A Study about clusters in the PEHNIX Muon Tracker

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Abstract

1 Cathode Strip Chambers

The basic mechanical construction of the cathode strip chambers is that of a conventional proportional wire chamber. However, rather than reading out the anode wire to get discreet position resolution, a precise position coordinate is determined from the induced signal on cathode strips prependicular or which has stero angles to the anode wires. The charge on the anode wire is due to ionization in the gas caused by passage of the muon through the gas volume and the gain of the chambers. In a typical gas volume the ionization process produces about 140 elections/cm so in the CSC chambers the number of elections produced will be 140 x 0.7 cm elections or 100 elections per track. Assuming a gain in the chamber of 20,000, the anode charge will be 2,000,000 electrons. The cathode charge is one half of the anode charge times a reduction factor called the "ballistic deficit factor" that is due to the finite integration times. Taking a ballistic deficit factor of 0.5, the total cathode charge will be 500,000 elections, or 80fC.

2 identification of good signal

general cluster width at each station, cluster and strip charge distribution relation between cluster width and charge distribution 1. general cluster width

3 problems and solution

See the dist. "number of cluster at station3 vs station2" See "Event vs strip number at station 1 octant 2" See the fitted position of center of cluster w.r.t cluswid

1. cluster width
a. single
b. 2 , 3 ,4

4 Cluster centroad Problem

1.If it is possible to have a cluster of size 3 having the maximum at the side strip ?
1)remove the clusters having dead or overflow strips for the adjacent one to the maximum strip
2)look at the total charge of the cluster

c. extra more than 5
d. 4(double hits) : frequency
2. pedestal and gain
list of bad
3. channel map
list of bad

5 Run of problem, position in detector , centrality

list of hot channel, dead channel, bad run or calibration

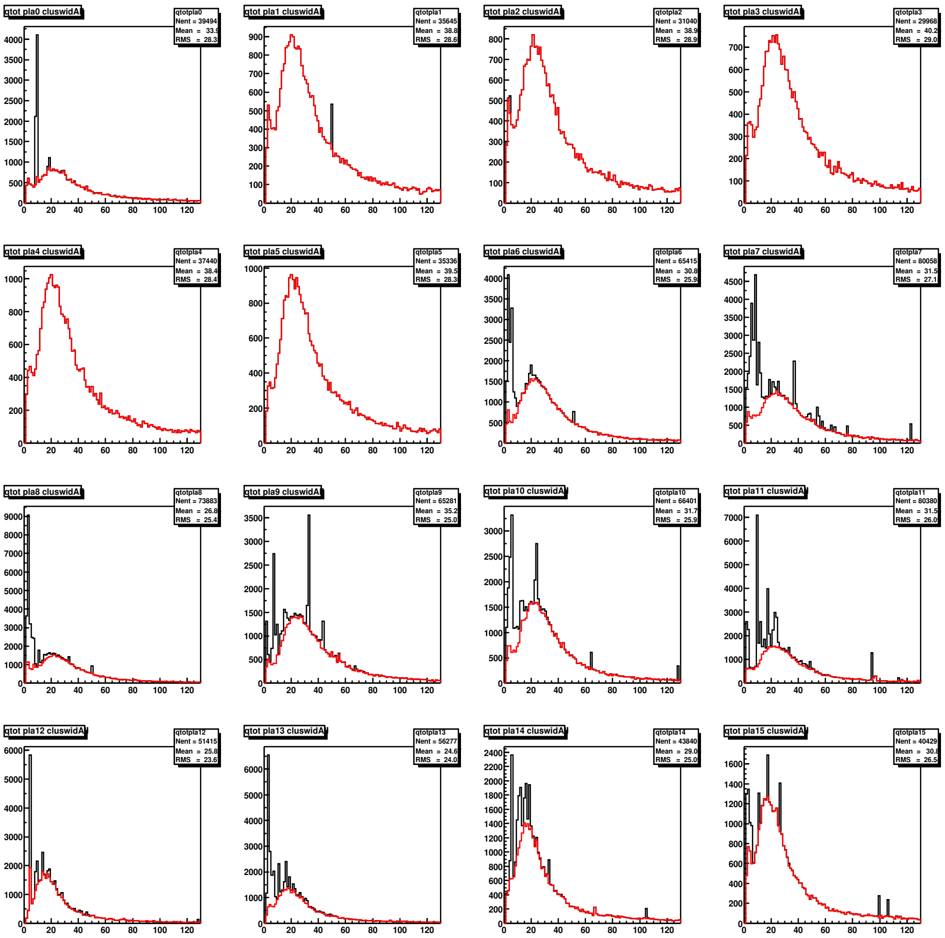

Figure 1: Charge distribution of identified clusters Black : from all channel Red : after removing hot channels

6 Stub

minimum required plane, width of searching window