

Strip Segmentation

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Strip segmentation *via* MultiSegmentation

- strip field in cellID descriptor. *E.g.* mpgd_outerbarrel.xml:

<id>system:8,layer:4,module:12,sensor:2,x:32:-14,y:-18</id>

→

<id>system:8,layer:4,module:12,sensor:2,strip:32:2,x:-15,y:-15</id>

- Each coordinate described by a <segmentation> line in a "**MultiSegmentation**" with a **distinctive strip** field but **same volumeID** (= 1st 32 bits of cellID).

<segmentation type="MultiSegmentation" key="strip">

<segmentation name="UStrips" type="CartesianGridXY" key_value="0"
grid_size_x="0.150*mm*sqrt(12)" grid_size_y="μRModuleWidth*sqrt(2)"

<segmentation name="VStrips" type="CartesianGridXY" key_value="1" ...
grid_size_x="μRModuleWidth*sqrt(2)" grid_size_y="0.150*mm*sqrt(12)"

- *Caveat: no yet tested...*

Special case of CyMBaL

- In CyMBaL, MultiSegmentation **also used to specify radii**:

small radius for inner sector *vs.* large radius for outer.

<id>system:8,layer:4,module:12,sensor:30:4,phi:-15,z:-15</id>

- MultiSegmentation key-word now takes **four** different values:

<segmentation type="MultiSegmentation" key="sensor">

<segmentation name="InnerPhi" type="CylindricalGridPhiZ" key_value="0" radius="RI" ...

<segmentation name="InnerZ" type="CylindricalGridPhiZ" key_value="4" radius="RI" ...

<segmentation name="OuterPhi" type="CylindricalGridPhiZ" key_value="1" radius="RO" ...

<segmentation name="OuterZ" type="CylindricalGridPhiZ" key_value="5" radius="RO" ...

- Hence **sensor** discriminating key impacts both **volumelD** and **strip**.

