

Z-vertex reconstruction

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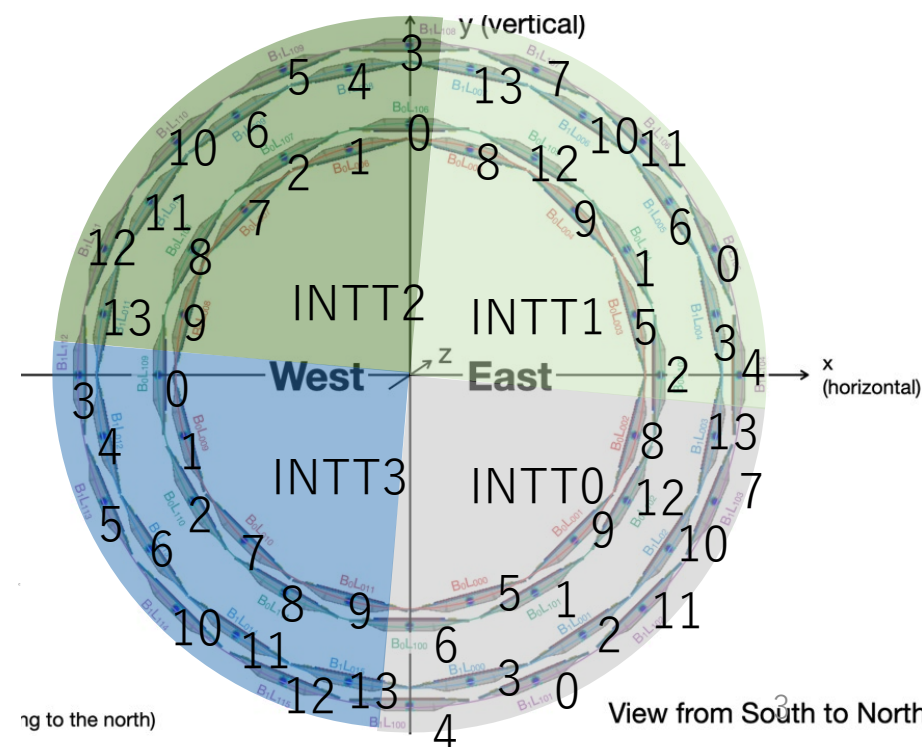
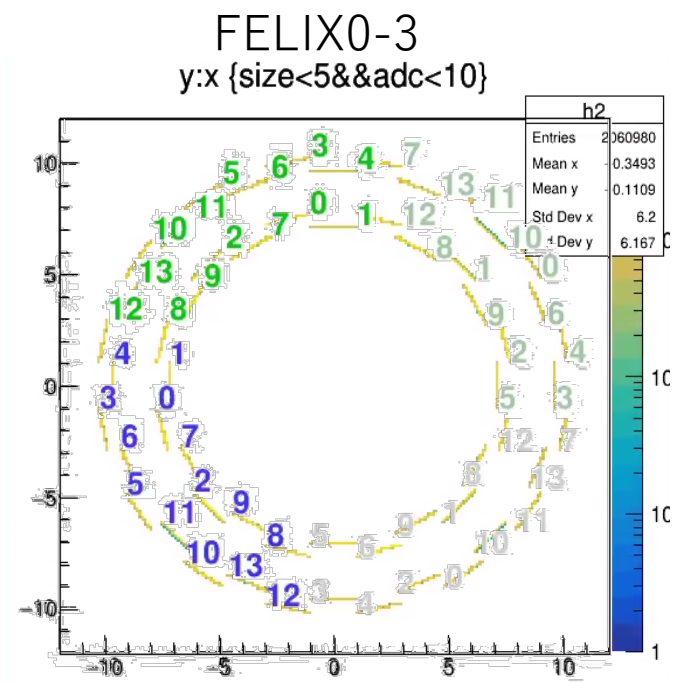
Nara Women's University

Decoder issue

- I reported the raw data decoder issue at the tracking meeting
 - Martin said he updated the decoder to take care of the issue. I didn't see that updated code. He said he will send e-mail to explain the new decoder. But nothing happen yet
- I will report about the current status of the Z-vertex reconstruction.

Geometry and Ch-conversion issue

- As reported last week, there were some issues on ladder position and ch-conversion
 - Ladder position (2nd layer should be placed at bottom as the right figure)
 - Offline-Online channel conversion
 - Offline start from 3 o'clock but Online start from 6 o'clock
 - Chip – channel conversion (see next page)
 - Chip# (1-26 -> 0-25)



Need to modify (2)

- In InttRawDataDecoder
 - This should be Y and X (y for chip is first)

```
offline = Intt::ToOffline(rawdata);

hit_key = InttDefs::genHitKey(offline.strip_x, offline.strip_y);
hit_set_key = InttDefs::genHitSetKey(offline.layer, offline.ladder_z, offline.ladder_phi, bco);

hit_set_container_itr = trkr_hit_set_container->findOrAddHitSet(hit_set_key);
hit = hit_set_container_itr->second->getHit(hit_key);
if(hit)continue;
```

Toward the Z-vertex reconstruction with INTT

- Z-vertex reconstruction

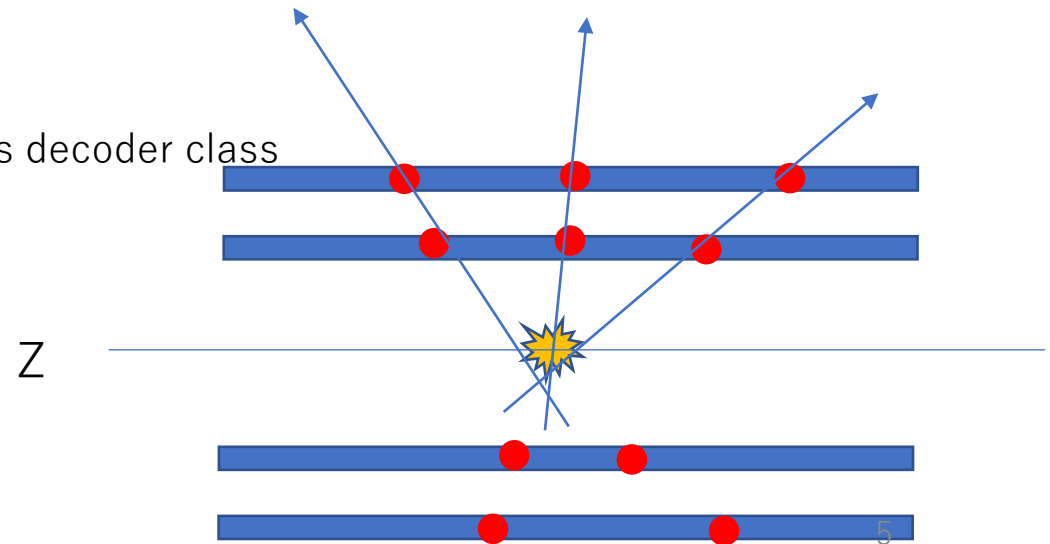
1. Connect two hits at the inner and outer layers to make a tracklet.
2. Calculate the focal point of these tracklets in 3D

Before the calculation, I check the distance of tracklet to the original point (0,0) in X-Y plane.

