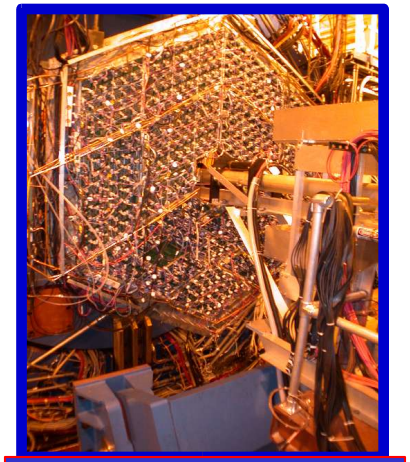
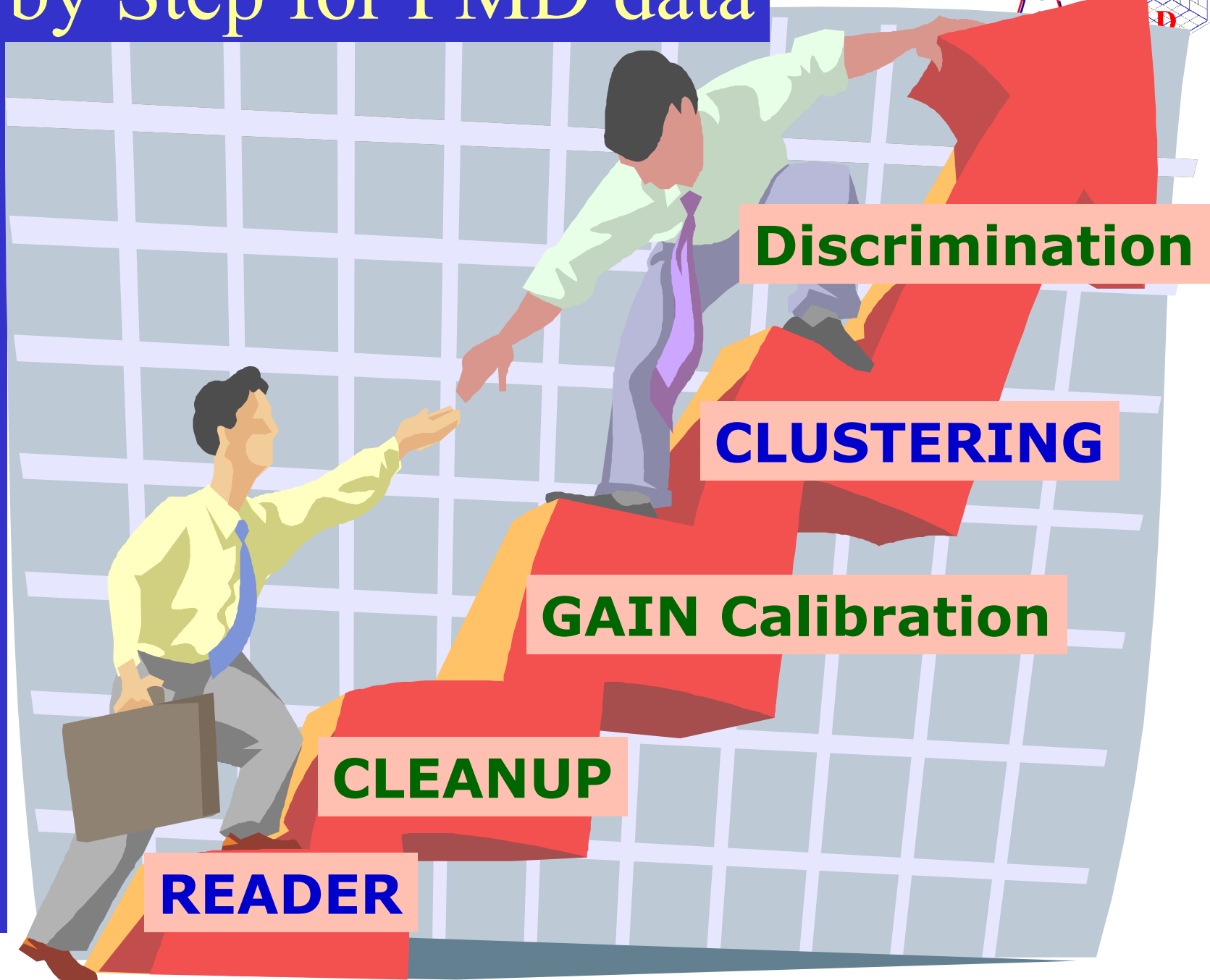
STAR PMD Software

Big Fool Chief (bfc)

