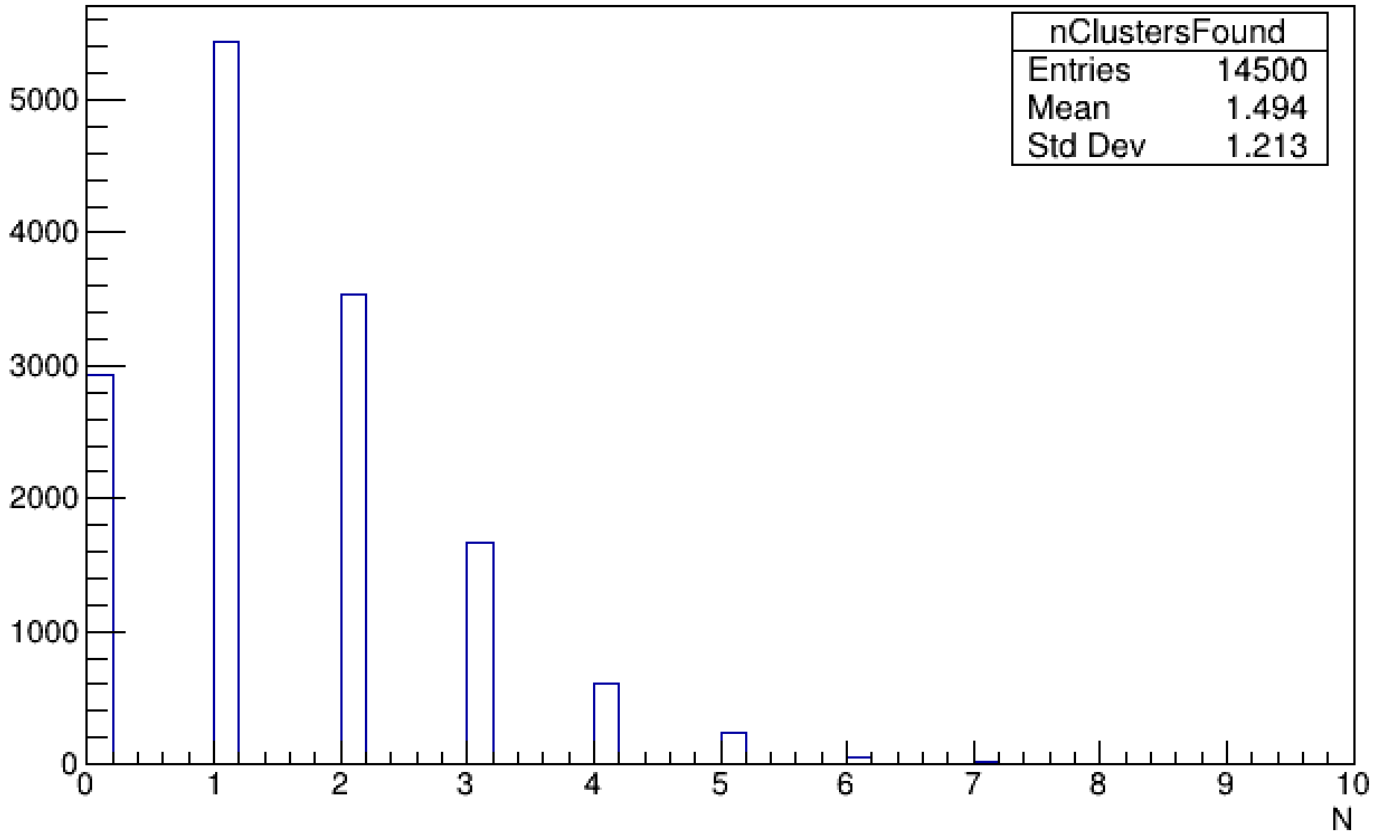
Updates 11/9

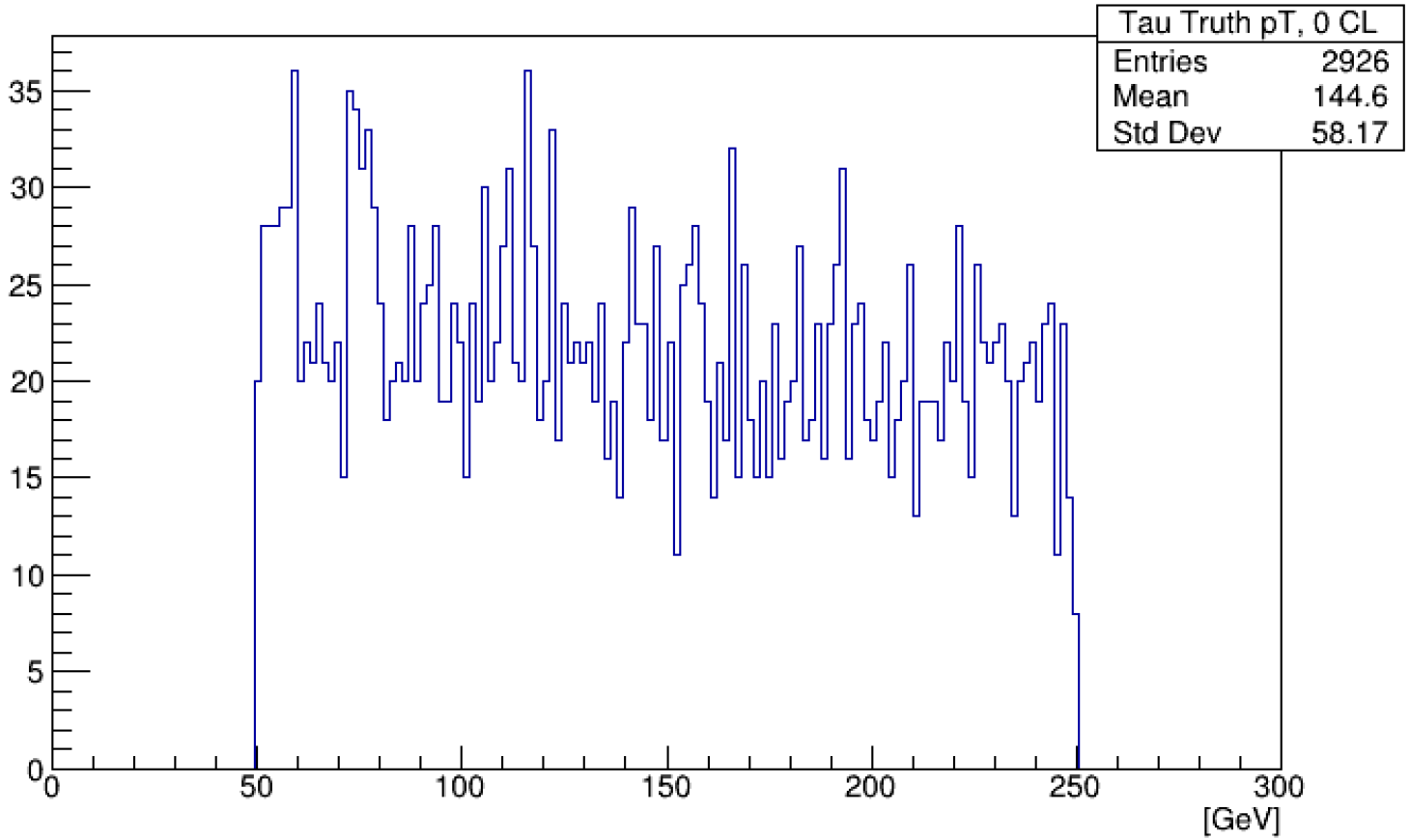
- Took a closer look at clusters
- Not as efficient at clustering as I previously thought
- Bad E-p consistency (low E)