- To do this, I made some useful code

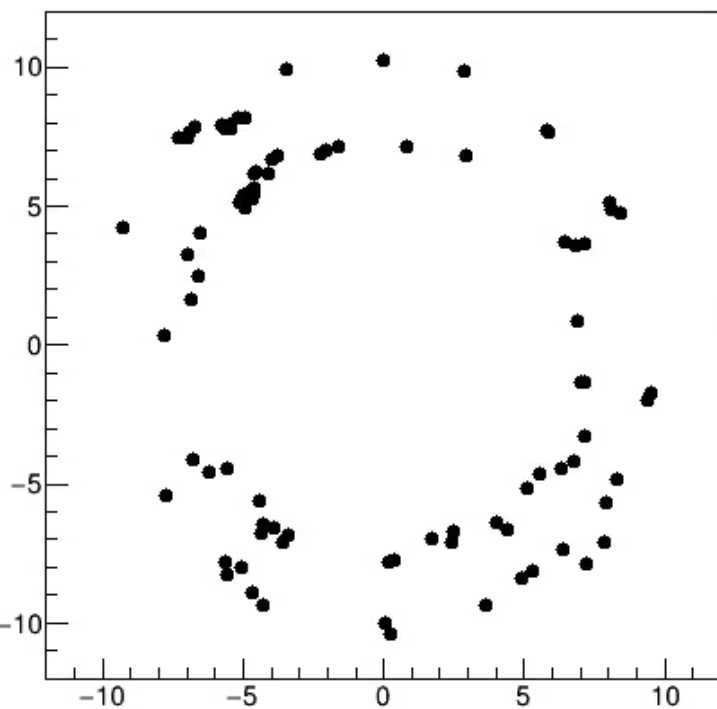
- Use EventBase tree as input to reconstruction DST(Offline reconstruction)
 - I started with MC reconstruction code and modified it
 - The issue in the decoder still remain. I cannot use Joseph's decoder class
 - Hits are not grouped in to single BCO_FULL
 - No synchronization among 8 FELIX

