Testbeam analysis update

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Outer HCAL standalone runs

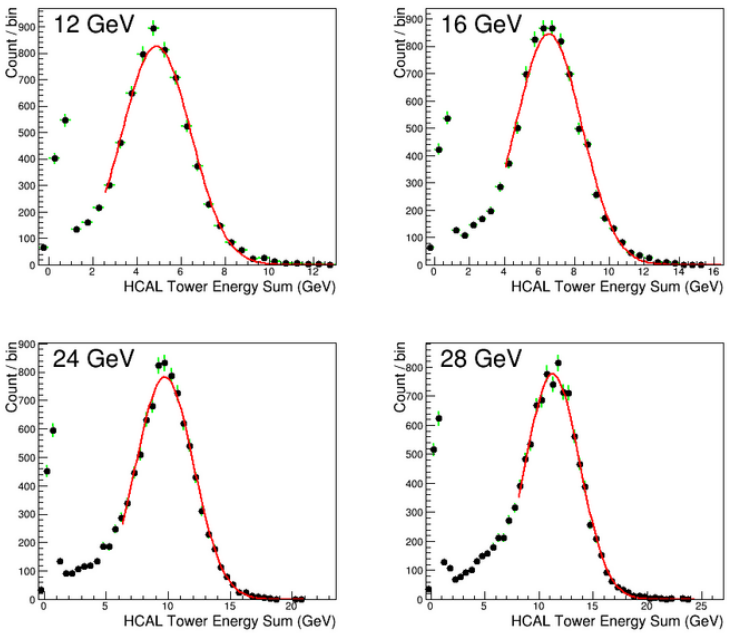
Inner HCAL was on rails, moved to one side to collect outer HCAL standalone data.

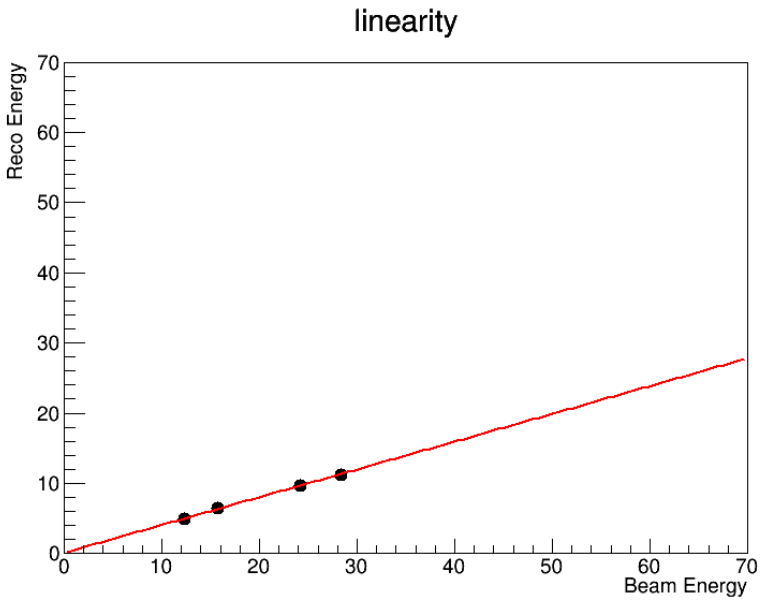
Note: Not useful for quantifying the issue of removing inner HCAL in ALD charge.

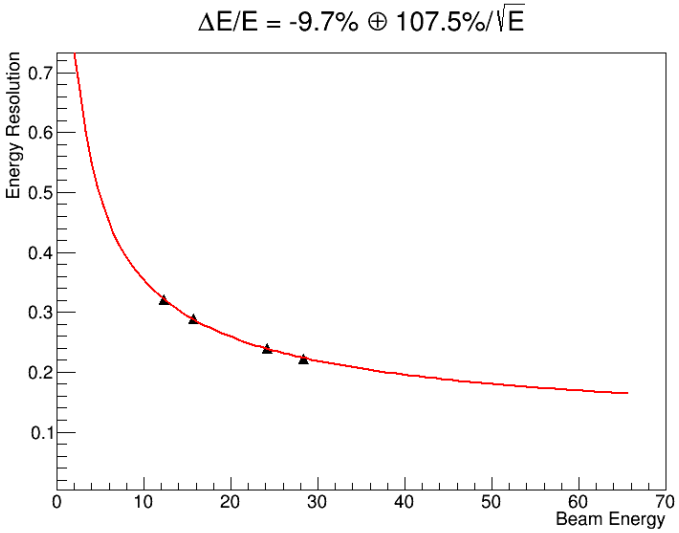
In this case shower develops only in outer HCAL.

