TOP-BOTTOM ASYMMETRY INVESTIGATIONS

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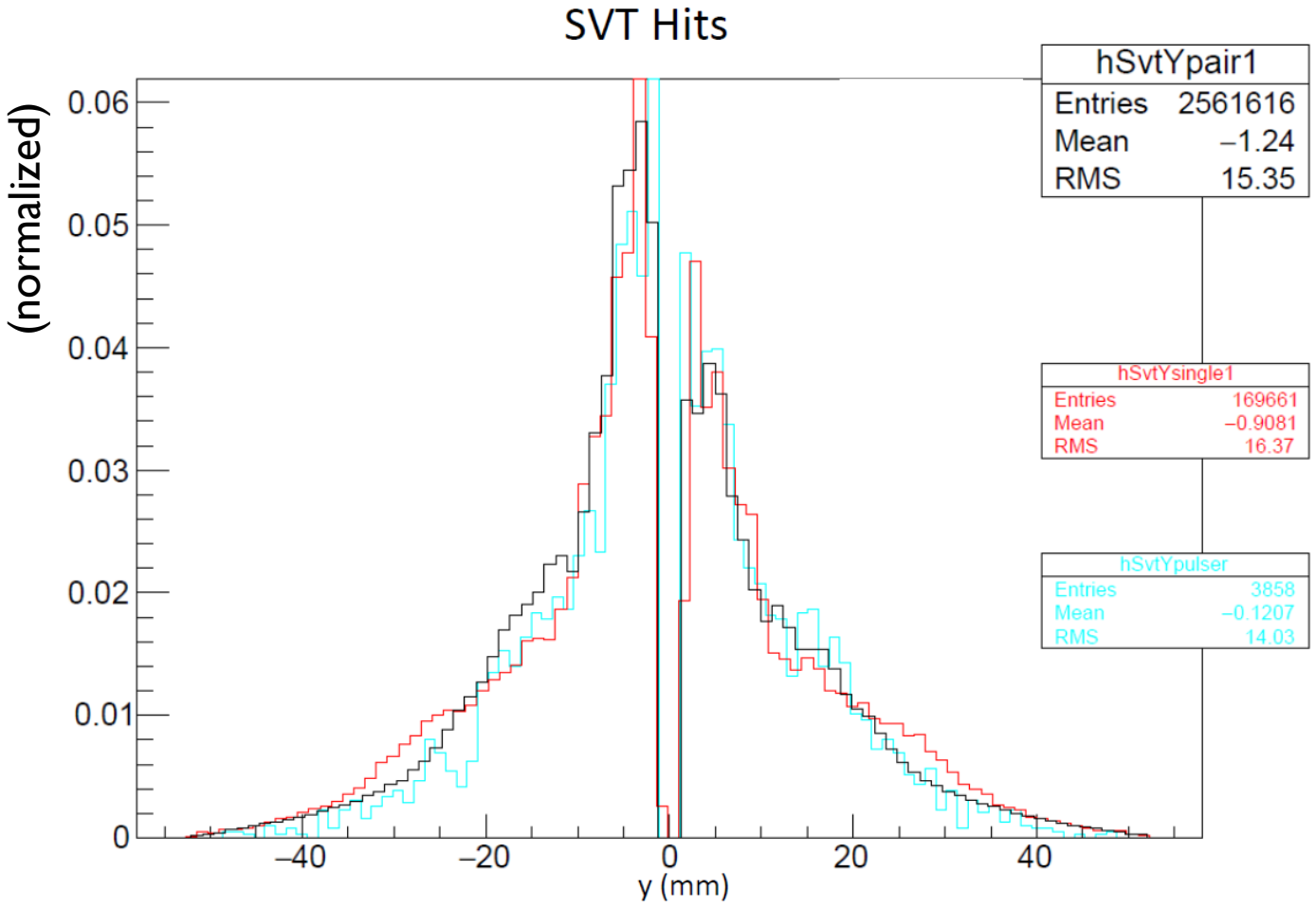
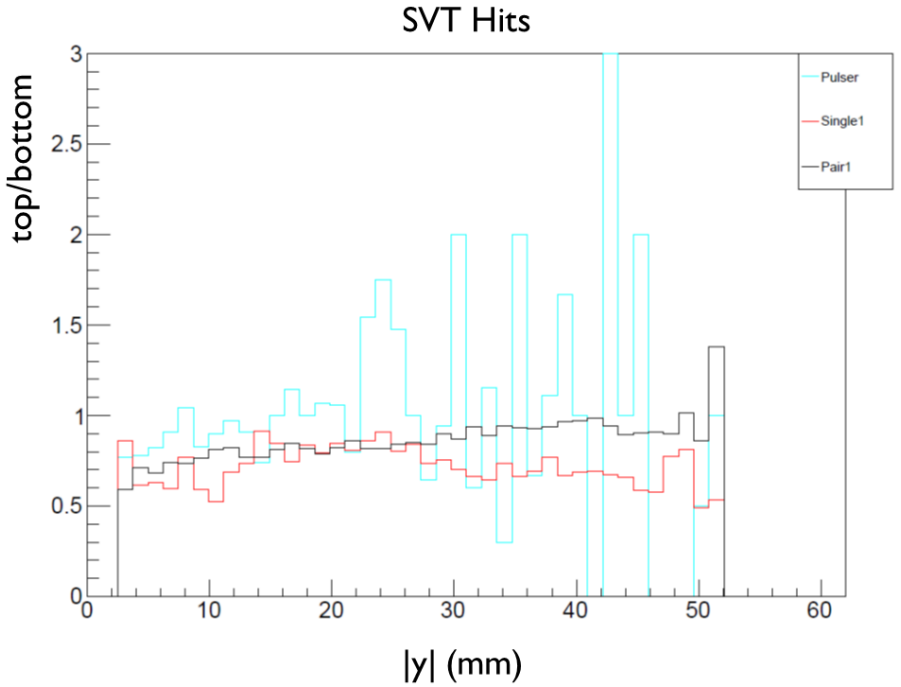
What a mess!