- **I made the code to input the event-based tree to DST reconstruction**

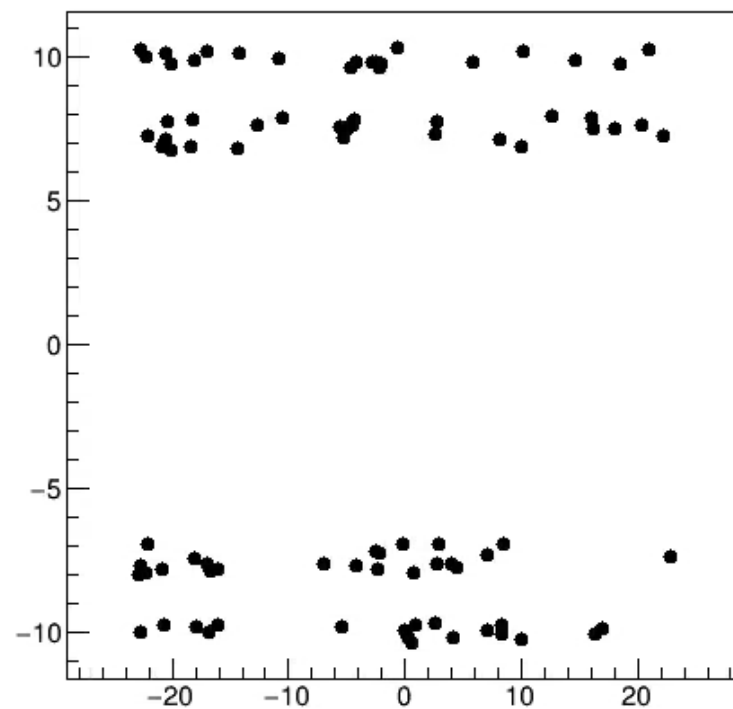


PYTHIA ZF

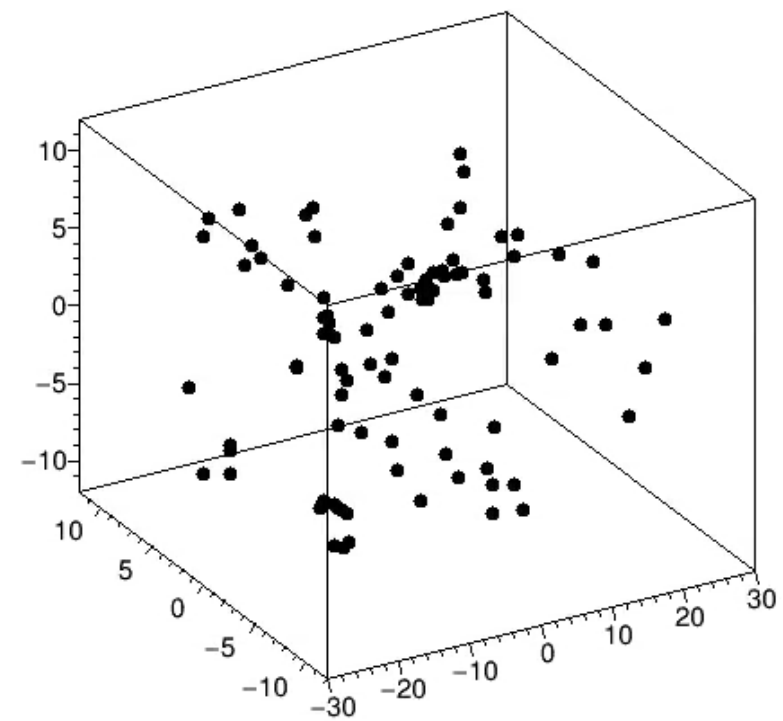
y vs x : 0



r vs z : 0

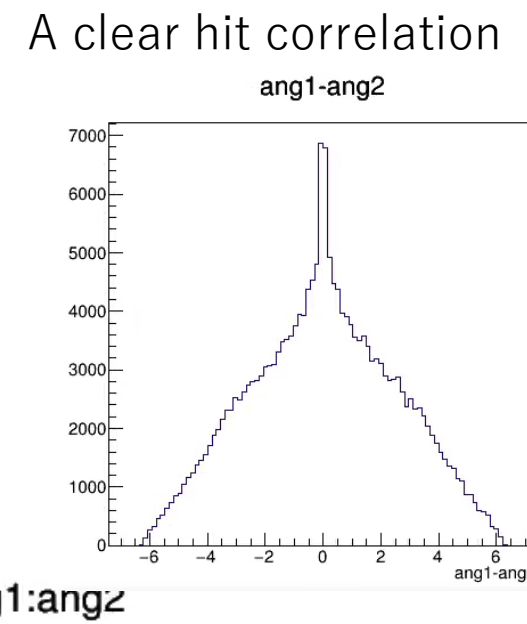
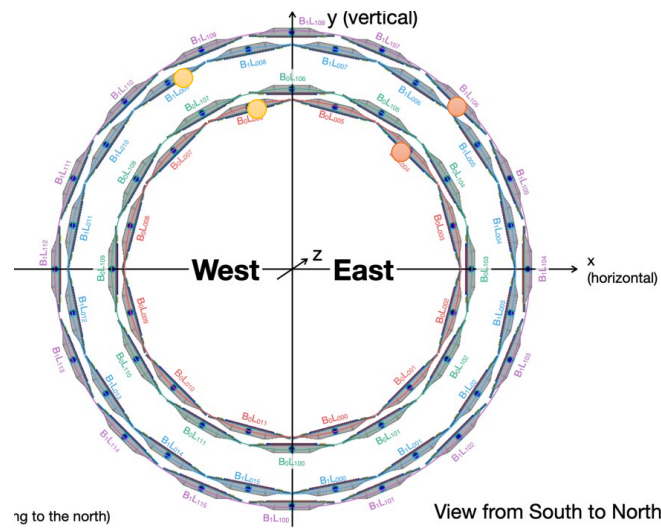
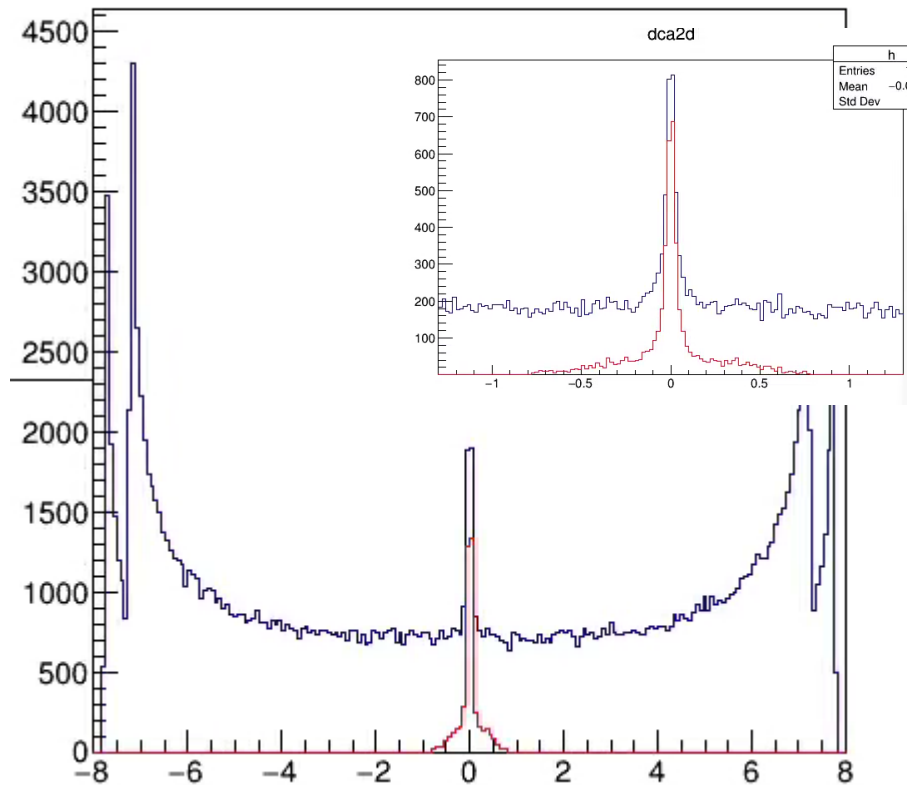


x vs y vs z : 0



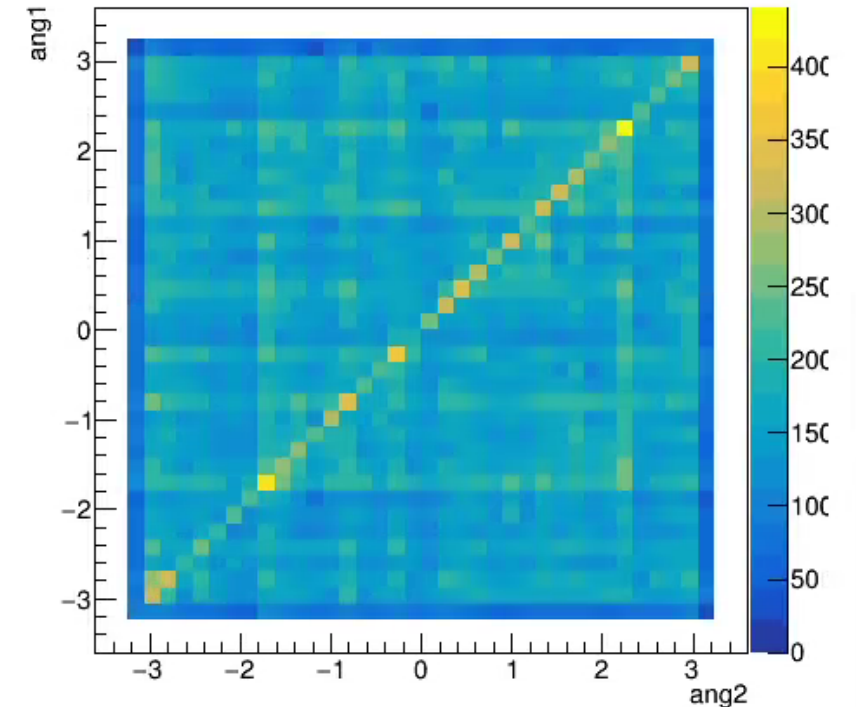
Sim ZF (collision at (0,0))

