

Preliminary TPC dE/dx Studies

J.L. Klay

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Cuts and software...

Datafile: mipp00012076.0000.root (~5k events)

Used TPCStudies/TPCRDriftVelT0.* as a template to create:

TPCStudies/TPCRdEdxStudies.*

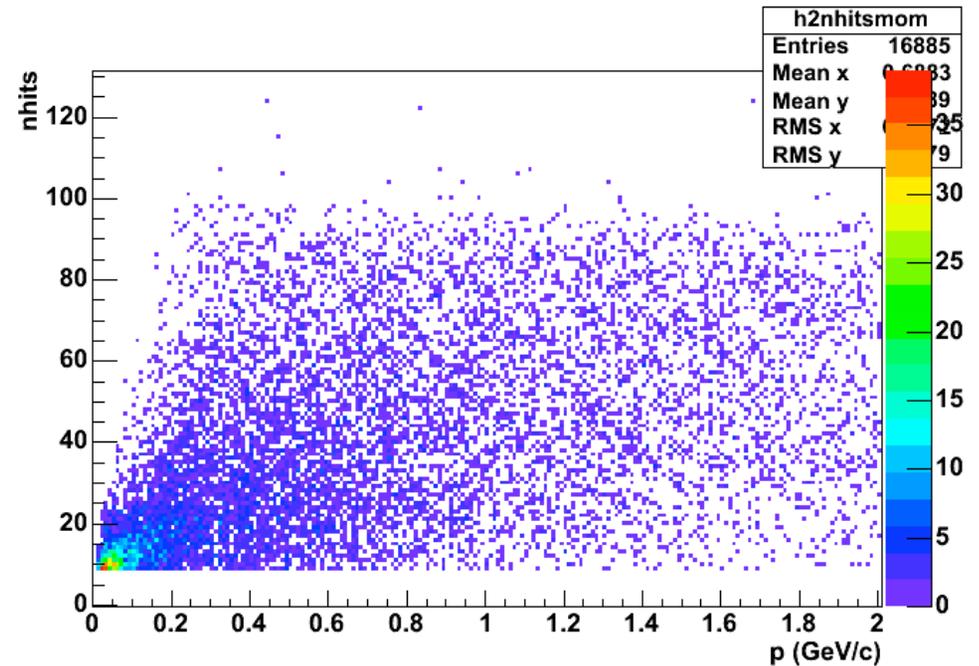
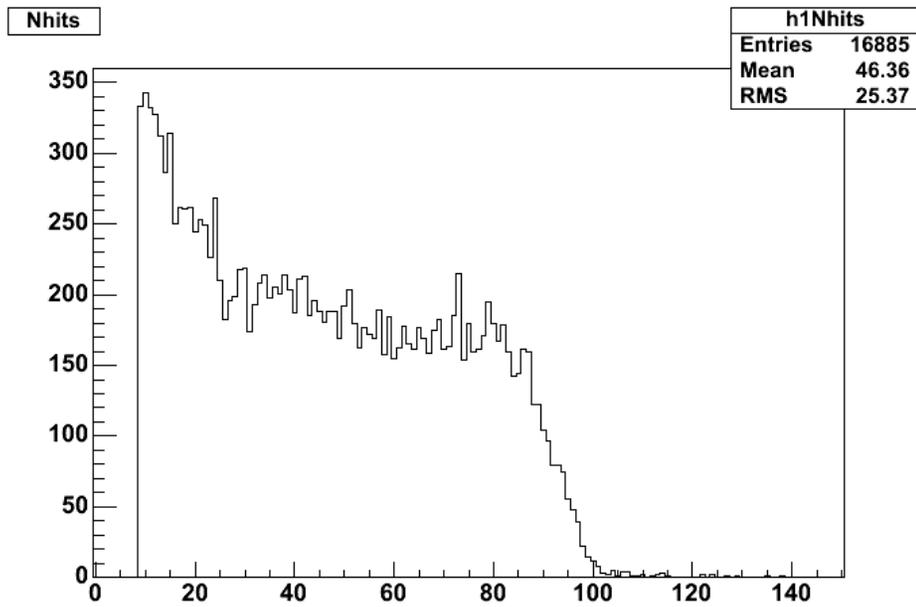
(not yet committed to CVS)

