

Detectors Calibration for $x > 2$ experiment

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Outline:

- 1, General Status
- 2, VDC, Scintillators & Timing
- 3, PID Detectors
- 4, Optics
- 5, To Do

1, General Status

- Data:

Check x>2 wiki for data we have taken:

https://hallaweb.jlab.org/wiki/index.php/E08-014_Run_Plan

Or EPICS info gathered by Patricia:

<https://hallaweb.jlab.org/wiki/index.php/Runlist>

- Detectors:

All detectors were working well during our experiment, except one noisy shower counters (#66), which is outside our acceptance.

- Optics

LHRS Optics is already good and needed minimum work. RHRS Optics is twisted due to RQ3 problem.

2, VDC, Scintillators & Timing

- VDC

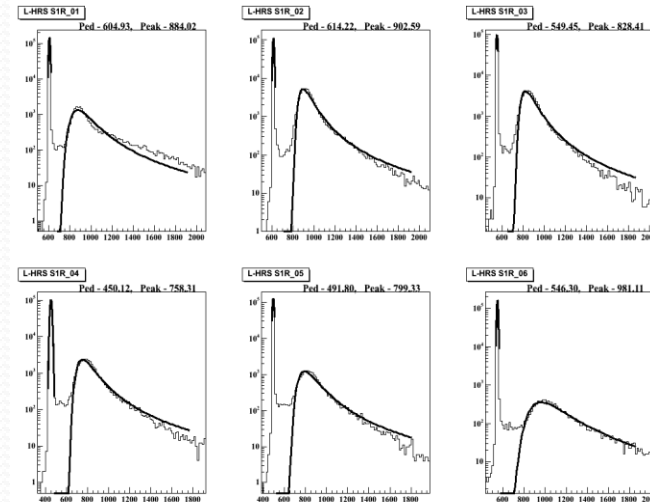
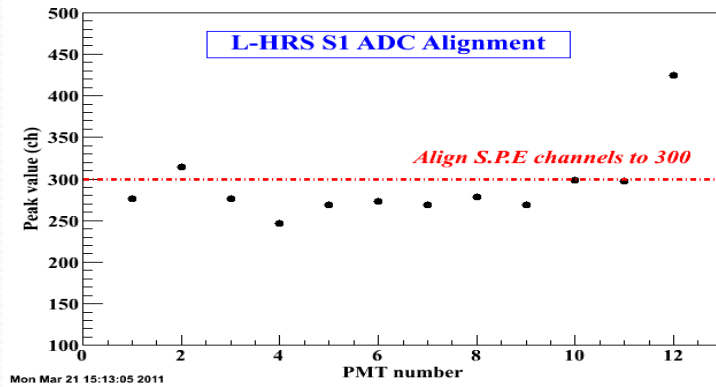
TO of VDCs on both arm have been calibrated.

- S1 & S2m ADC

S1 ADC on both R- and L- had been calibrated roughly during SRC experiments but have not been calibrated using our data.

S2m ADC are not needed to be calibrated.

In general, ADCs are only used for time work correction, so we don't need a good calibration on them.



