ilcsoft comparison
v01-16-02 vs. v01-17-11

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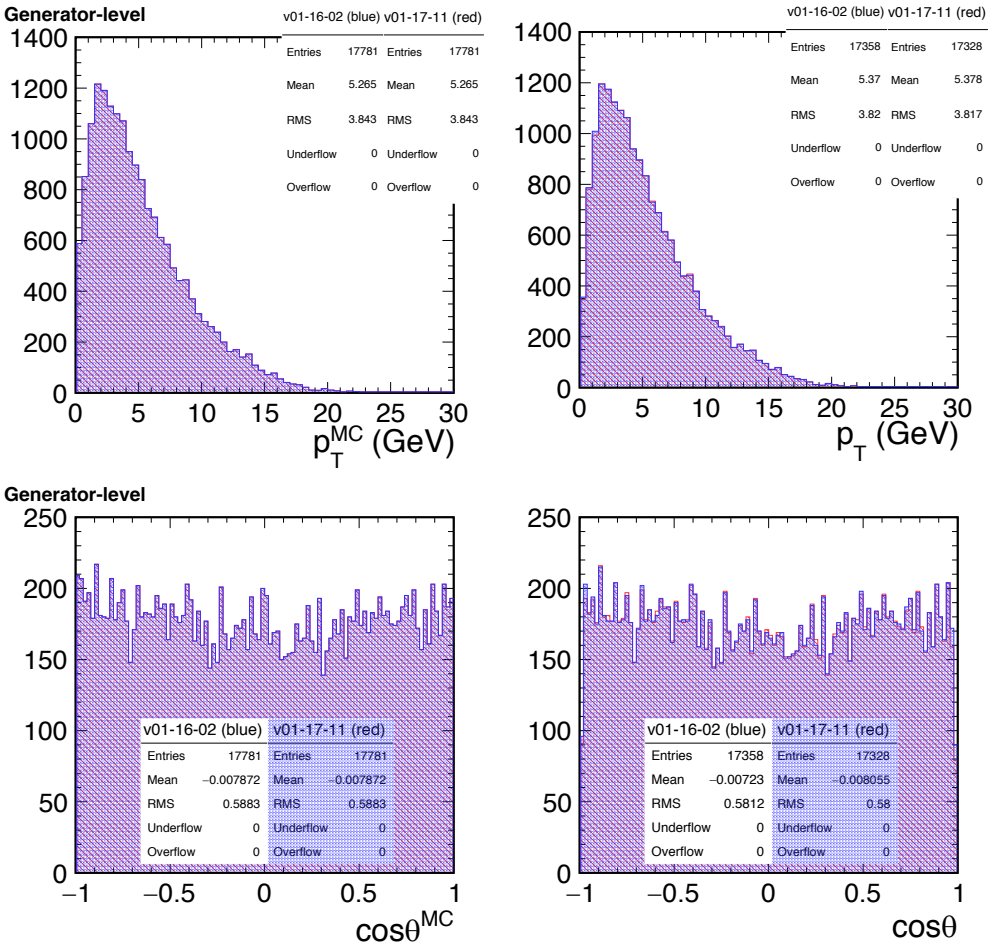
Introduction

- It was previously reported that different ilcsoft versions (v01-16-02 and v01-17-11) show discrepancies in the reconstructed variables involving cluster energies.
- As before, the sample is higgsino N1N2 events with N2 decaying to a muon pair. The first muon (usually positive) is selected as the MCParticle to match against.
- The muons are rather low in pT (avg. ~5 GeV) and more-or-less flat in cosθ.

Generator-level naturally identical.

