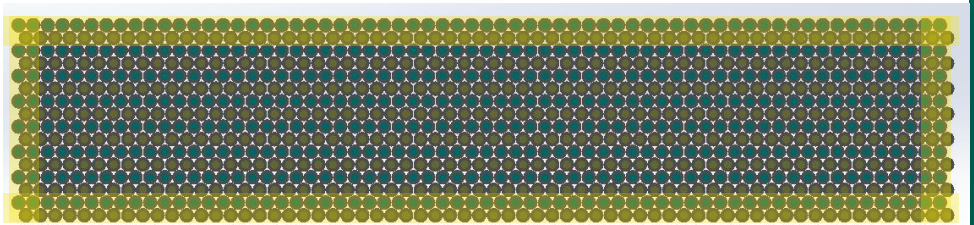
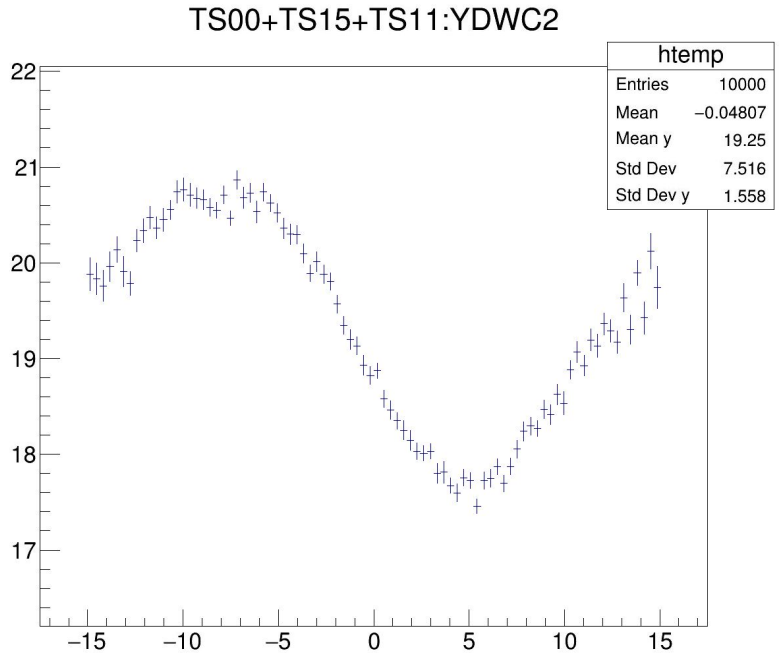
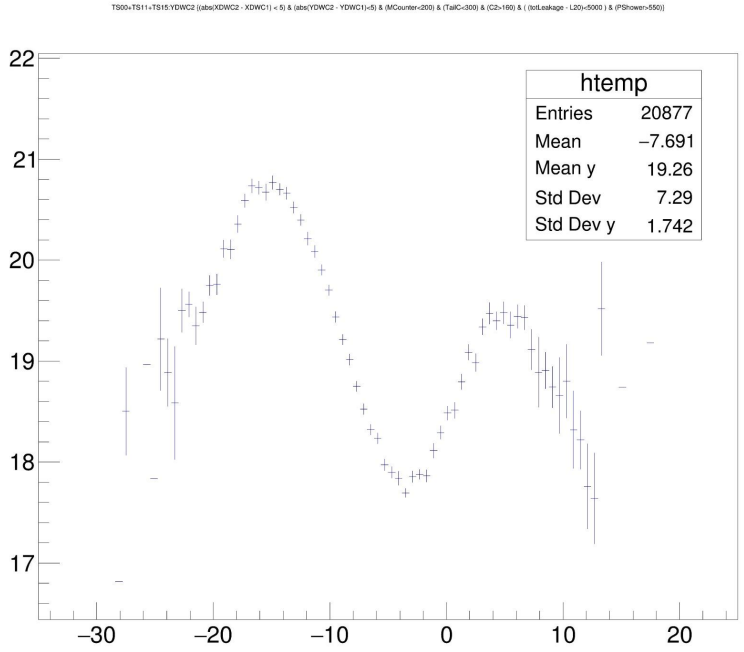
Test Beam 2024
Electron and Pion beam analysis