Clear peak at ~ 0 dca2d



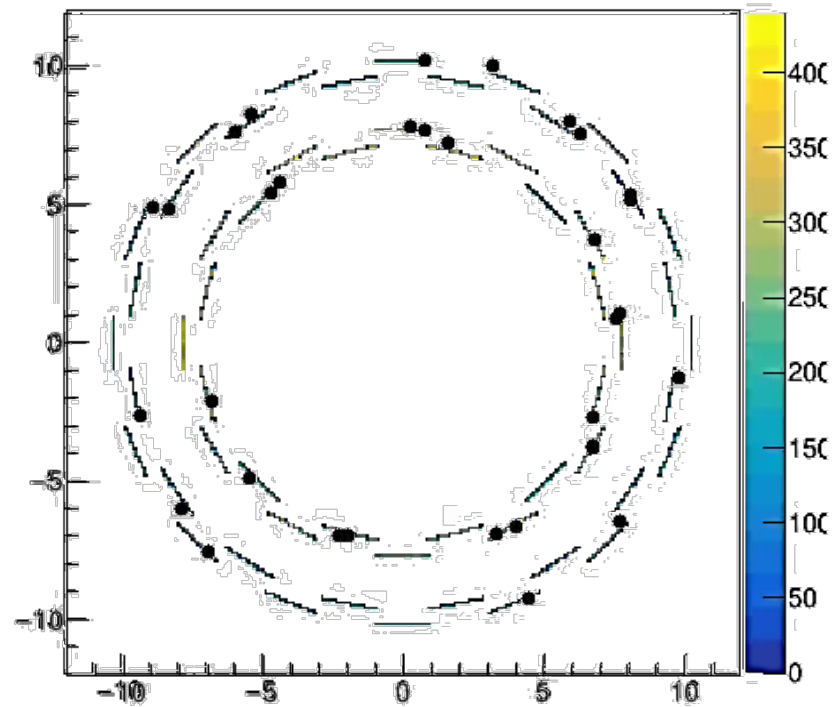
- PYTHIA + GEANT
- Clear correlation and peak seen
 - Calculation is OK

2023/7/14

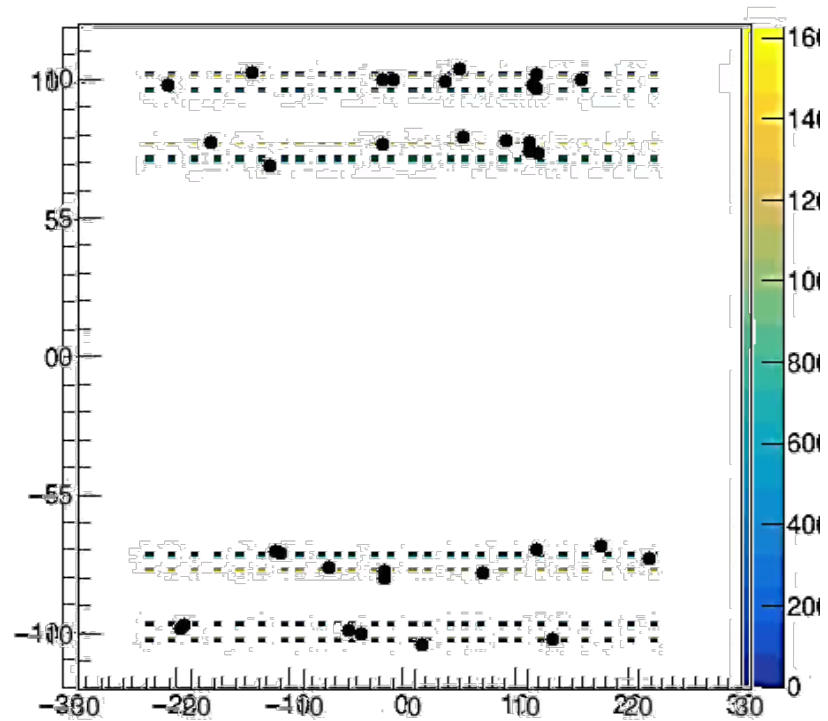


Run20444 (FF)

