Tracker Status Update

D Adey
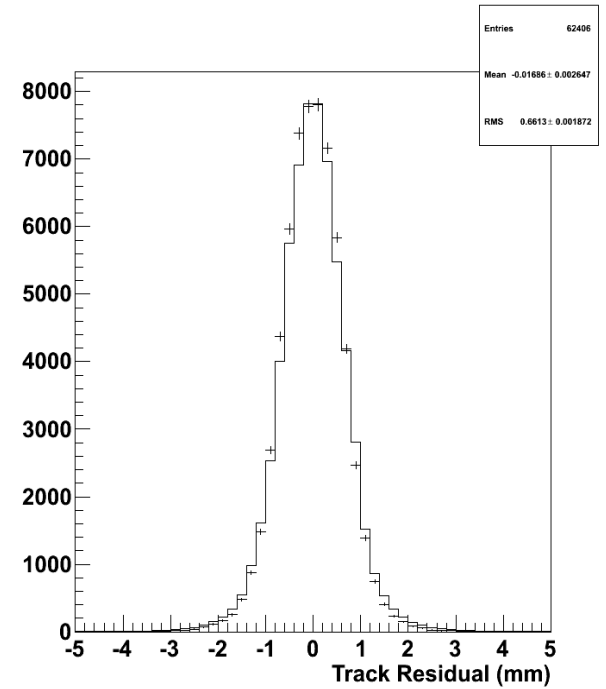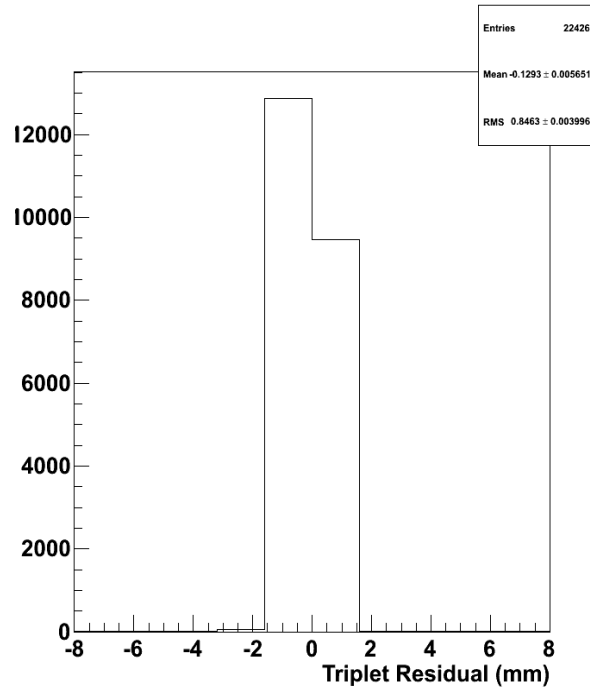
CM28 Detector Session

Sofia

05/10/10

Since CM27

Finalised a space point reconstruction method

Investigated non-track clusters in cosmic ray data

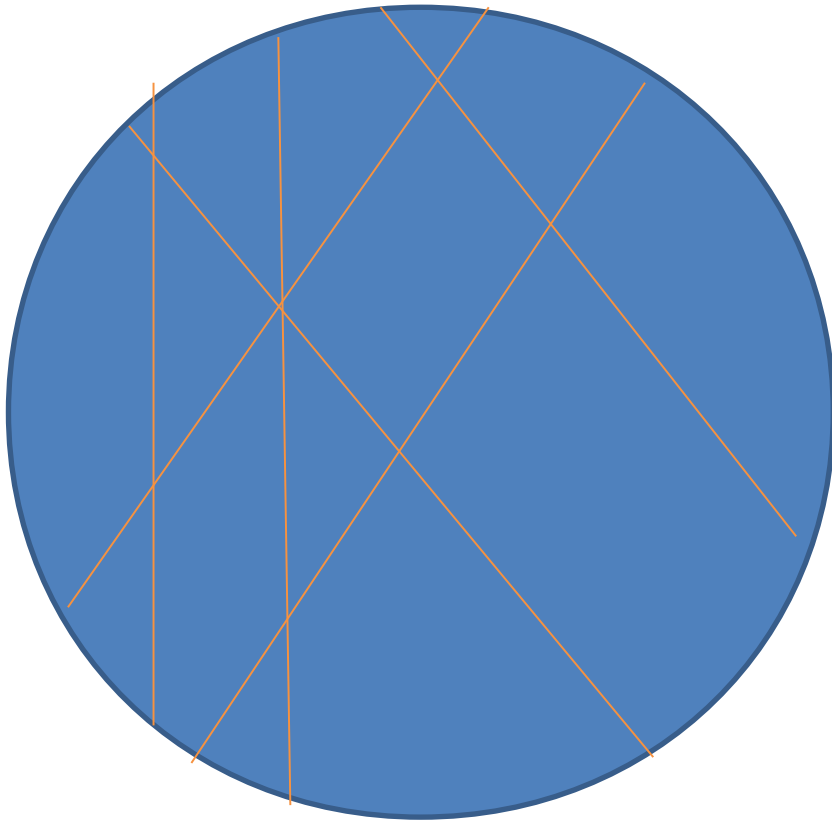Planning for Step III/IV comparison - track reconstruction needs

Summary of cosmic test results – submitted to NIM A

arXiv:1005.3491v2

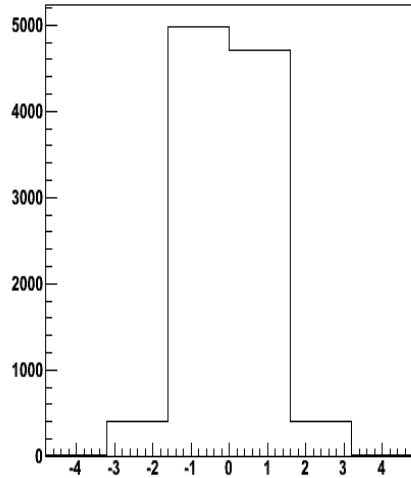|	Track Residual (μm)	Light Yield (PE)	Efficiency (%)
Tracker 1	661	11.23	99.8
Tracker 2	643	10.73	99.6

Space Point - Definitions

Triplet – Crossing of 3 channels
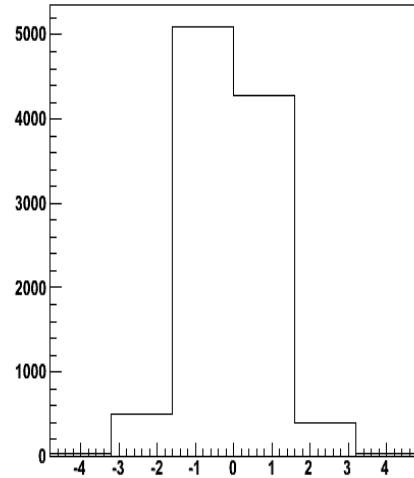
Doublet – Crossing of combination
of u,v,w