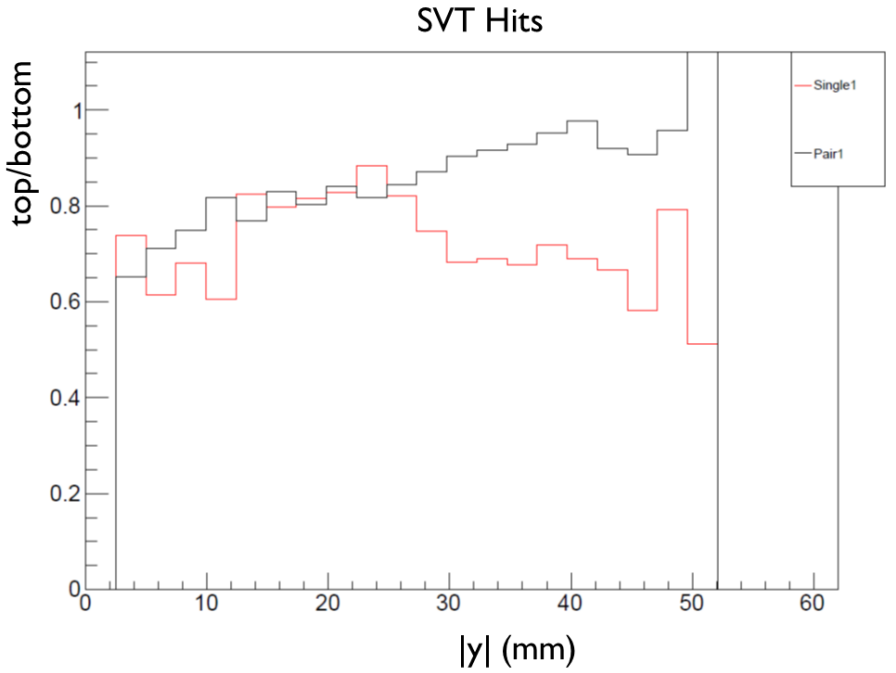
OUTLINE

- Plots broken down by trigger:
  - SVT hits
  - SVT channel occupancy
  - ECal clusters & hits
  - Max sample #
- Timing issues
- Next up: studies with 2-cluster events