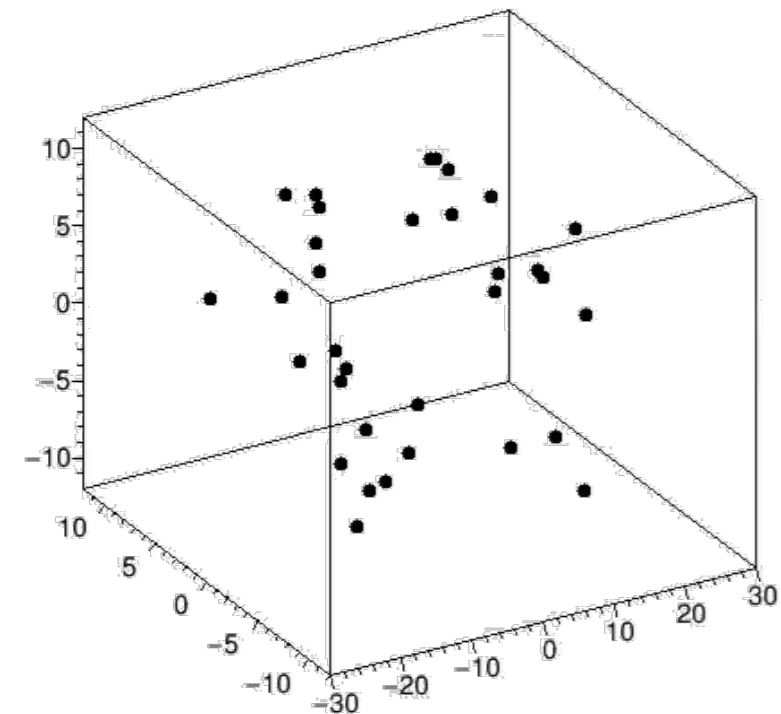
y vs x: 73



r vs z: 73

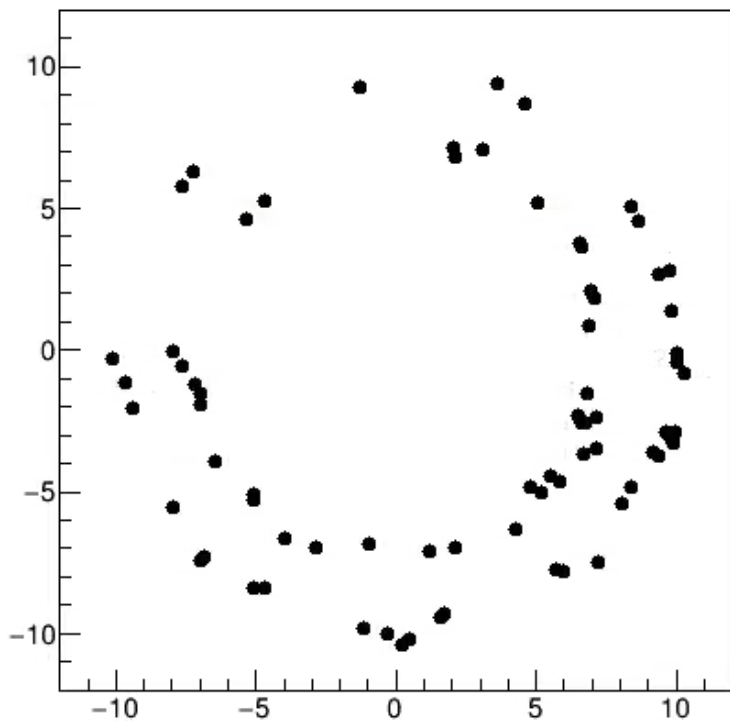


x vs y vs z: 73

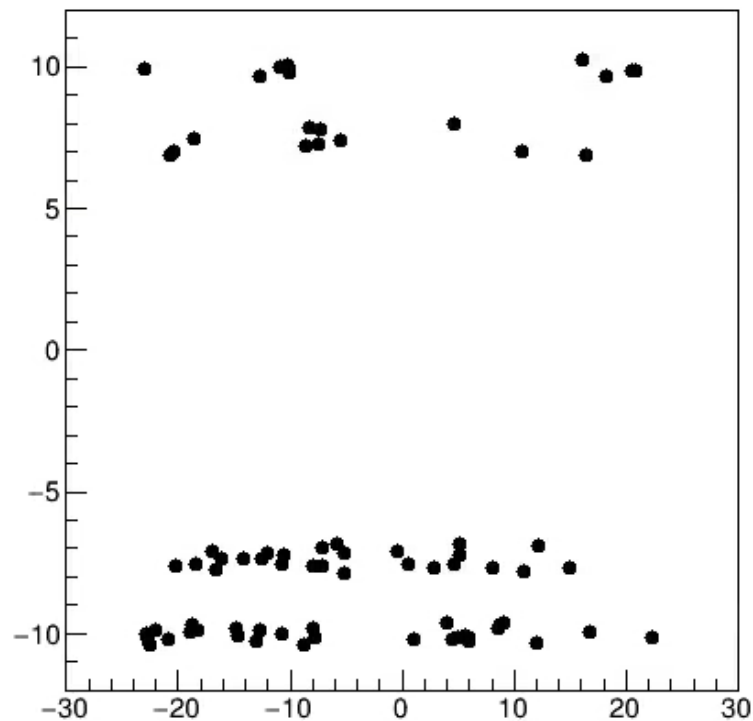


Run20864 (ZF)