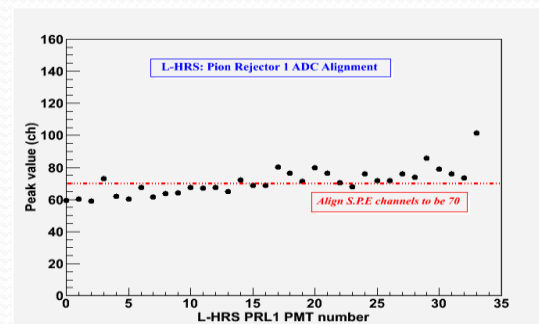
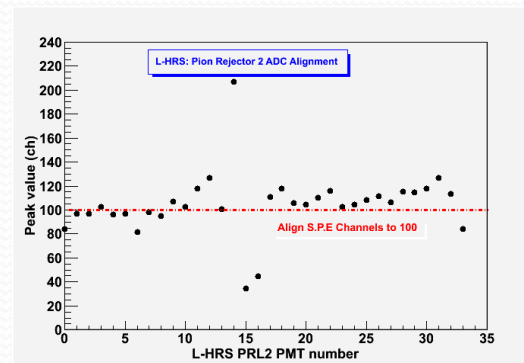
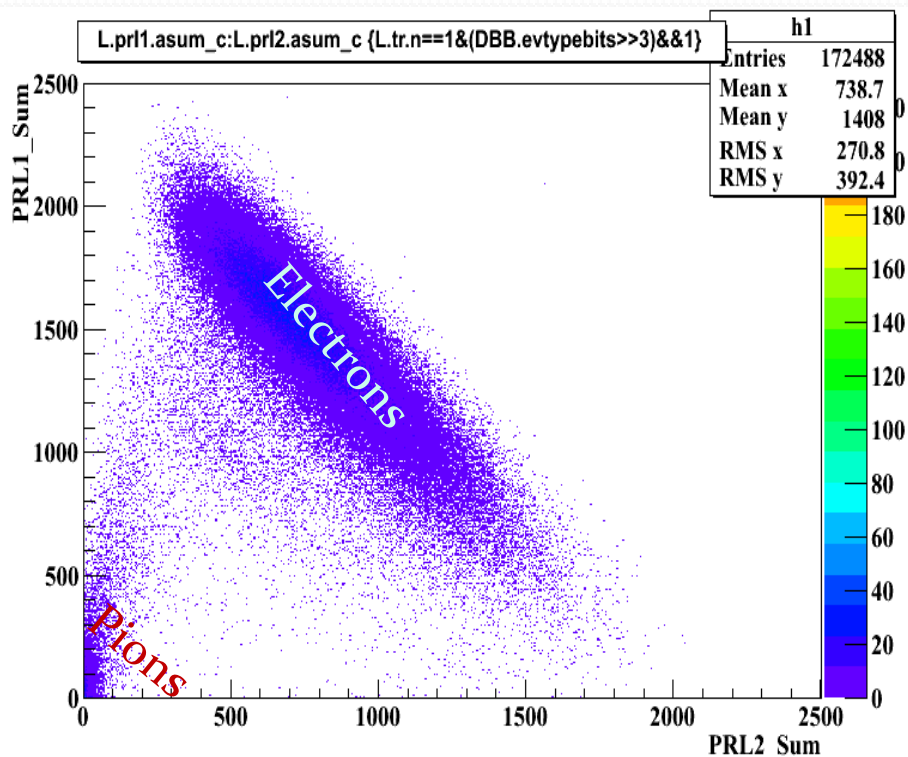
- S1 & S2m timing:

Timing on both arm are needed to work. Paul and his student is working on this.

3, PID detectors

- Pion Rejectors 1&2 on LHRS

I used cosmic ray data to basically align all ADCs of Pion Rejectors detectors, but will do fine calibration with electrons energy when studying PID efficiency.