- Select on Interaction triggers
- Select tracks connected to TPC vertices
- Select hits connected to these tracks

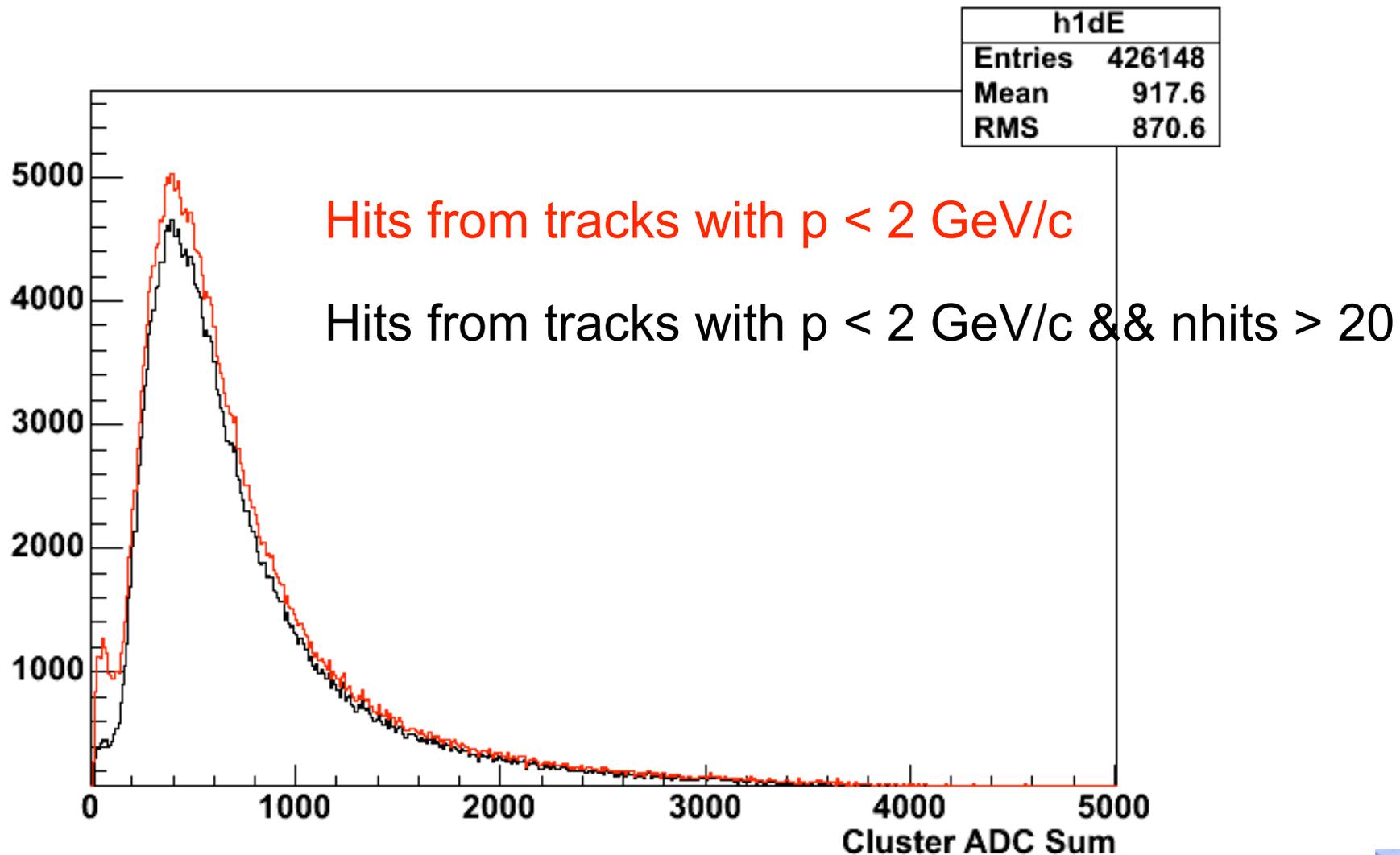
No calibrations of any kind have been applied,
simple momentum calculation assumes $B = 0.75$ T