ddump -t 9 -p 940 /gpfs/mnt/gpfs02/sphenix/data/data01/t1044-2016a/fnal/beam/beam_00002919-0000.prdf > hcal.jpg

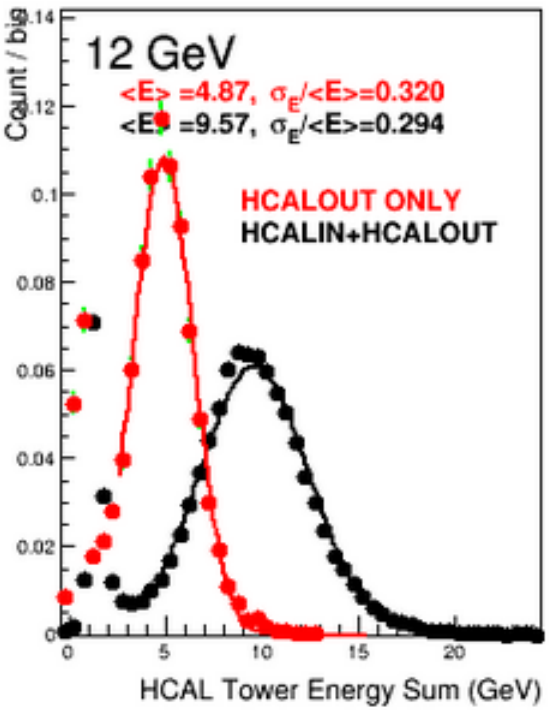
Energy reconstructed

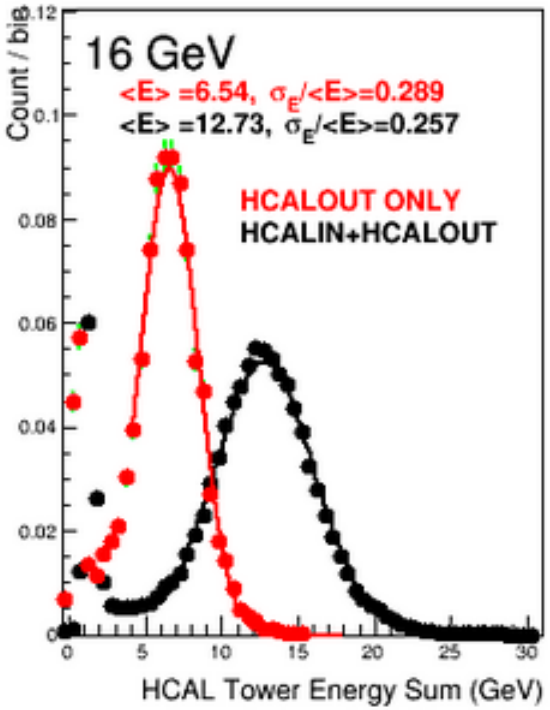


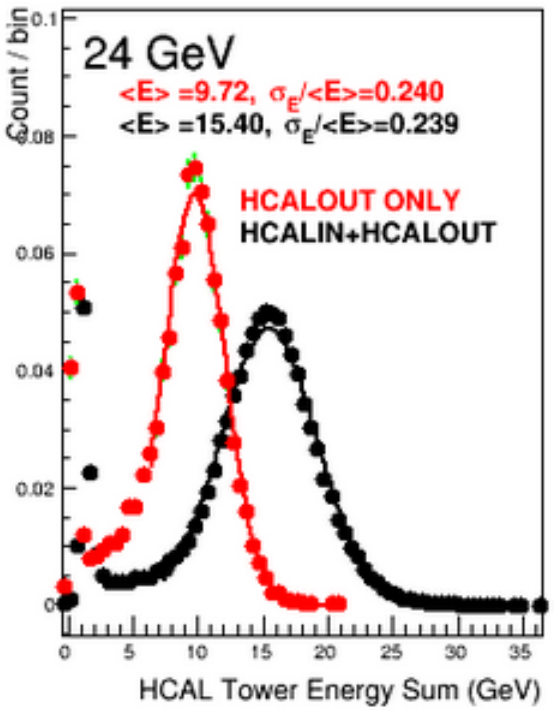




Inner+Outer vs Outer







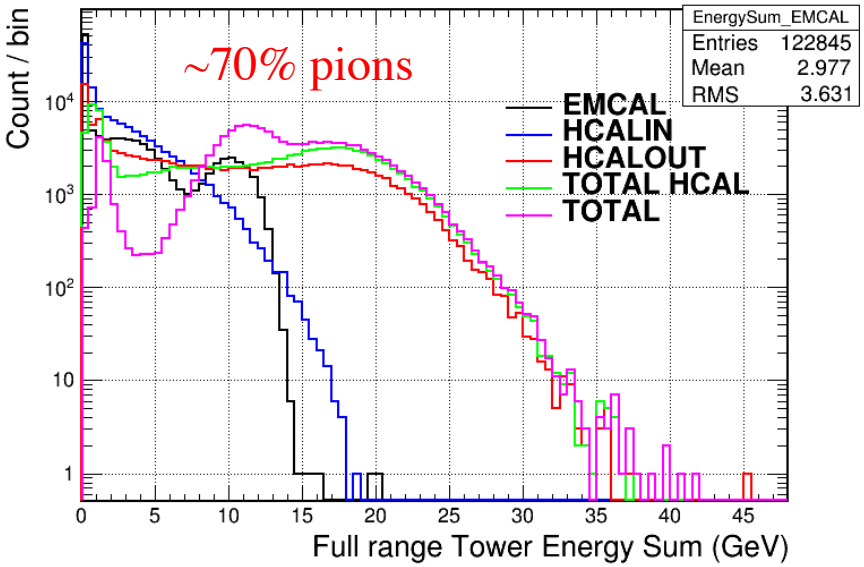
At high energies the resolution drives mostly by outer HCAL. Expected no big difference.

At low energies resolution dependence on the inner HCAl is more important.

