TPC dE/dx Update

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Calibrations

Anode and drift calibrations applied* in:
TPCR2DClusterFind (to find/make clusters) and
TPCRHitFind (to correct hit dE, calculate hit ddE*)
TPCRTrackFind (hit ddE used as weight in <dE/dx>)

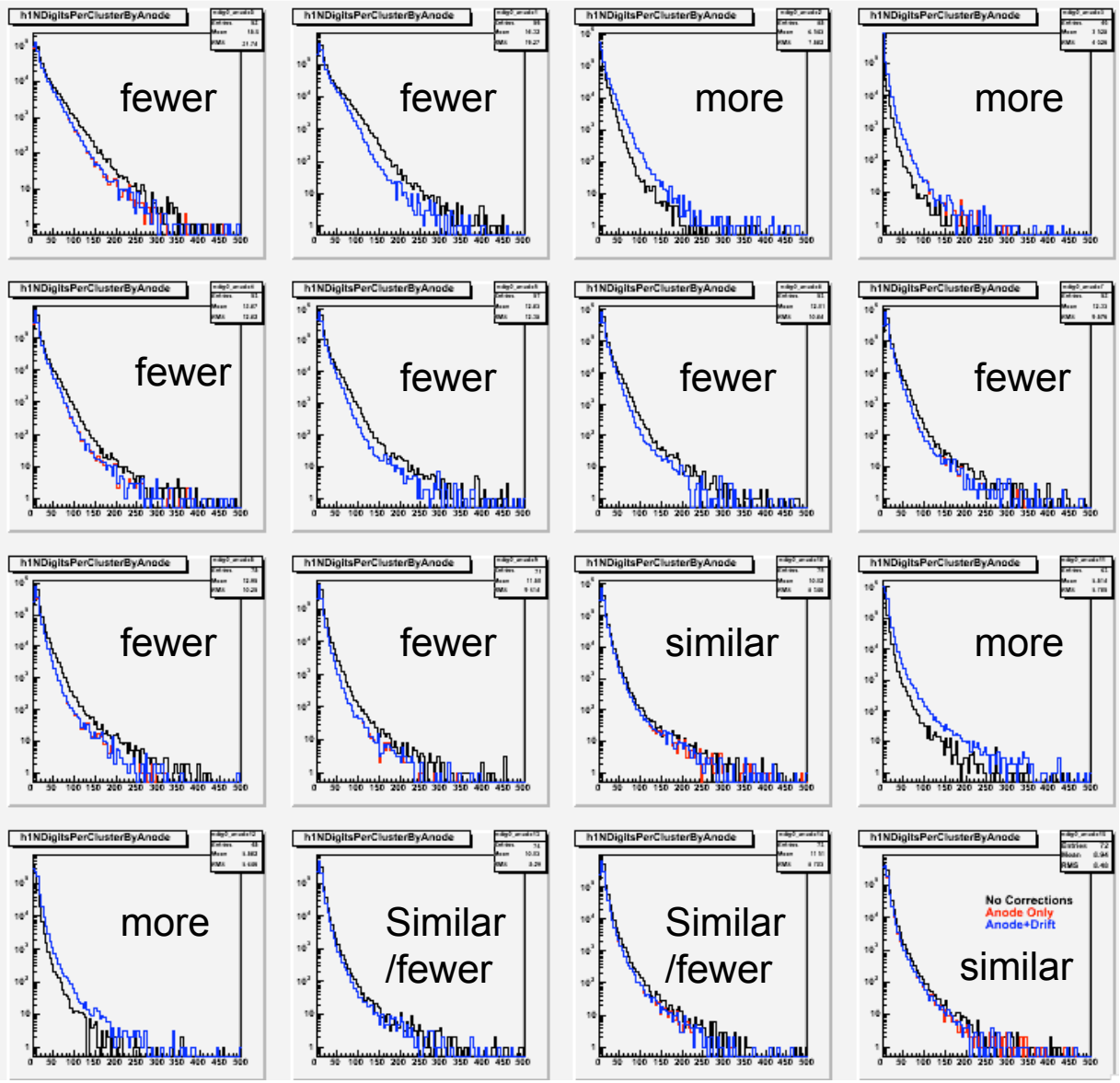
What effect do they have on number/size of found clusters? dE/dx resolution?