Geometry and channel number ordering mean sum of triplet channel numbers will equal sum of central channel numbers.
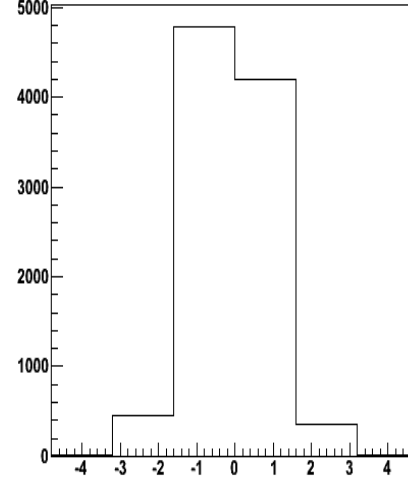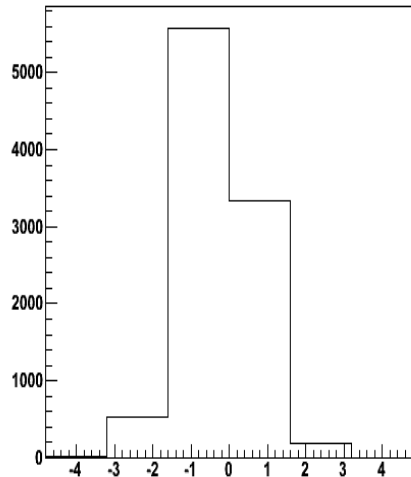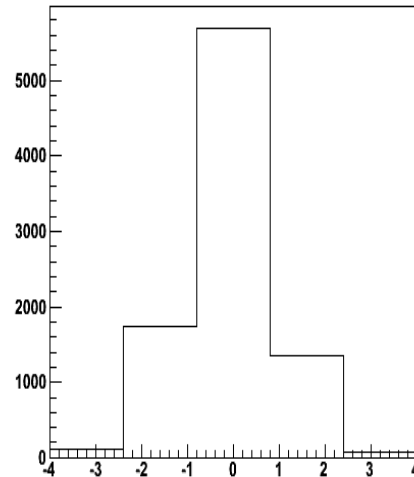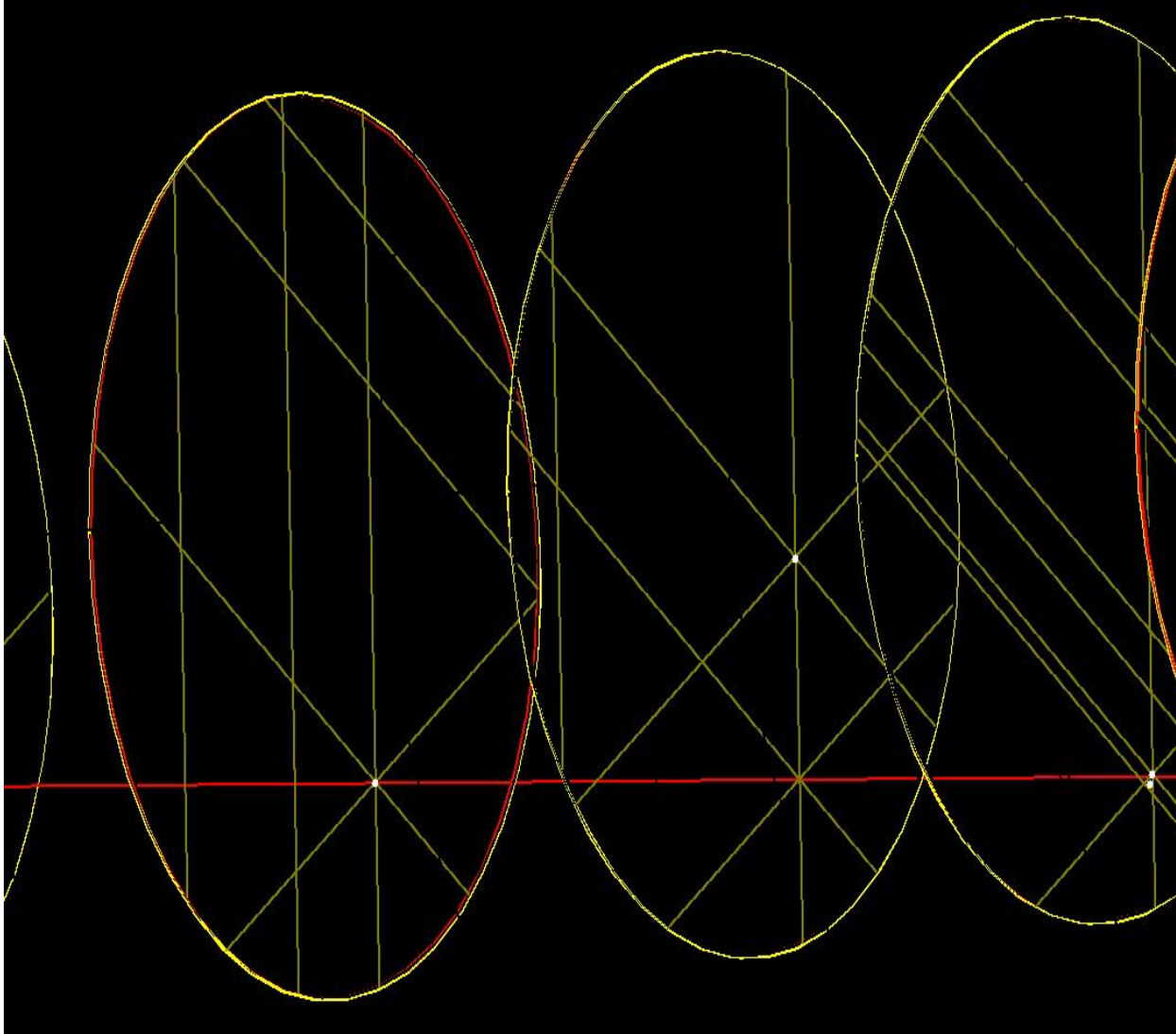
Space Point Reconstruction

Clusters sorted by light yield and geometry. Triplets only formed if sum of channel numbers within plausible range. Clusters in a triplet removed from search.