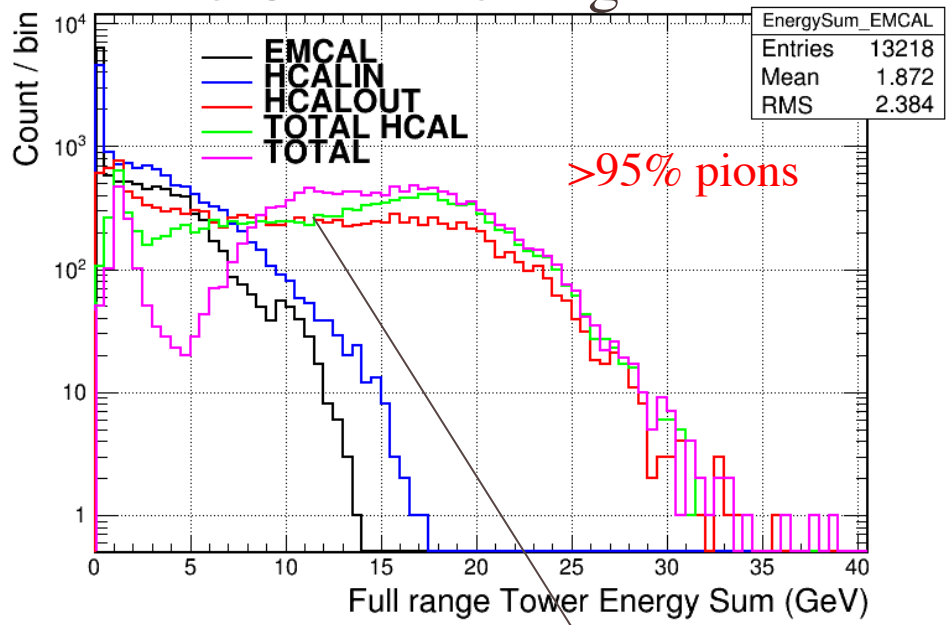
EMCAL+INNER+OUTER analysis

24 GeV negative beam

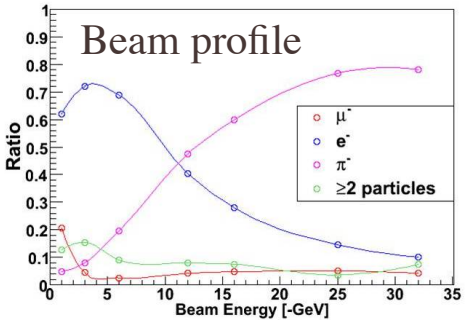
ALL events



No Cherenkov signal cut

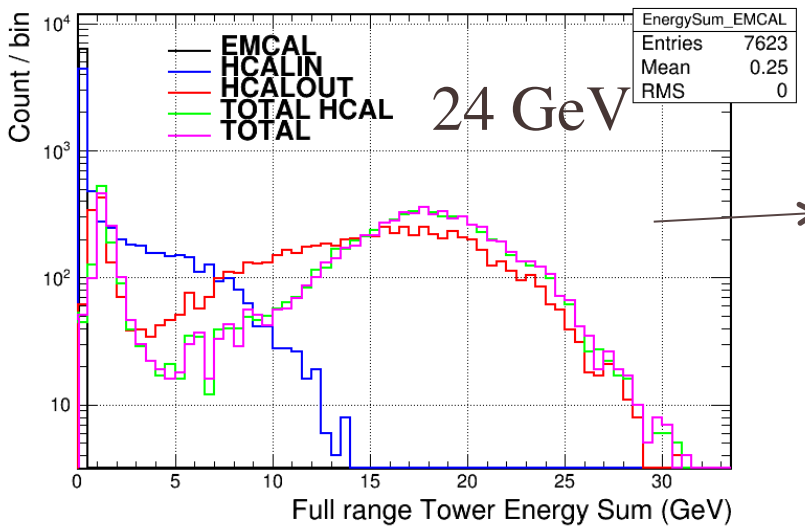