All checks shown with run 15860

* Quadrature sum of statistical uncertainty on dE plus relative calibration uncertainties

* Direct / Indirect

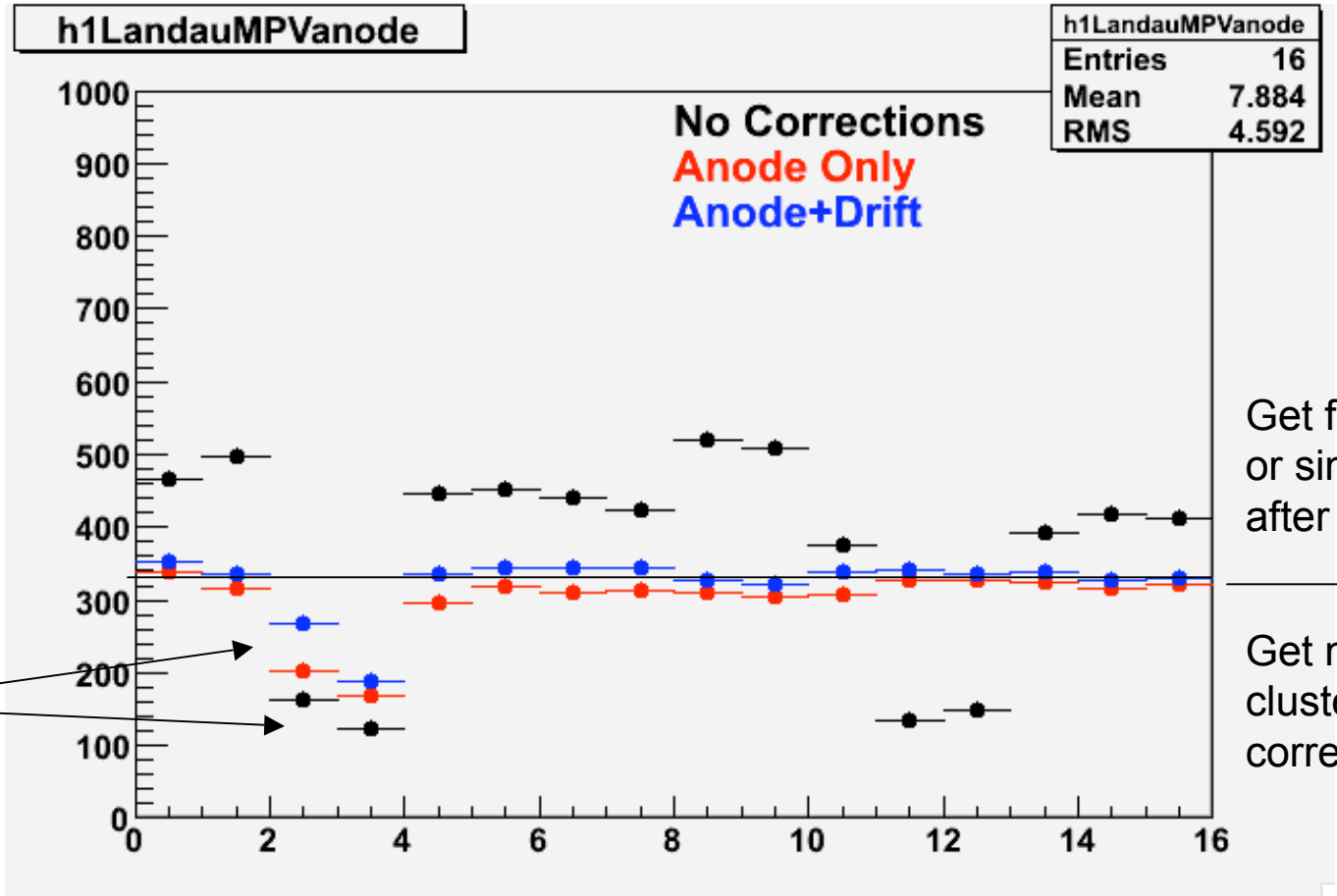
Cluster effects