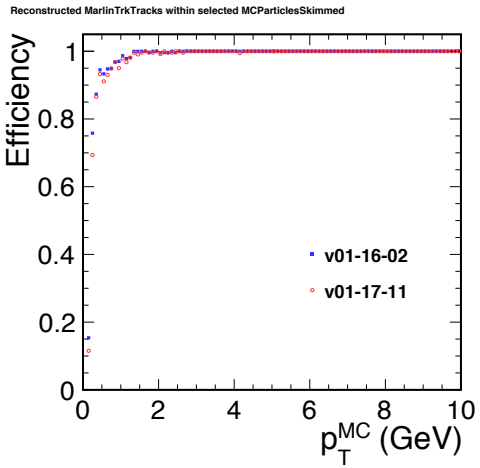


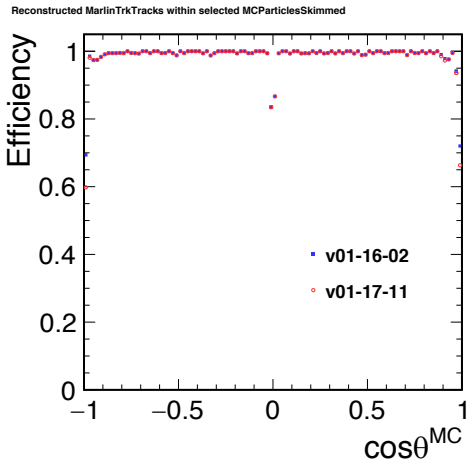
# of PFOs now agree at 0.2% level.

For v01-17-11, the track-based weight (the higher-order 4 digits) is used.