Doublets formed from all possible combinations.
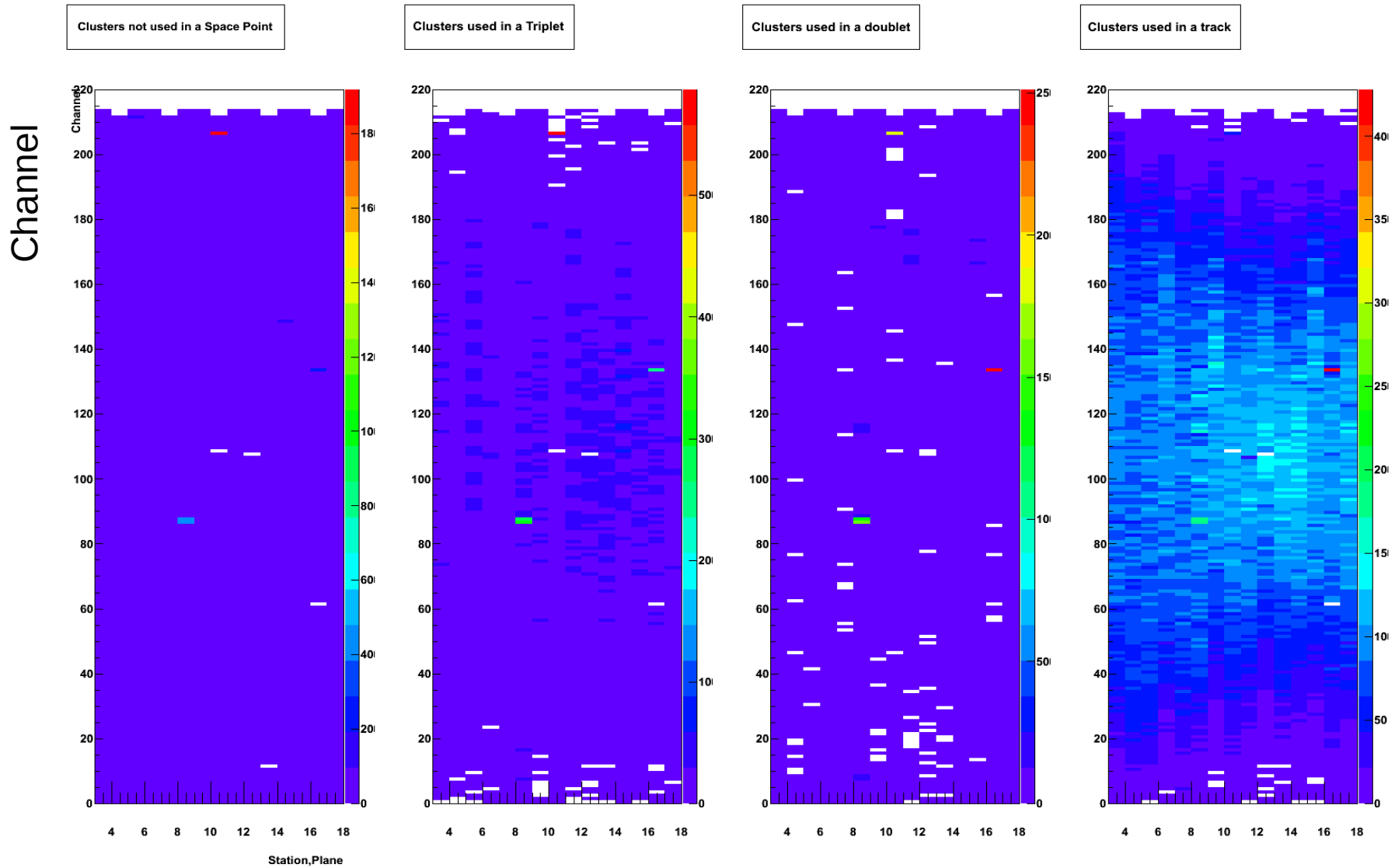
Detailed in (soon to be) MICE note.

Non-track clusters

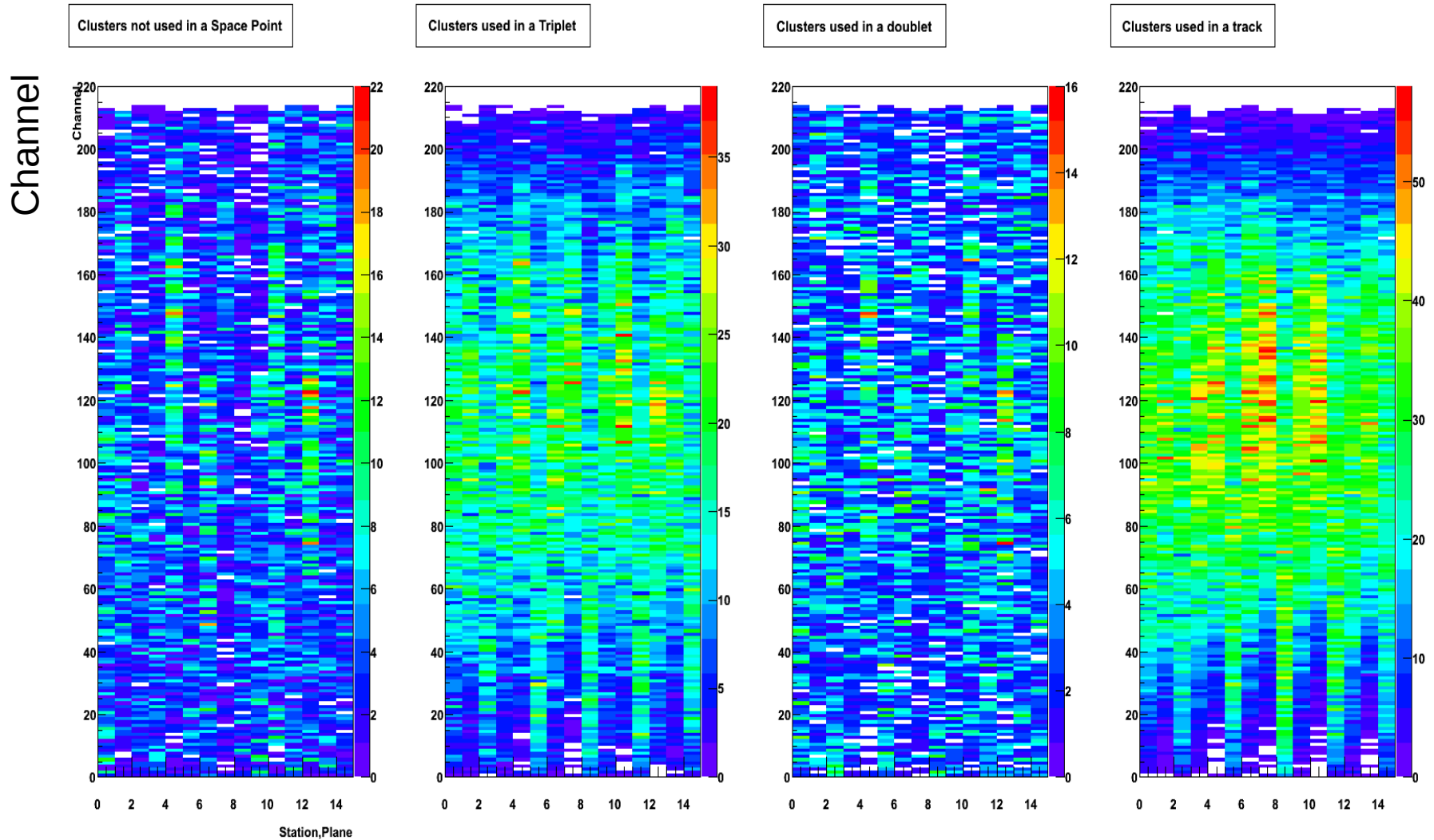Clusters not visibly part of a track were causing problems in reconstruction.