Nhits on tracks

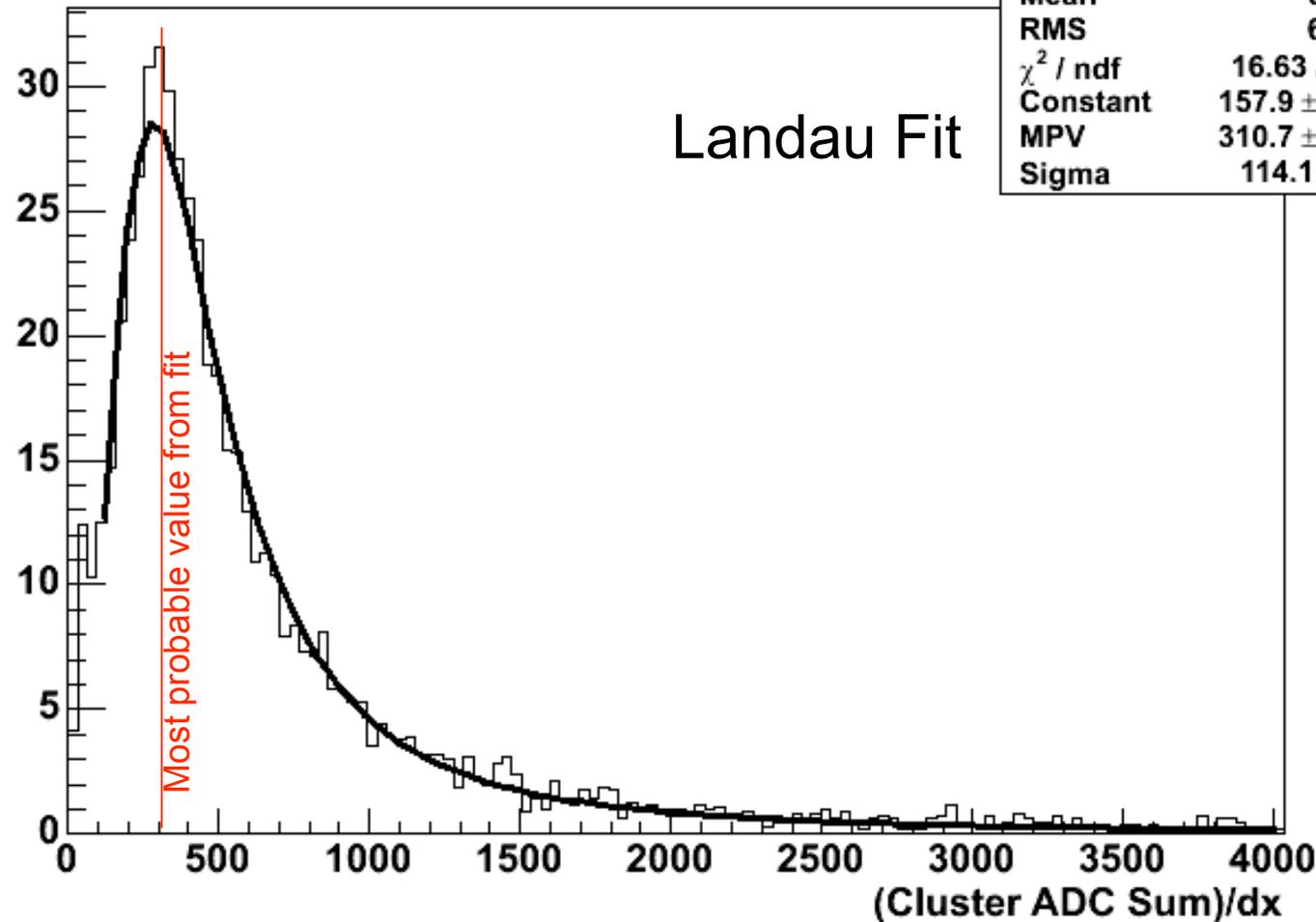


Cluster ADC Sums (Hits)