Number of clusters per event, ~1500 evts



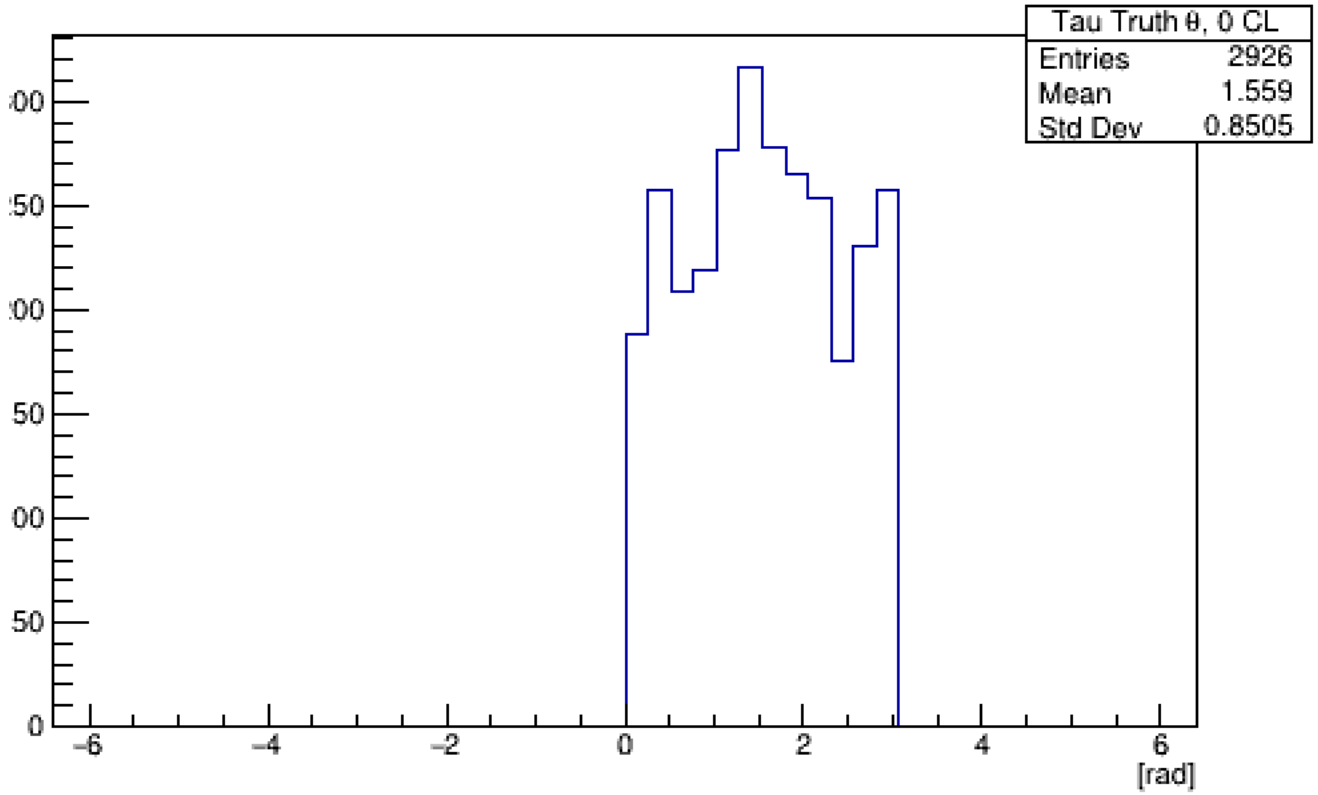
~ 20% of events reconstructed without a cluster