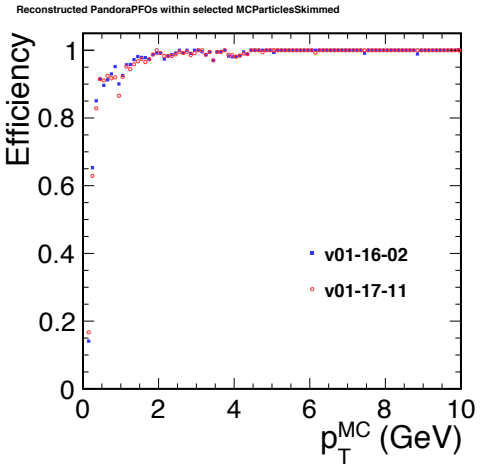
Efficiency

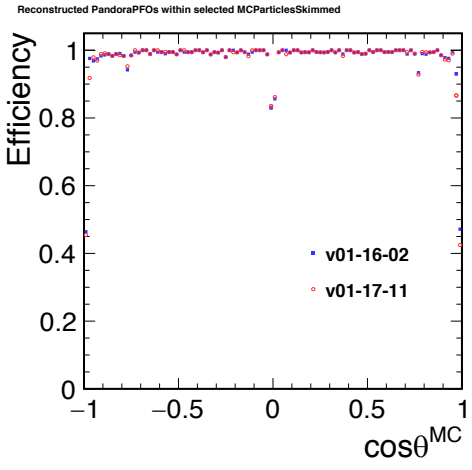
Tracking Efficiency →





PFO Efficiency →

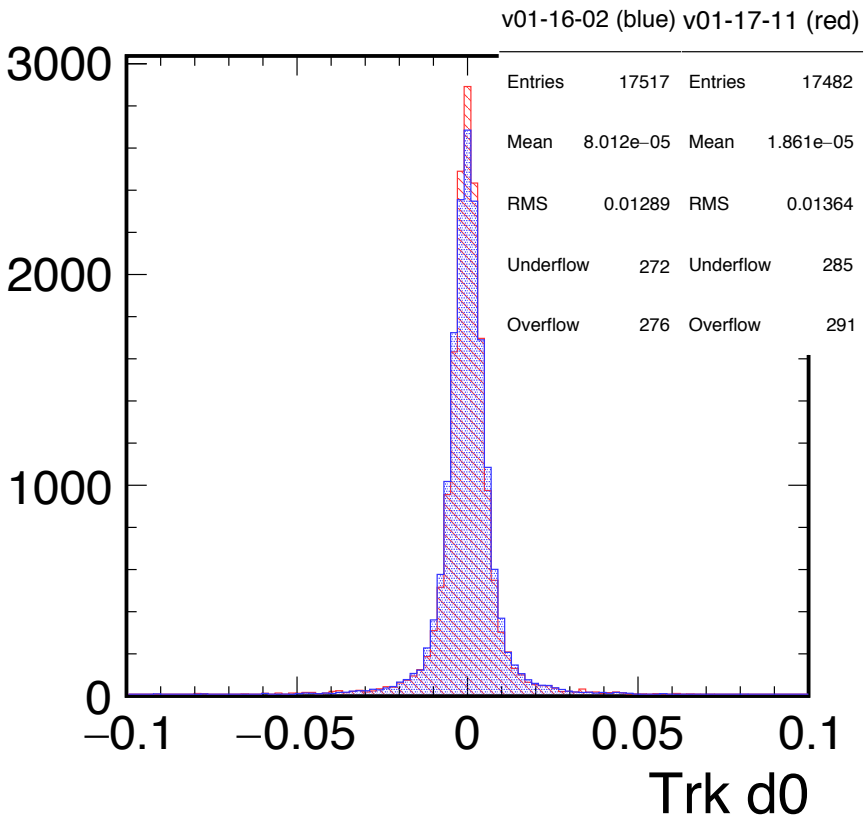


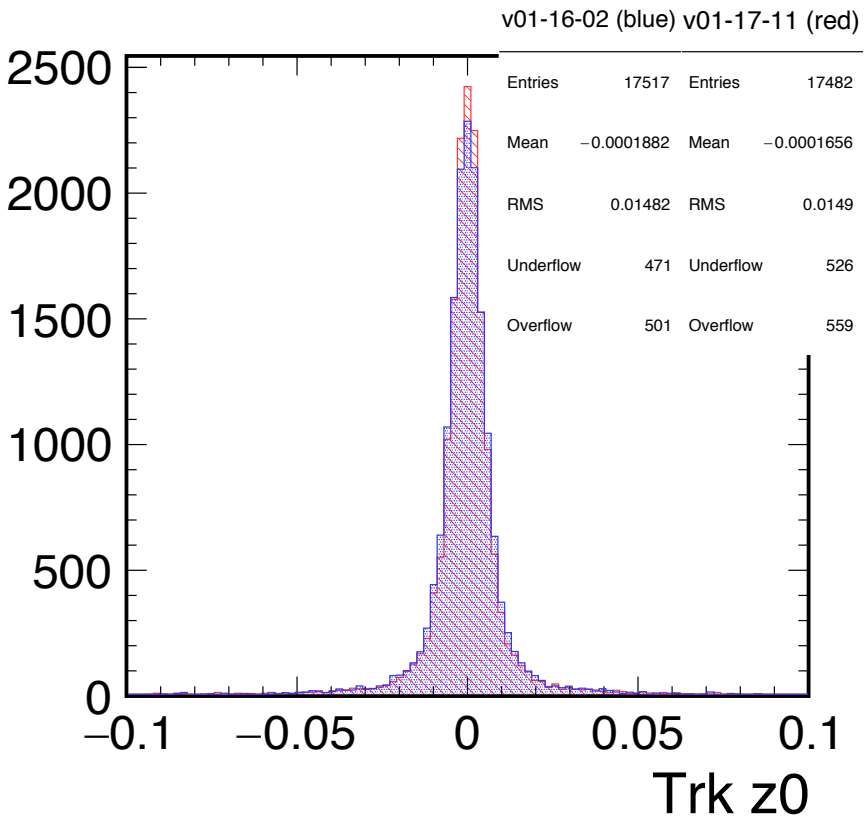


DBD tracking should be used in both versions.
Slightly lower efficiency observed in the forward region