Cluster ADC Sums (Hits)

0.8 < p < 1.2 GeV/c && 20 < nhits < 30



h1hitdedx1	
Entries	6110
Mean	675.7
RMS	685.7
χ^2 / ndf	16.63 / 146
Constant	157.9 ± 11.2
MPV	310.7 ± 11.8
Sigma	114.1 ± 7.3

Roughly
250 tracks

MIPP $dx(==dL) = \text{padLengthZ} * \sqrt{1 + (dy/dz)^2 + (dx/dz)^2}$

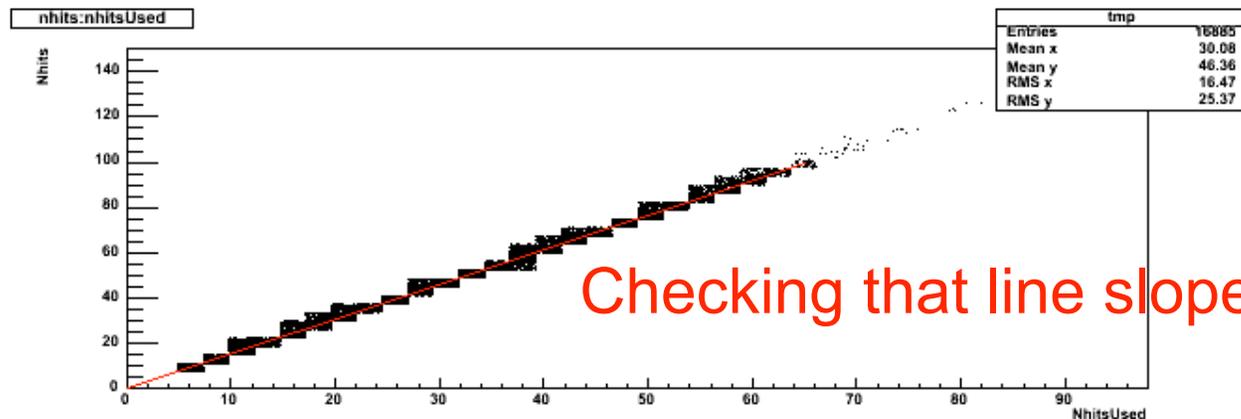
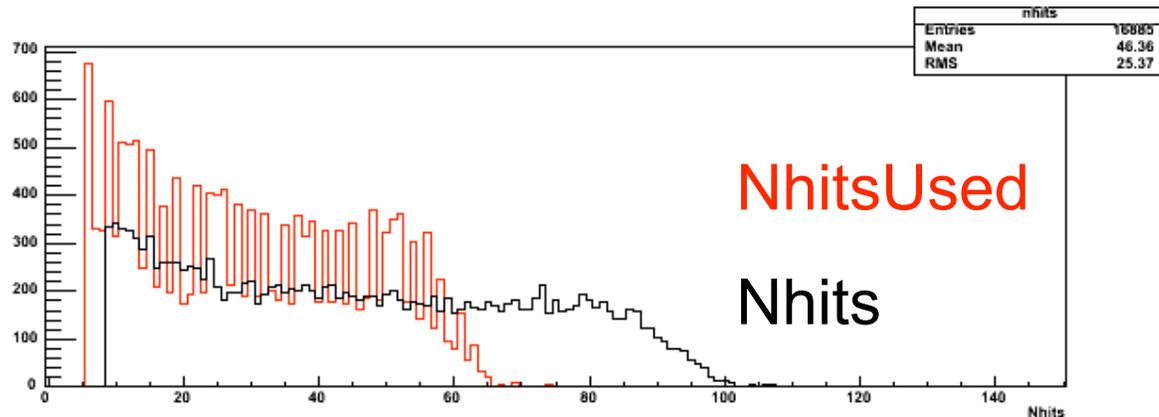
