=    1.00 *
* :              : Tree compression factor =    2.59 *
*****
*Br 0 :run      : run/I *
*Entries :      5 : Total Size=      568 bytes File Size =      91 *
*Baskets :      1 : Basket Size=      32000 bytes Compression=    1.07 *
*****
*Br 1 :evt      : evt/L *
*Entries :      5 : Total Size=      596 bytes File Size =     104 *
*Baskets :      1 : Basket Size=      32000 bytes Compression=    1.07 *
*****
*Br 2 :ncell    : ncell/I *
*Entries :      5 : Total Size=      582 bytes File Size =      93 *
*Baskets :      1 : Basket Size=      32000 bytes Compression=    1.00 *
*****
*Br 3 :incident_energy : incident_energy/F *
*Entries :      5 : Total Size=      628 bytes File Size =     103 *
*Baskets :      1 : Basket Size=      32000 bytes Compression=    1.00 *
*****
*Br 4 :layer    : vector<int> *
*Entries :      5 : Total Size=  3753968 bytes File Size =   20530 *
*Baskets :      5 : Basket Size=      32000 bytes Compression= 182.83 *
*****
*Br 5 :eta      : vector<float> *
*Entries :      5 : Total Size=  3753946 bytes File Size =  2498365 *
*Baskets :      5 : Basket Size=      32000 bytes Compression=    1.50 *
*****
*Br 6 :phi      : vector<float> *
*Entries :      5 : Total Size=  3753946 bytes File Size =  1685645 *
*Baskets :      5 : Basket Size=      32000 bytes Compression=    2.23 *
*****
*Br 7 :e        : vector<float> *
*Entries :      5 : Total Size=  3753940 bytes File Size =  1596006 *
*Baskets :      5 : Basket Size=      32000 bytes Compression=    2.35 *
*****

```

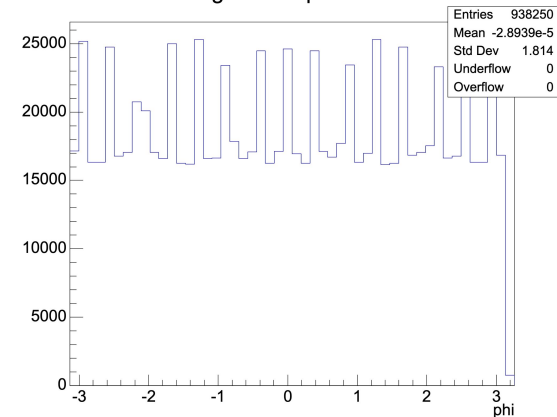
N_cell per event = 187650

```

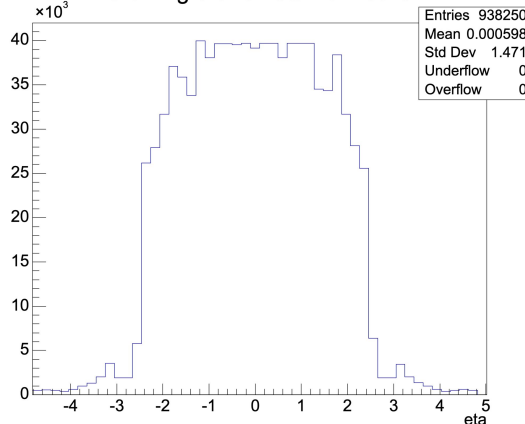
root [16] t->Scan("e", "Entry$==2");
*****
*   Row   * Instance *          e *
*****
*      2   *      0   * 347.94485 *
*      2   *      1   * 353.31152 *
*      2   *      2   * -577.7276 *
*      2   *      3   * -749.6426 *
*      2   *      4   * -428.1759 *
*      2   *      5   * 555.55712 *
*      2   *      6   * -472.5457 *
*      2   *      7   *      0 *
*      2   *      8   * -639.7152 *
*      2   *      9   * -131.9287 *
*      2   *     10   * 347.94485 *
*      2   *     11   * 188.95230 *
*      2   *     12   * -485.7630 *
*      2   *     13   * 963.15722 *
*      2   *     14   * 302.06933 *
*      2   *     15   * -121.0537 *
*      2   *     16   * 152.49285 *
*      2   *     17   * -492.4631 *
*      2   *     18   * -398.2447 *
*      2   *     19   * -306.9544 *
*      2   *     20   * -492.4631 *
*      2   *     21   * 69.901519 *
*      2   *     22   * -631.7354 *
*      2   *     23   * 492.46310 *
*      2   *     24   * 96.516304 *
*****

```

drawing branch phi from cells



drawing branch eta from cells



drawing branch layer from cells