Ndigits per cluster by anode region

Changes are consistent with expectation from anode calibrations →

Beam track/anode check



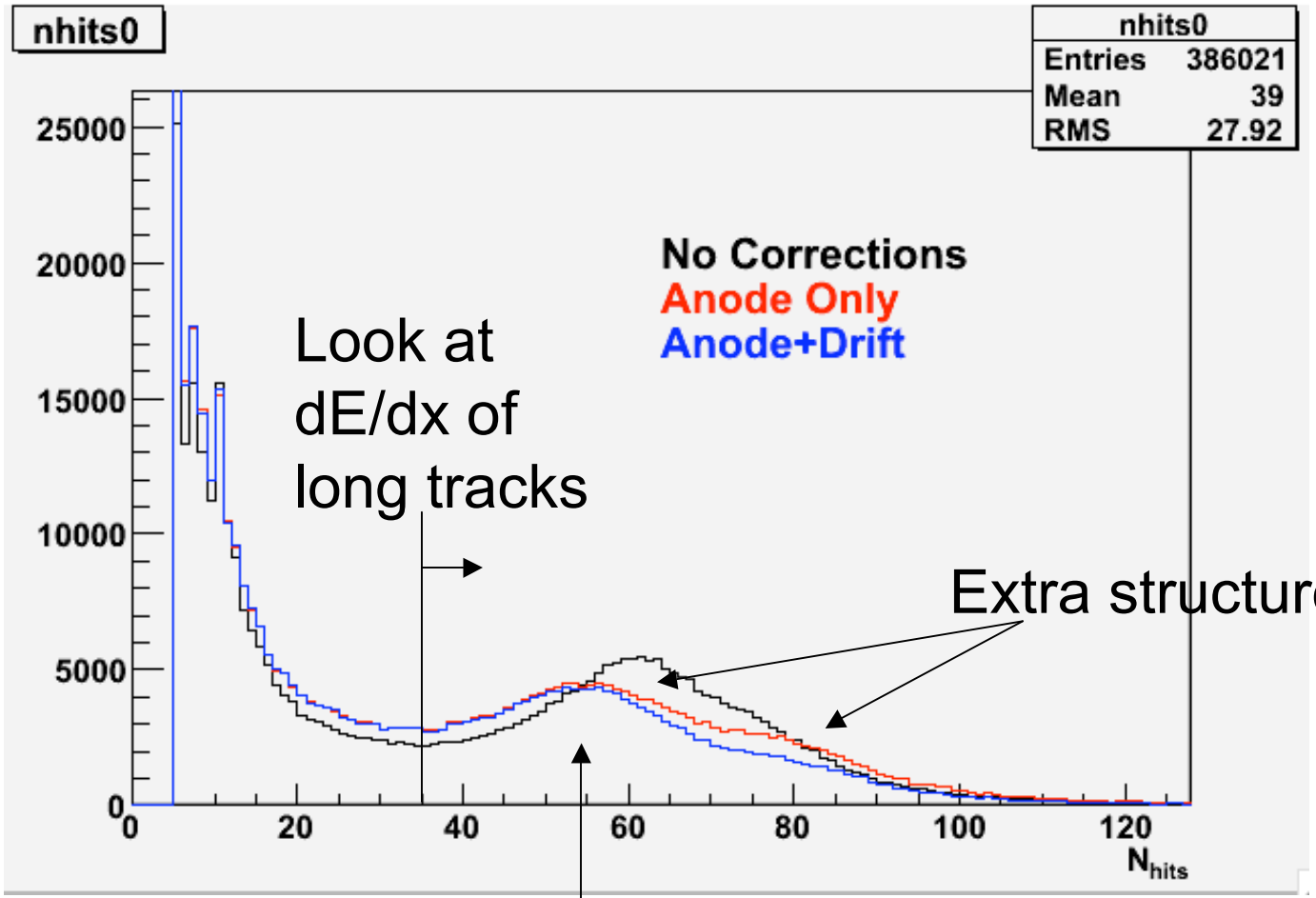
Bad anodes