SVT HITS

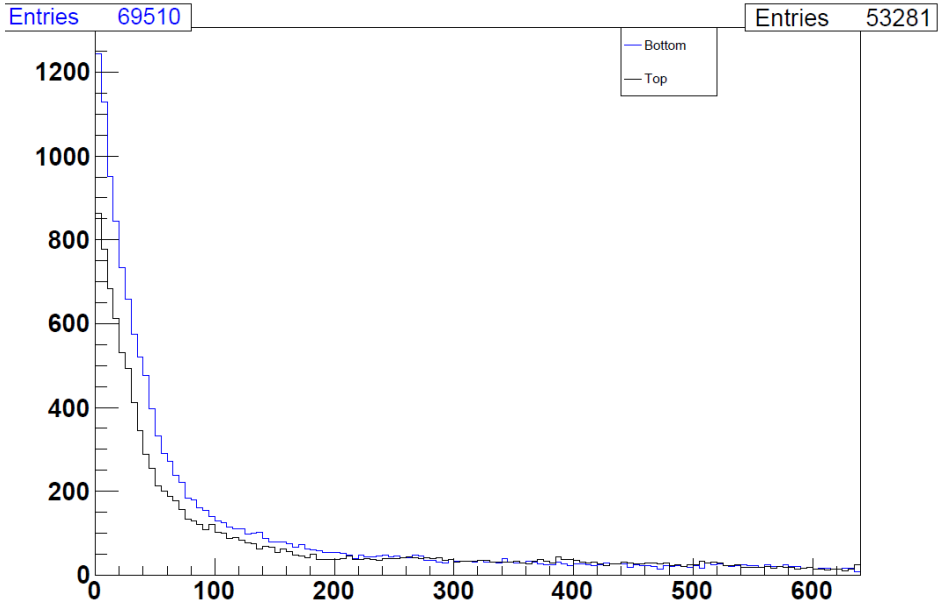

SVT Hits
(normalized)
0.06
0.05
0.04
0.03
0.02
0.01
0
−40
−20
0
20
40
y (mm)
hSvtYpair1
Entries 2561616
Mean −1.24
RMS 15.35
hSvtYsingle1
Entries 169661
Mean −0.9081
RMS 16.37
hSvtYpulser
Entries 3858
Mean −0.1207
RMS 14.03


SVT Hits
top/bottom
3
2.5
2
1.5
1
0.5
0
10
20
30
40
50
60
|y| (mm)
Pulser
Single1
Pair1

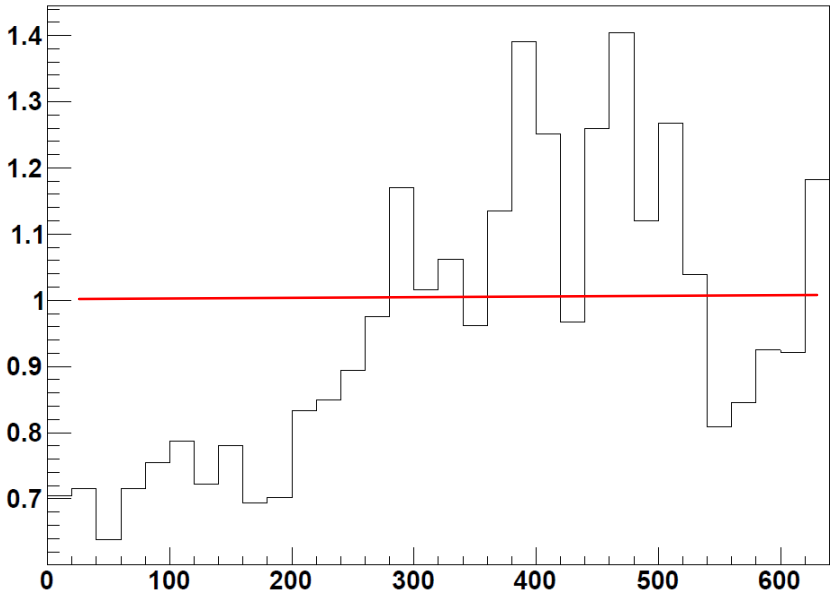

SVT Hits
top/bottom
1
0.8
0.6
0.4
0.2
0
10
20
30
40
50
60
|y| (mm)
Single1
Pair1

SVT CHANNEL OCCUPANCY

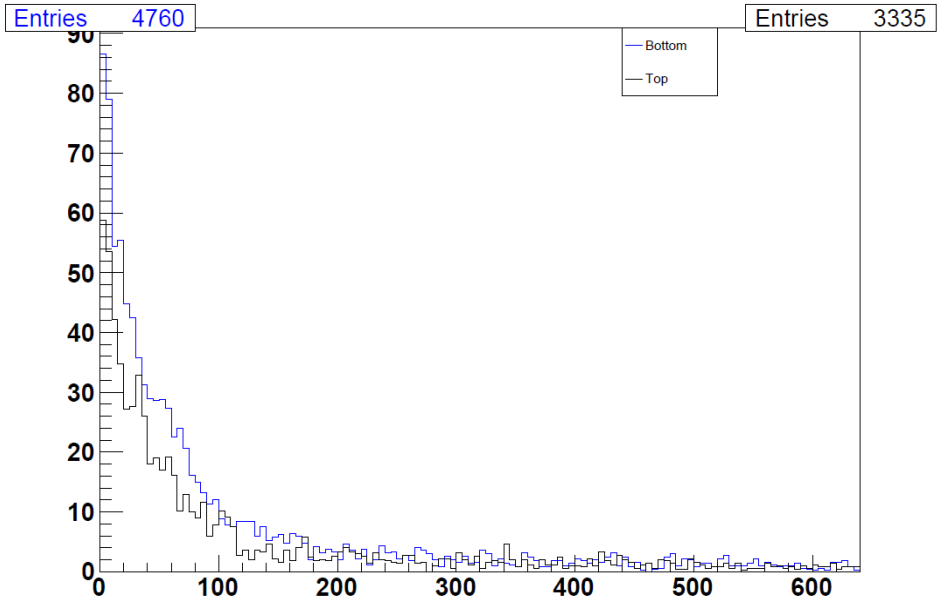
module_L2 _halfmodule_axial_sensor0 - Occupancy Pairs1