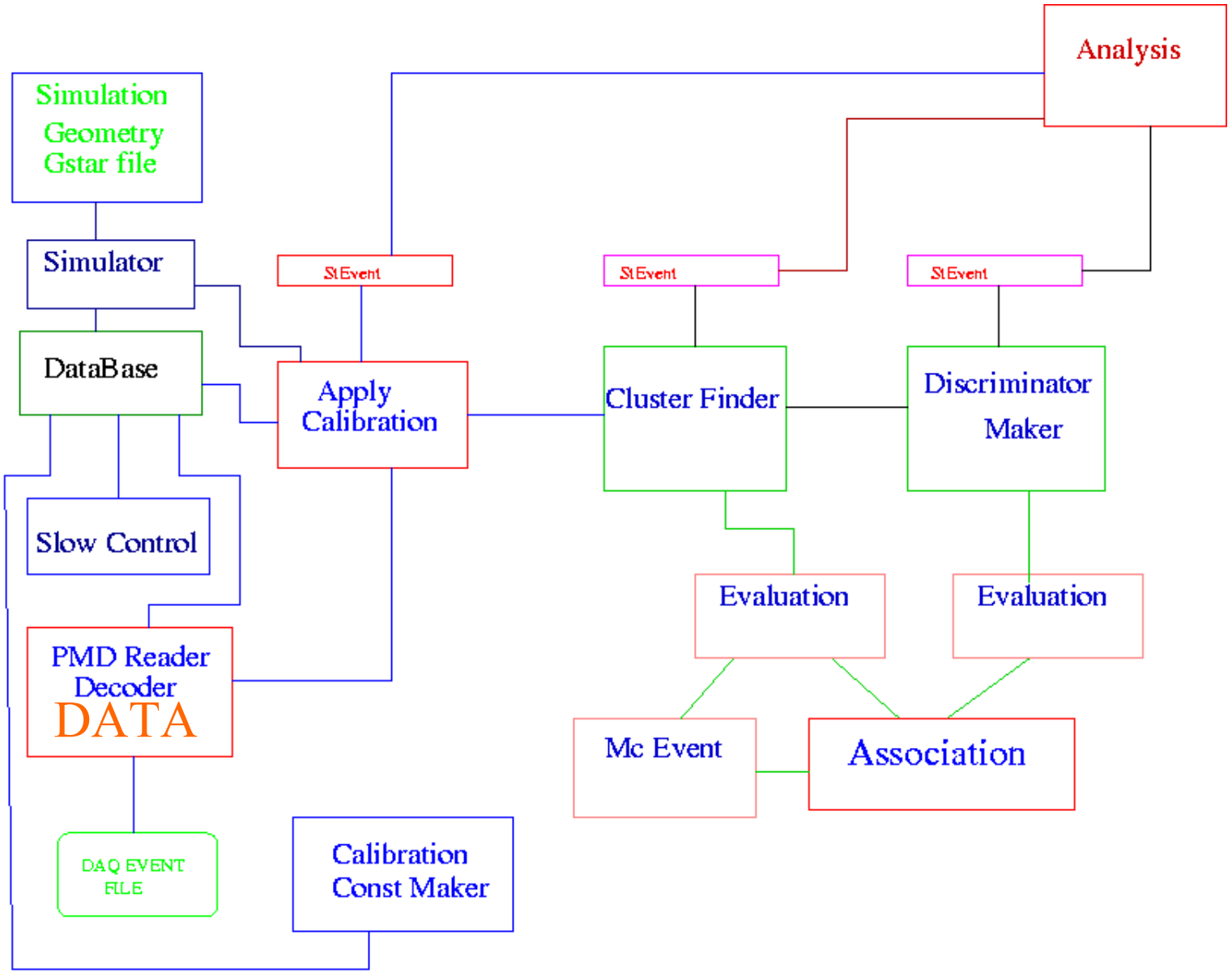


July 17, 2004

Step by Step for PMD data



Software Chain for PMD



StPmdReadMaker

Recent Modifications:

- Logic now includes Various Conifurations of DAQ Crates
  (one or two depending on the Running period)

- ADC for channel#0 has been forcibly made zero to avoid the channel zero effect.

More QA Plots filled

StPmdClusterMaker

Recent Modifications:

New Better and Faster Clustering Routine

- Refinement has been implemented for calculation of cluster centroid. The cluster spread is now better represented by two parameters: (sigmaL and sigmaS)

- The parameter sigma of the cluster for StPhmdCluster has been replaced by sigmaL and sigmaS

Important

After inclusion of sigmaL and sigmaS the ***MuDST*** part has to be modified.