pT distribution of 0-cluster events



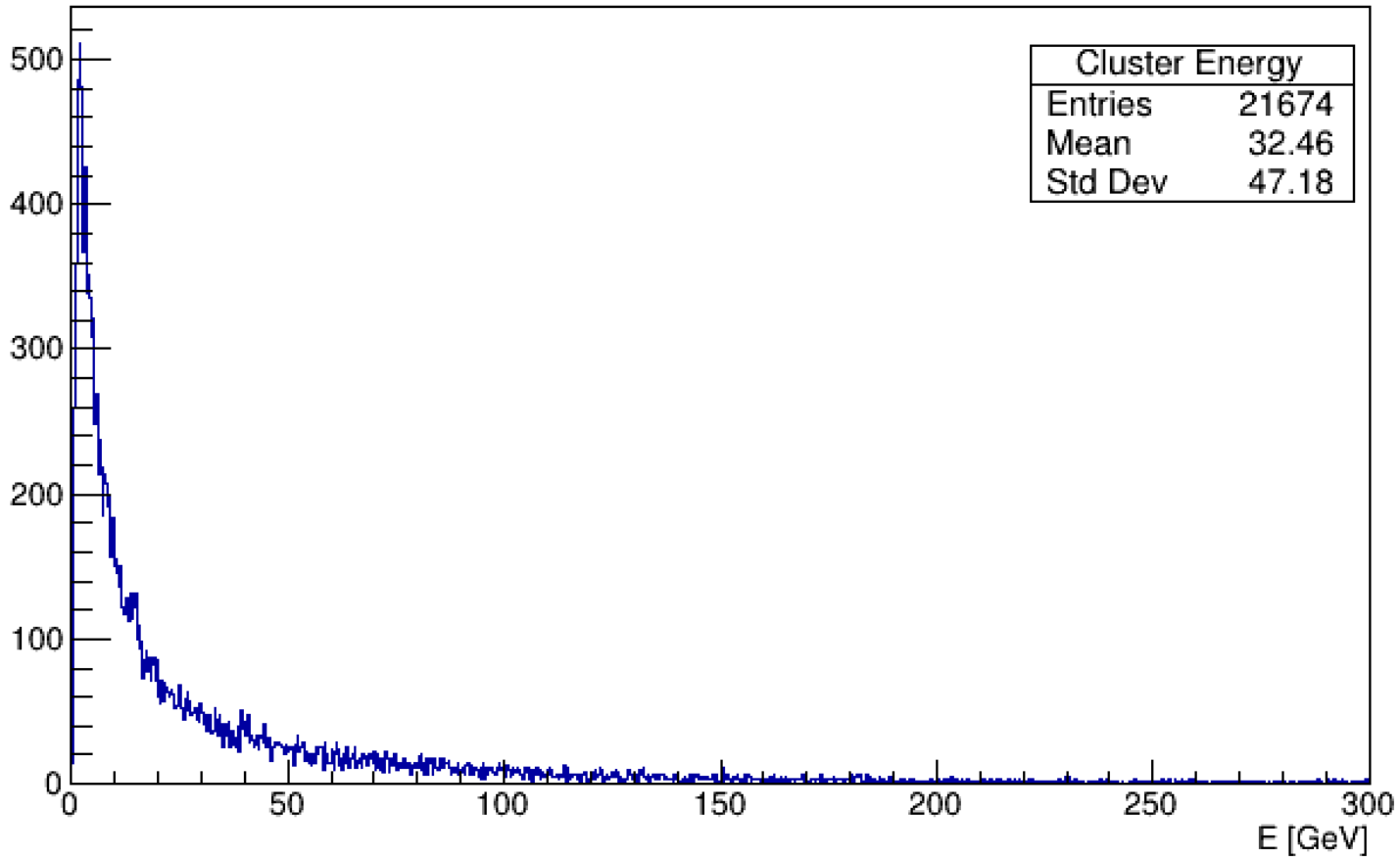
Slight skew towards low-pT events (reasonable) but overall pretty flat in pT