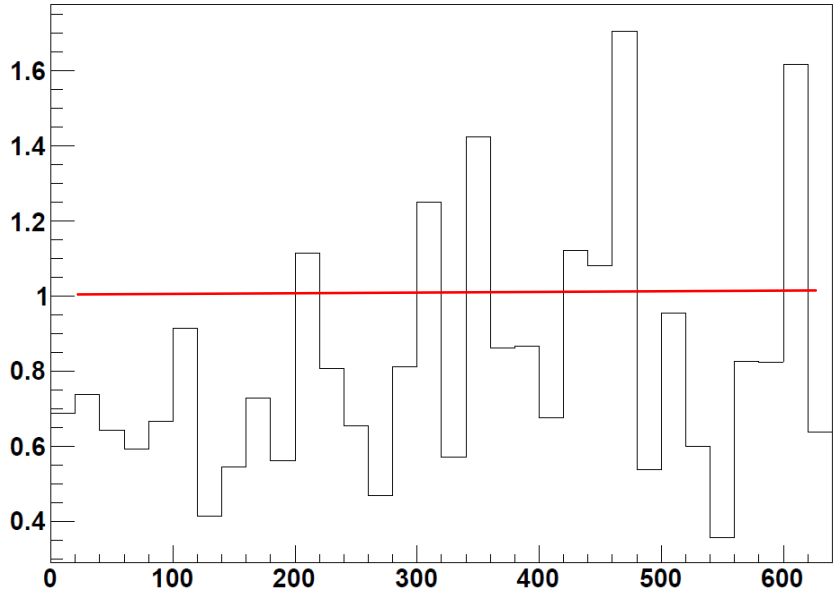
module_L2 _halfmodule_axial_sensor0 - Occupancy Pairs1Ratio



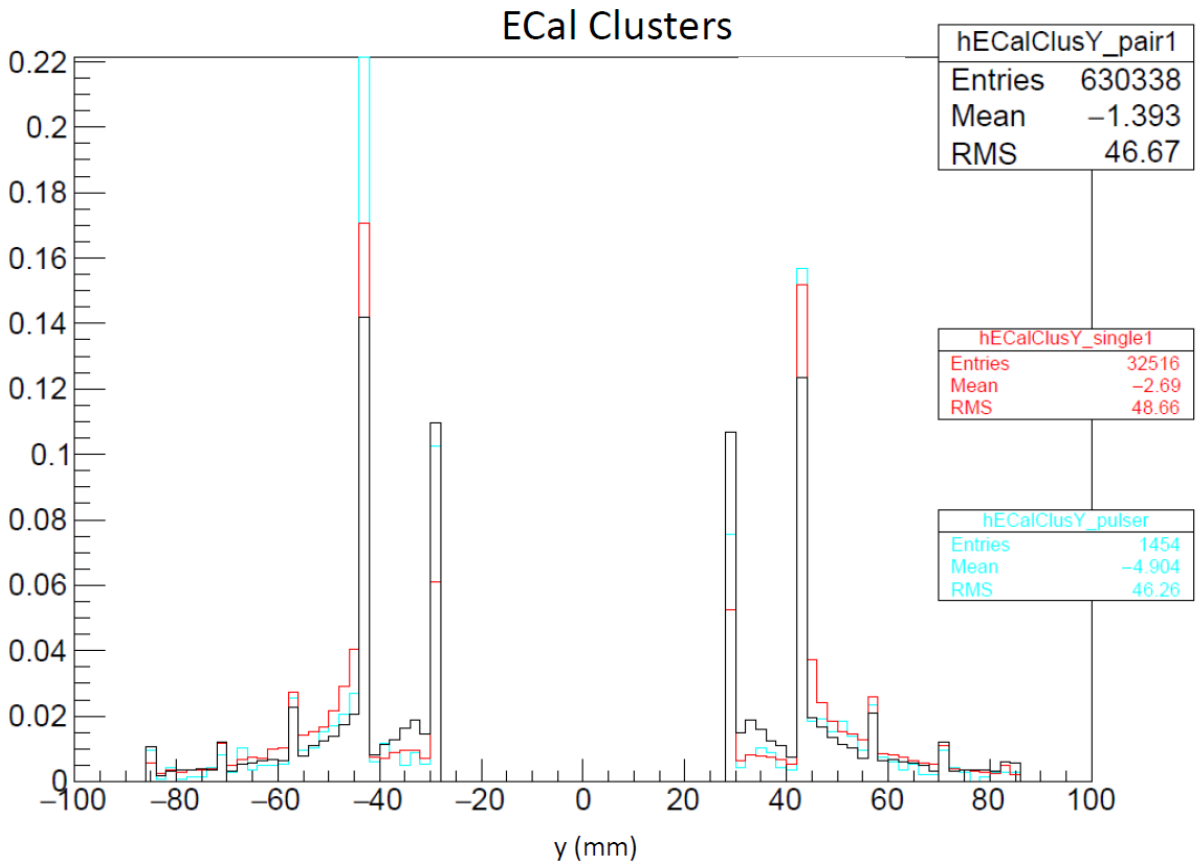
module_L2 _halfmodule_axial_sensor0 - Occupancy Singles1