PMD Chain for 200 GeV Production

Chain for 200 GeV production will consist of

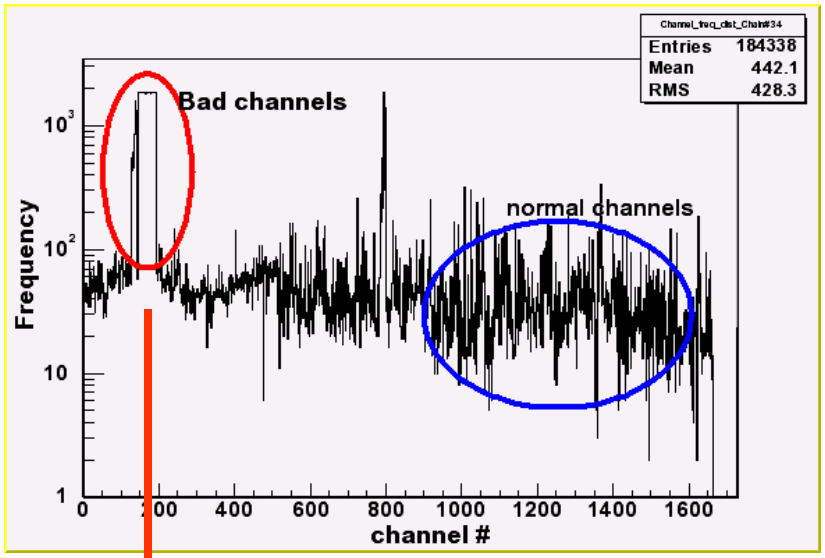
StPmdReadMaker + StPmdClusterMaker

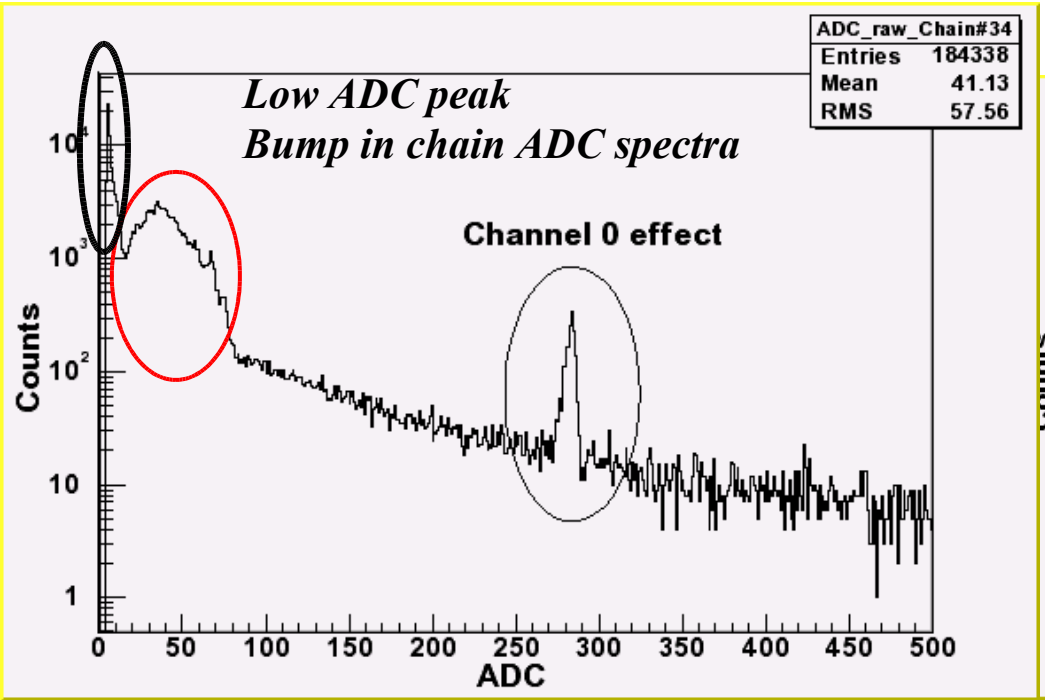
PMD clusters to be put in the common ***MuDST***

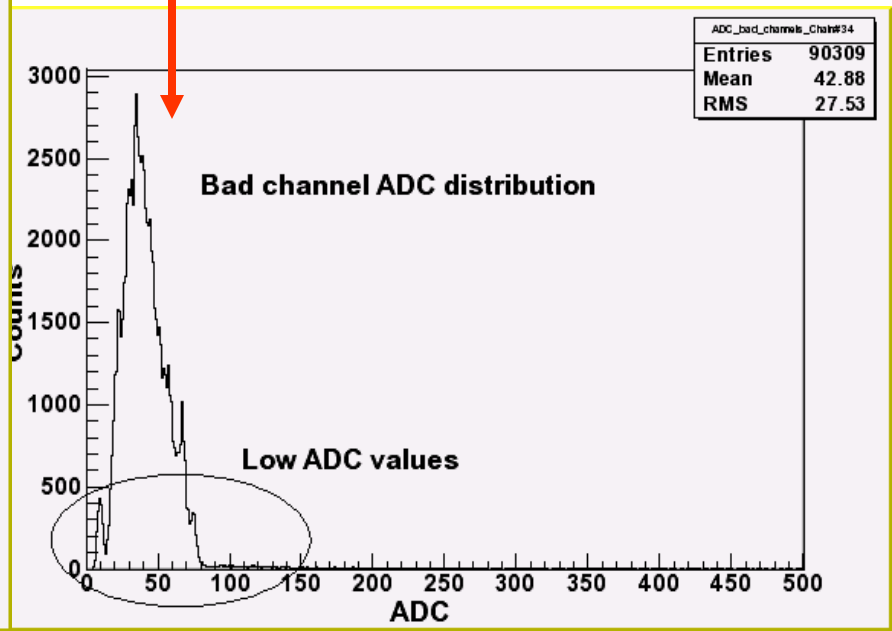
QA Plots from the production will be used to select Good runs, Good FEE chains. Further analysis will be done only for good data.

Data Cleanup (62.4 GeV)