A miscalibration between HCAL and EMCAL

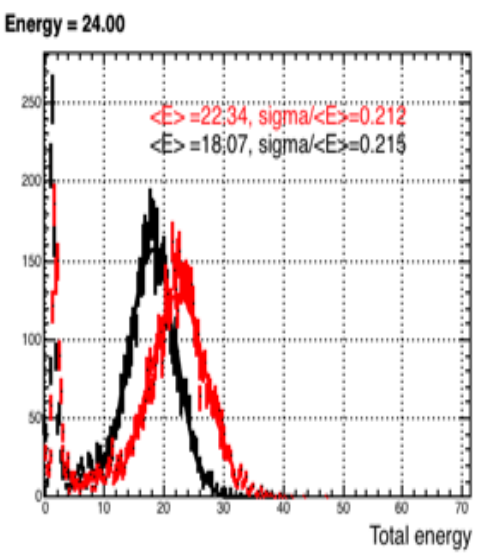


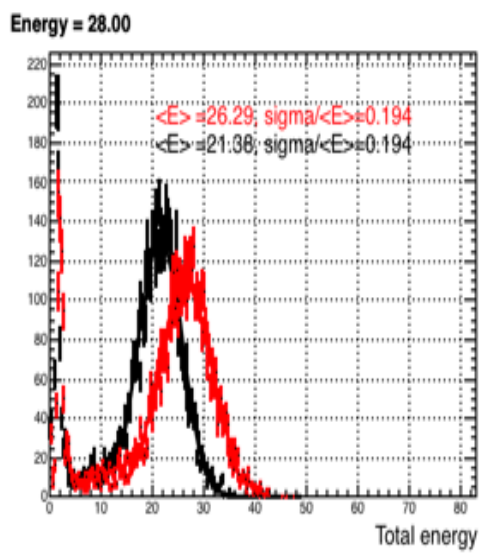
Strategy: Focus on high energies to balance EMCAL and HCAL using a cleaner hadron sample. Use them for low energies.