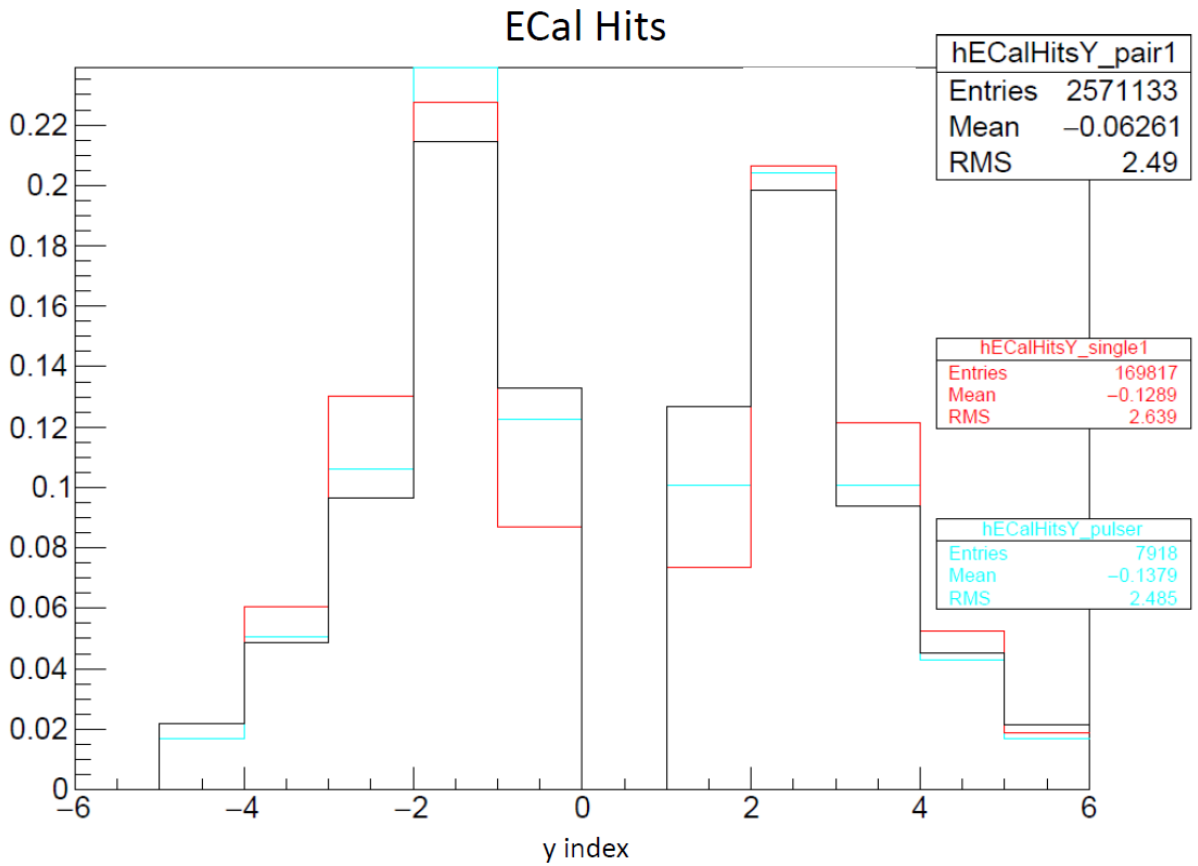


module_L2 _halfmodule_axial_sensor0 - Occupancy Singles1Ratio



ECAL CLUSTERS & HITS

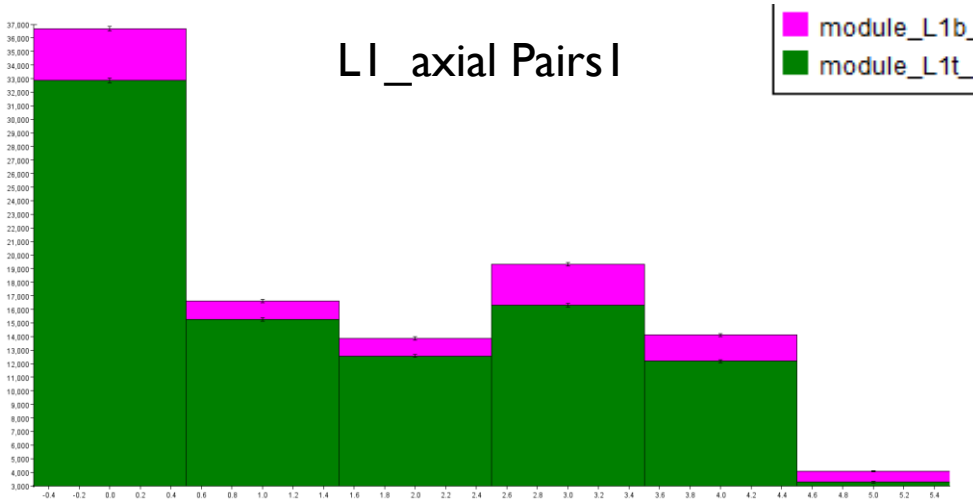




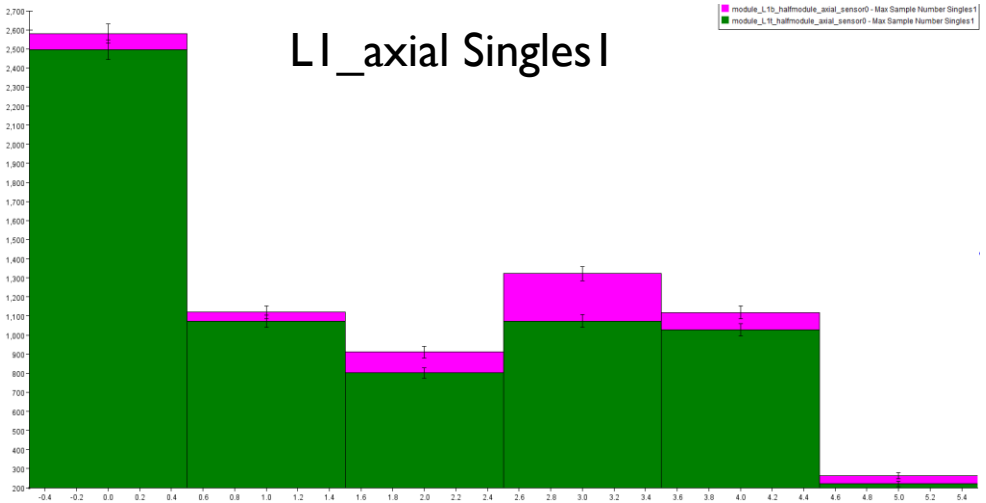
Don’t understand structure of y peaks

MAX SAMPLE

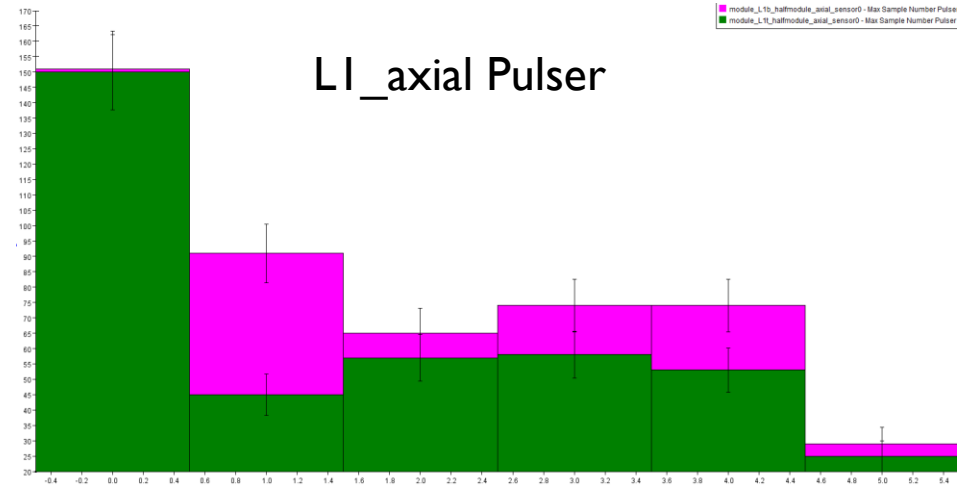
L1_axial Pairs1



L1_axial Singles1



