

Status of Strip Clustering

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ILD-Asia Physics-Software meeting

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with Latest Mokka, PandoraPFANew, and Daniel's Splitting module for hybrid ECAL

I am studying with;

Latest Mokka --- allow us to make Scintillator strips intrinsically and to make virtual $5 \times 5 \text{ mm}^2$ cells in a strip to compare performance.

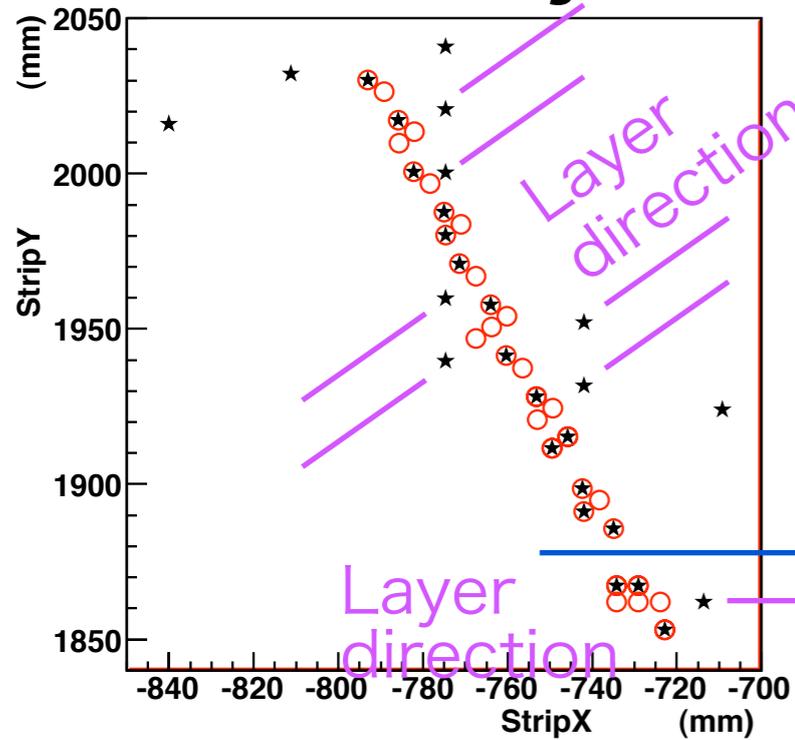
PandoraPFANew --- Easier parameter setting.

Strip-Splitting module by D.Jeans --- lighter than my code and Endcaps have already been implemented

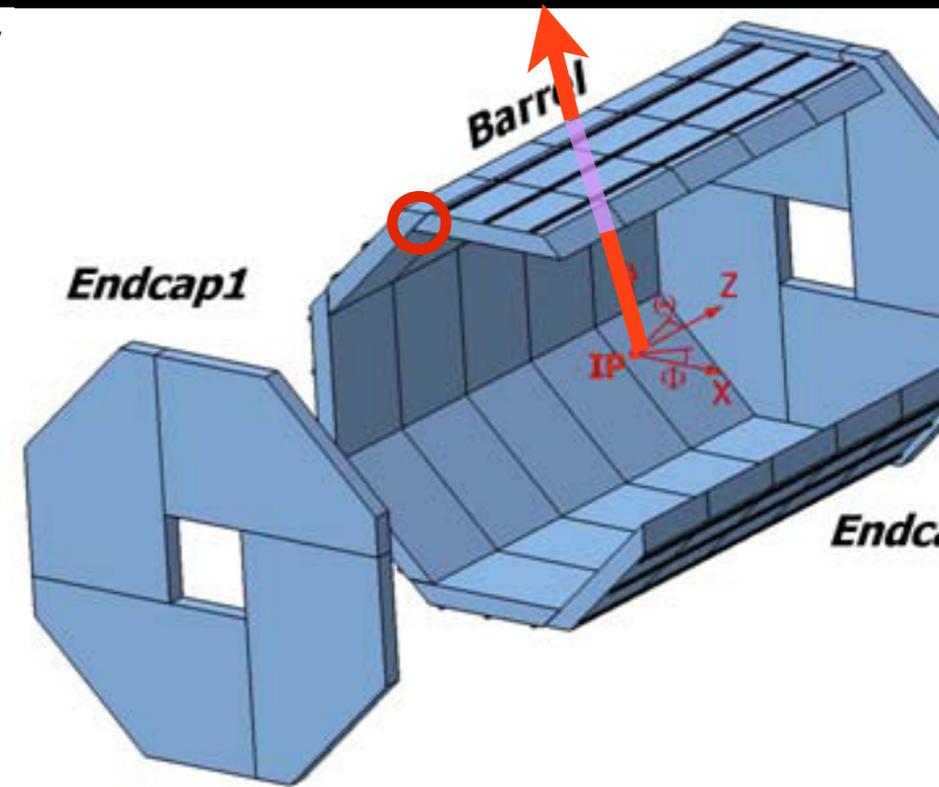
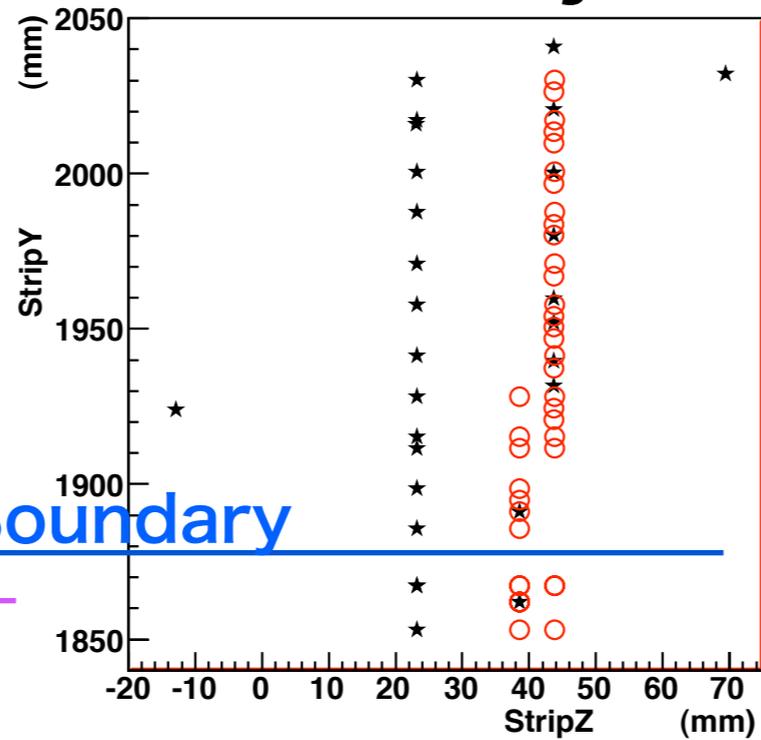
In last meeting I showed how it works well for muon events in just upward direction.