EMCAL MIP showers



No Cherenkov signal +
EMCAL MIP (E_EMCAL<0.5GeV)



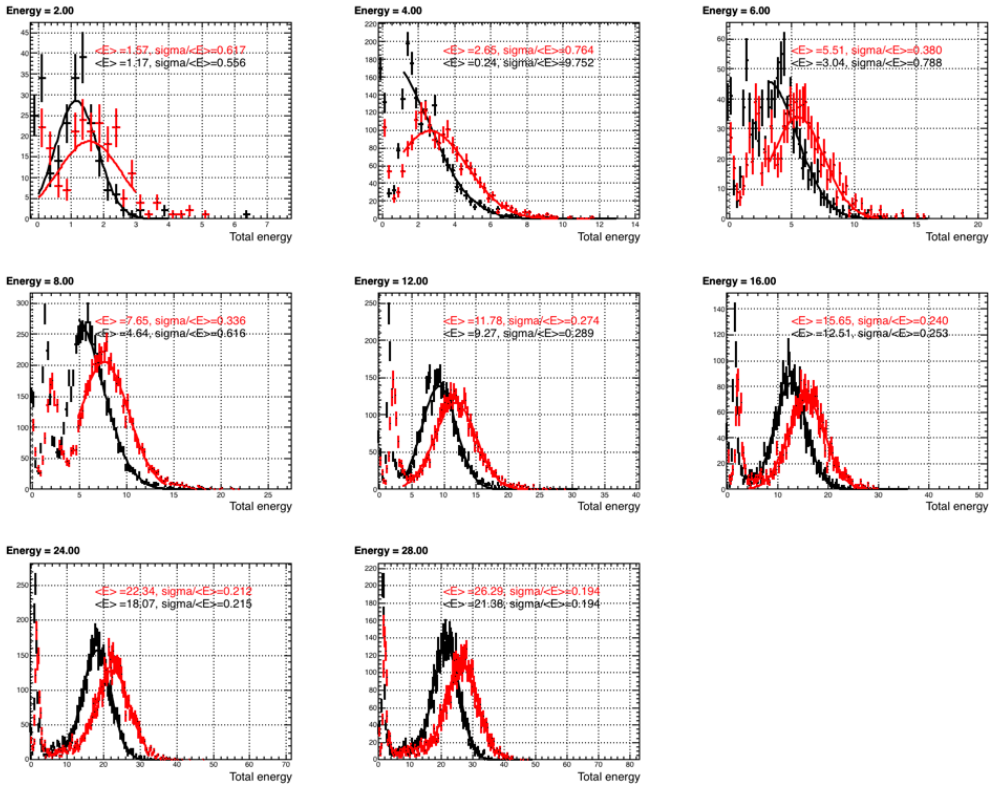


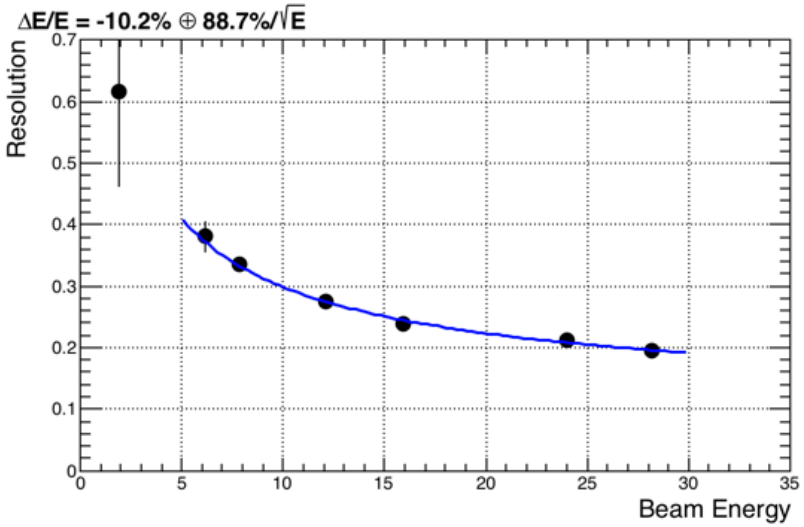
Reco_E = P0 * E_inner + P1 * E_outer

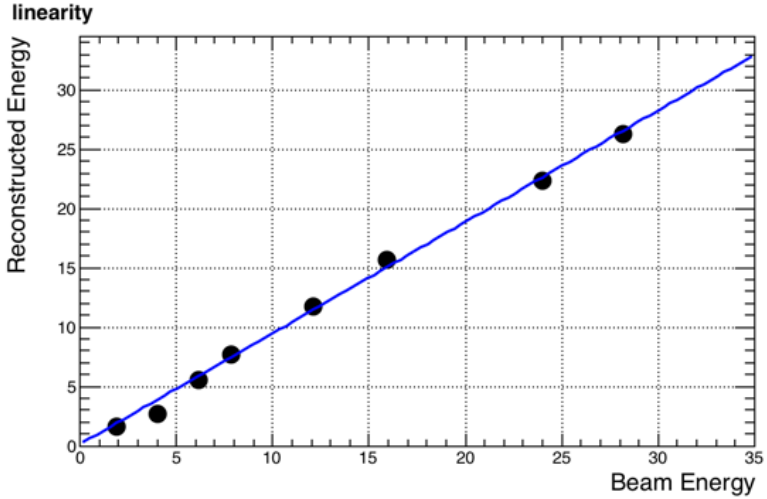
Left the weights as free parameters. It didn't improve the resolution.

Inner and Outer HCAL are well calibrated to each other.