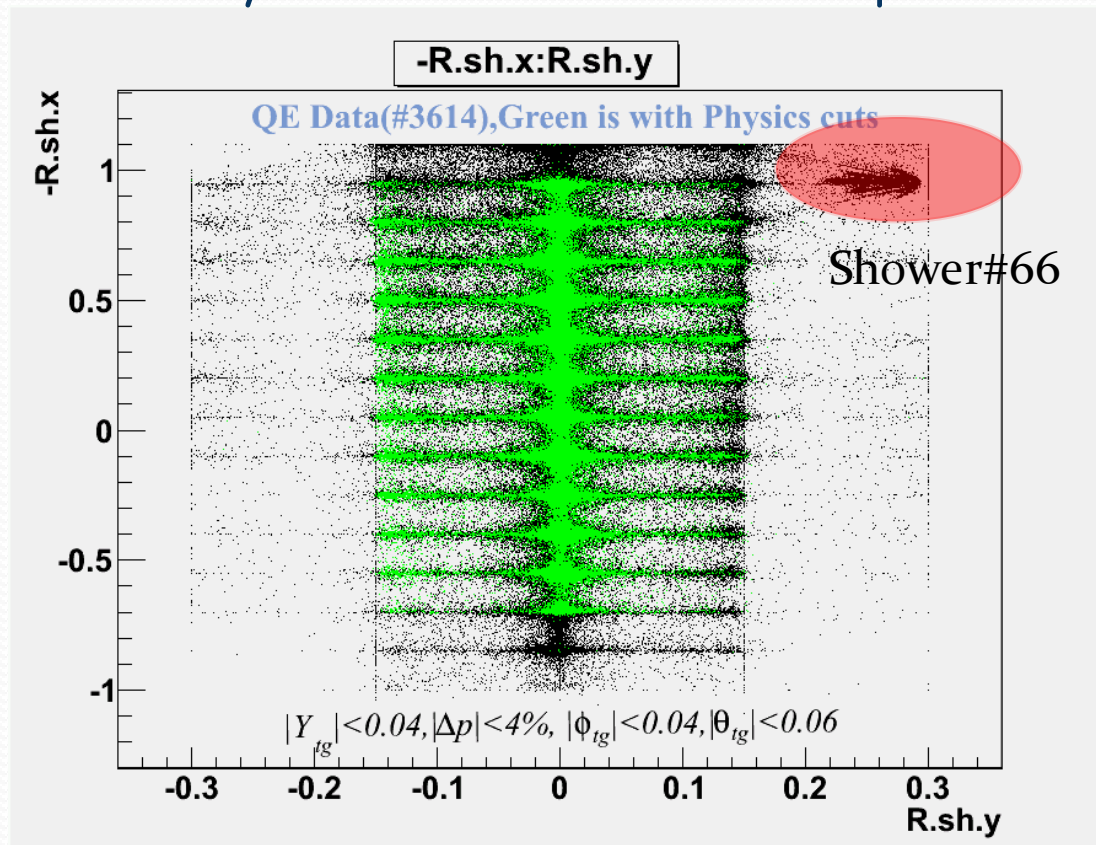


There are two Pion Rejectors layers with 48 PMT tubes on each.

- Shower and Preshower on RHRS

Finally understand the map of the shower counters. Paul and his student will work on the Shower and PreShower calibration.

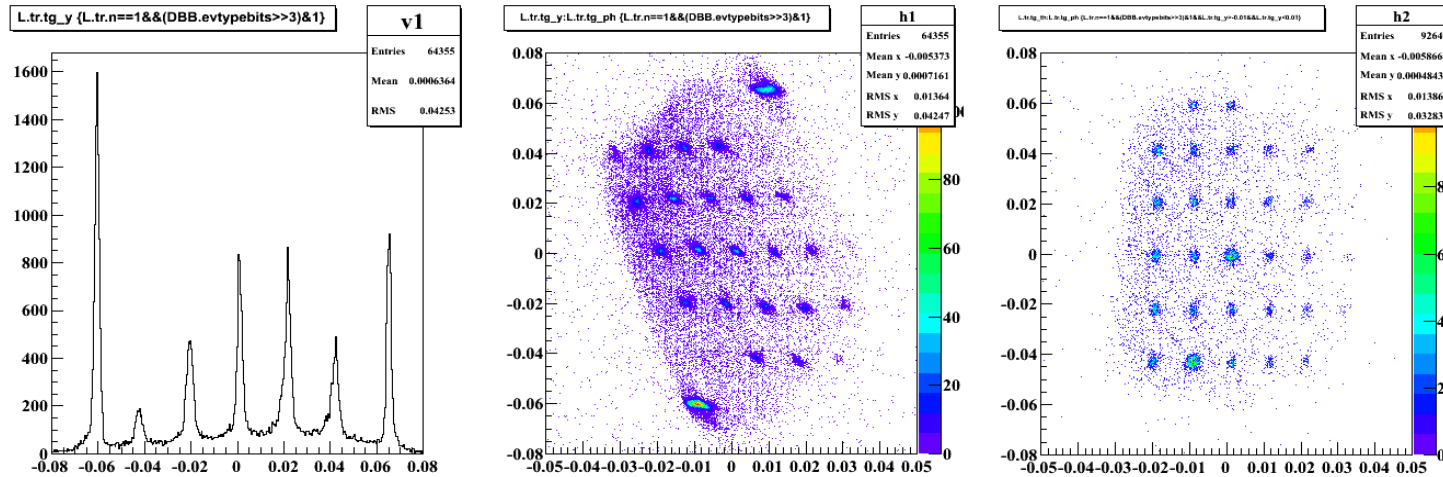
Shower#66 is noisy but it is outside our acceptance.



4, Optics

- LHRS Optics:

JinGe's matrix is already very good for LHRS but still need work:



- RHRS Optics:

We scaled down momentum setting of RQ3 with the factor of $2.8273/3.155$, where 3.155 GeV is the maximum momentum we need and 2.8273 is the highest value RQ3 can achieve.