- Peak corresponding to Ch = 0
- Hot channels with low ADC





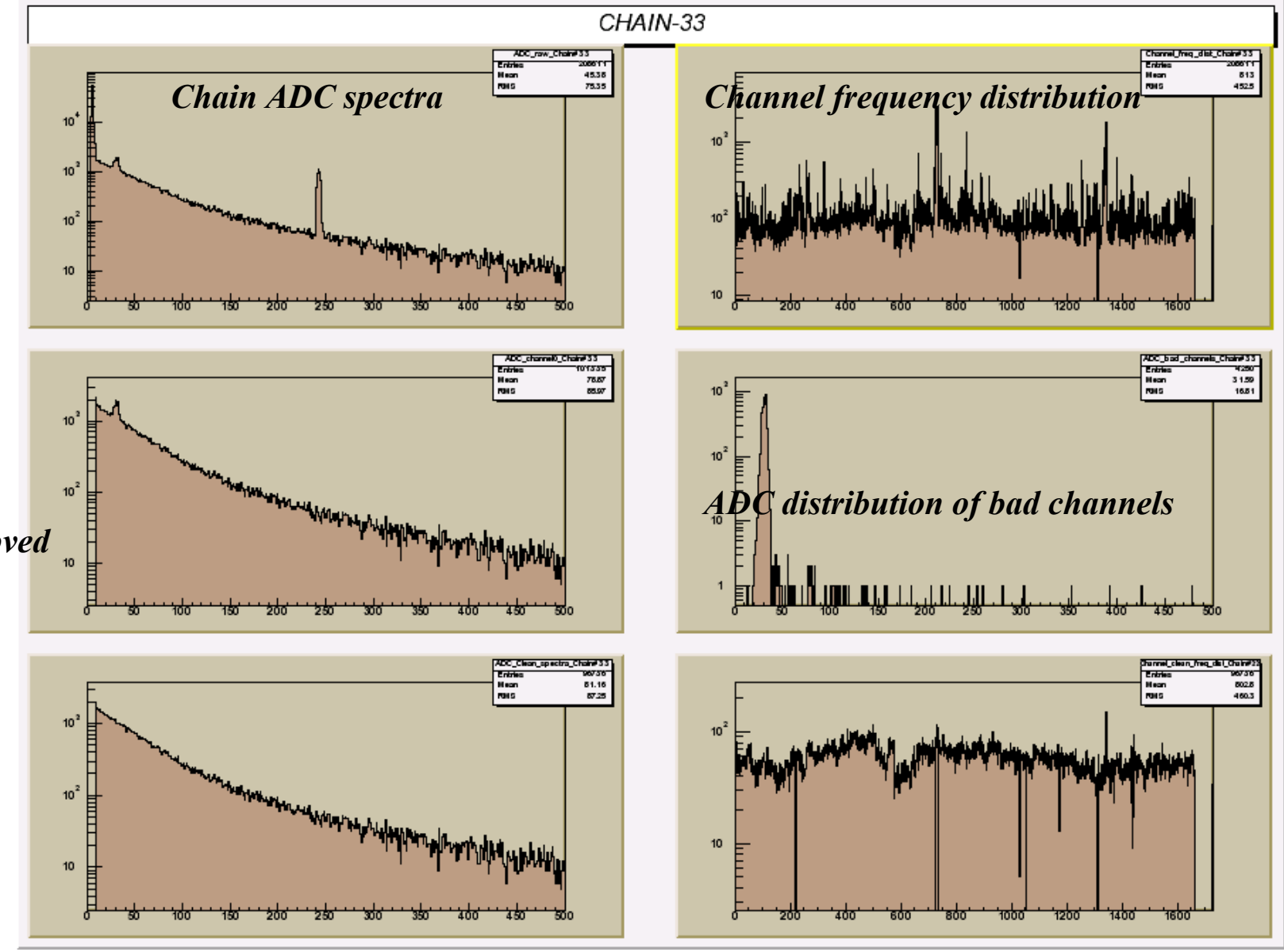


Data Cleanup (62.4 GeV)