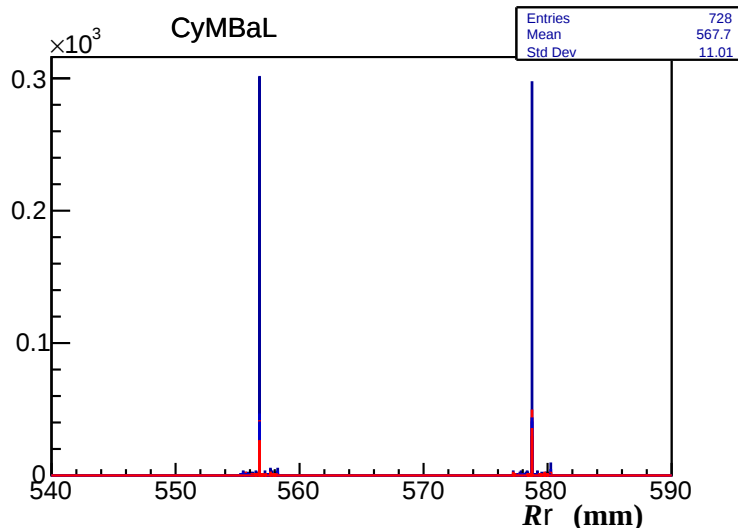
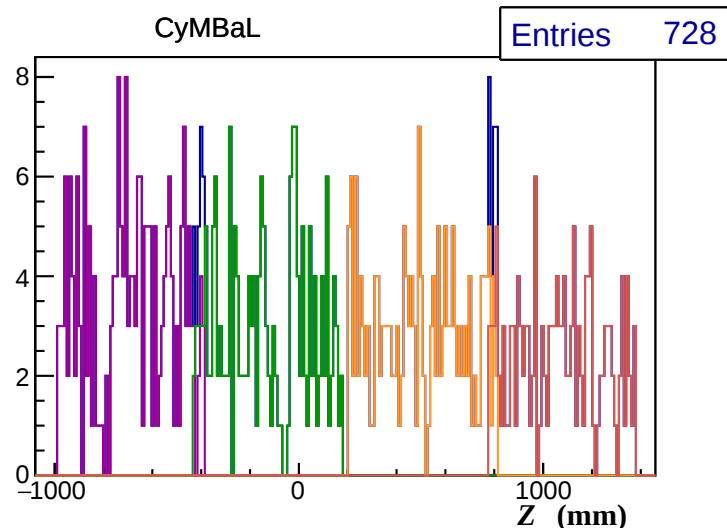
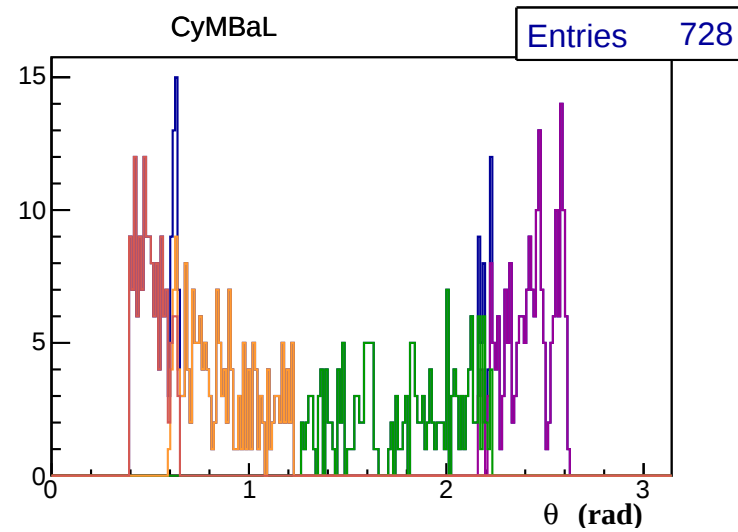
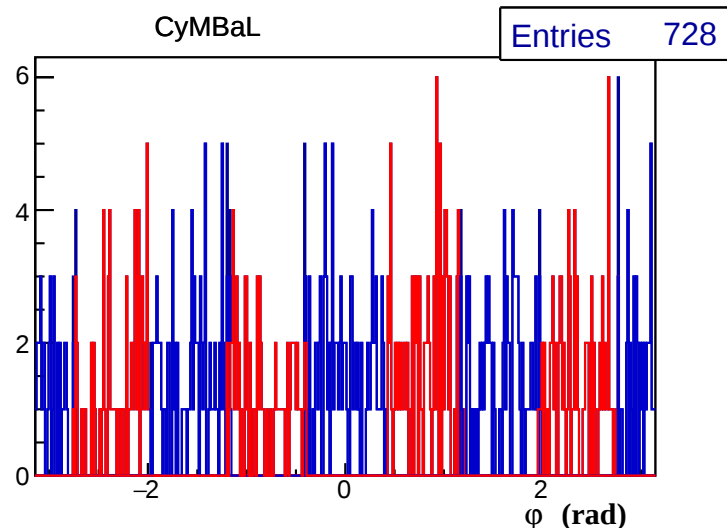
How to have DD4hep **set** detMask **to set aside the strip piece** when **looking up a volumelD**?

At present, using a dirty trick. . .

- Note: PR to AIDAsoft/DD4hep in order to get the signed phi segmentation correct.