Theta distribution of 0-cluster events



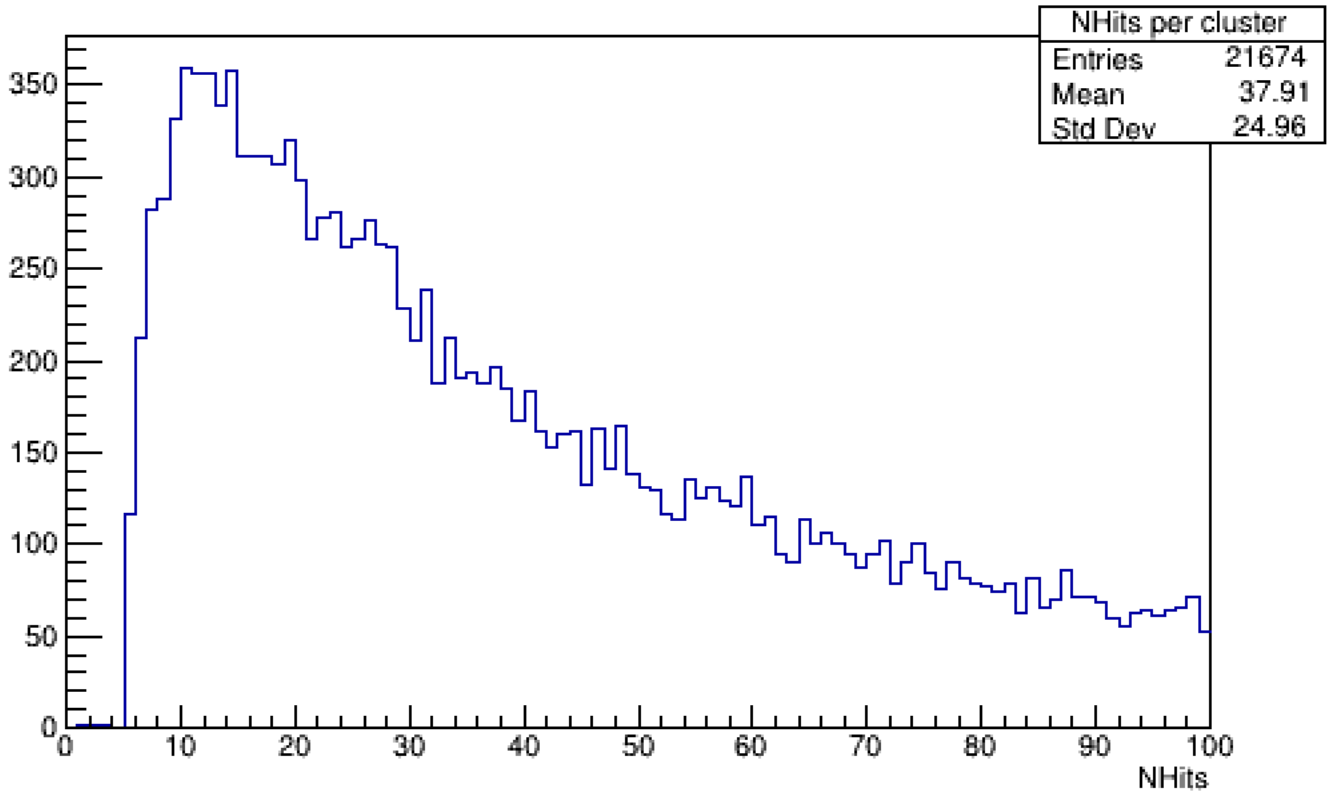
Matches pretty much the theta distribution of the sample