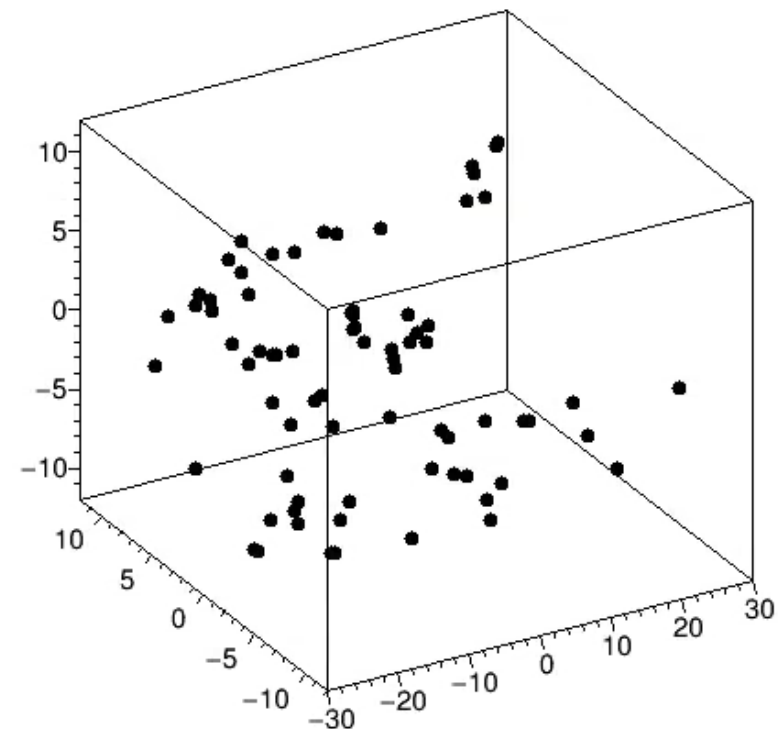
y vs x : 76



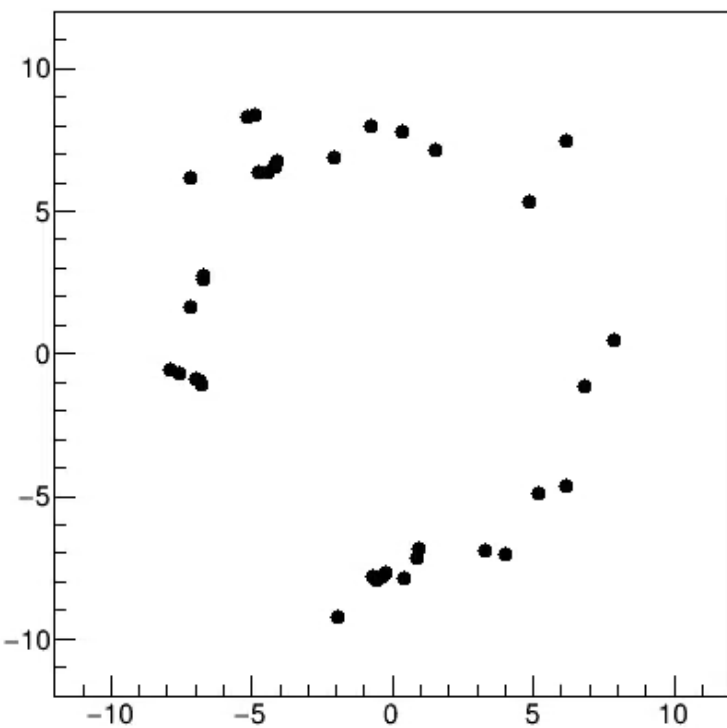
r vs z : 76



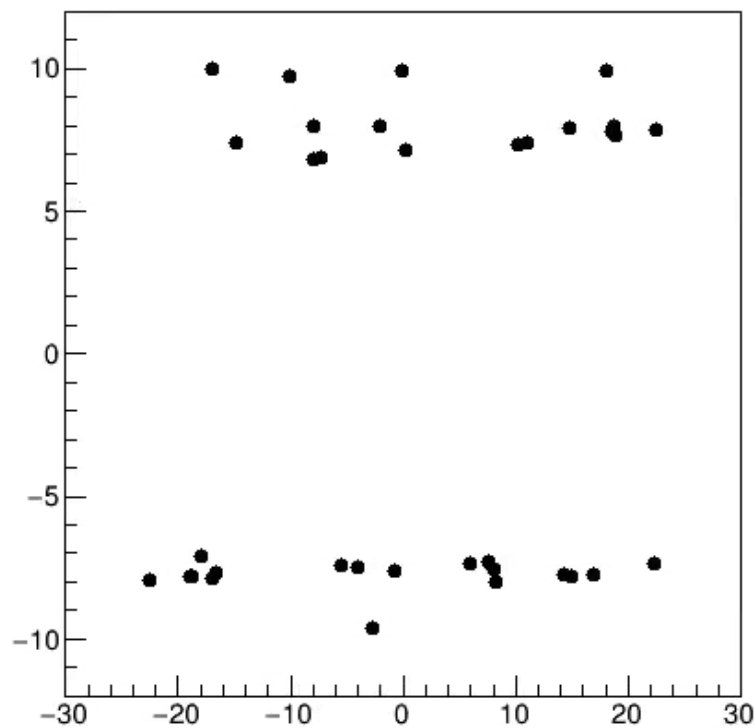
x vs y vs z : 76



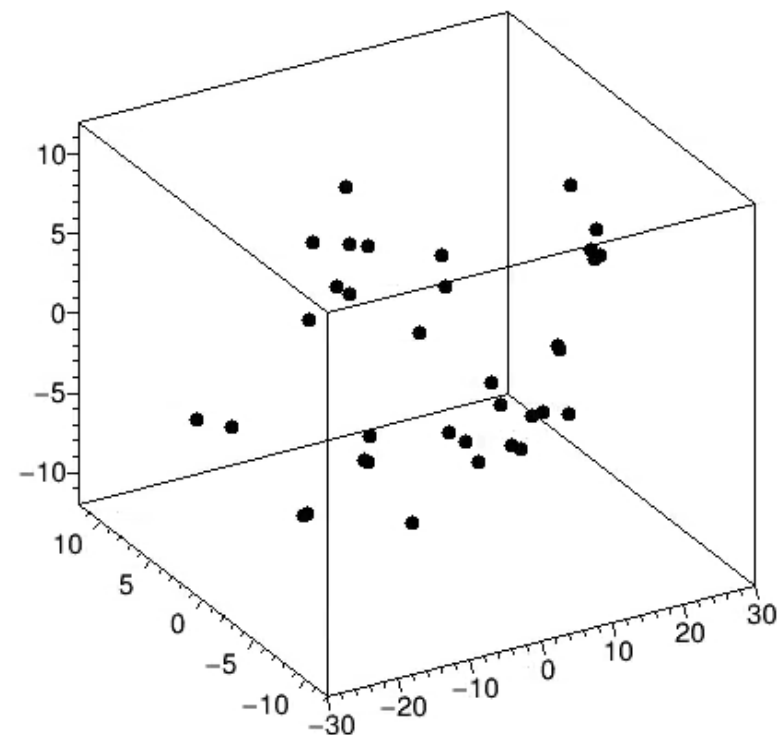
y vs x : 1199



r vs z : 1199

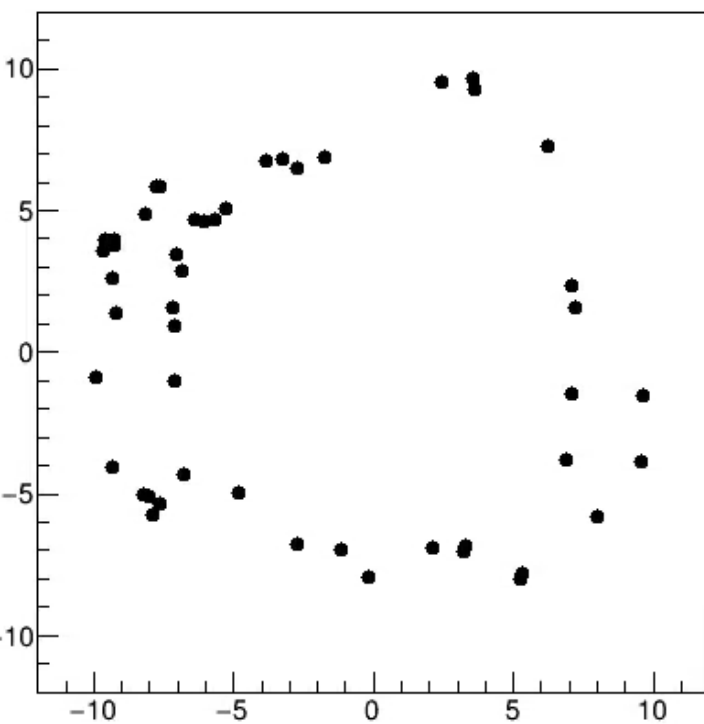