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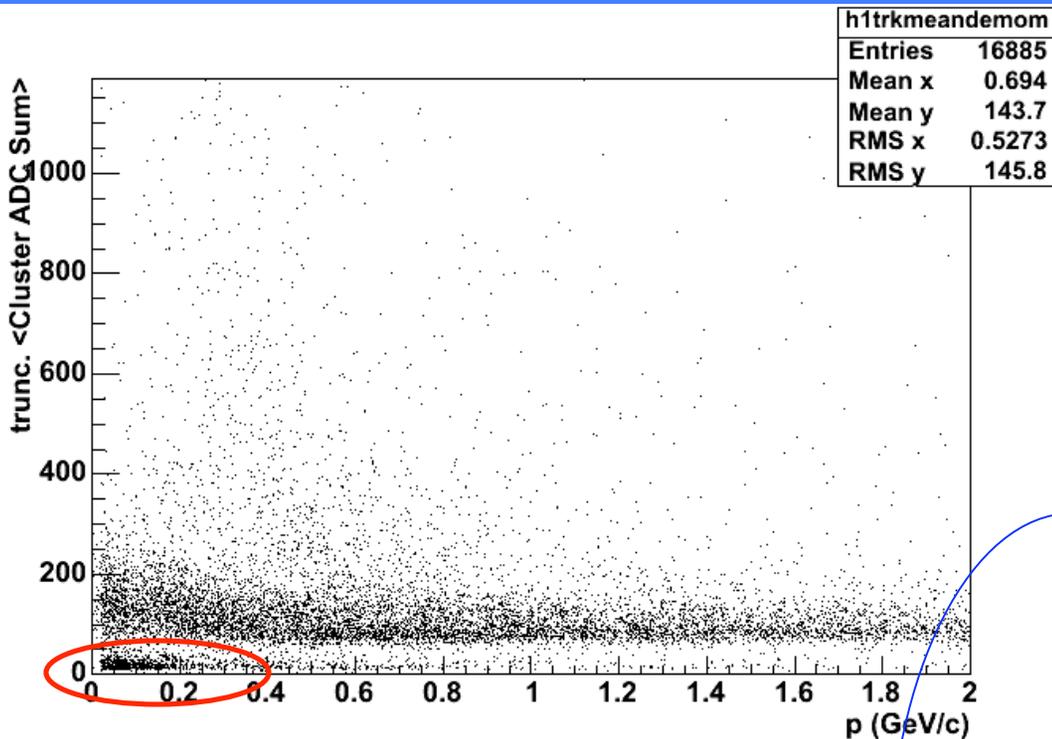
Truncated Mean Cluster ADC Sums (Tracks)

Cluster ADC sums are sorted and then truncated - 5% off the bottom and 30% off the top, simple mean is calculated from the remaining hits (Note: bug in following plots, mean = sum/nhits, not sum/nhitsUsed)

(Discretization
cause of spikes in
NhitsUsed)