Cosmic showers?
Noise?
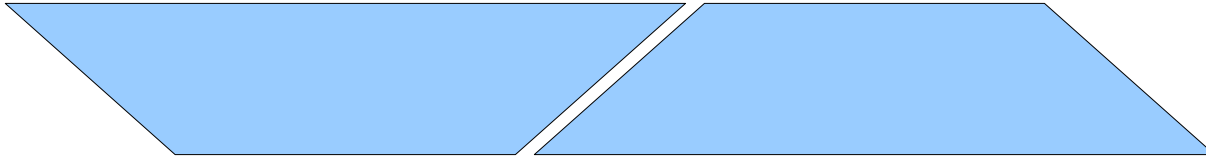Cross talk?

Tracker 1 Cosmic Test – cluster frequency by type

Clusters not used in a Space Point

Clusters used in a Triplet

Clusters used in a doublet

Clusters used in a track

Channel

Station,Plane

Station 1-5, Plane 0-2

Tracker 1 Clusters per event (with 1 track) by Station

Tracker 2 Cosmic Test – cluster frequency by type
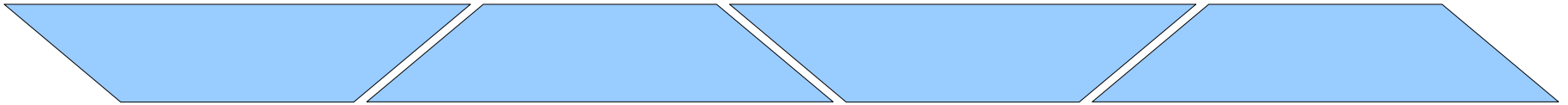

Station 1-5, Plane 0-2

Check for Cross Talk
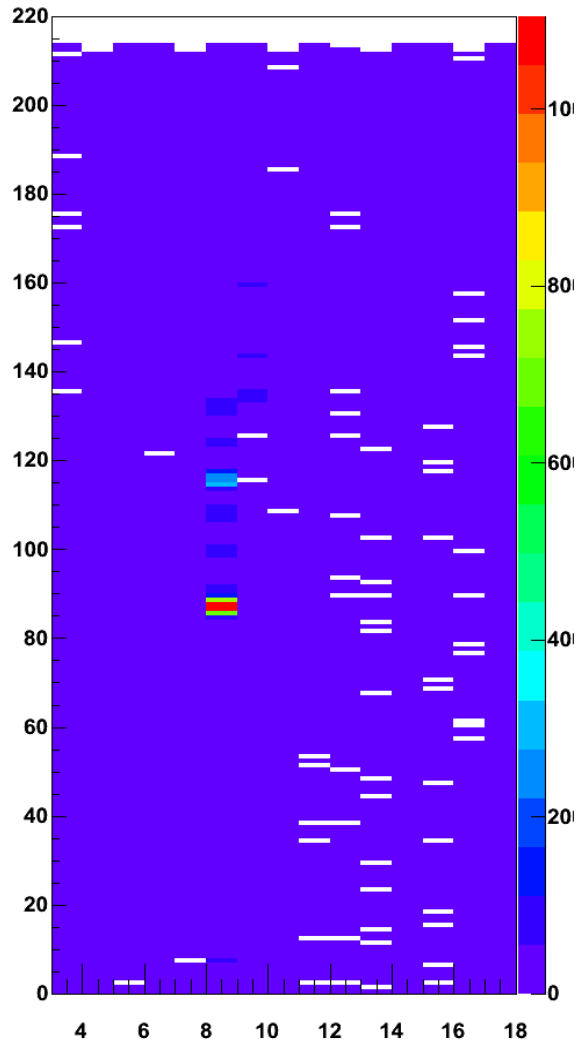
A cluster contains (at most) 2 neighbouring channels