x vs y vs z : 1199

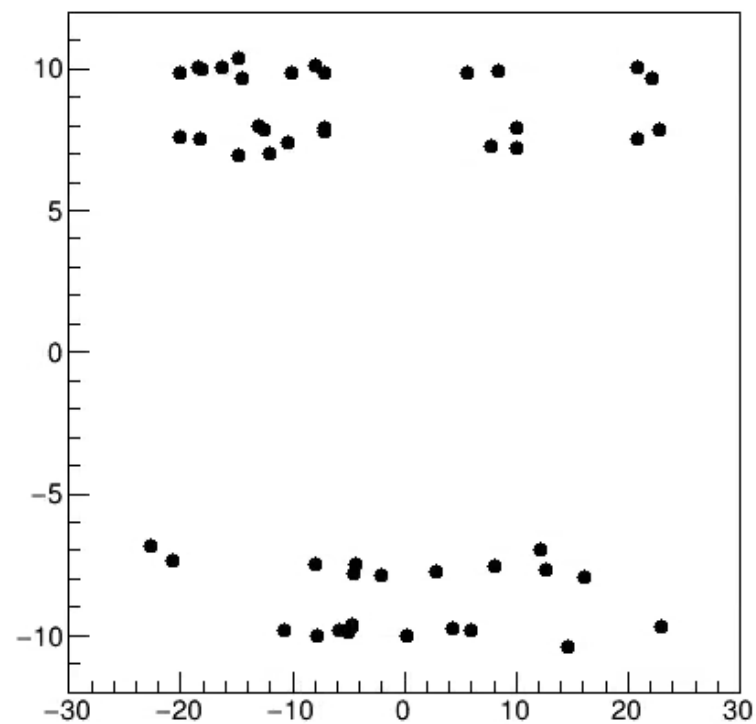


• 2405, 3827, 4264

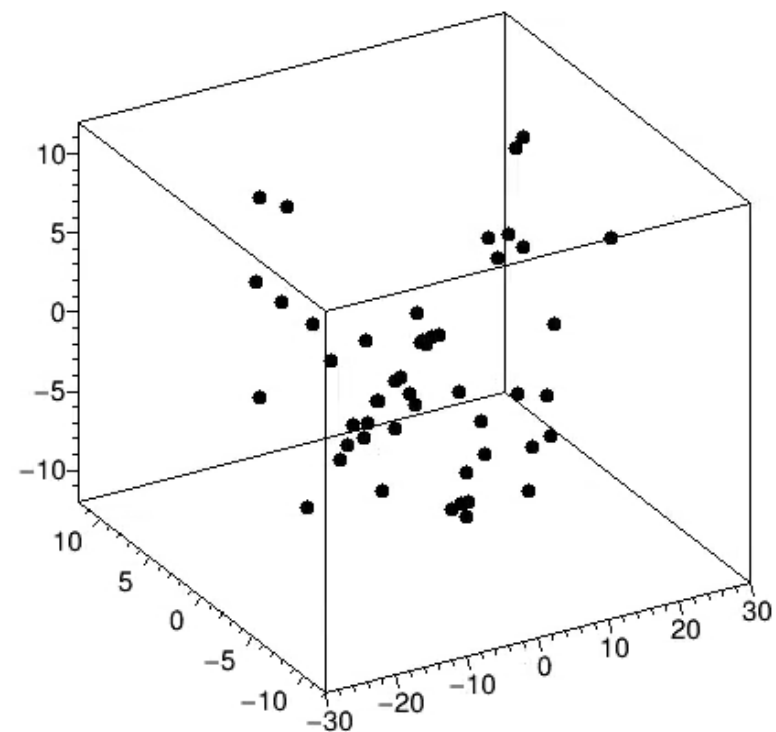
y vs x : 2405



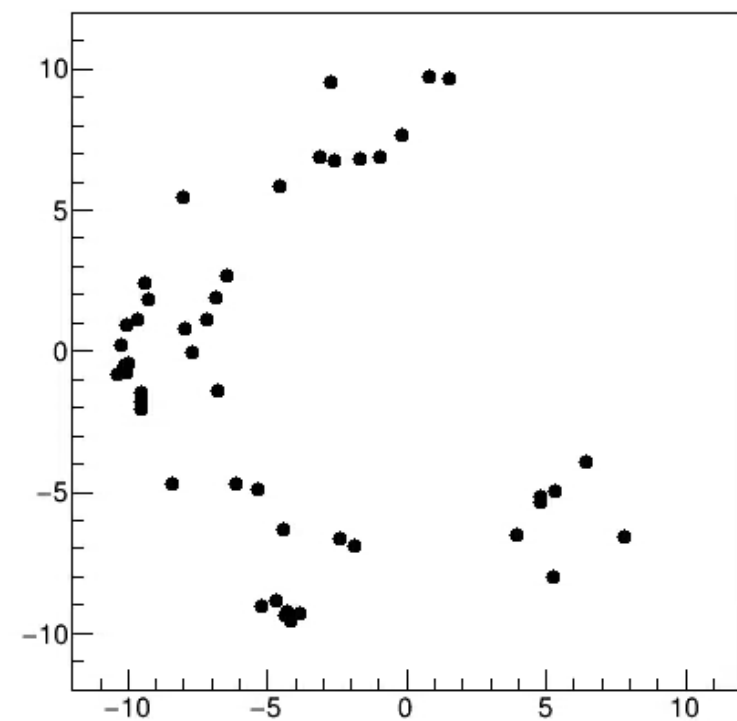
r vs z : 2405



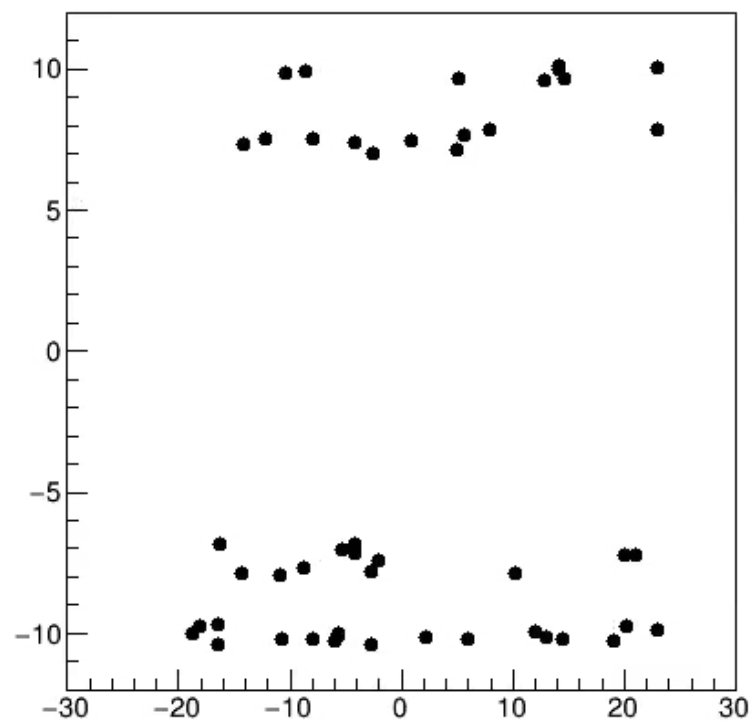
x vs y vs z : 2405



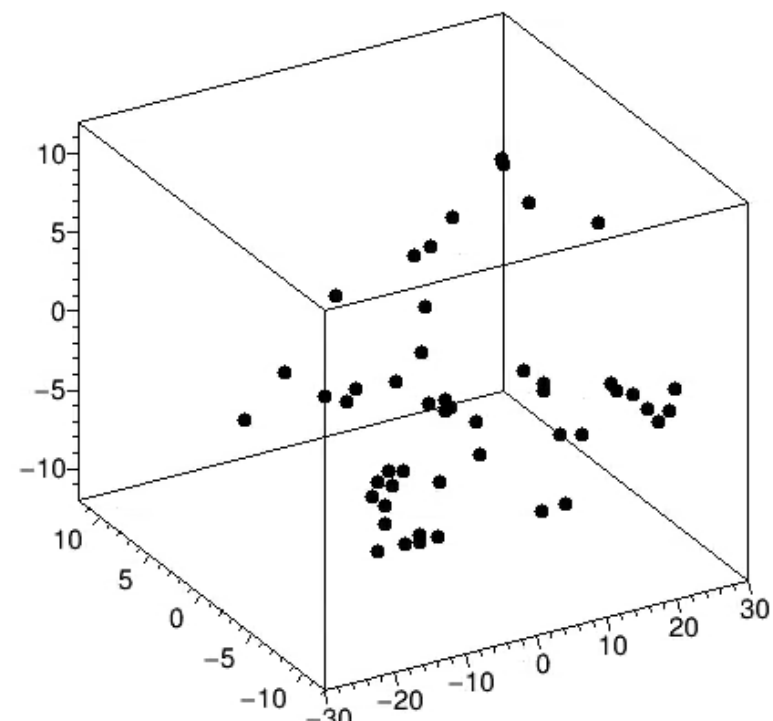