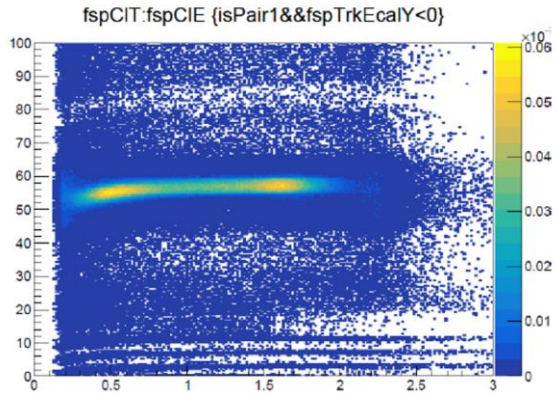
L1_axial Pulser

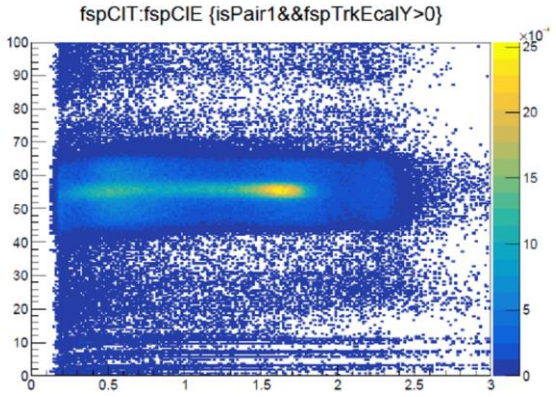


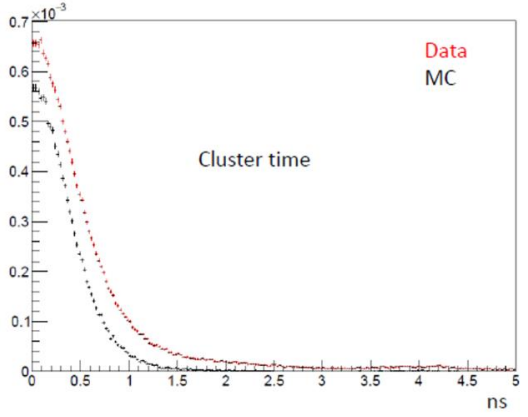
Don't yet understand what these mean

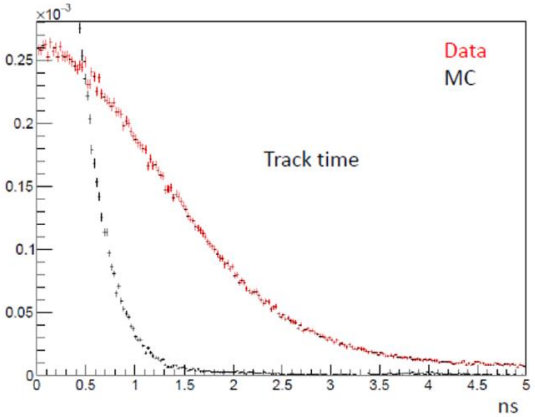
TIMING ISSUES

- Cluster Time, Track Time plots don't mean what we thought they mean
- Discussion in #software