- Optics Calibration Data we took:

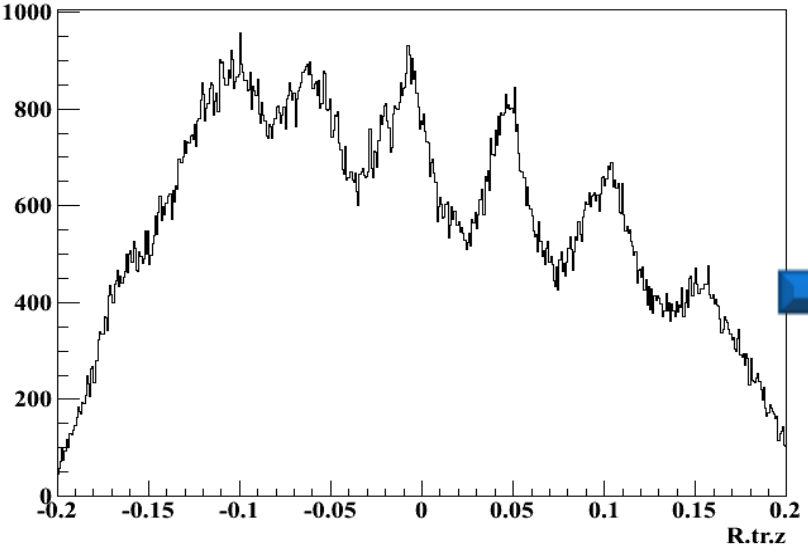
https://hallaweb.jlab.org/wiki/index.php/Optics_Run_Plan

RHRS Optics Calibration

a) Vertex (Loop1)

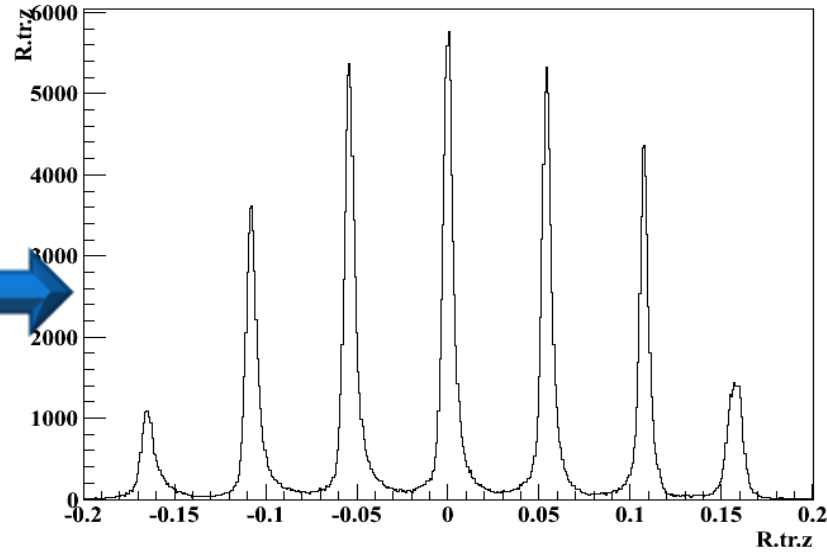
R.tr.z for Multi-C12 target, before Vertex Calibration

Statistics	Value
Entries	241989
Mean	-0.01212
RMS	0.08674



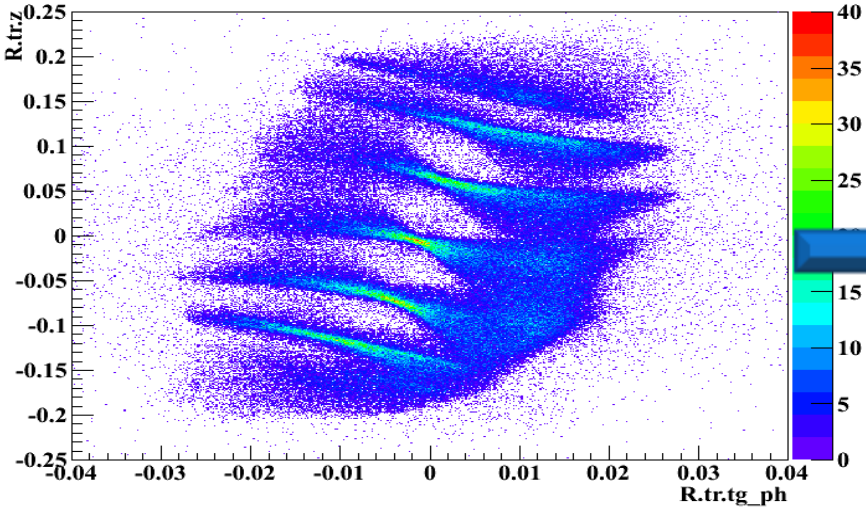
R.tr.z for Multi-C12 target, after Vertex Calibration