Track Impact Parameter

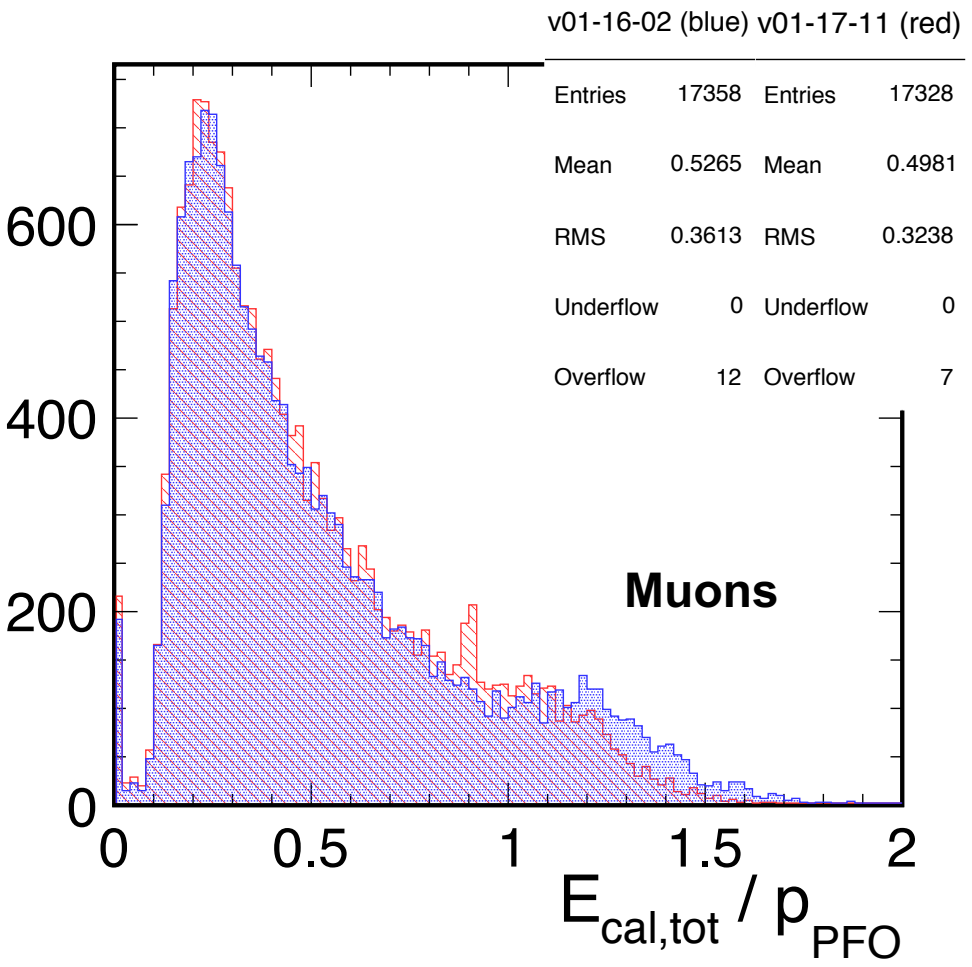
- Comparison of impact parameter distributions (transverse and longitudinal).
- v01-17-11 has considerably better impact parameter resolution. (why?)





Cluster Energies

- E/p is obtained by the sum of ECAL and HCAL subdetector energies, divided by the PFO momentum.
- Differences are seen…
- A bump at ~0.9 ?

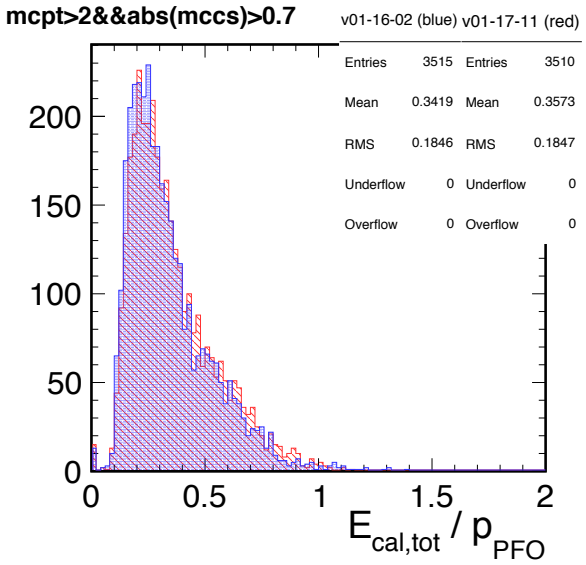


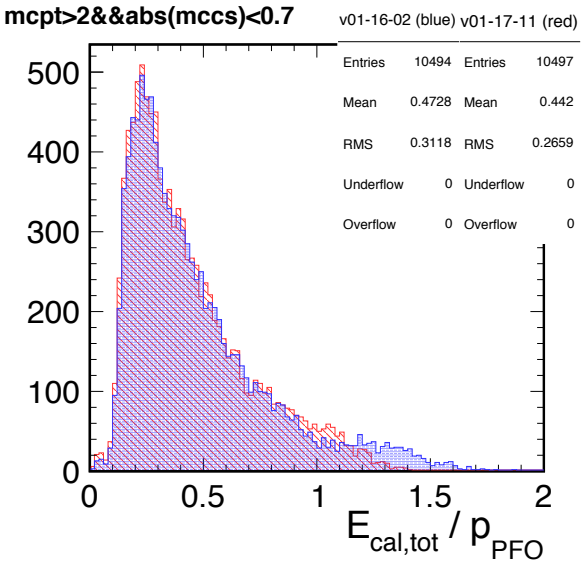
E/p

- pT and angle cuts shown as a “matrix”