Get fewer/smaller or similar clusters after correction

Get more/larger clusters after correction

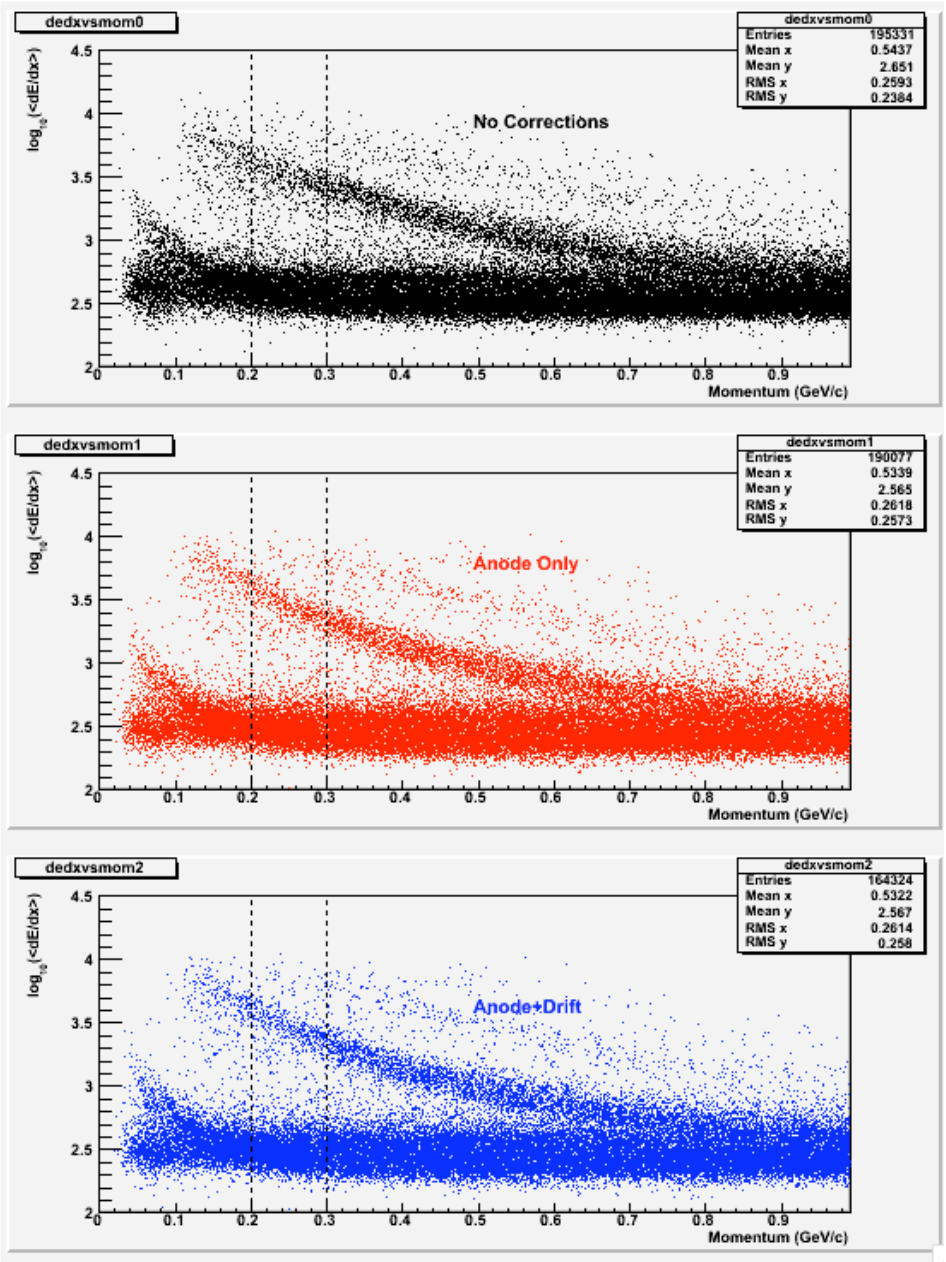
Fit to Beam track dE/dx in different anode sectors with/without corrections