Statistics	Value
Entries	241989
Mean	0.00212
RMS	0.00674



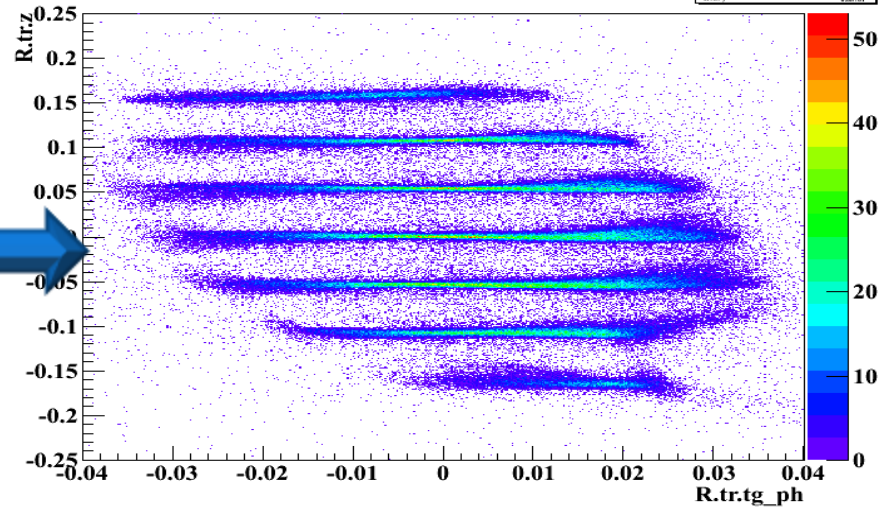
Z vs Phi for Multi-C12 target, before Vertex Calibration

Statistics	Value
Entries	241989
Mean	-0.01212
RMS	0.08674



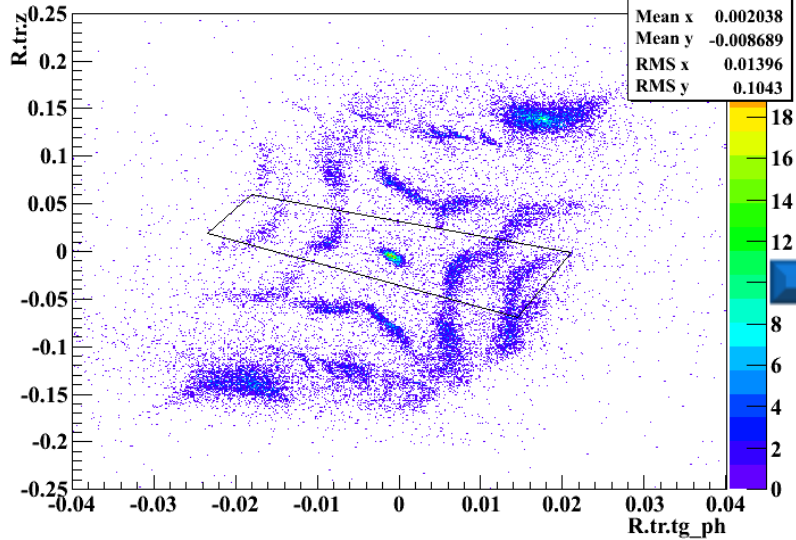
Z vs Phi for Multi-C12 target, after Vertex Calibration