500GeV μ^+ event going to the boundary of staves

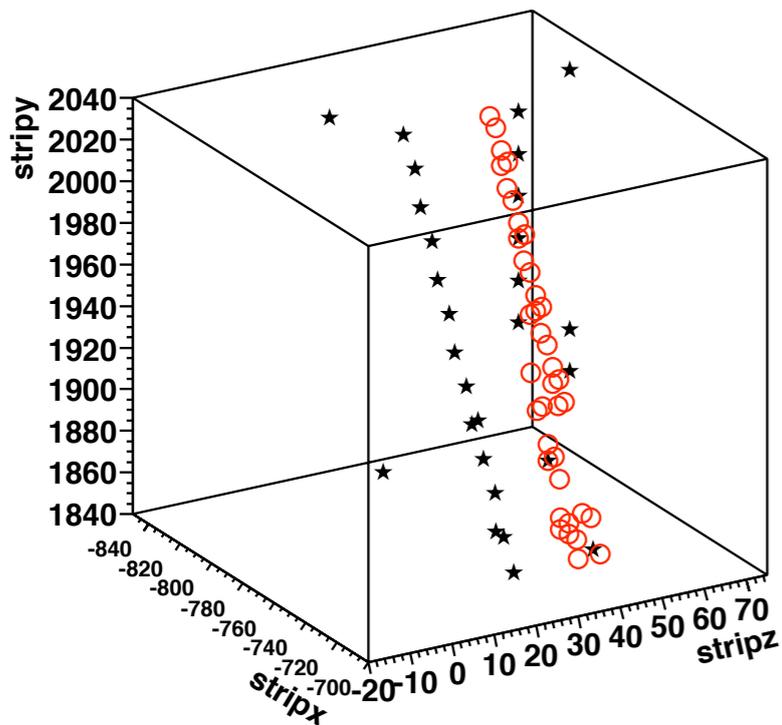
stripy:stripx {nevent==1} **xy view**



stripy:stripz {nevent==1} **zy view**



stripy:stripz:stripx {nevent==1}



5mm

★ :before
○ :after
Strip-Splitting

Longitudinal hits do not have correct position before Strip-Splitting method and they are corrected by Strip-Splitting.