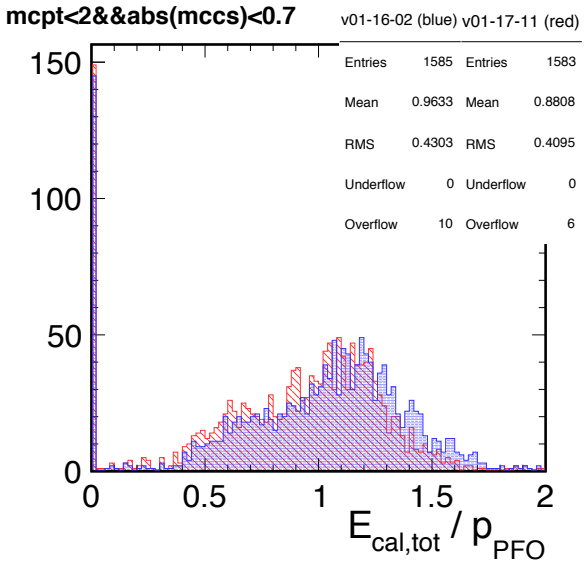
|cosθ|<0.7 | |cosθ|>0.7

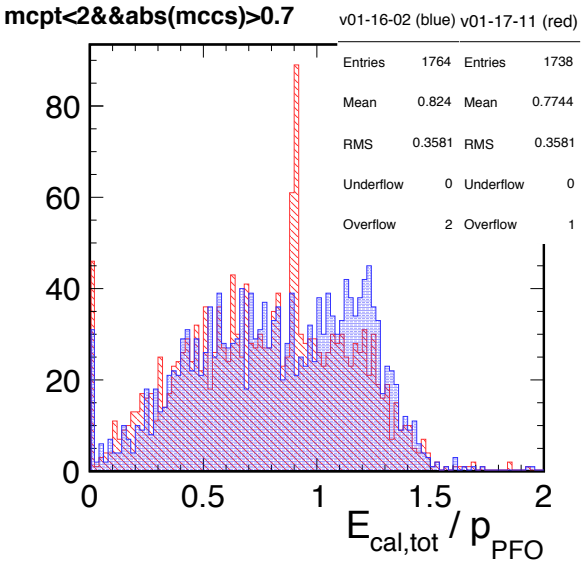
p_T>2 GeV





p_T<2 GeV





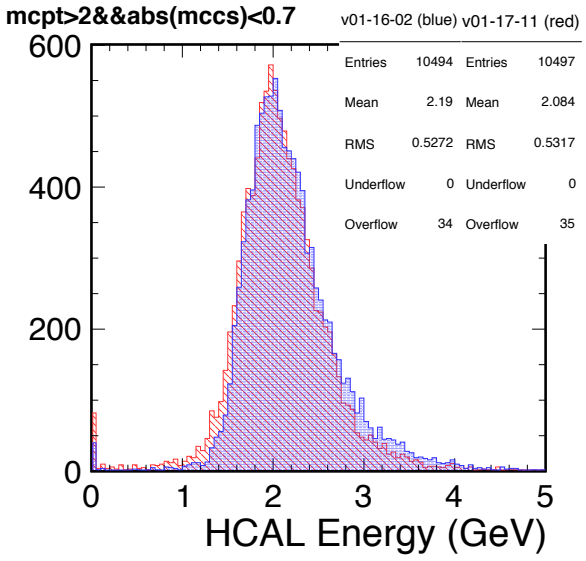
Bump at ~0.9 seen for endcap (forward, low pT)