Look for clusters in same event geometrically adjecent
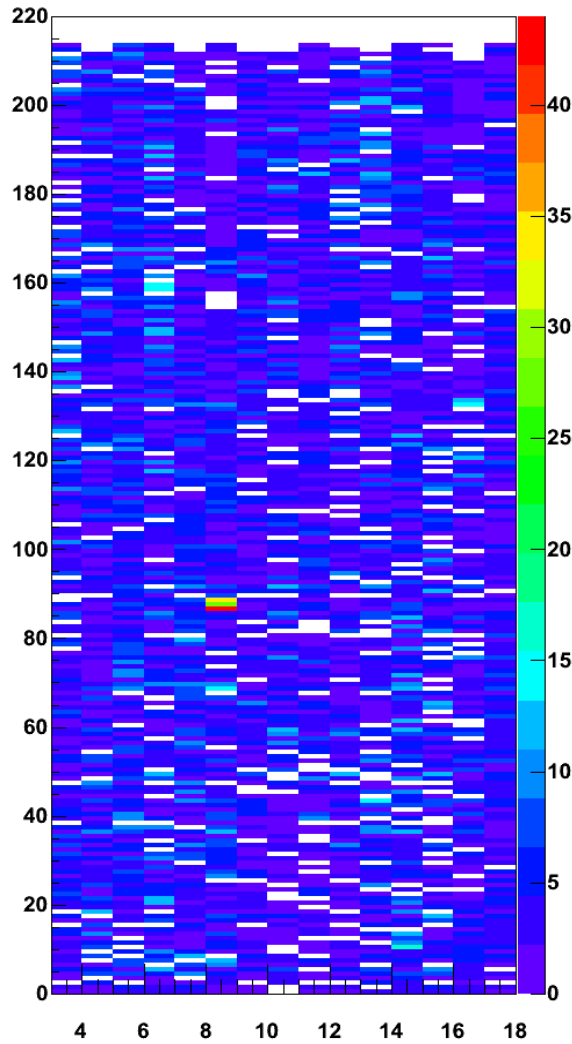
Plot by use in space point and track
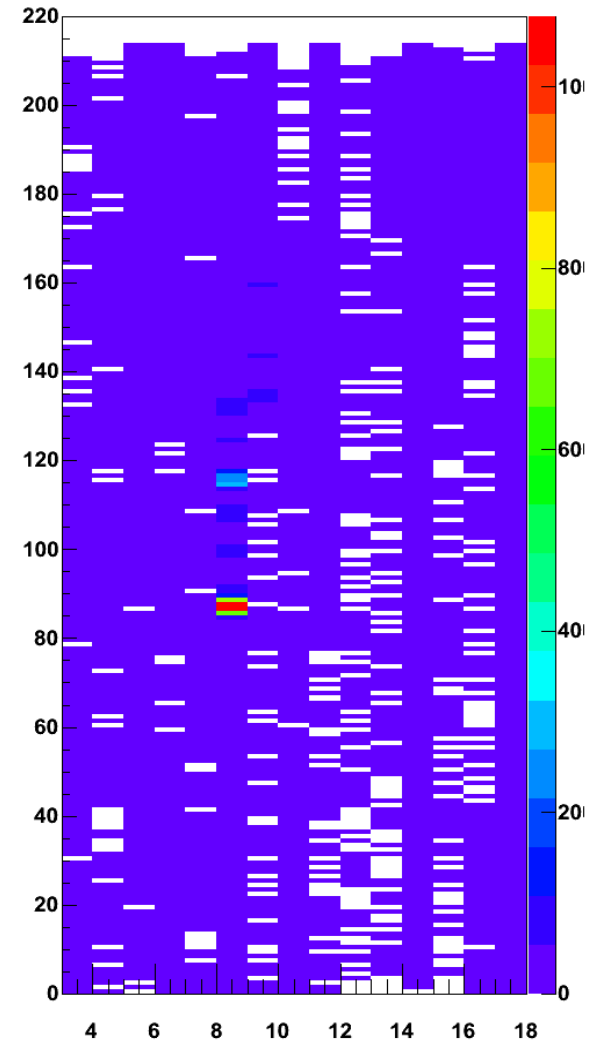
Tracker 1 Cosmic Test – Adjacent Clusters
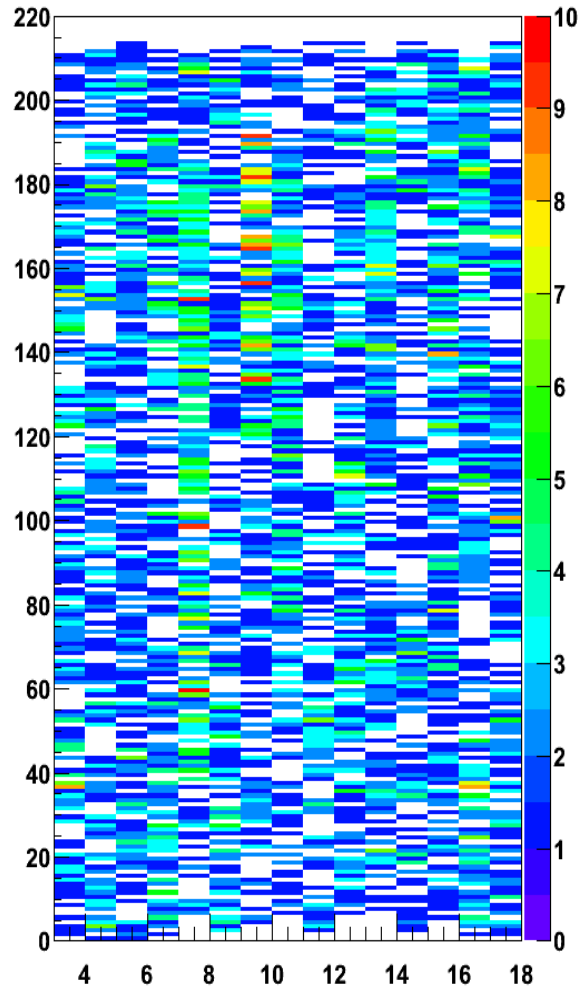

All clusters

Not used in space point
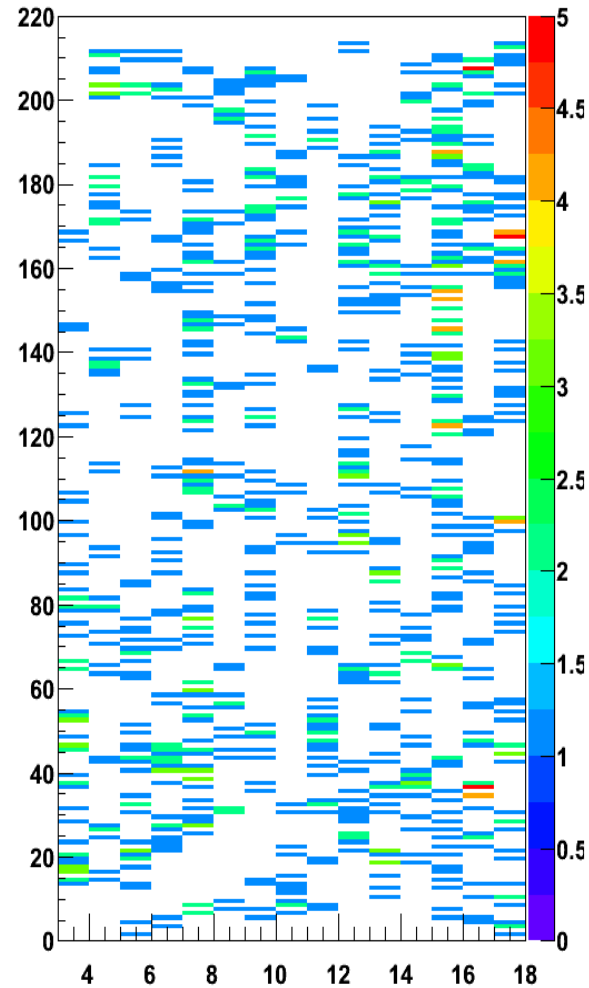
Used in space point