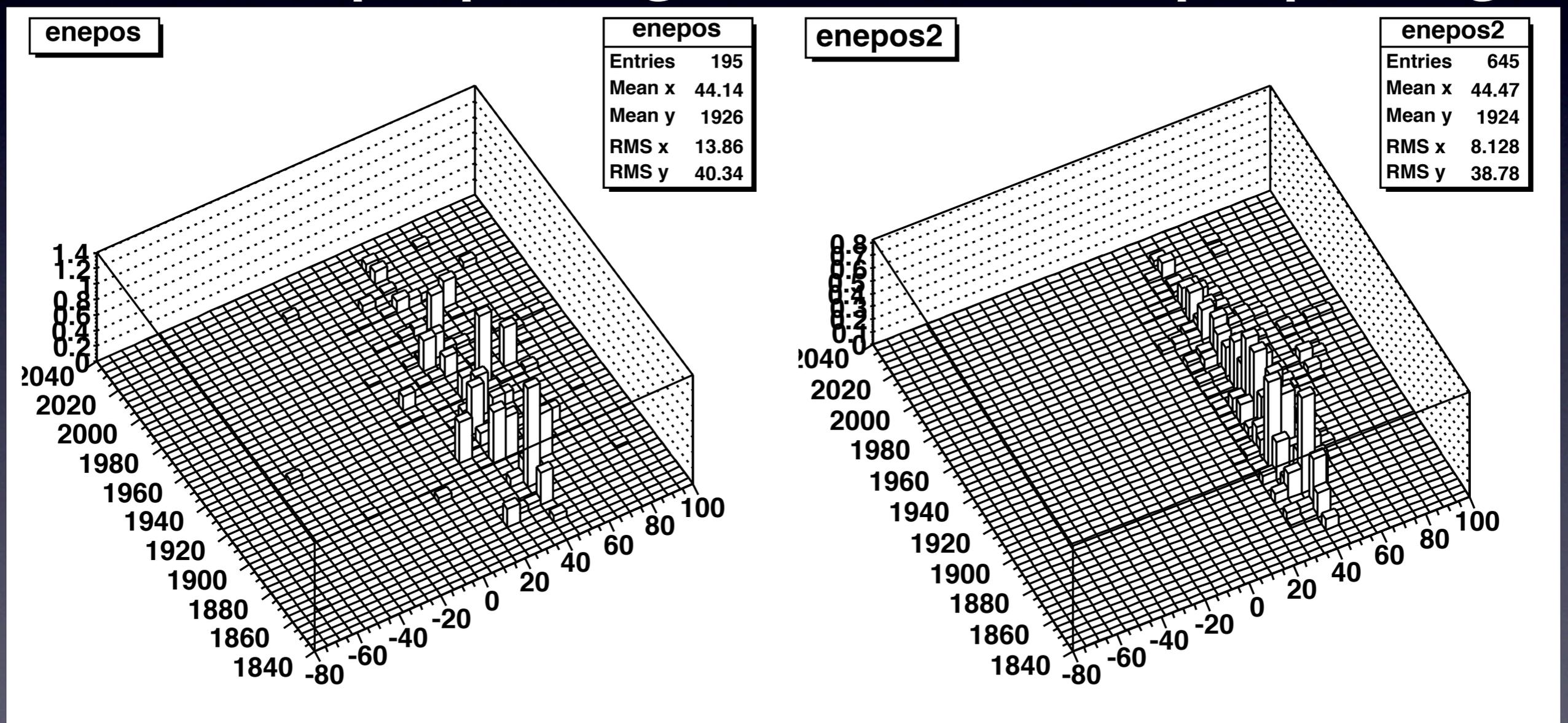
Boundary hits are also moved correctly.

10GeV photon typical event

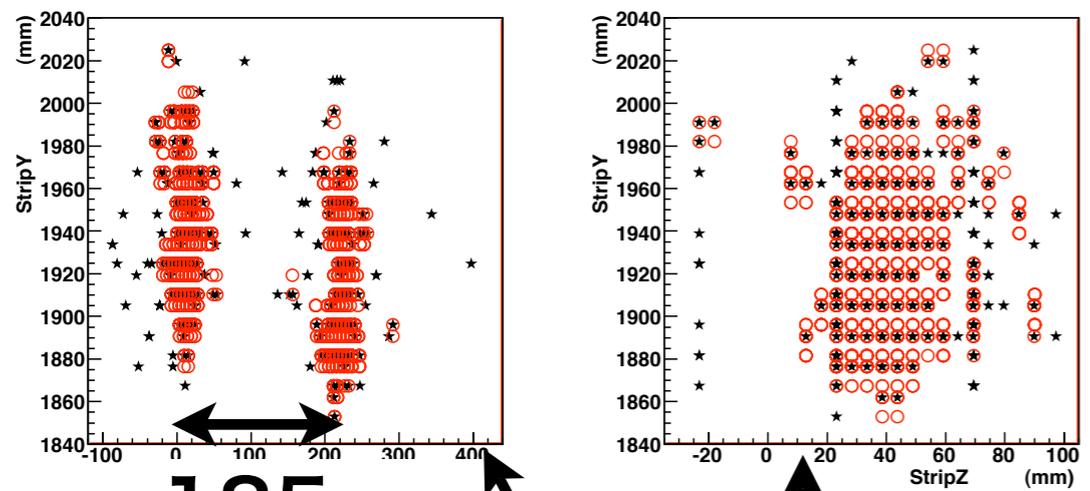
Energy summed up to z direction (y-x plane)

Before Strip-Splitting

After Strip-Splitting



Nice cluster can be seen after Strip-splitting.