y vs x : 3827



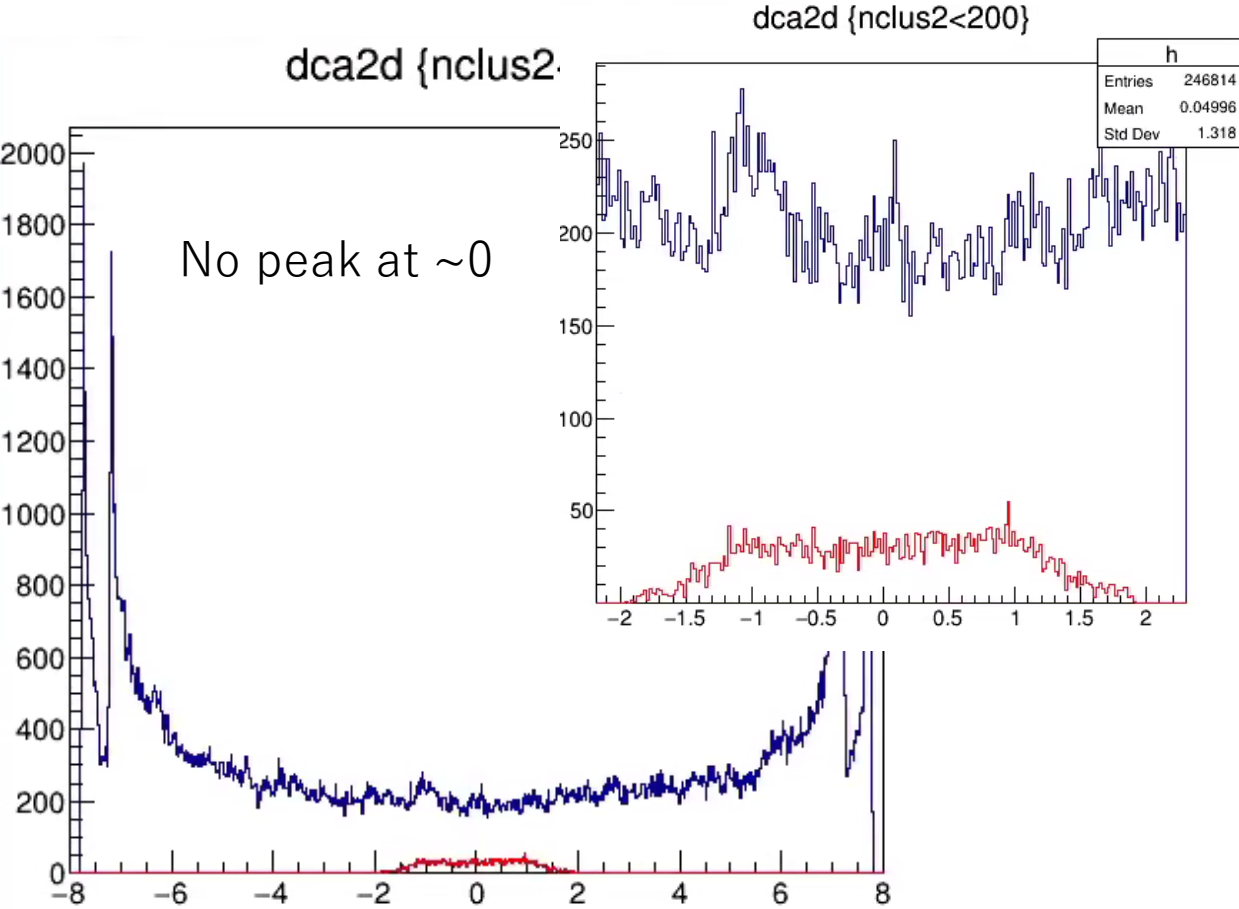
r vs z : 3827



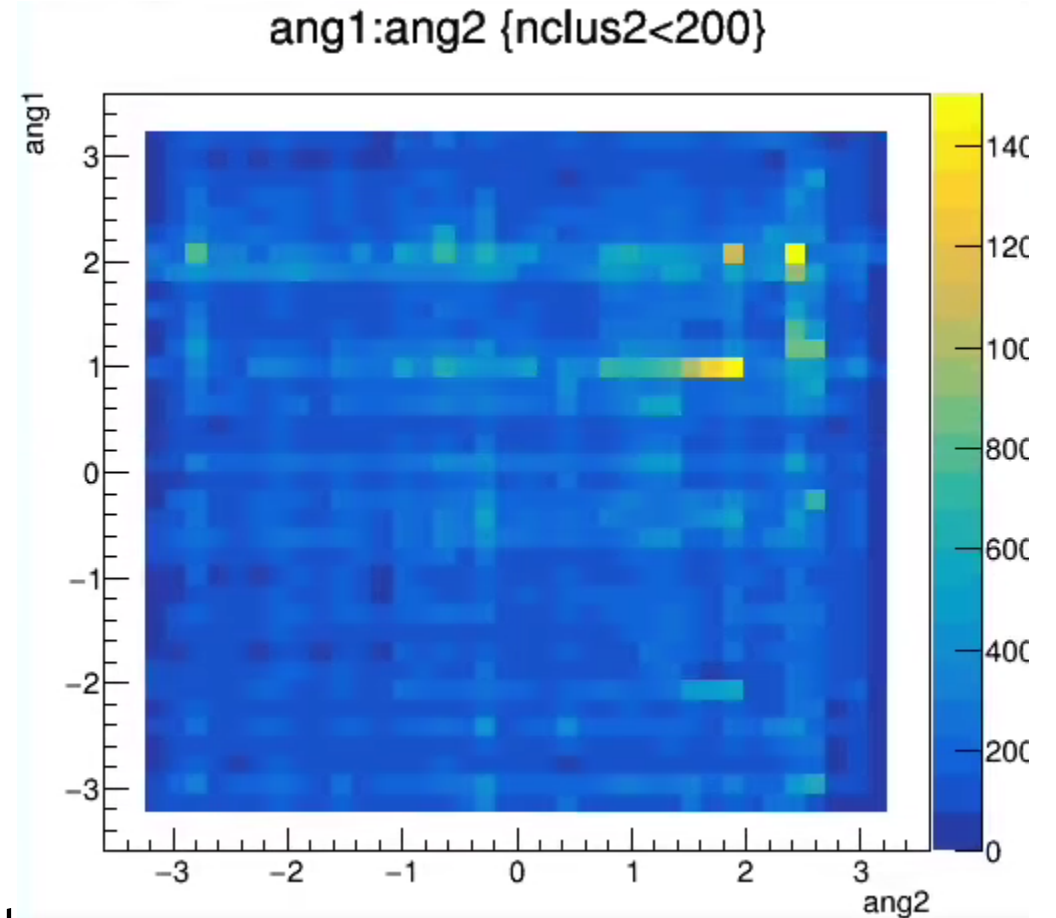
x vs y vs z : 3827



Run20864 (ZF)



No hit correlation



- No peak and correlation. Cluster position must be wrong
- Other remaining (but not found) issue?