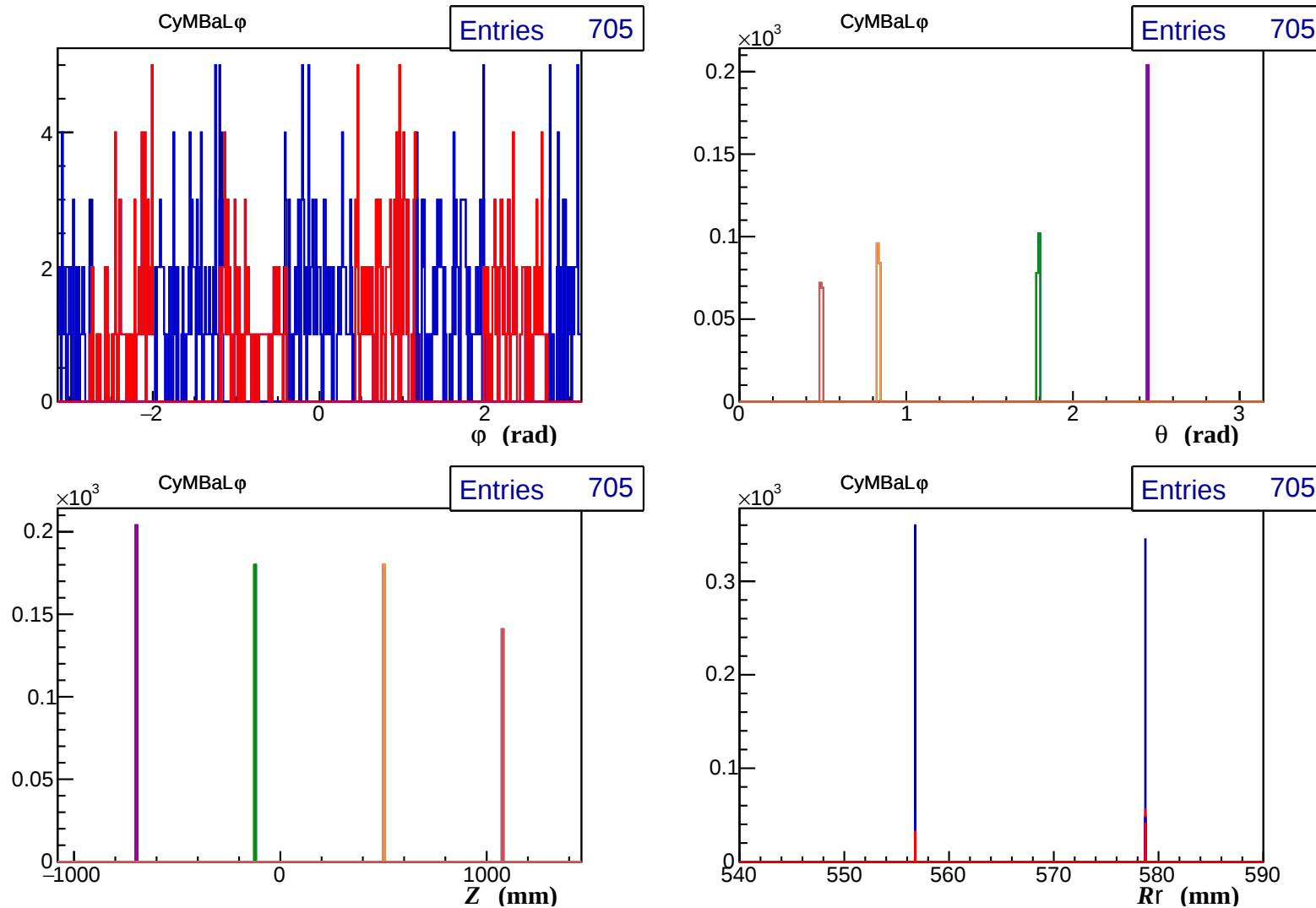
Simulated Hits

- ddsim: SIM.gun μ^- $15 < \theta < 165$ deg. $P = 10$ GeV

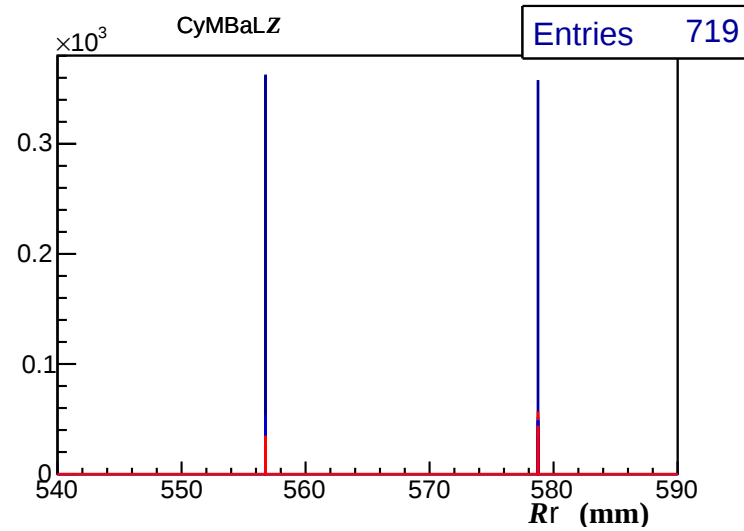