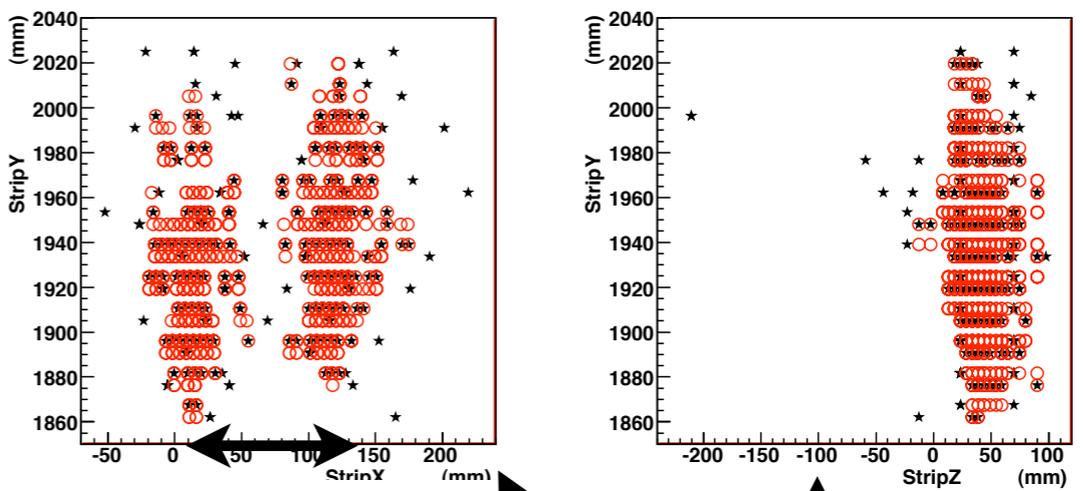
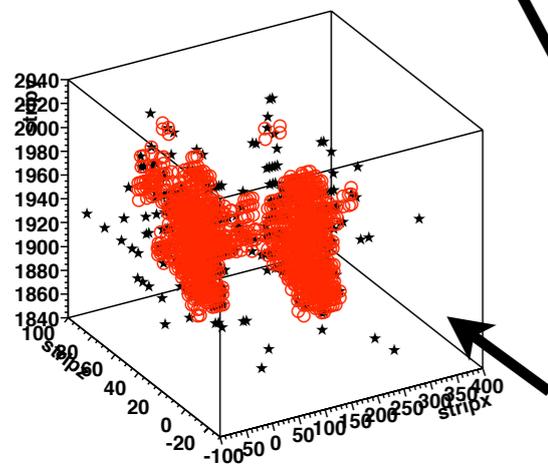


185 mm

zy view

xy view

3D view

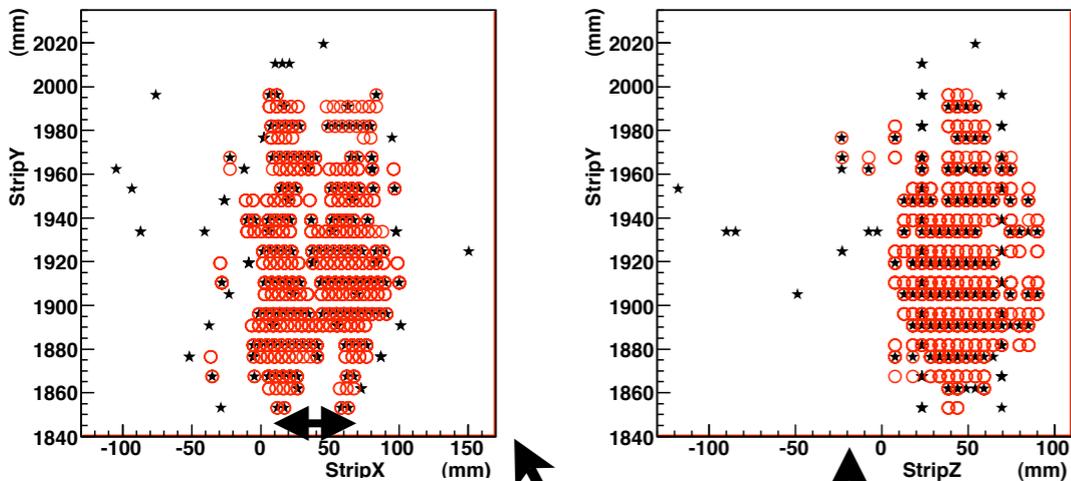
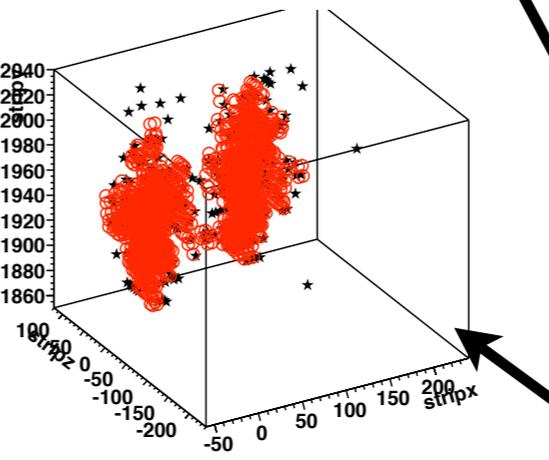