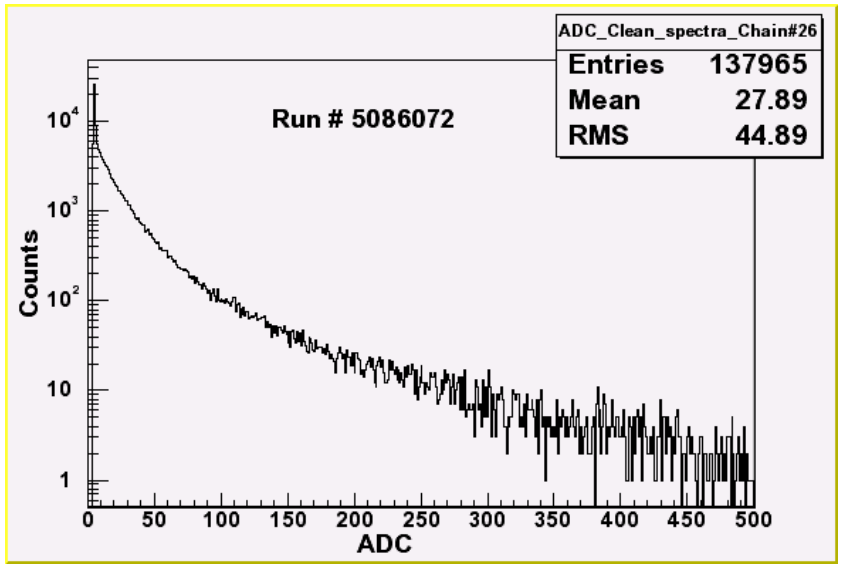
Before clean up

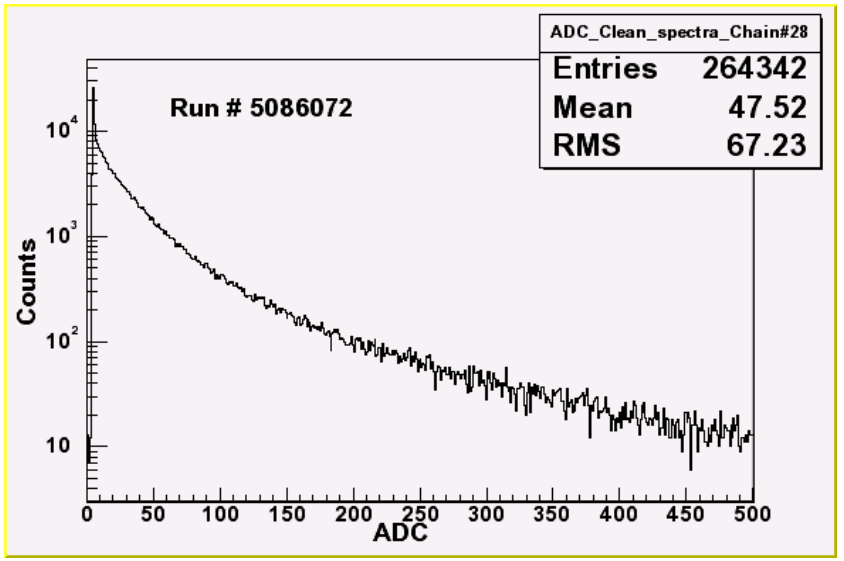
Channel 0 removed

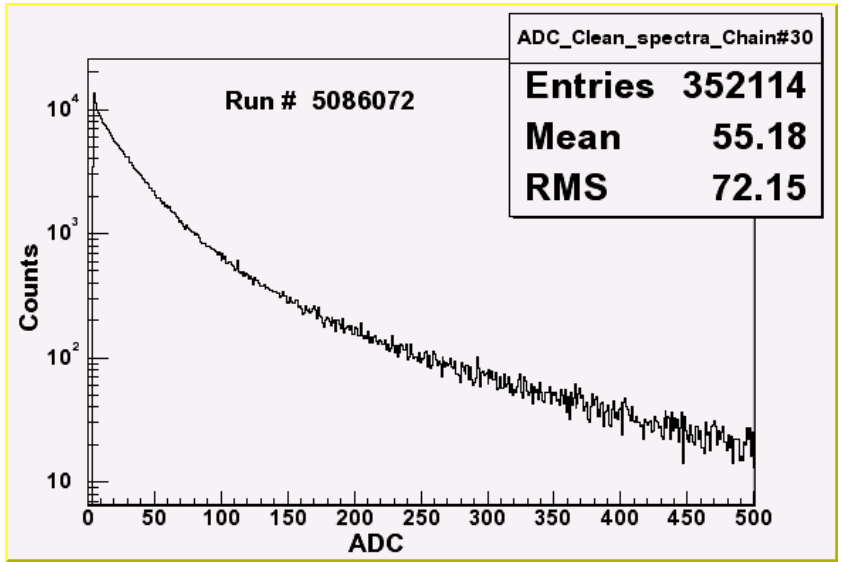
After clean up

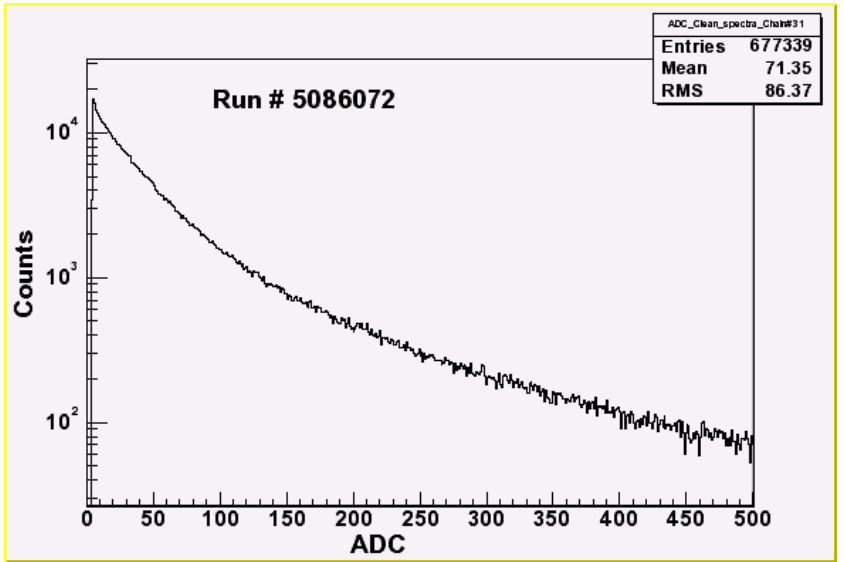


ADC Spectra after Cleanup (62.4 GeV)