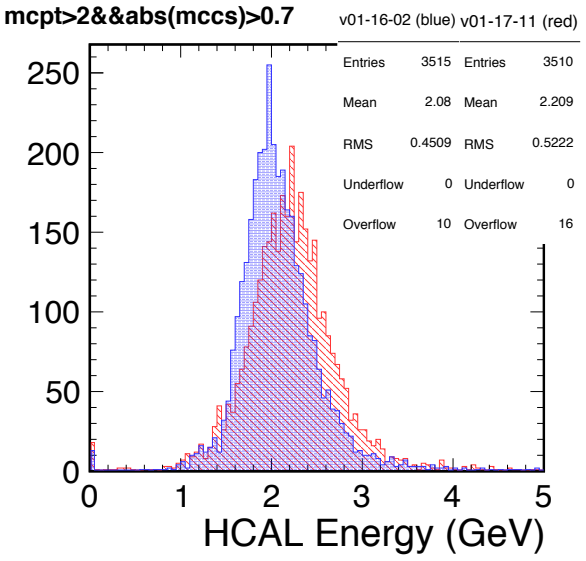
HCAL Energy

- pT and angle cuts shown as a “matrix”

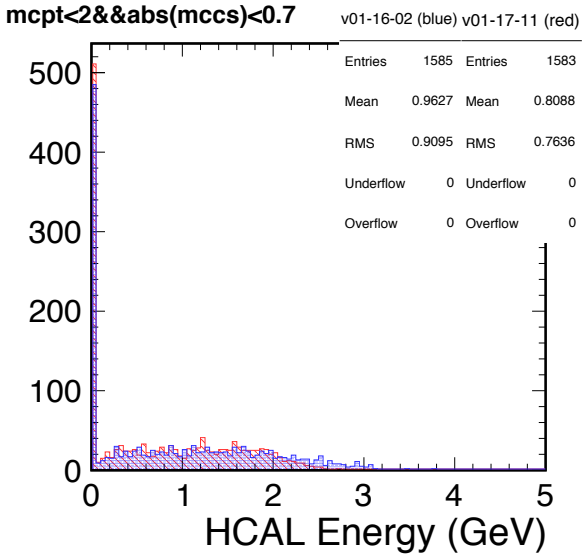
|cosθ|<0.7 | |cosθ|>0.7

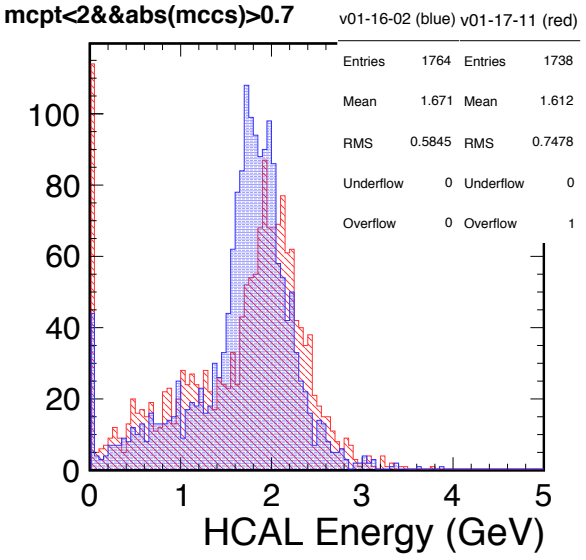
p_T>2 GeV





p_T<2 GeV





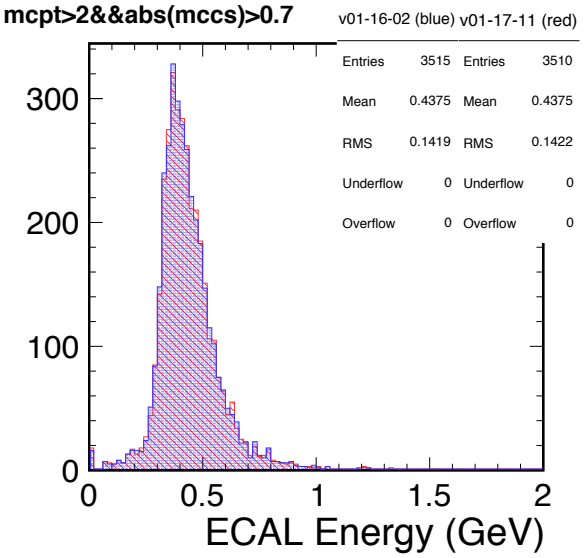
Differences seen in the forward region

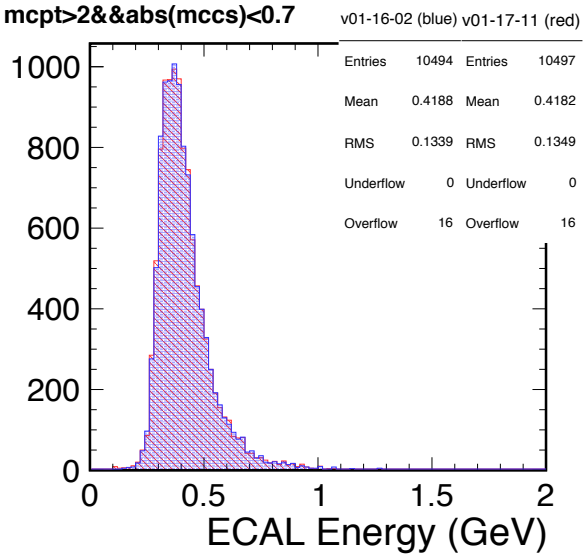
ECAL Energy

- pT and angle cuts shown as a “matrix”