92 mm

zy view

xy view

3D view

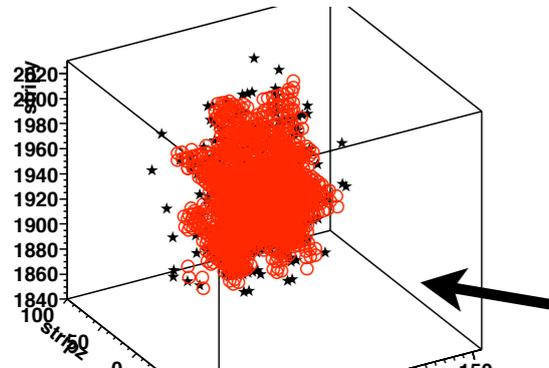


46 mm

zy view

xy view

3D view



Separation two 10 GeV photon

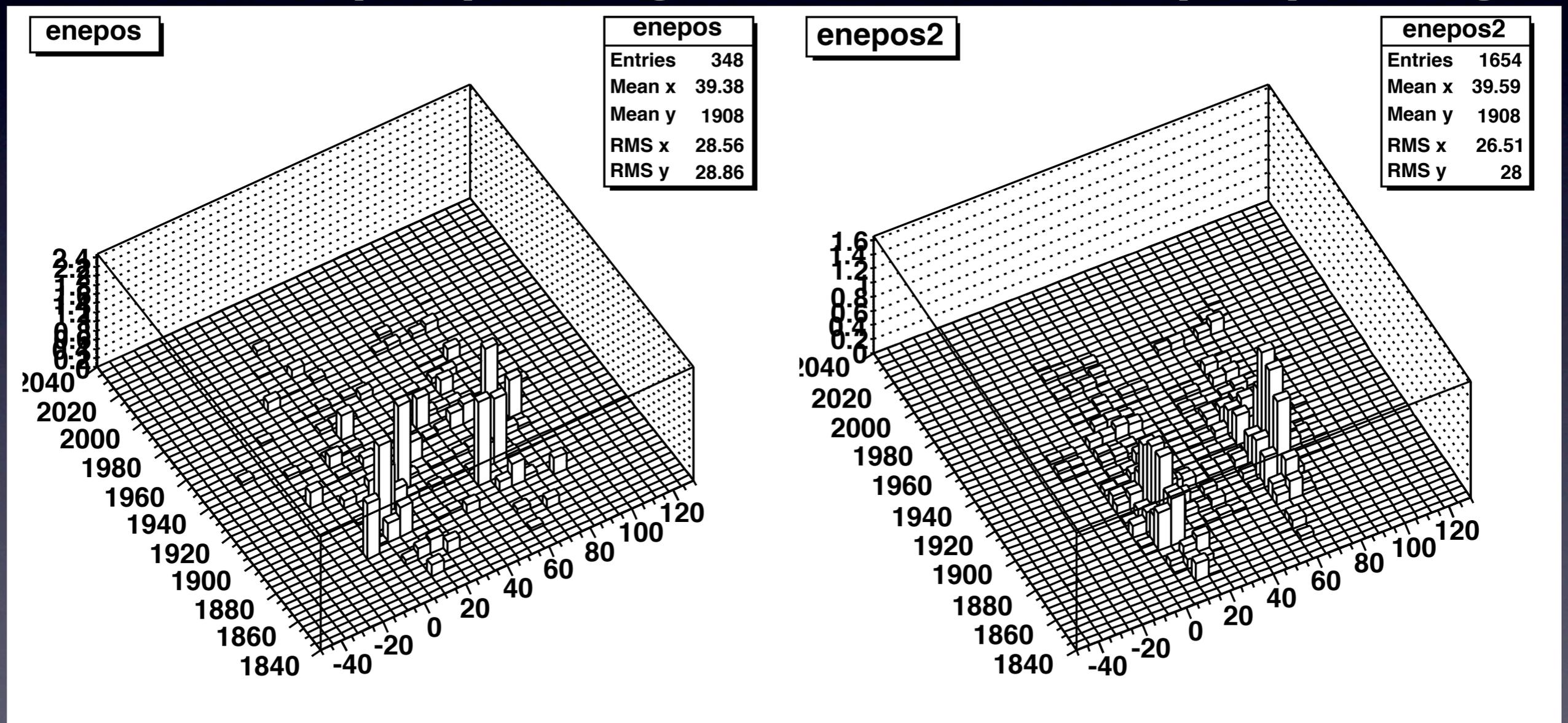
These are just positrons so ...