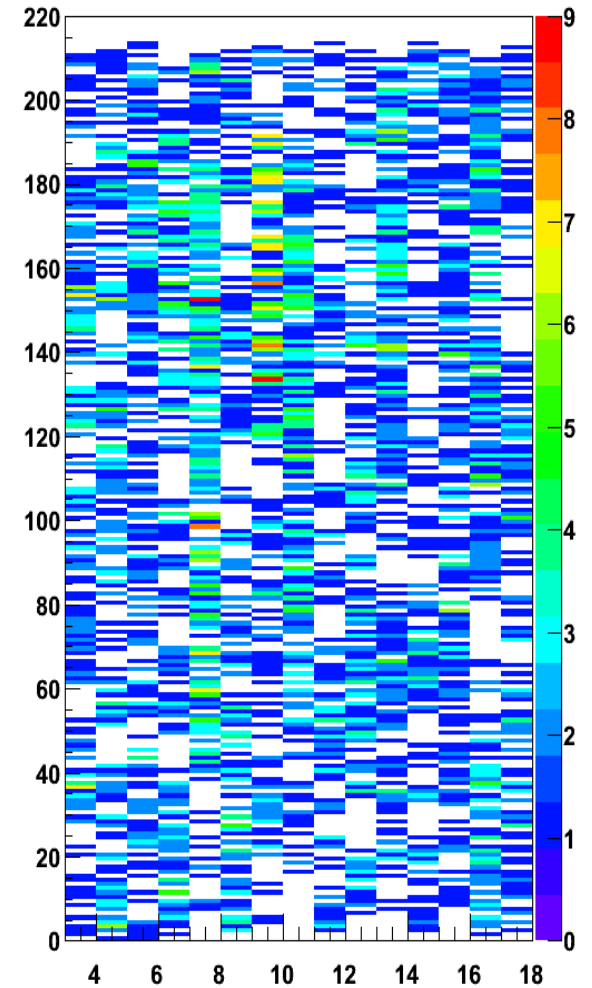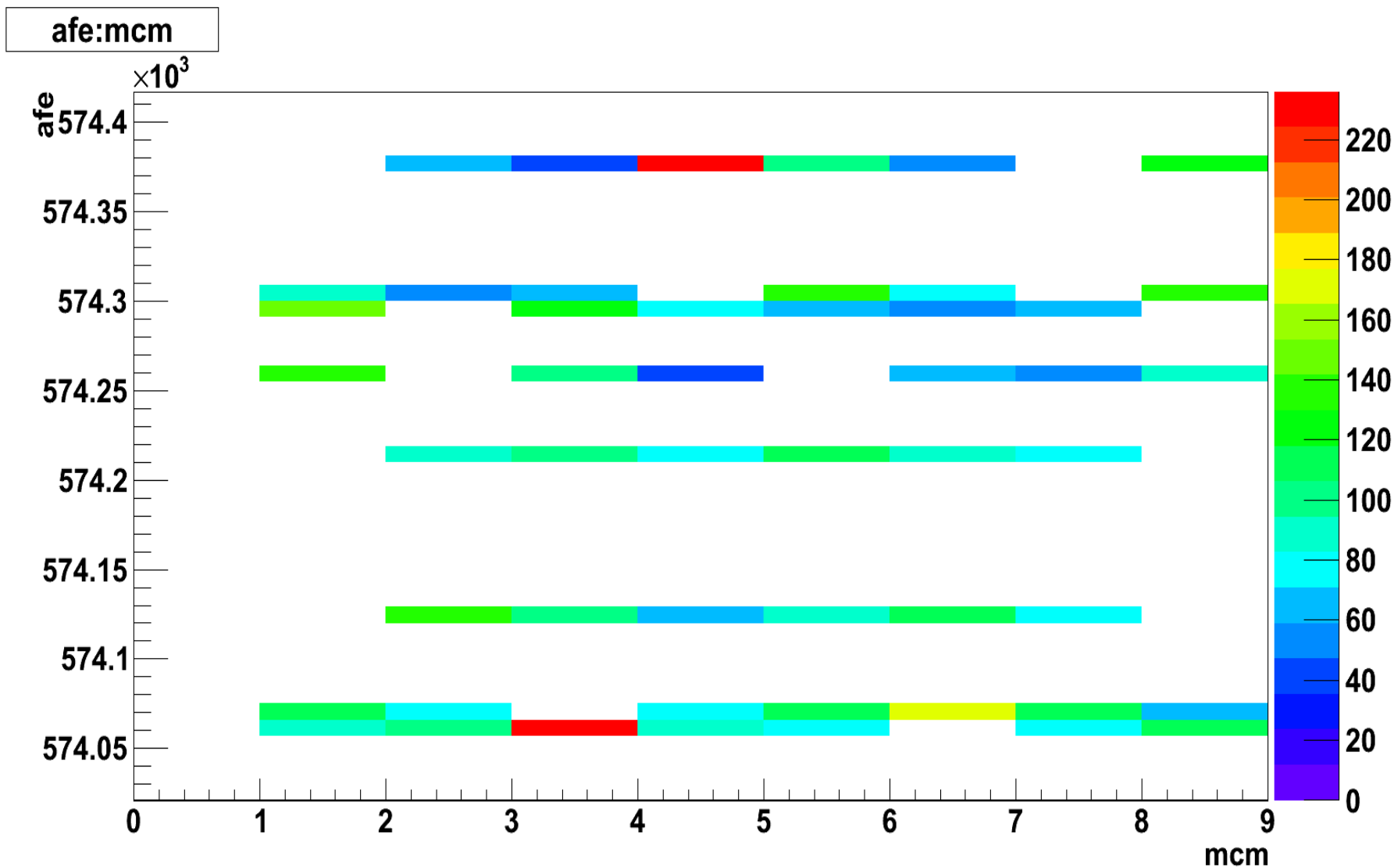# Tracker 2 Cosmic Test – Adjacent Clusters

All clusters

Not used in space point

Used in space point

Tracker 2 adjacent clusters by electronics

Tracker Online Monitoring

Will be writing monitoring application for trackers

Needs to integrate with current monitoring

Plan to test during next cosmic tests

Suggestions?