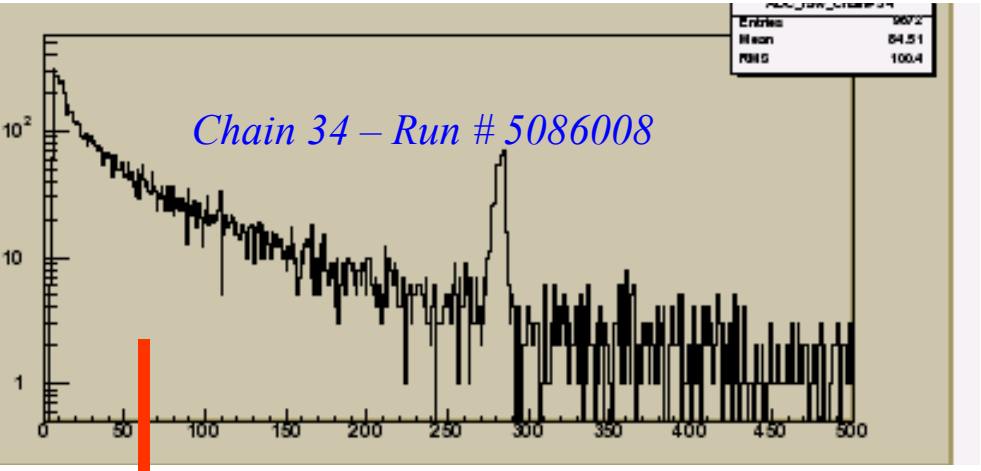




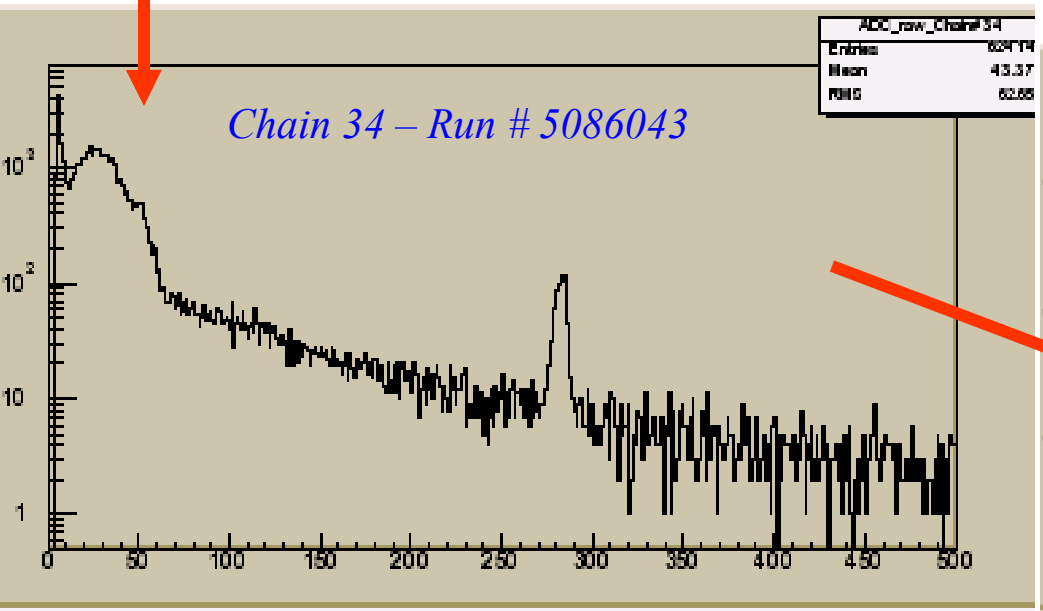


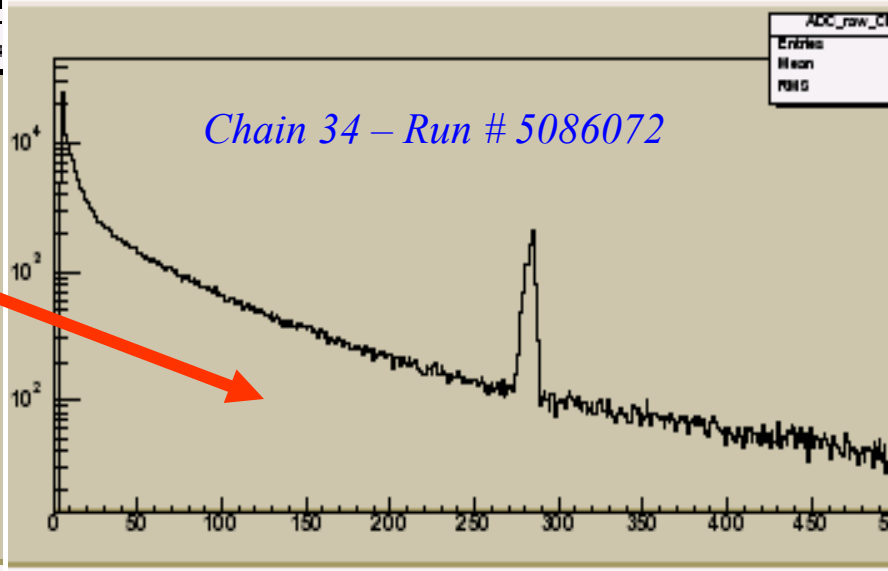


Run-to-Run Cleanup



Data has to be cleaned up on Run to Run basis

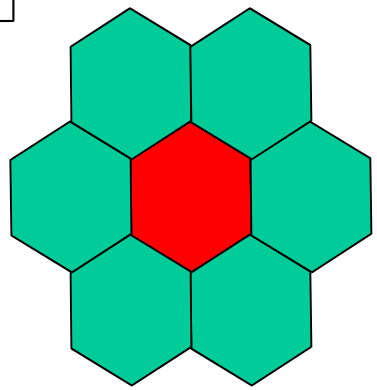