Nhits on tracks



Fewer hits on tracks with corrections

dE/dx vs. momentum



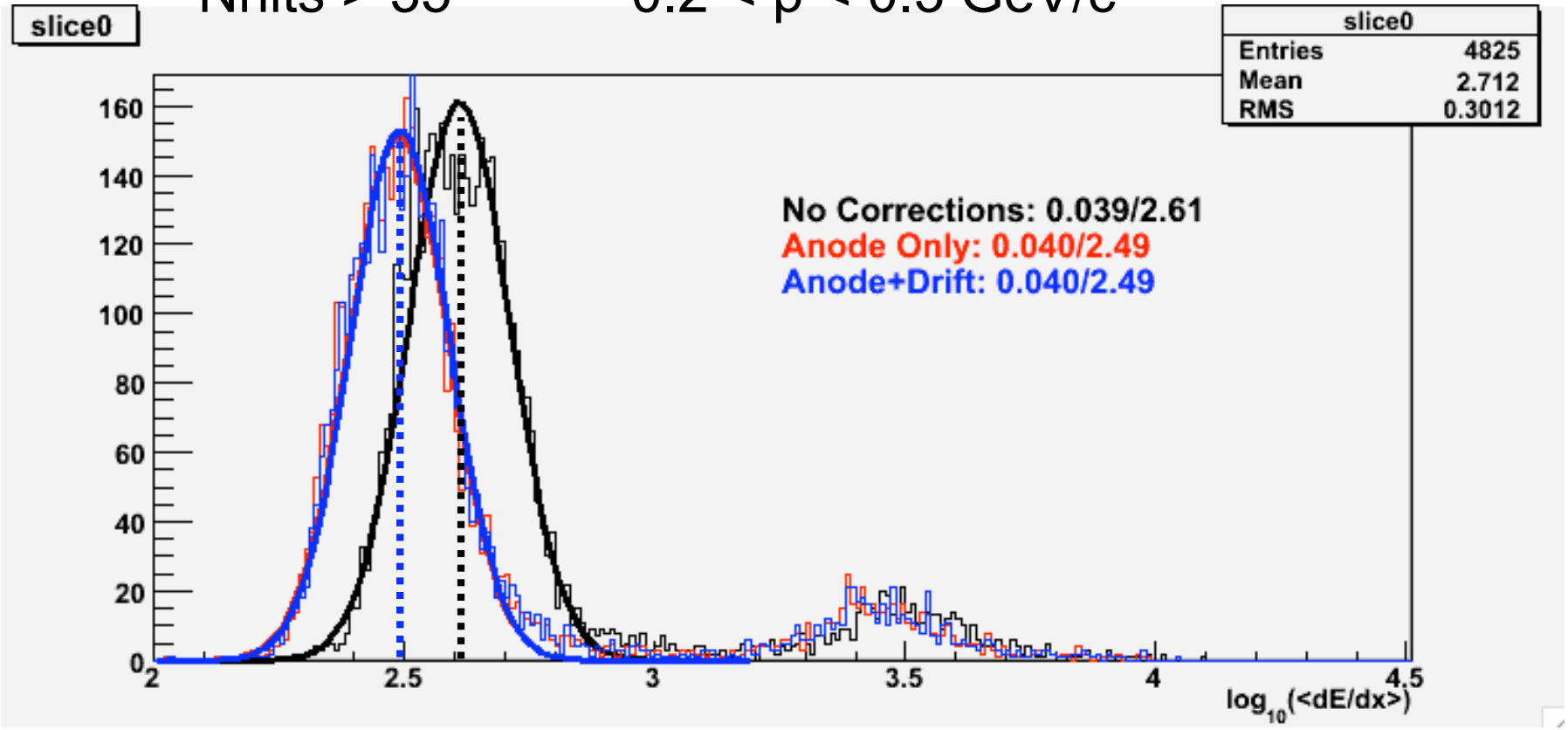
Nhits > 35

Corrections expand gap between pions/protons (effect of $\log_{10}$?)

Compare <dE/dx> within 0.2 < p < 0.3→

dE/dx Slices

Nhits > 35 0.2 < p < 0.3 GeV/c



Single Gaussian fit to pion band --> resolution worse with corrections?

May be due to shift in Nhits of tracks before/after corrections

To-do

1. dE/dx truncation parameter optimization
2. Nhits ↔ resolution study
3. Updated dE/dx plot (need to integrate statistics over many runs to increase density of kaons)
4. PID probabilities