Summary

Evidence of noise/miscalibrated channels

Some clusters geomtrically adjacent
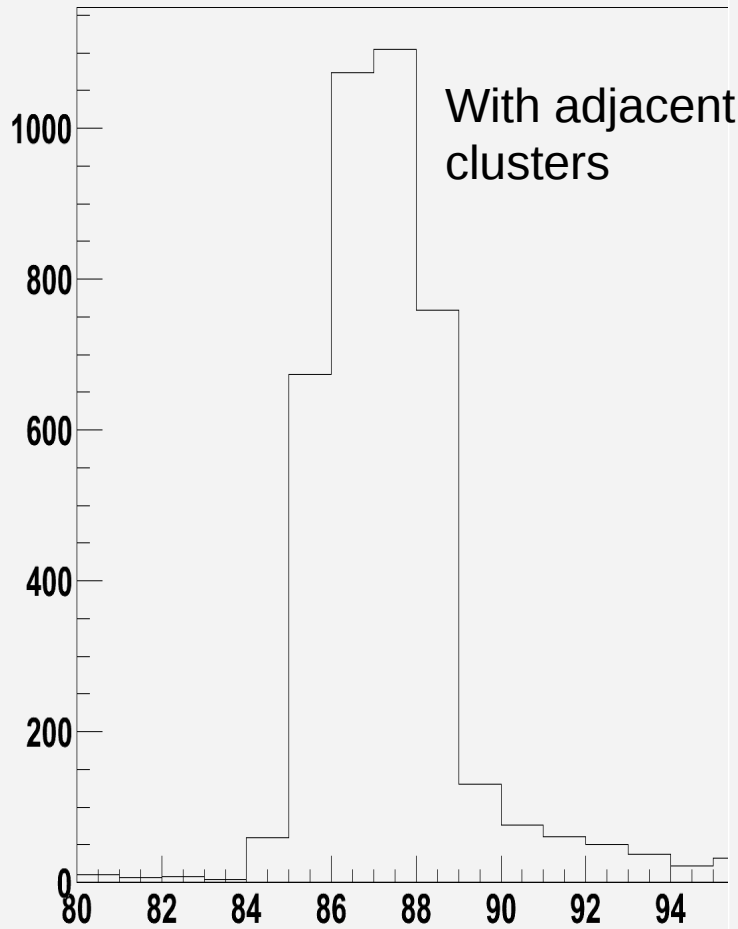
Data set limited and old

Plan to take relevent data at next test –
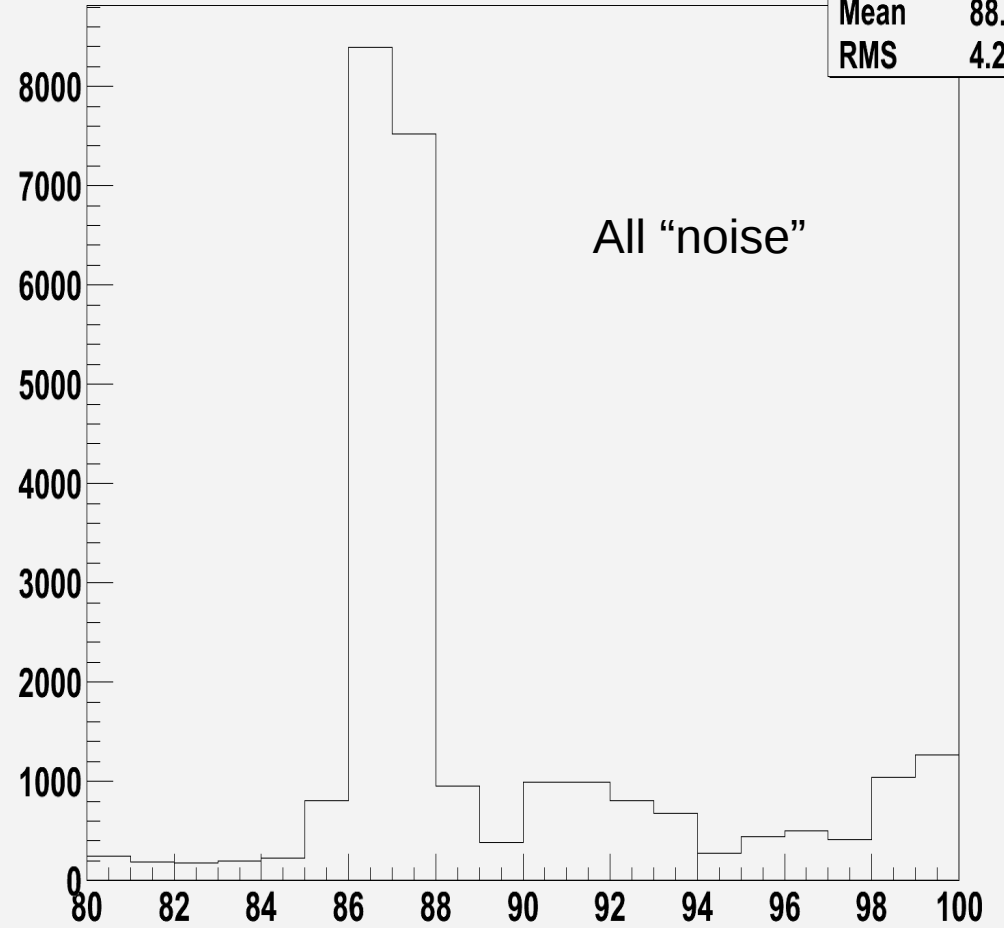 probably in November