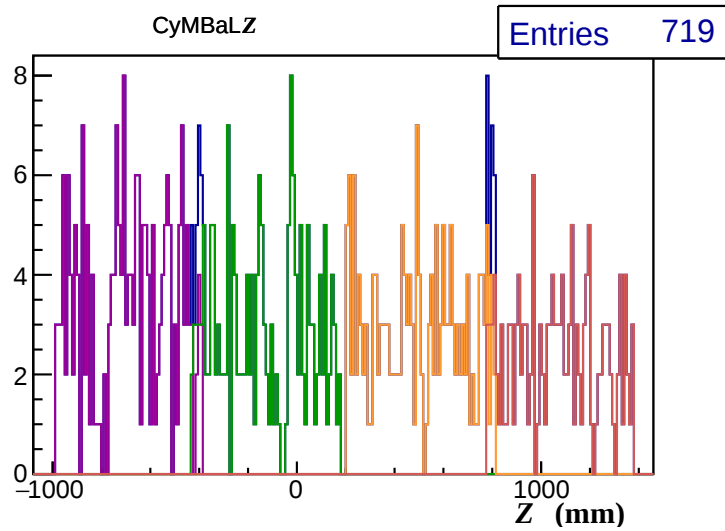
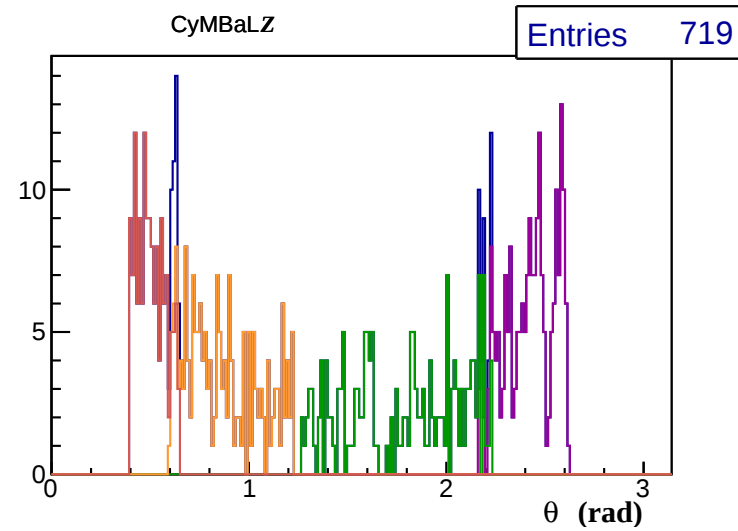
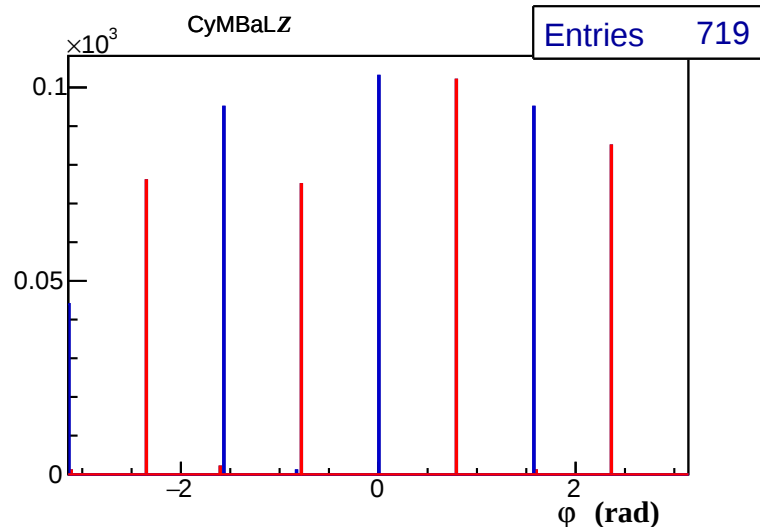