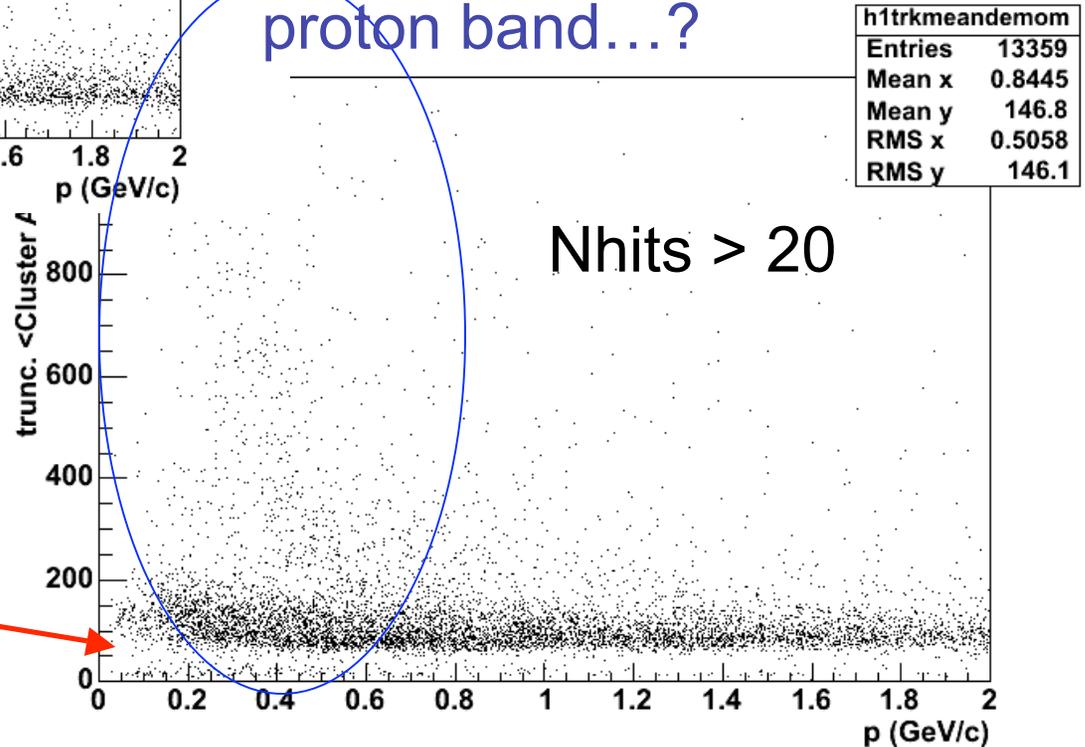


Trunc. <Cluster ADC Sums> (Tracks)



The crap is low nhits junk

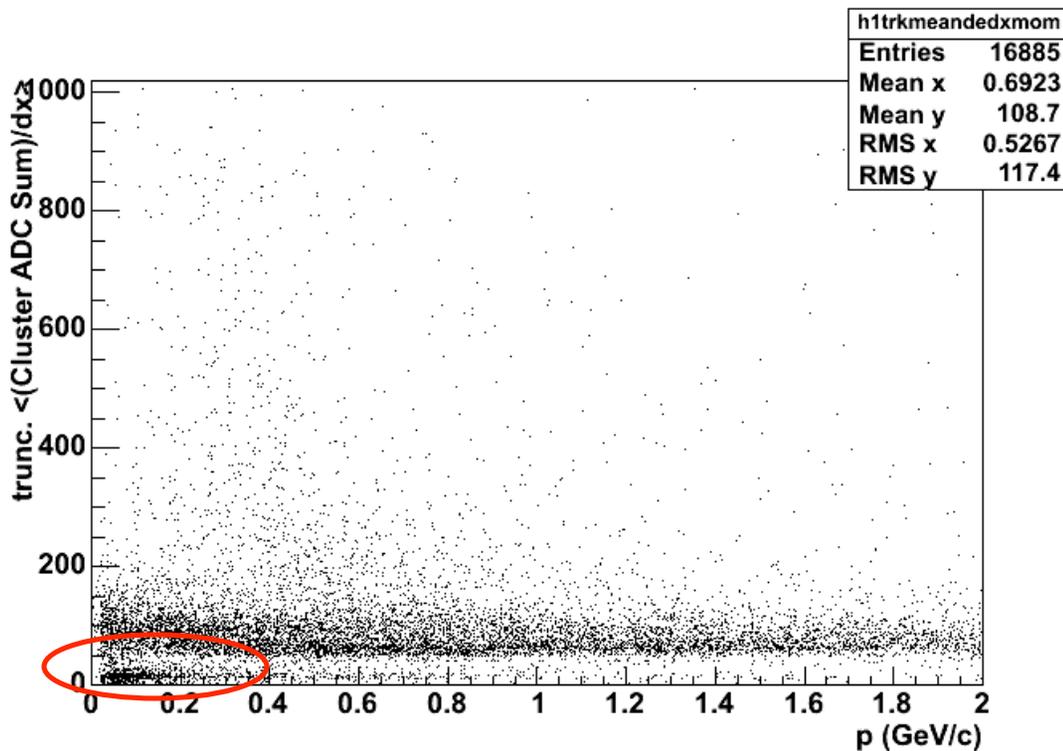
Squint for a proton band...?