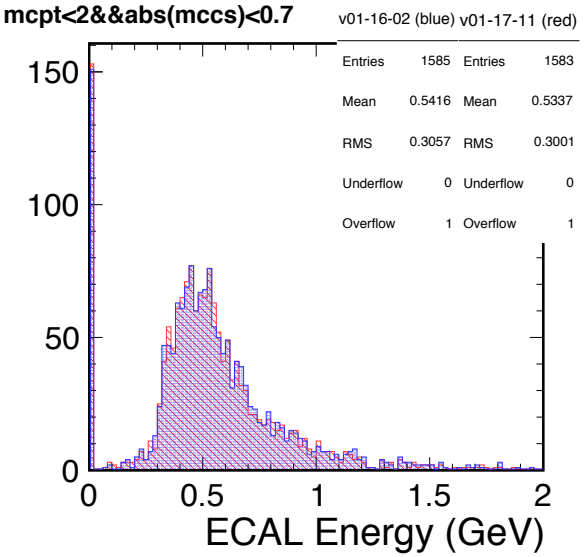
|cosθ|<0.7 | |cosθ|>0.7

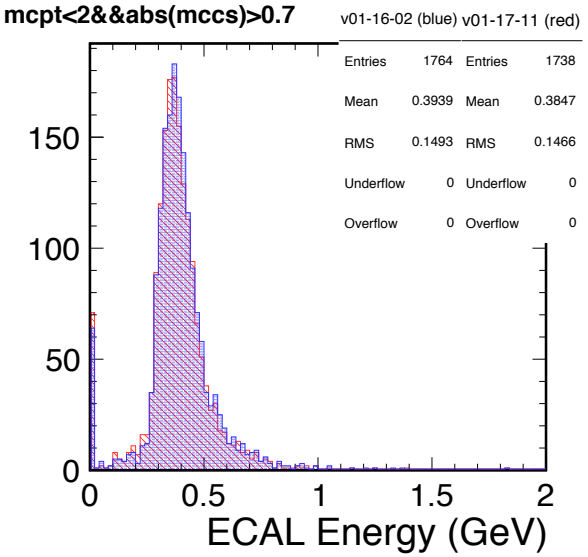
p_T>2 GeV





p_T<2 GeV



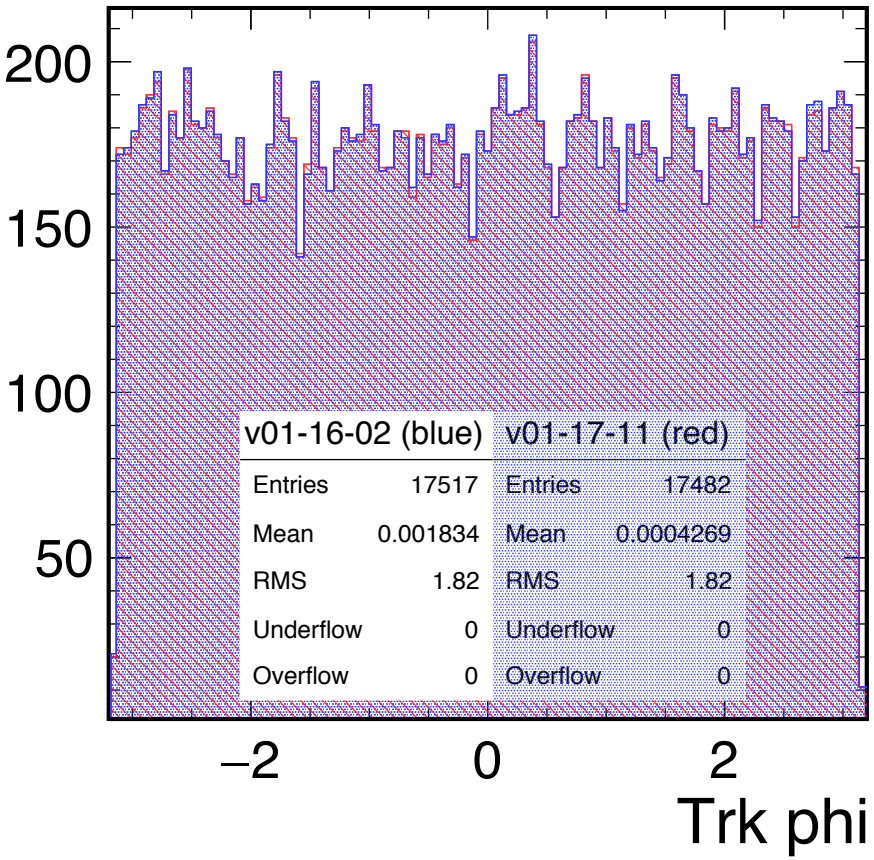


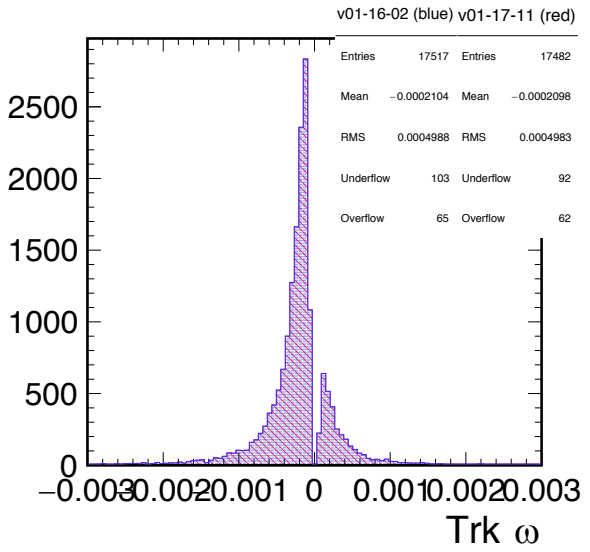
ECAL looks similar

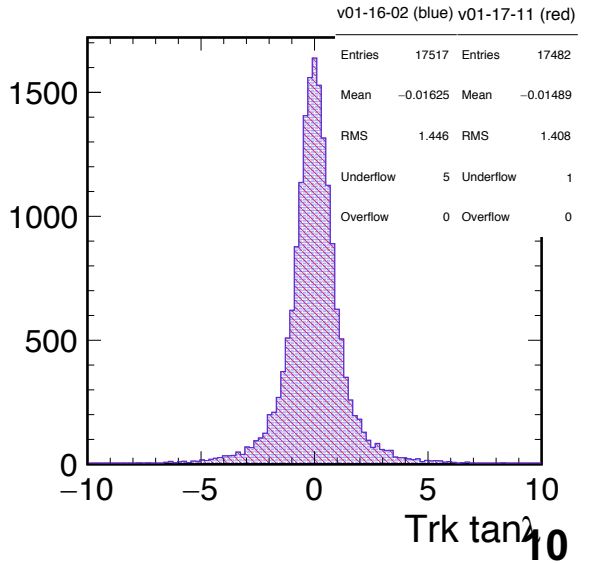
Additional Plots

Reconstruction-Level: Tracks

- Comparison of the other three track parameters.
- Omega and tan(lambda) are essentially identical.
- Slight difference in phi presumably due to side effect of better d0 & z0?







Particles around the E/p~0.9 bump

- Showing ECAL, HCAL, and (ECAL+HCAL) energies, and momentum for particles with 0.85 < E/p < 0.95