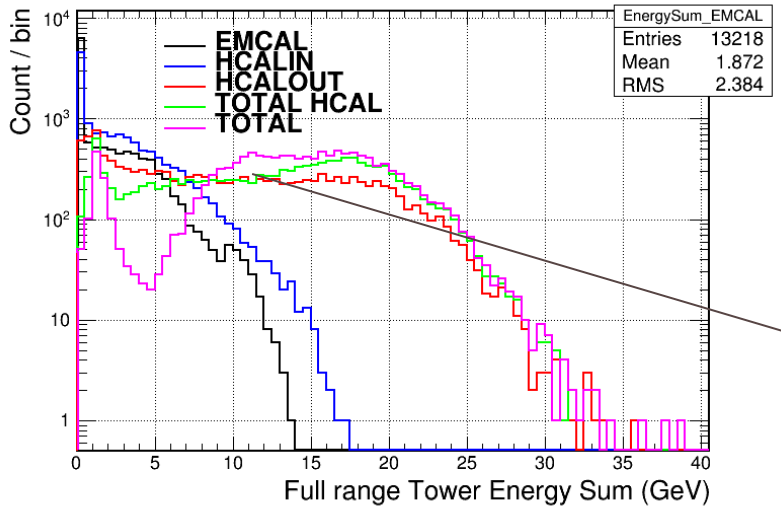
EMCAL MIP reconstruction





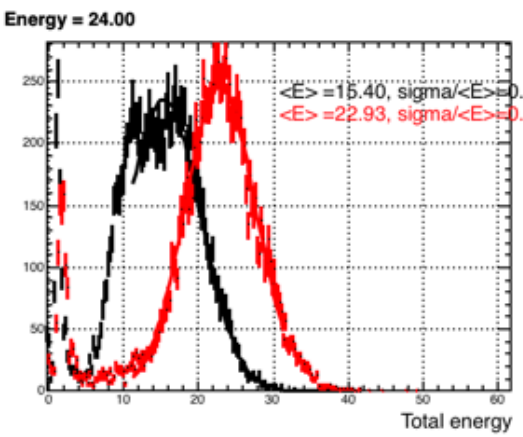


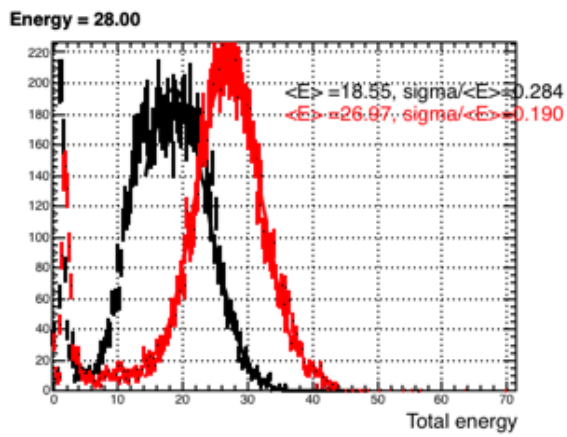
Only Cherenkov



Only "no Cherenkov signal" cut.
C1 inner energy <10
C2 outer energy <10