Recalibrate - develop automated procedure
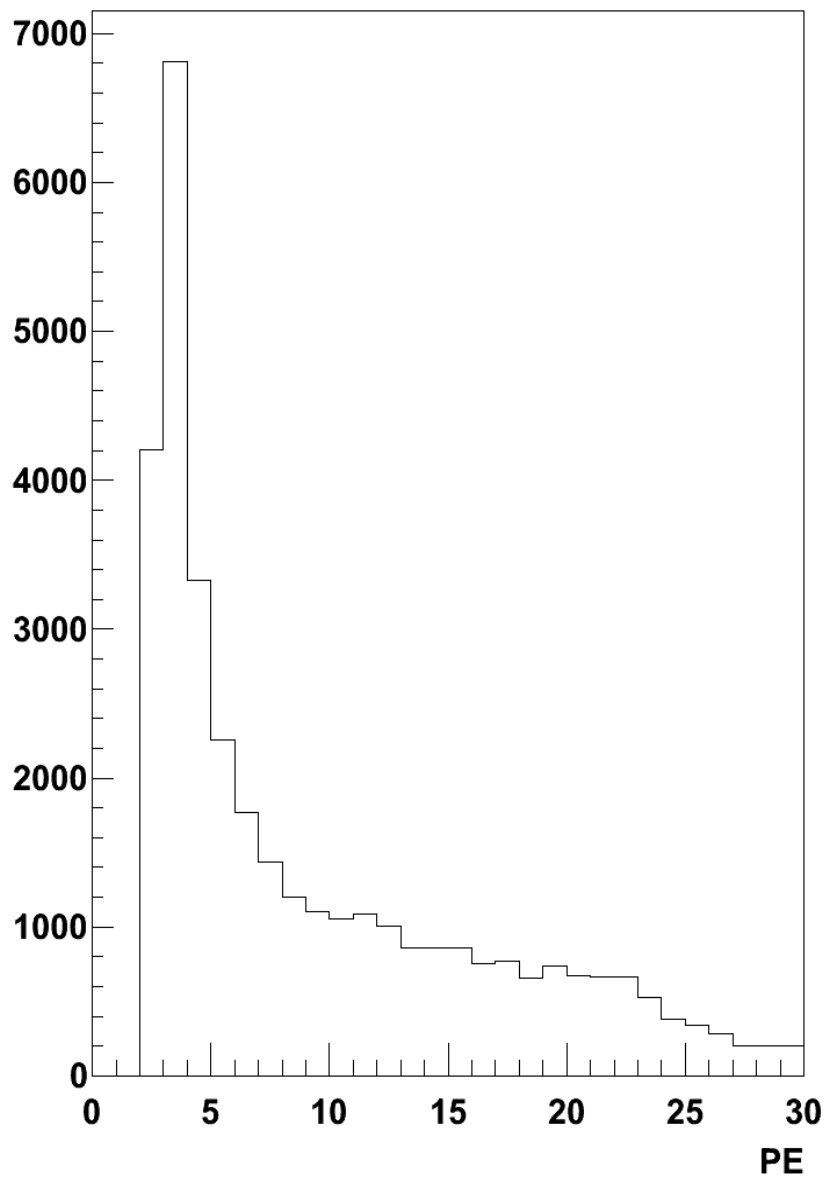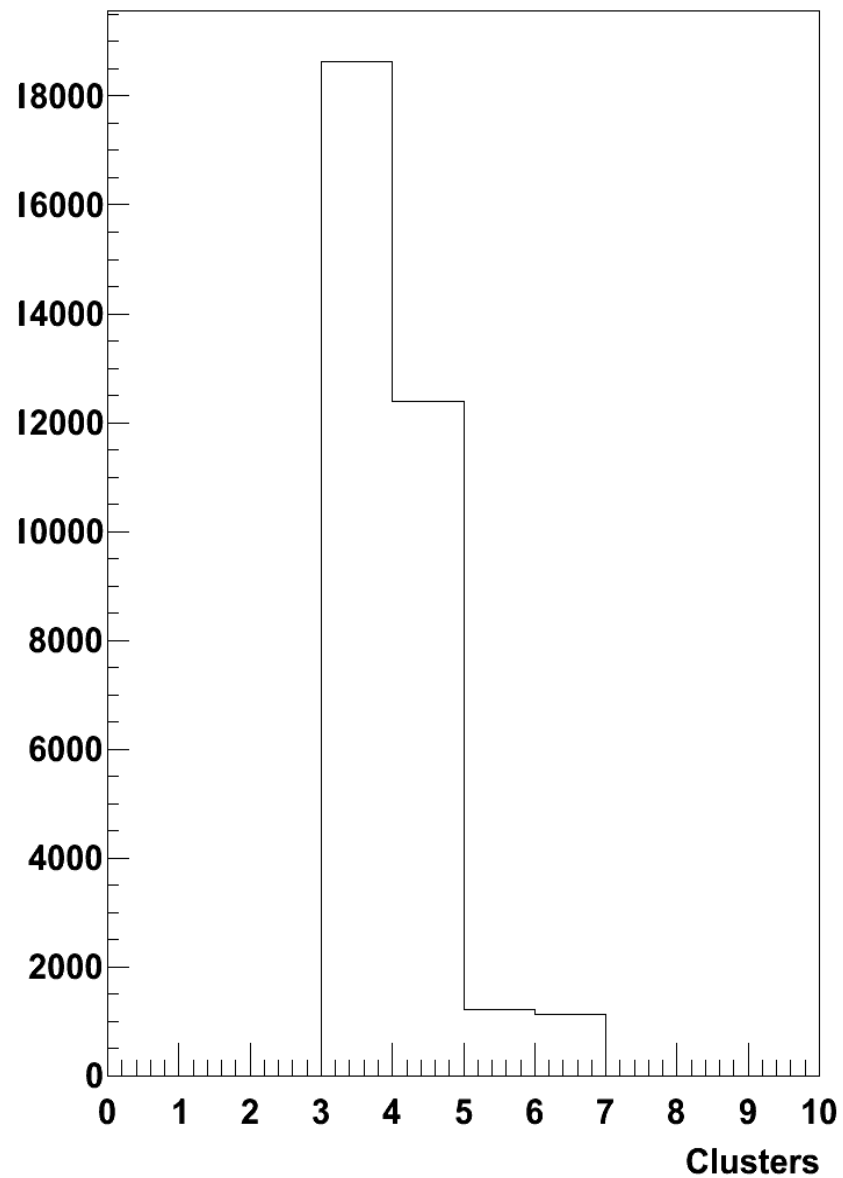
Additional Slides

Tracker 1 Station 2 Plane 2
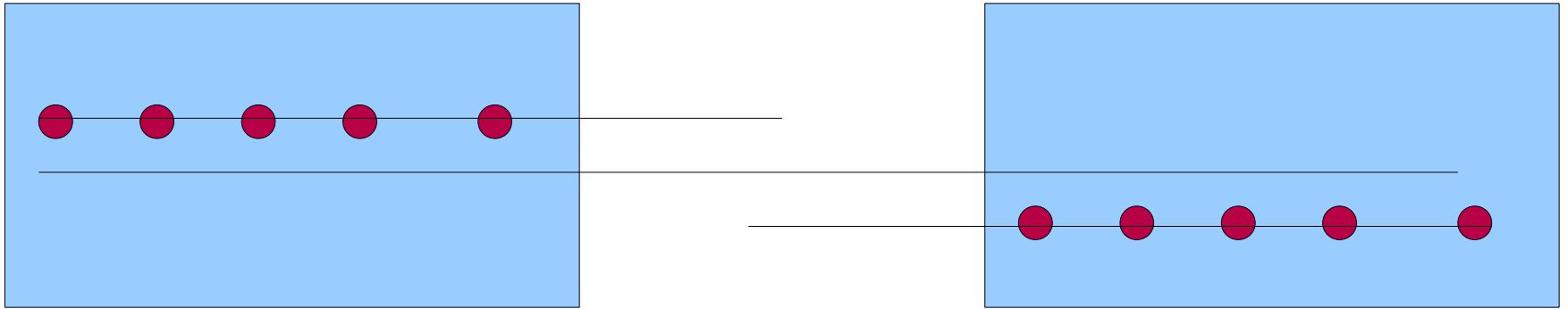
Light Yield

Total clusters

Tracker 1

PE

Clusters

Step III / IV Reconstruction

Extrapolation of one tracker to another or some defined plane