10GeV photon 46 mm separation

Energy summed up to z direction (y-x plane)

Before Strip-Splitting

After Strip-Splitting



Next time I will show these events with 5x5 cells. 6

Quantitative evaluation of separation

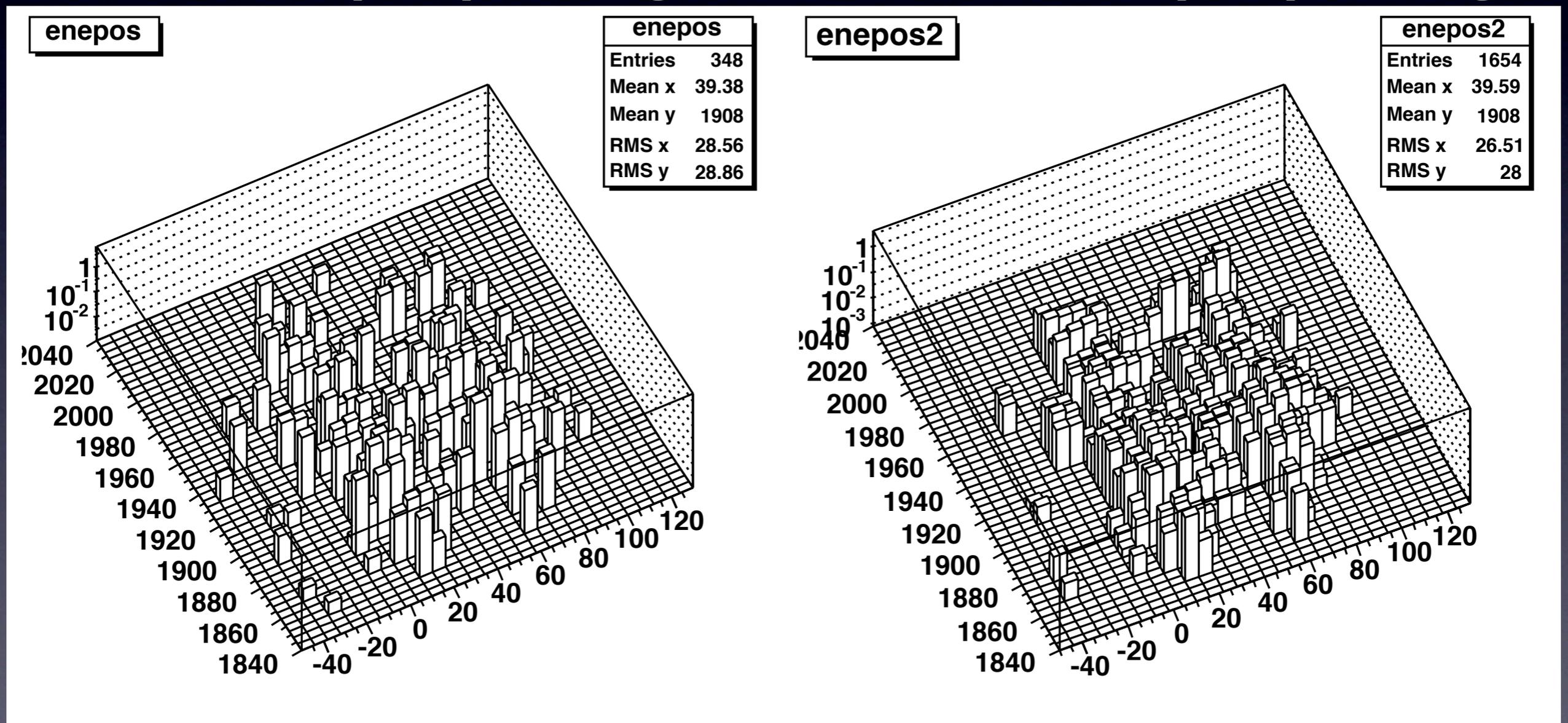
- Energy resolution of each of two incidental PFO(photon) by PandoraPFANew as a function of;
 - distance between two PFO,
 - energy difference between two PFO,
 - incident direction in ECAL
 - ...
- However...
 - just not serious problem that PandoraPFA(New) does not make PFO with CalorimeterHits made by HybridSplitter.