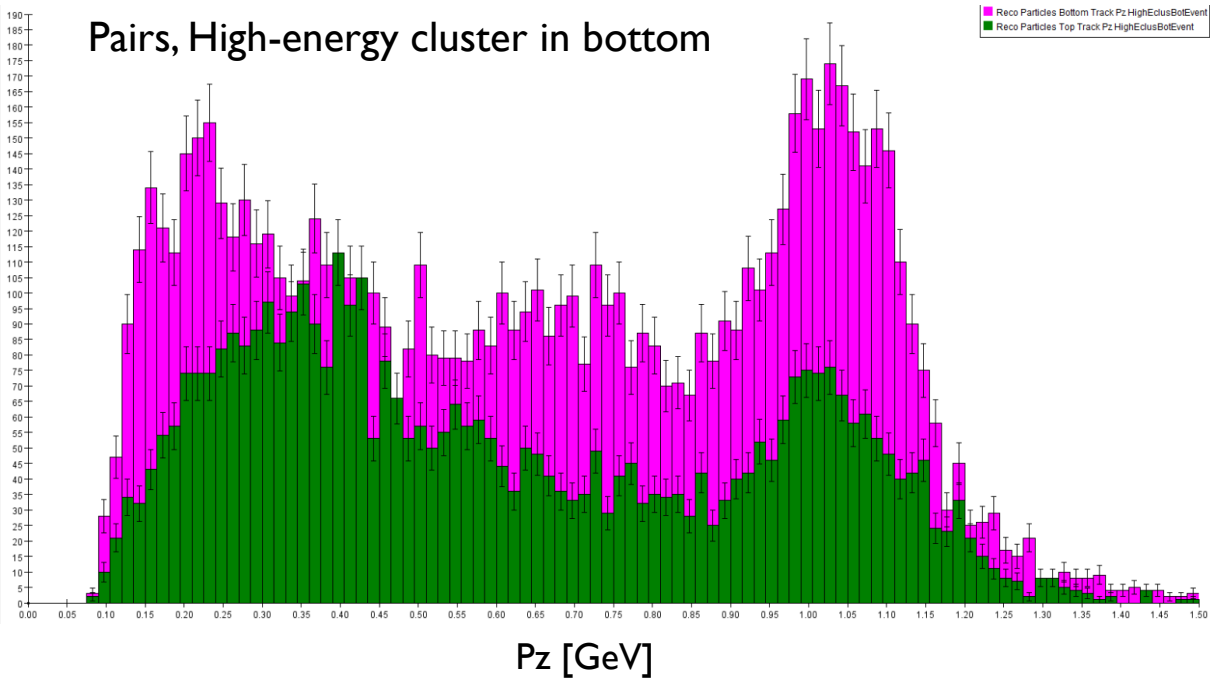


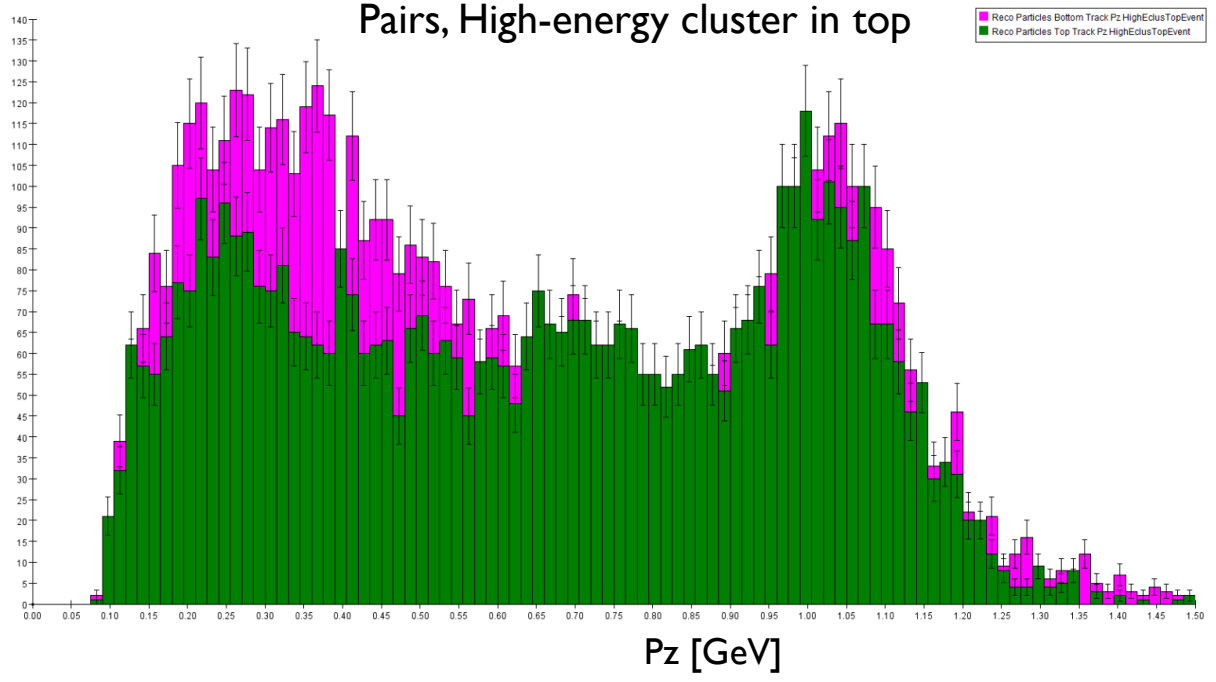




- To make Reco Cluster Time meaningful, must subtract time of closest RF bucket and take mod
- Reco RF time in Pairs: determined by most energetic cluster
- Online trigger time in Pairs: determined by bottom cluster

NEXT UP…



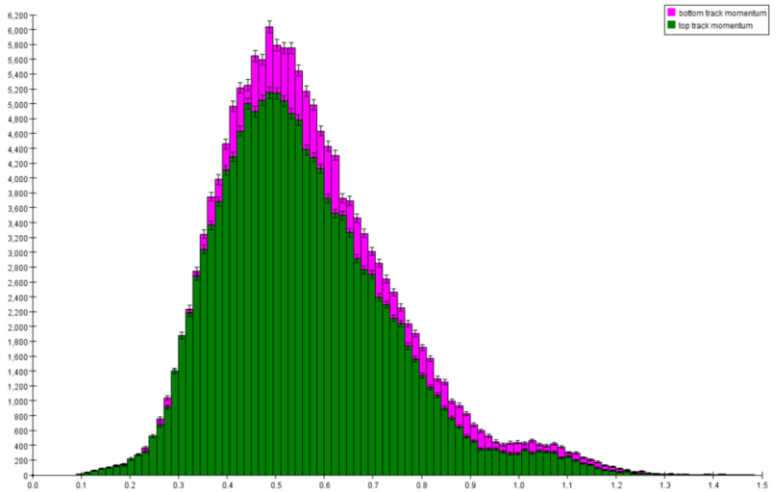


- Preliminary Pairs studies (but need more statistics):
  - When there is a trigger cluster seed with low energy (<100 MeV) in bottom, asymmetry goes away
  - When there is a trigger cluster seed with high energy (>150 MeV) in bottom, large asymmetry

NEXT UP: STUDIES WITH 2-CLUSTER EVENTS

- Norman: skimmed events with 2 reco clusters, from unblinded 5772, pass8
  - Pairs sub-sample with: 1 track associated with 1 of the clusters, no other tracks in event, Δ(cluster t) = 2ns, ESum within 15% of beam energy

    (electron + brem photon, like FEE study with Pairs)
    - Asymmetry goes away
  - Significantly many events with no tracks but some strip hits
    - Try again with looser timing cuts in reco



- Tim: from this skim, look for Pairs events with 1 cluster in top & 1 in bottom
  - Sub-sample where bottom has no track
  - Sub-sample where top has no track
    - How many SVT layers have a hit?