Reconstructed Hits

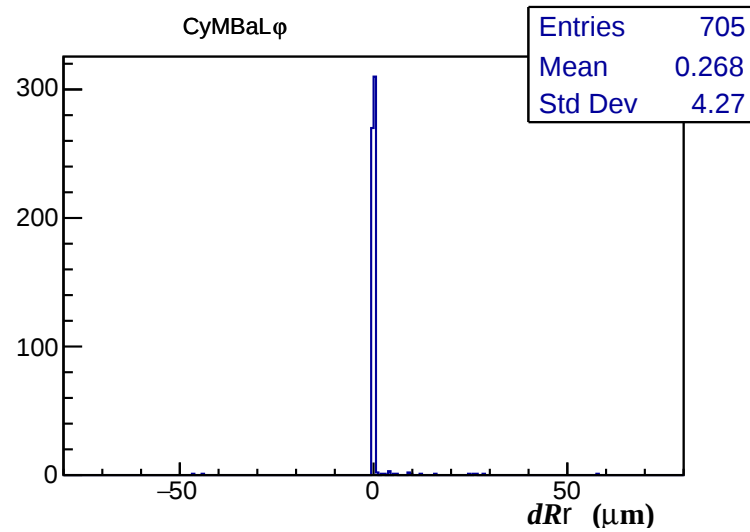
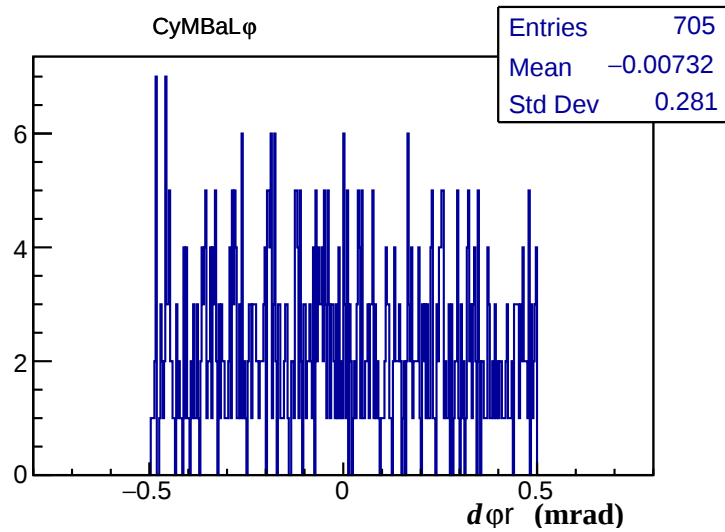
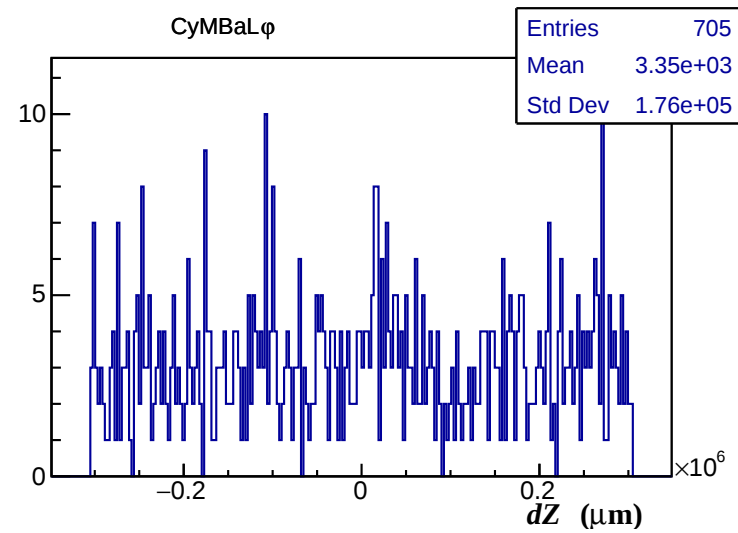
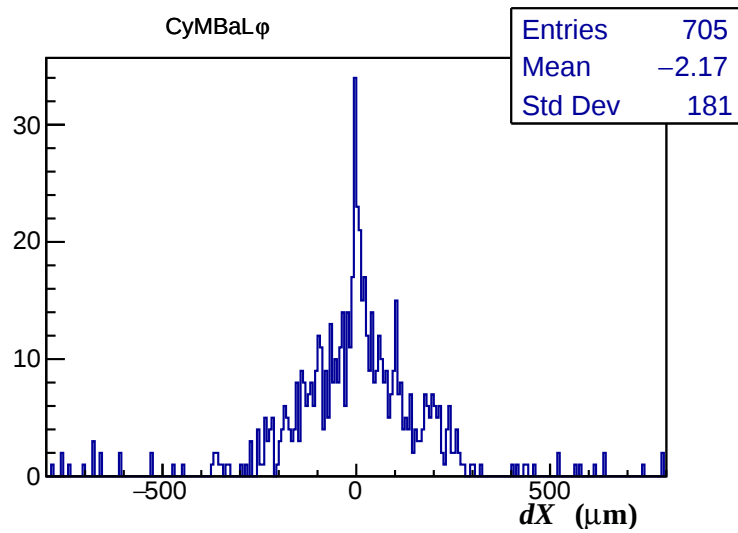
- Instantiated @ digitization time in MPGDTrackerDigi (*Cluster of size 1 so far*)



Reconstructed Hits along Z



Residuals along φ



Residuals along Z

