Strip Segmentation
MPGD Meeting 11/04/2024

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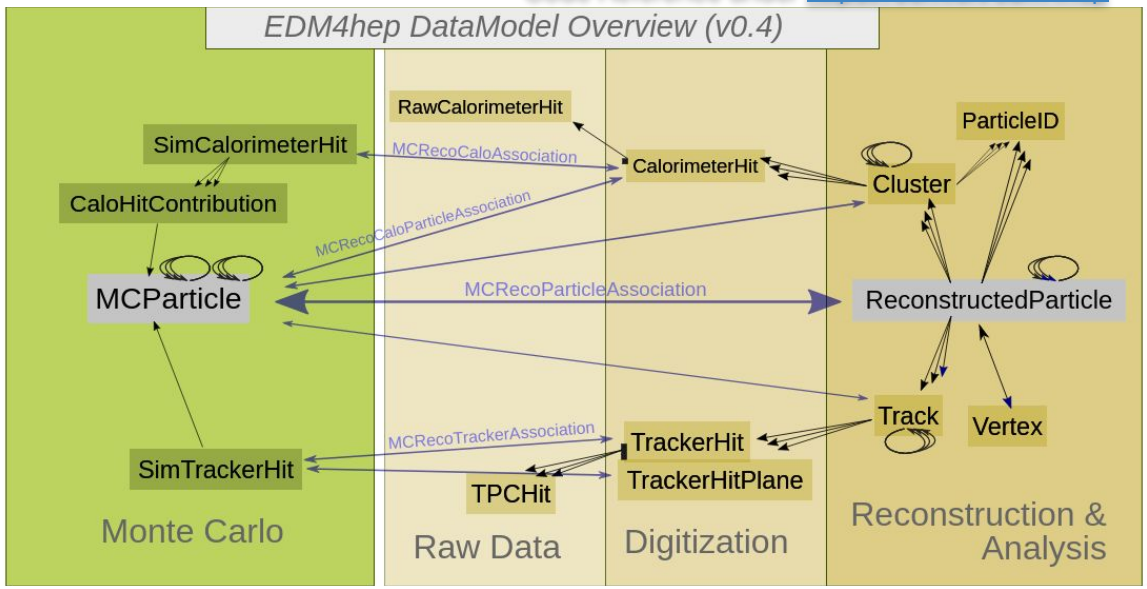
4 November 2024

EventDataModel4hep

Code Reference under https://cern.ch/edm4hep



- ~~**One to one** `SimTrackerHit` $\leftrightarrow$ `TrackerHit`~~

  ~~$\Rightarrow$ "Digitization" needs to be already at the level of `Geant4Tracker::Hit`~~

- Digitization in `EICrecon`: new `MPGDTrackerDigi` class based on `SiliconTrackerDigi`.

  Need segmentation again: assign distinct cellID to `TrackerHit` along φ/Z (or X/Y ...)

  Access segmentation as in `FarDetectorTrackerCluster` (*suggested by Wouter*).

- Clusterization.

Two-coordinate Strip Segmentation

- Two `TrackerHit`'s *per* `SimTrackerHit` along two distinct coordinates: φ/Z or U/V.
- True also for µRWELL OuterBarrel and EndCap.
- Each coordinate described by a <segmentation> line in a "**MultiSegmentation**" with a distinctive **sensor** parity.
- CyMBaL, *e.g.*: **Four** segmentations needed, using `CylindricalGridPhiZ` (*Strip = Elongated* $\varphi \times Z$ *pixel*):

```
<segmentation type="MultiSegmentation" key="sensor">
  <segmentation name="InnerPhi"  type="CylindricalGridPhiZ" key_value="0"  radius="RI"
    grid_size_phi="1*mrad"                grid_size_z="MMModuleLength"
    offset_phi="-MMInnerAperture/2" offset_z="-MMModuleLength/2"
  <segmentation name="InnerZ"    type="CylindricalGridPhiZ" key_value="1"  radius="RI"
    grid_size_phi="MMInnerAperture" grid_size_z="0.150*mm*sqrt(12)"
  <segmentation name="OuterPhi" type="CylindricalGridPhiZ" key_value="2"  radius="RO" ...
  <segmentation name="OuterZ"    type="CylindricalGridPhiZ" key_value="3"  radius="RO" ...
```

- Get φCellID from input *Or re-evaluate?* ⇒ *Different segmentations for same simulation input.* Increment **sensor** parity and get ZCellID.

Digitization

- Same algorithm for all MPGDs:
  - Random draw cluster size according to beam test distribution
    ($size = 2$, $in\ a\ first\ step$).
  - Total amplitude from energy deposit, randomized ($by\ how\ much?$)
  - Distribute amplitude along strips to implement measured resolution ($= 150\mu m\ in\ a\ first\ step$).

- Customization: What as a Data Base? `epic/calibration`?

Clusterization

- Already existing algorithm in `EICrecon`?