A miscalibration between HCAL and EMCAL

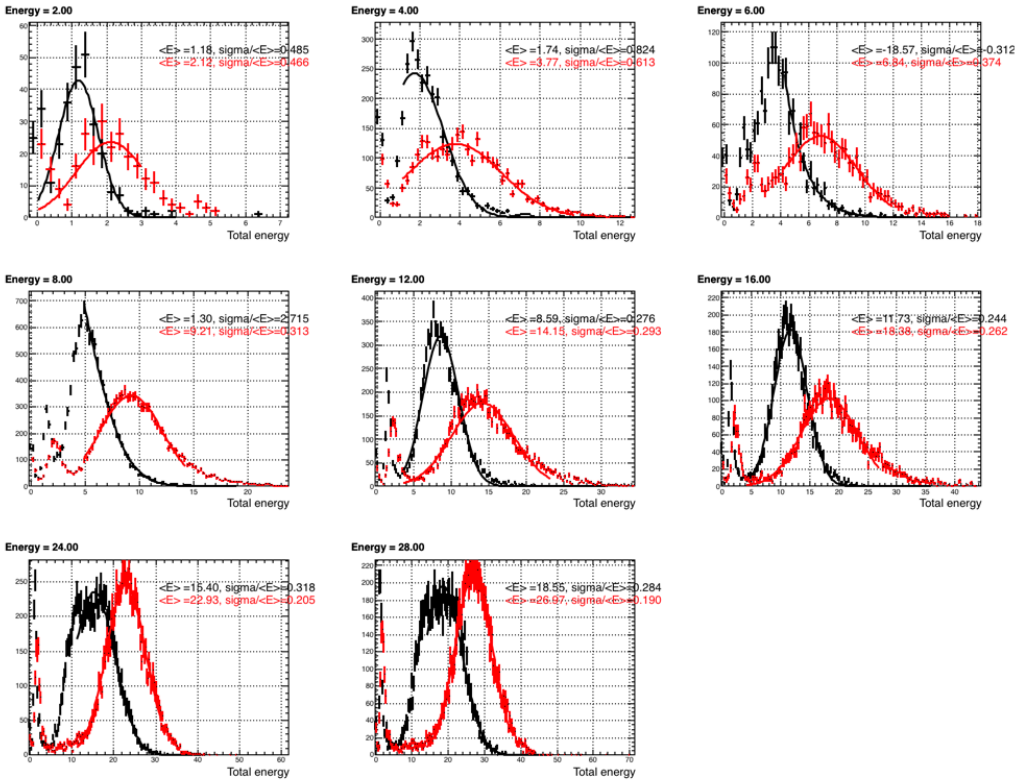


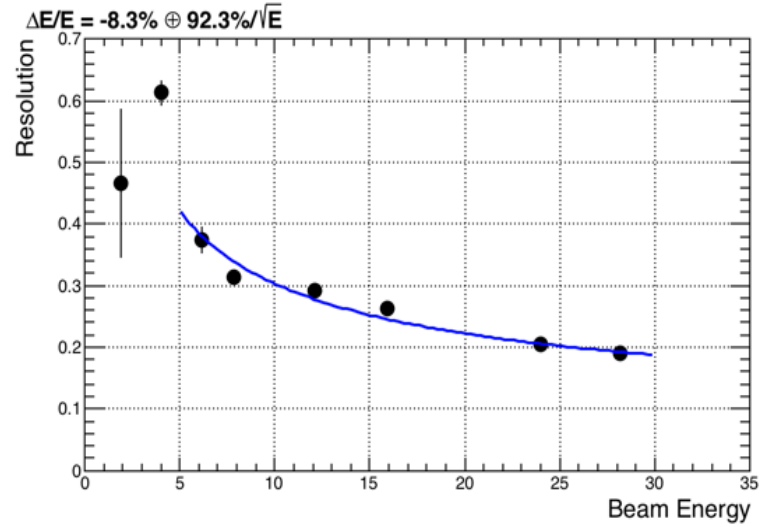


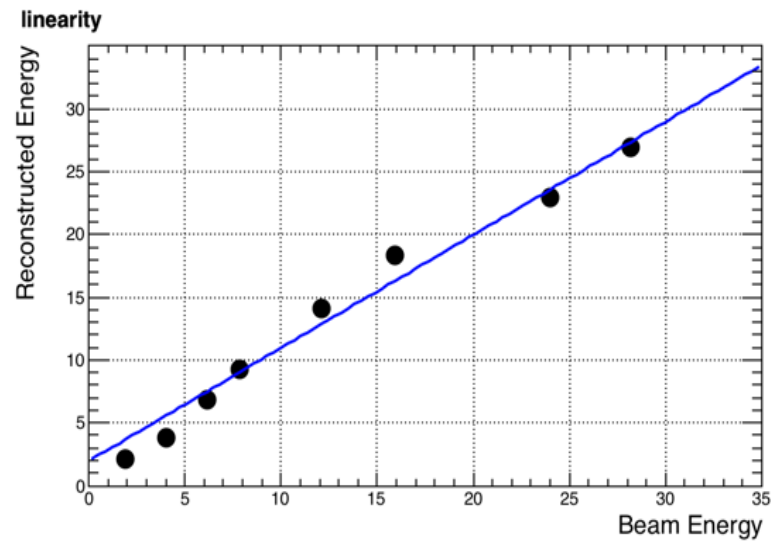
P2 ~ 2 with respect to HCAL.
What is EMCAL e/pi ?

Reco_E = P0 * E_inner + P1 * E_outer + P2 * E_emcal