Energy of clusters



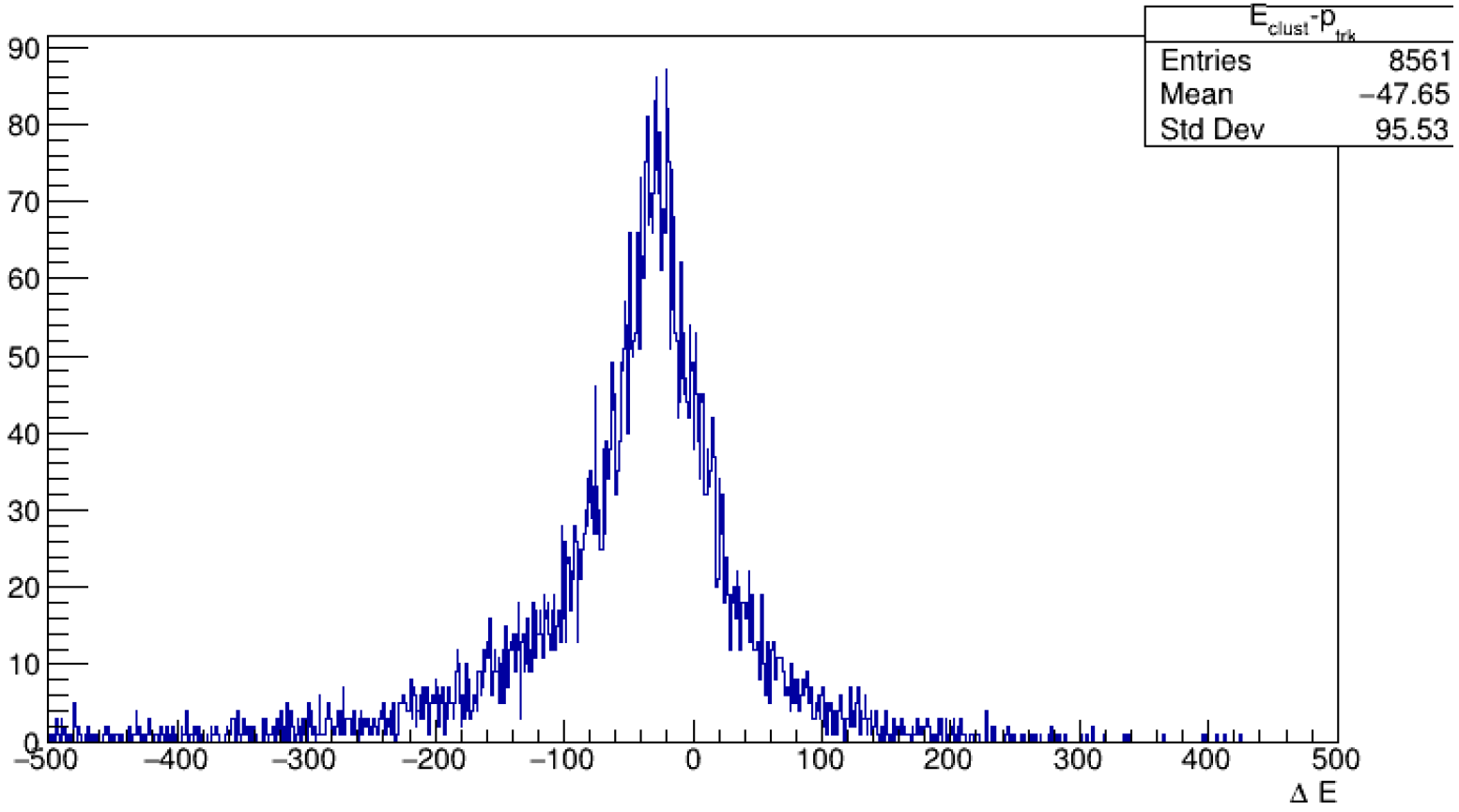
NHits per Cluster

(Obviously there is overflow, but I just wanted to check we weren't losing PFOs due to low-hit clusters – the cutoff is 5 hits, so that doesn't seem to be the problem)



E-p consistency

NB: this is actually (E_clust-p_trk) – (m^2/(E+p)), i.e. what E-p **should** be is subtracted off
Tracks and clusters associated here with dR matching



Where do we check E-p consistency?

- In the FinalParticleIDAlgorithm, which is called near the very end
  - Actual comparison done in the LCParticleIDPlugin
- Track-cluster association is checked first, and then E-p
- However, this step seems to be for electron and muon tagging; when it comes to pions, it seems their ID is performed mostly in the PFOCreationAlgorithm
- (so E-p may not be very crucial at all)
- Regardless, failure to form clusters is now another possible source of inefficiency
- I plan to look at the (extremely lengthy) clustering steps in the PandoraSettings and see if I can better understand what we are doing