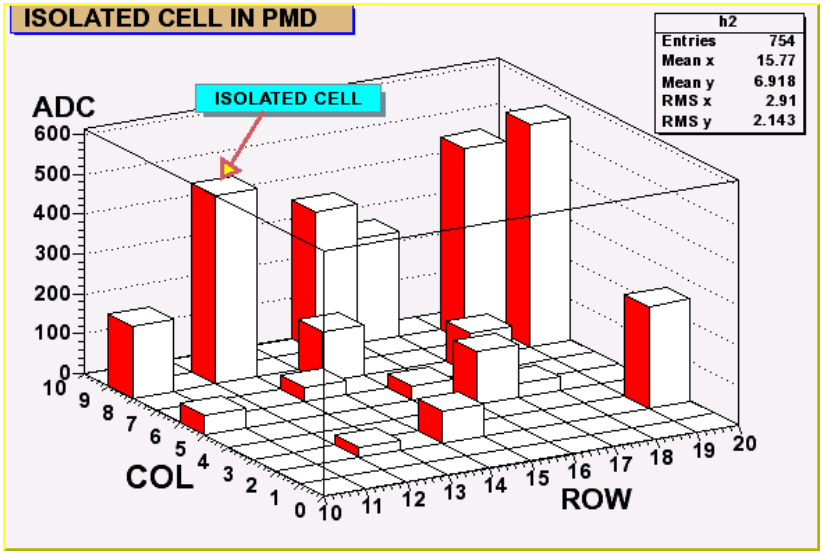


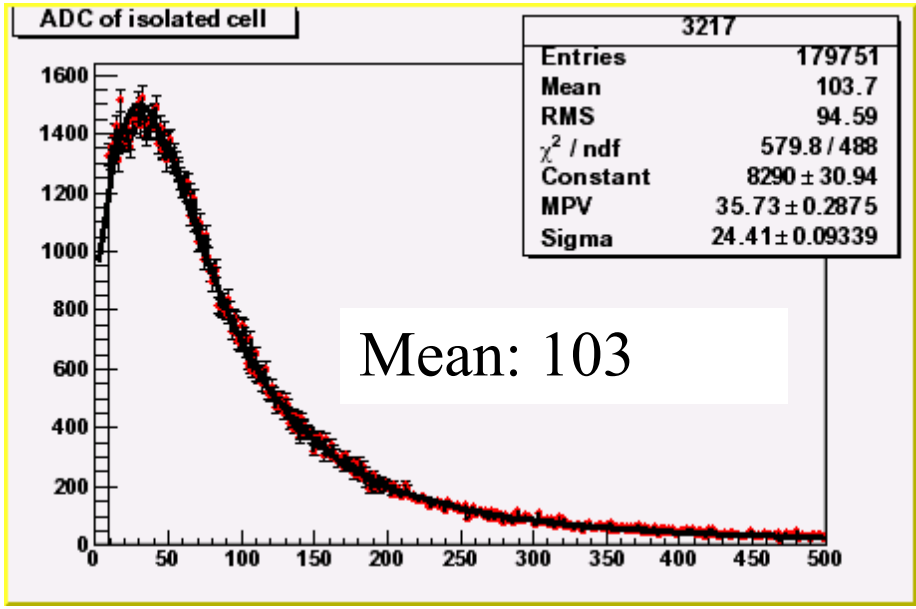
Cell-to-cell Calibratoin

Response of single cell - Algorithm

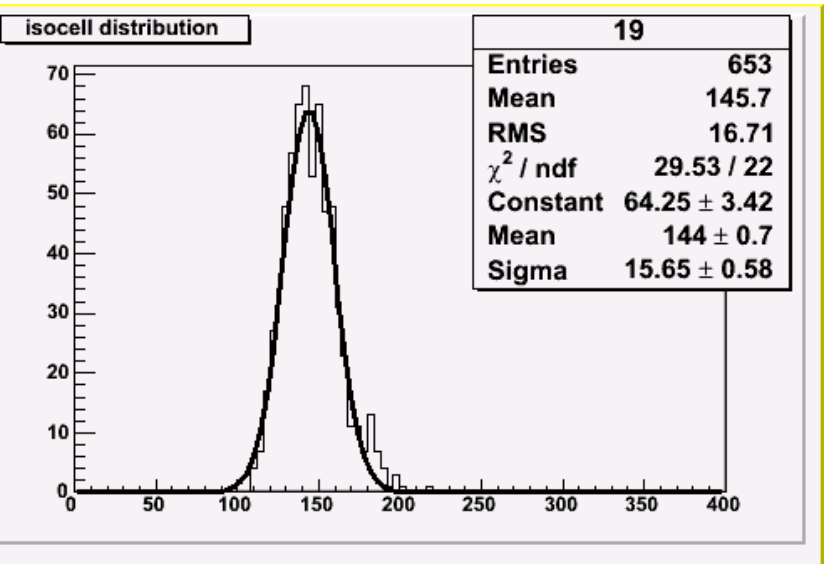
ISOLATED CELL : zero ADC value for six neighboring cells