Statistics	Value
Entries	241989
Mean	0.00044
RMS	0.00721
RMS2	0.00520

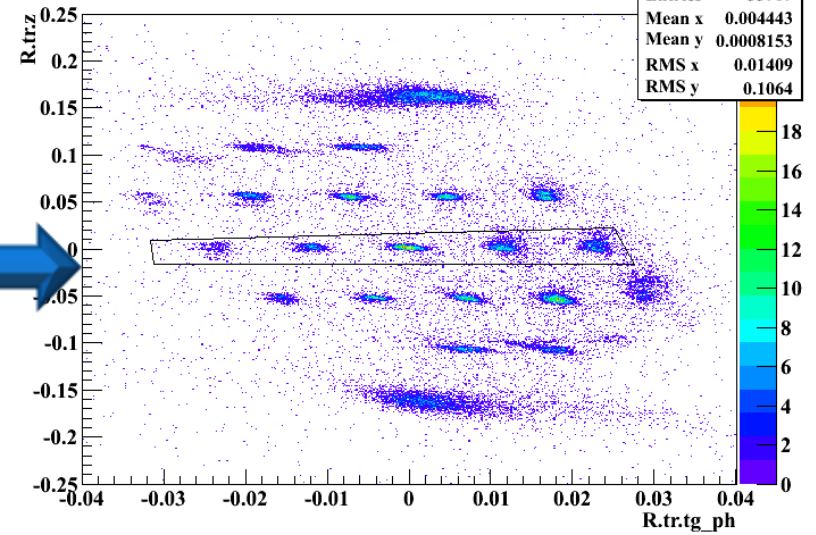


b) Sieve - (Loop1)

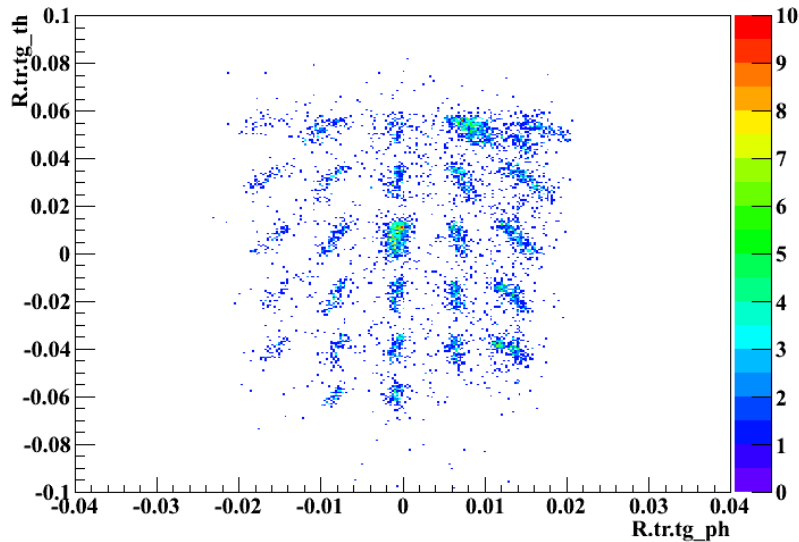
Z vs Phi for Multi-C12 target with Sieve, before Sieve Calibration



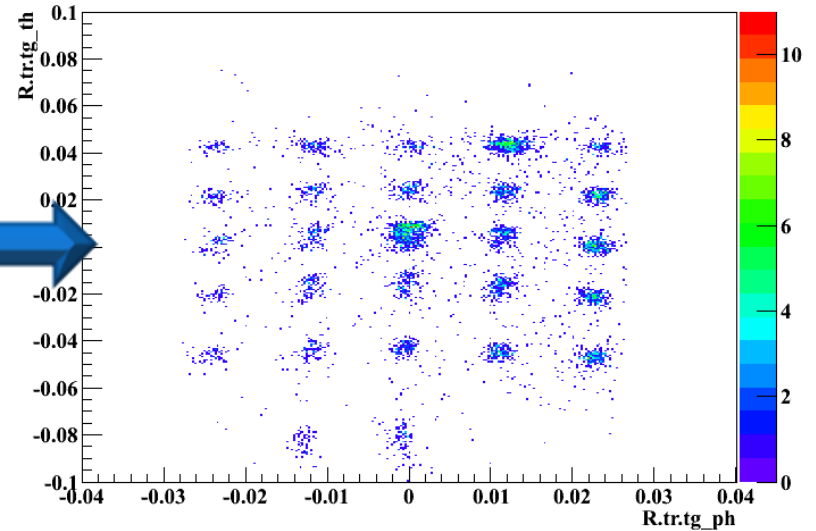
Z vs Phi for Multi-C12 target with Sieve, after Sieve Calibration



Theta vs Phi for Multi-C12 target with Sieve, before Sieve Calibration



Theta vs Phi for Multi-C12 target with Sieve, after Sieve Calibration



e) Delta P (momentum scan):

Still working on it ...

5, To Do:

- RHRS Optics Calibration up to certain resolution.
- Timing Calibration (Then final Optics Calibration)
- Shower Calibration
- tracking efficiency study
- PID efficiency study
- Mysql data base?