10GeV photon 46 mm separation :Log scale

Energy summed up to z direction (y-x plane)

Before Strip-Splitting

After Strip-Splitting



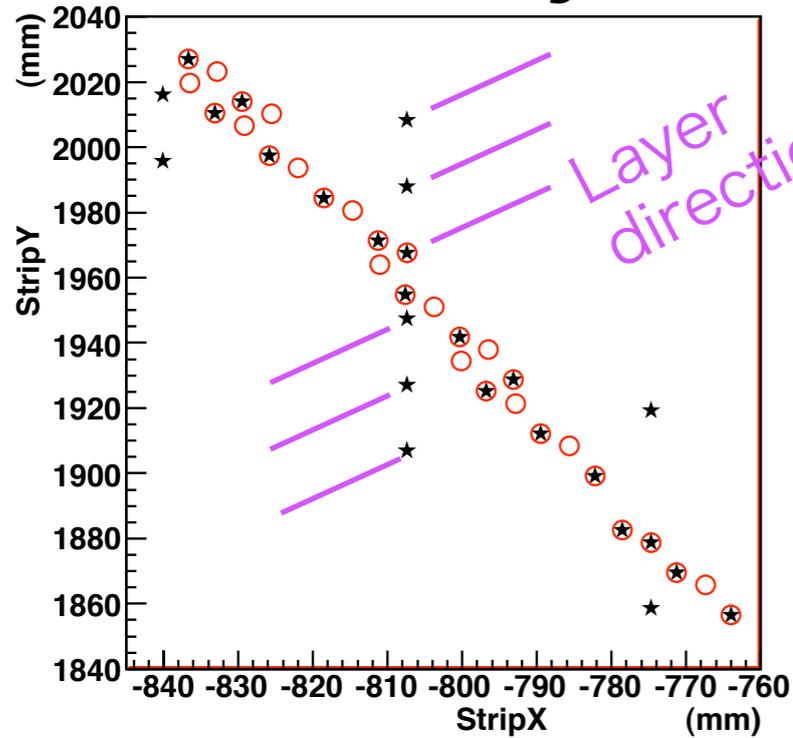
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Immediate plan