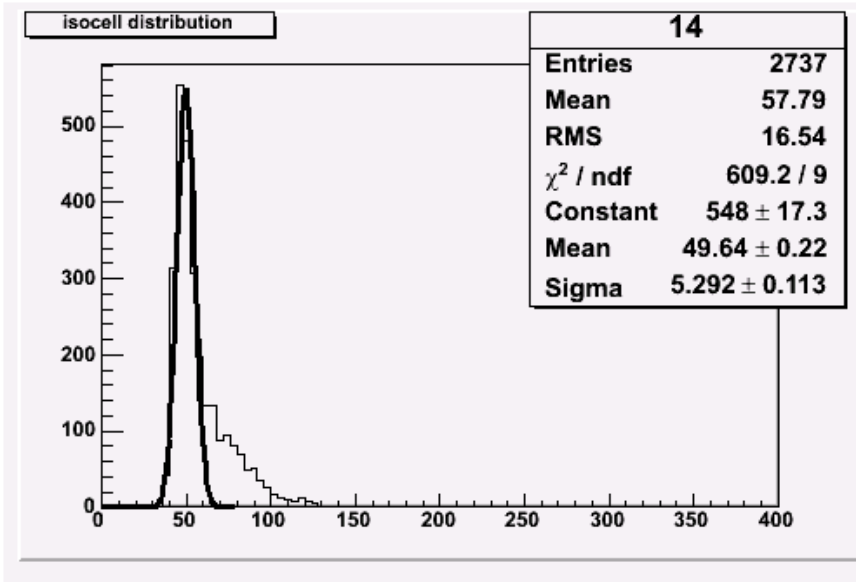


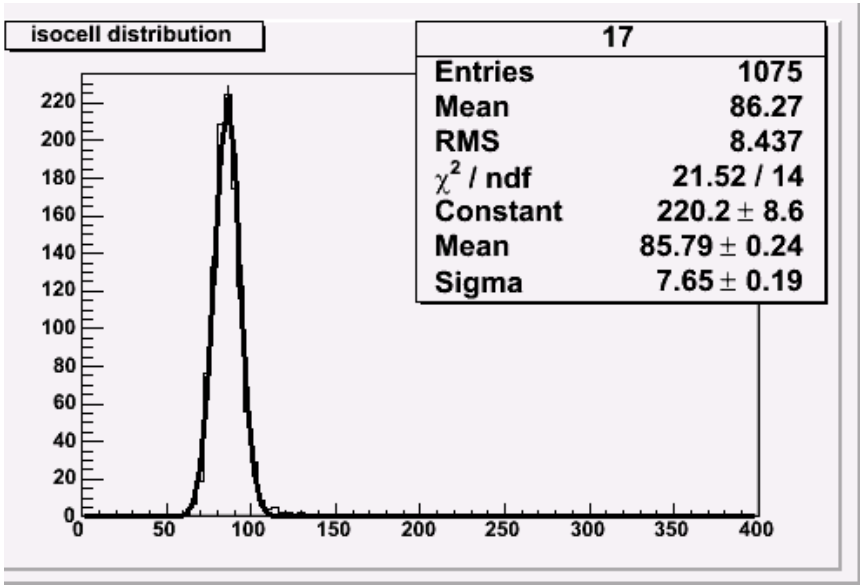




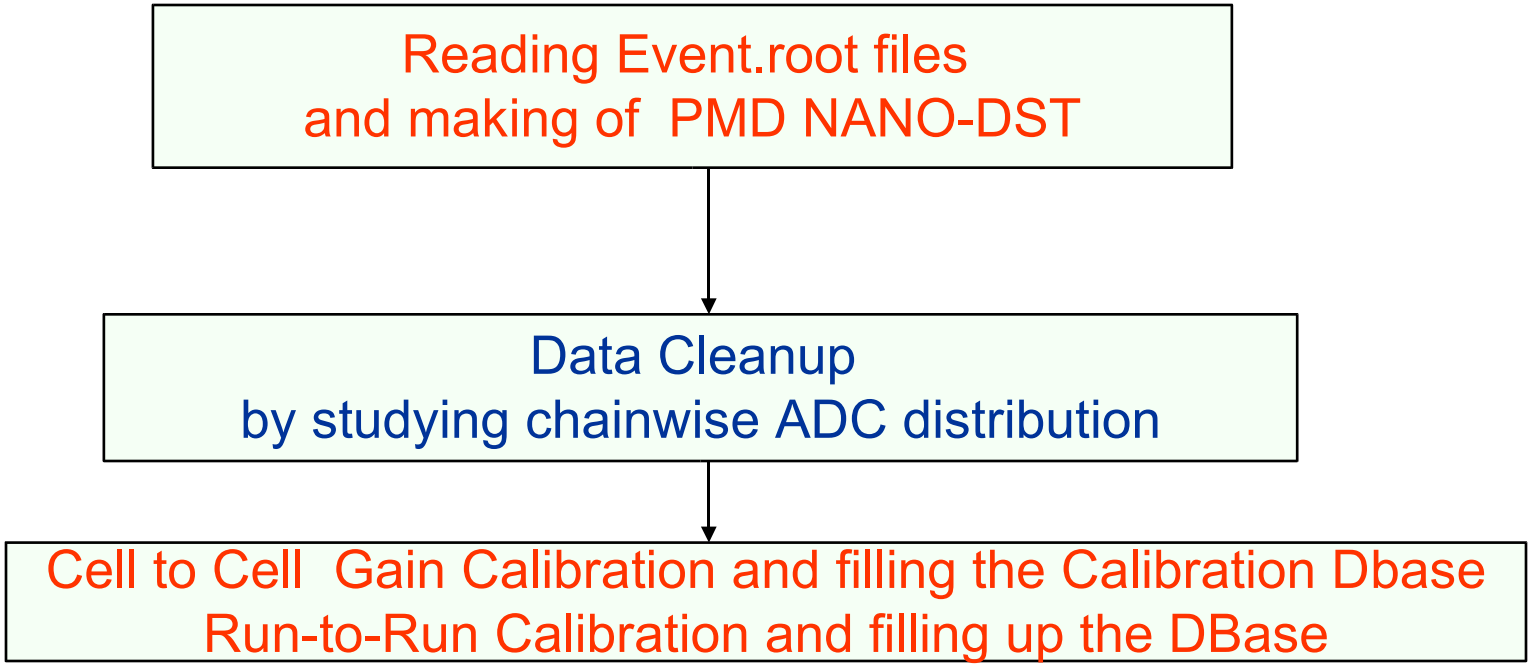
Calibration SM wise







Plan for 200 GeV
Post-production analysis (I)



This can be done locally or with RCF resource ???

Our preference is to use the RCF resource, we'll provide all the codes for each step and manpower for this case..

Making of PMD Nano-DST

- TREE Structure
- Event information
  - Event number
  - CTB hits
  - ZDC ADC
  - Vx, Vy, Vz
  - PMD + CPV hits
- Hit level information
  - Detector Id
  - Chain No.
  - Channel No.
  - Super Module No.
  - Row
  - Col
  - ADC
  - Energy

Typical file size ~ 10 MB for 1K events

Plan for 200 GeV Post-production analysis (II)

Reading Event.root files for the hits as well as the Calibration Dbase and do **Clustering**

↓

Photon Hadron Discrimination

↓

Writing the COMMON ***MuDST*** again this time with PMD clusters

Our preference is to use the RCF resource for this also.

Simulation for 62.4 and 200 GeV

1. Our simulation requirement is a bit different:
   we need to decay p0 before going to Geant.
   This is for the associationmaker to associate photon tracks.

5. The geometry before clustering takes into account the all the dead channels, chains from the Dbase.

3. We've run about 50K events for each beam energy here using RCF facility.

4. The simulation is being used to:
   - Understand detector characteristics
   - Obtain Efficiency and Purity
   - Embedding
   - For physics analysis

12. Similar chain as for data is being followed here.
    Storage space for the simulated data to be found.

Summary

- 62.4 GeV data:
  - Clustering with new Calibration constant.
  - Put the clusters in the COMMON MuDST
- 200 GeV data:
  - General production with MuDST
  - Post-production for final MuDST
- SIMULATION
- Disk Space requirement at BNL for all these and performing other checks.