Left the weights as free parameters. Significant improvement of the resolution.

Total reconstructed energy



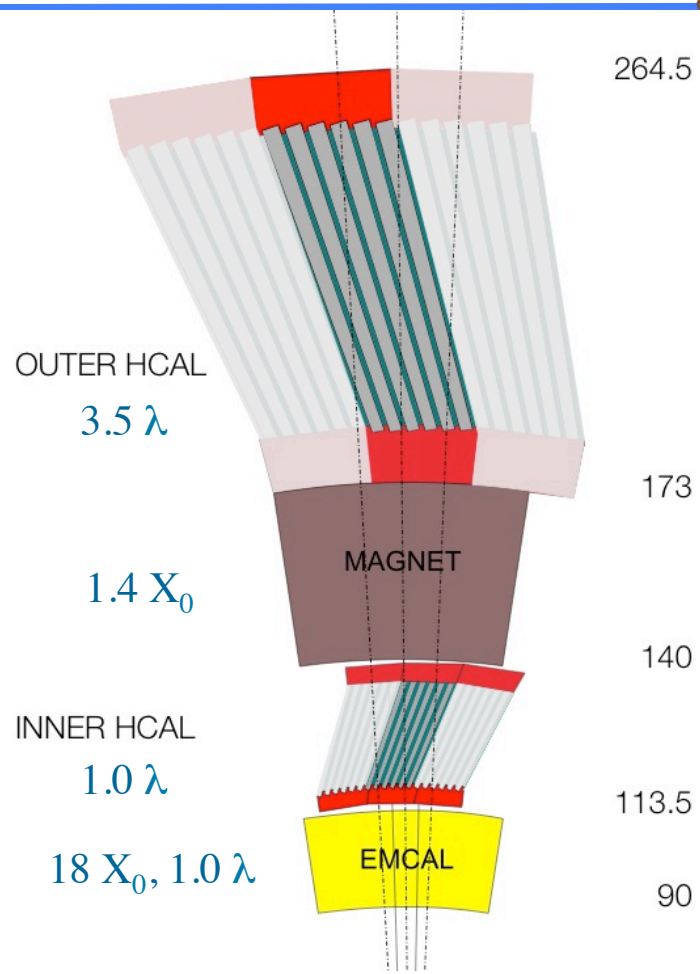




Work in progress!

BACKUP

Interaction lengths



EMCAL + HCAL ~ 5.5 λ