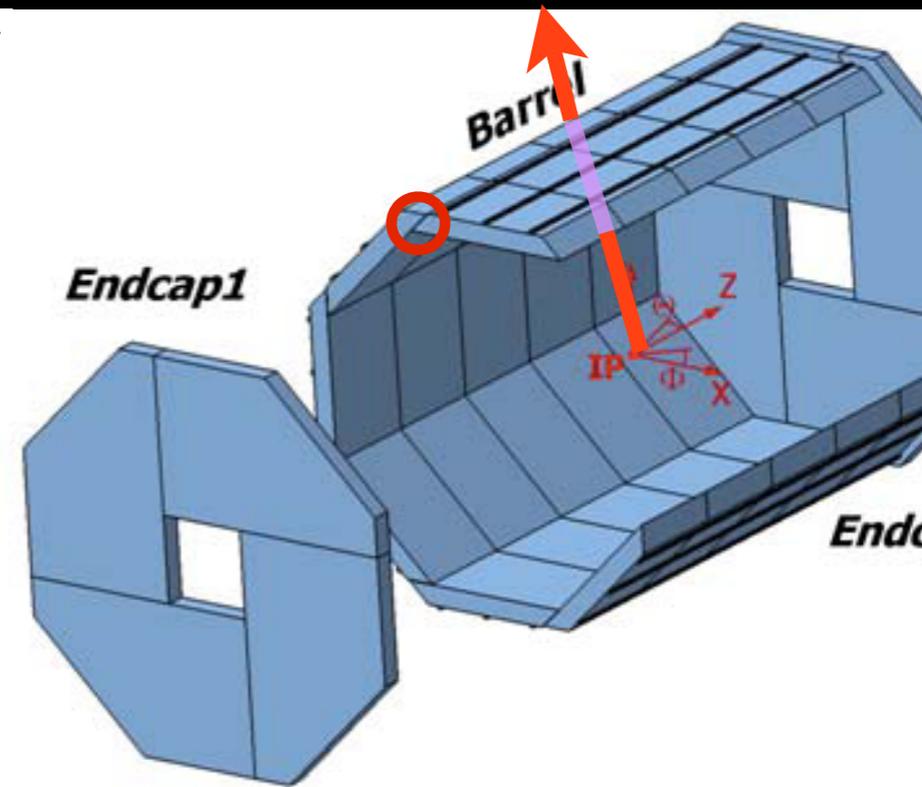
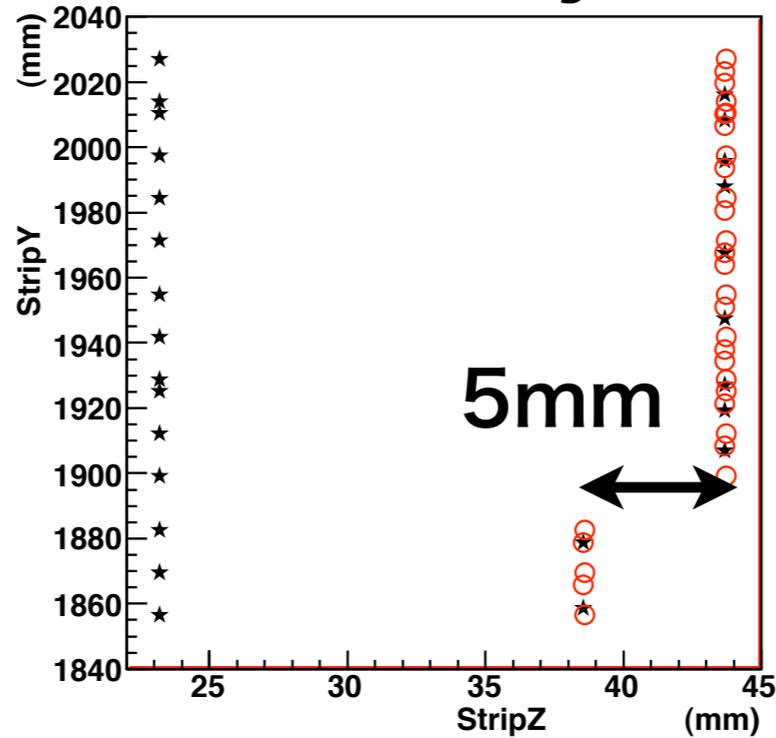
- Comparing with 5x5 virtual square cell ECAL
 - New Mokka allows us to evaluate the energy deposits in the virtual square cells simultaneously for Sci.Strip.
- Quantitative evaluation of photon separation
- Study of population of PFO for jet events.
- Evaluation of Jet Energy resolutions.

500GeV μ^+ event

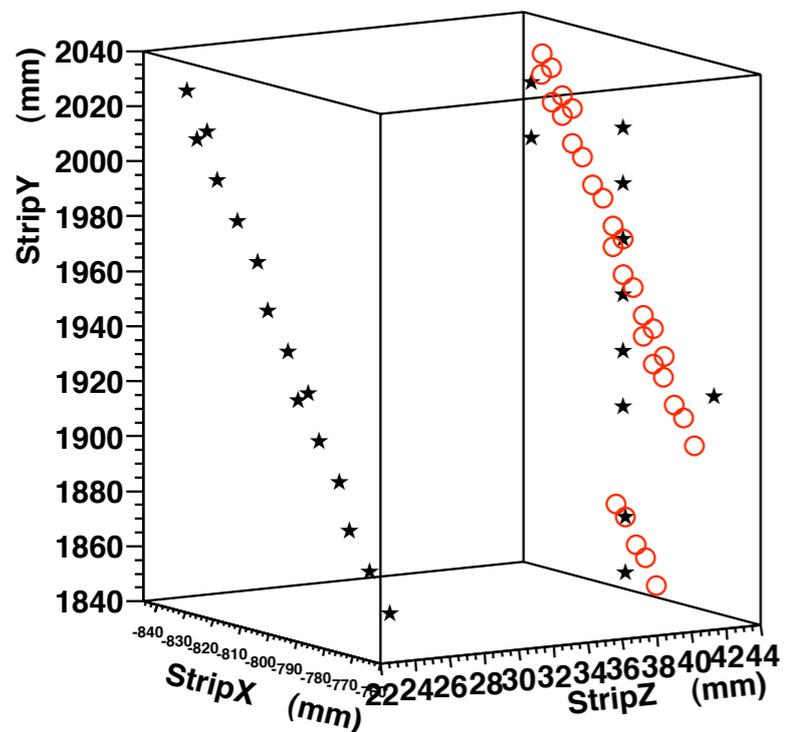
stripy:stripx {nevent==2} **xy view**



stripy:stripz {nevent==2} **zy view**



stripy:stripz:stripx {nevent==2}



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○ :after

Strip-Splitting