Nhits cut cleans it up

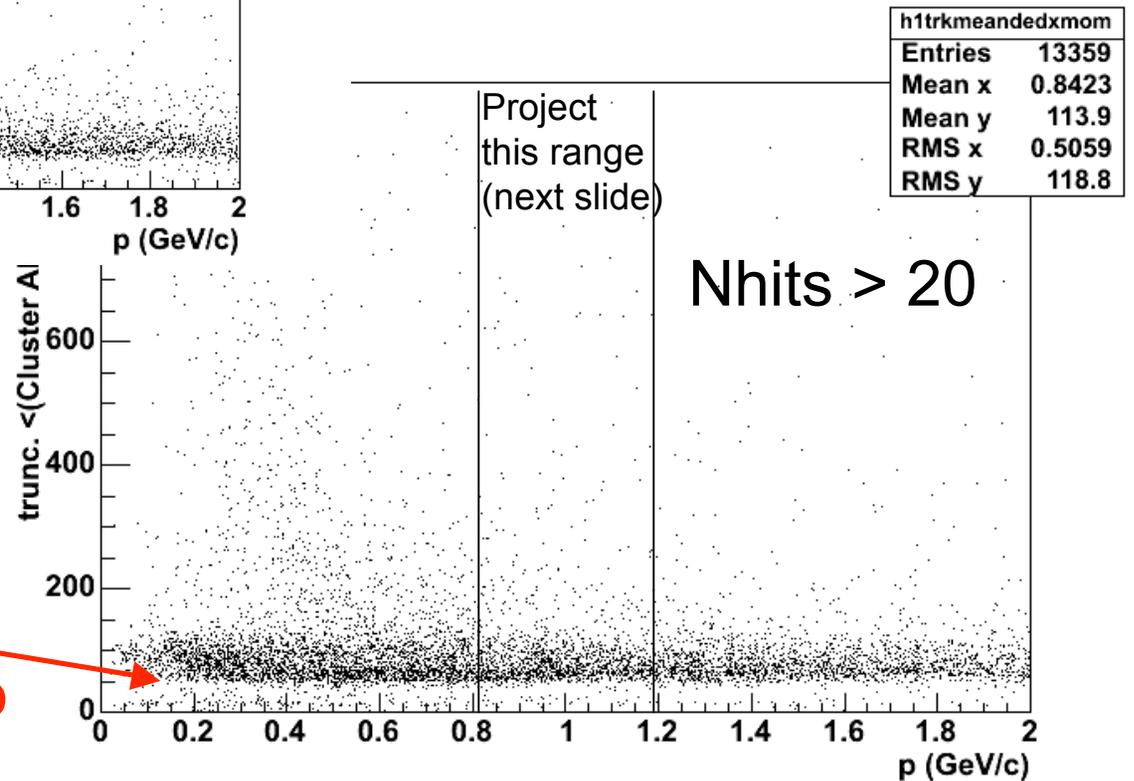


Trunc. $\langle(\text{Cluster ADC Sums})/dx\rangle$



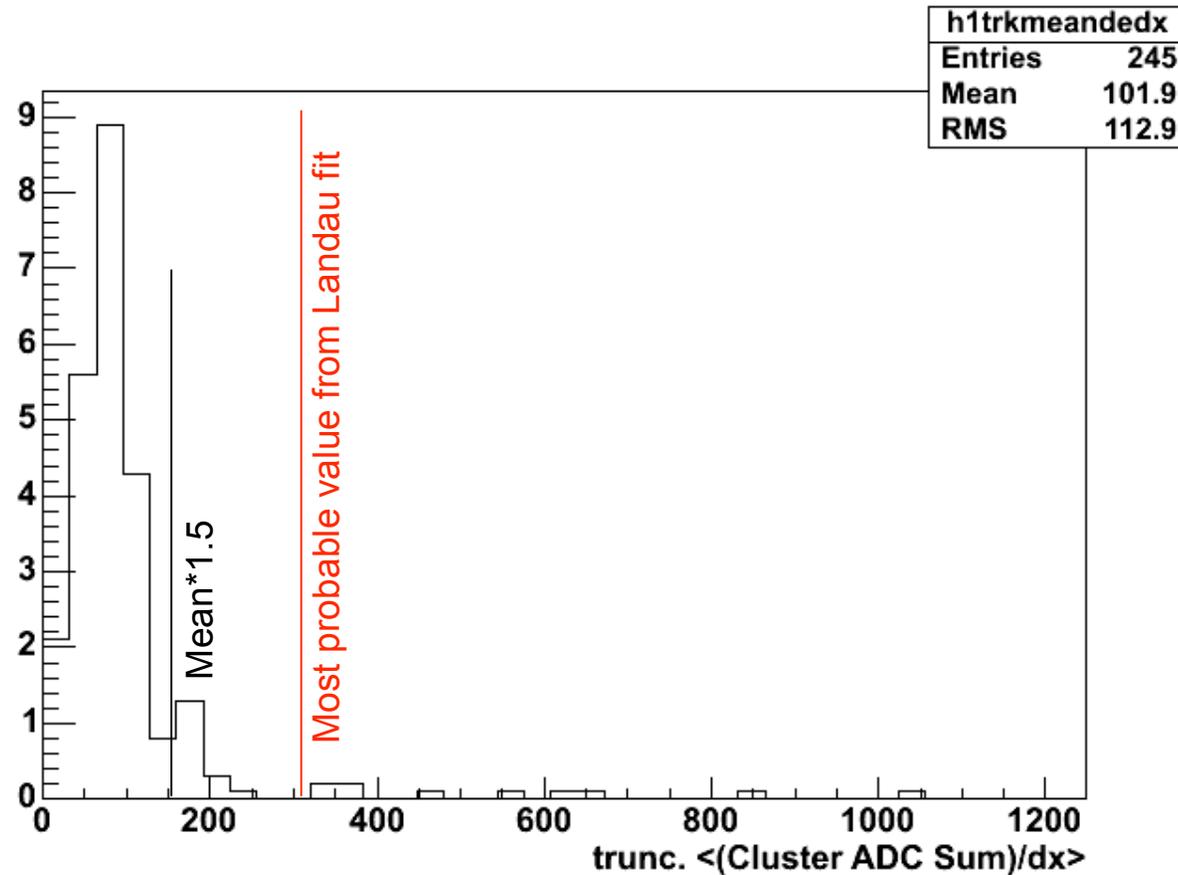
The crap is low nhits junk

Nhits cut cleans it up



Trunc. $\langle dE/dx \rangle$ distributions

$0.8 < p < 1.2 \text{ GeV}/c$ & $20 < n_{\text{hits}} < 30$



Bug mentioned before means scale (and mean) should shift by ~ 1.5 (have to track down the factor of 2 diff to MPV)

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To do

A sample list...

Calibrations

Cluster fitting for dE, cluster size
dx calculation using pathlength, s

MPV optimization

Landau fit?

Truncation?

Code included in TPCRecoJP