Andrea Pareti - 21/01/2025

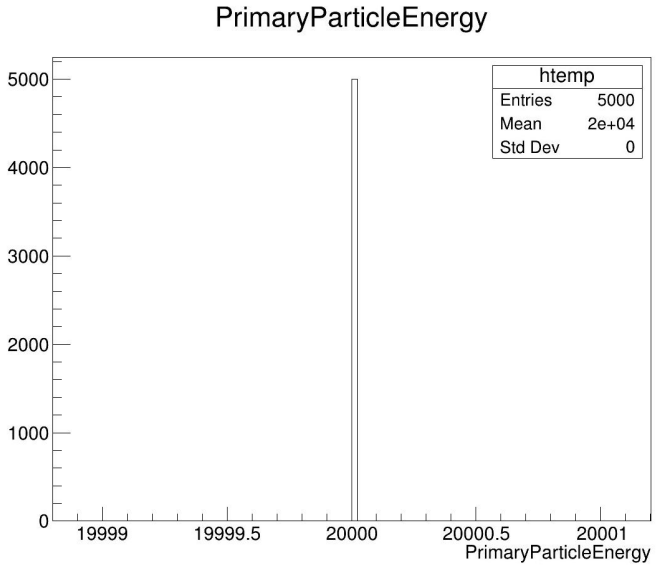
Tried to reproduce signal dishomogeneity in simulation
-> associate a 70% probability to each optical photon to be read out, if it belongs to the first and last two rows/columns



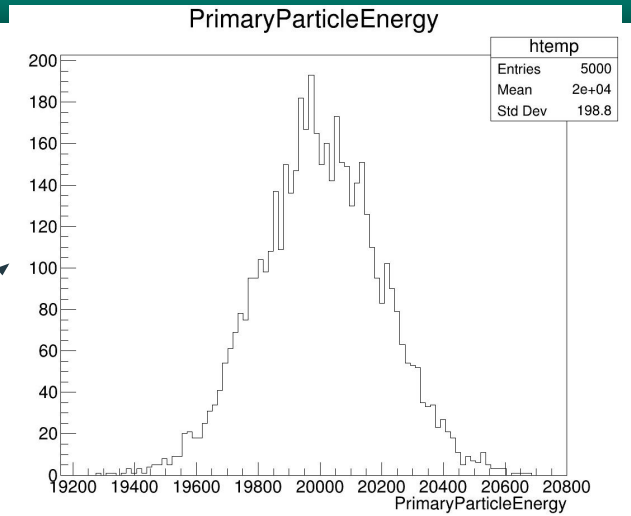




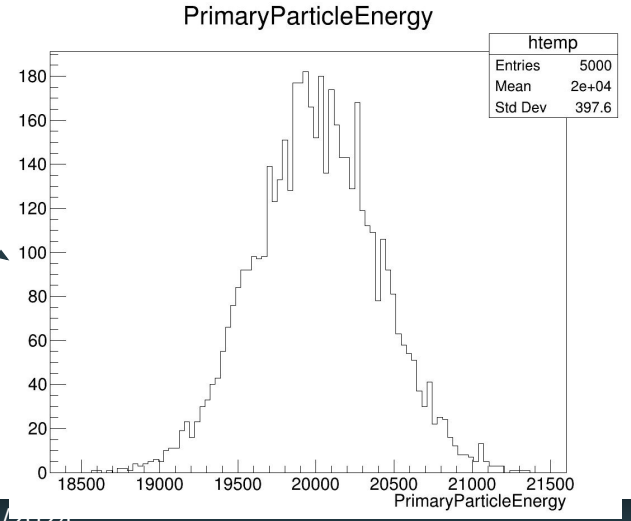
Adding beam energy spread

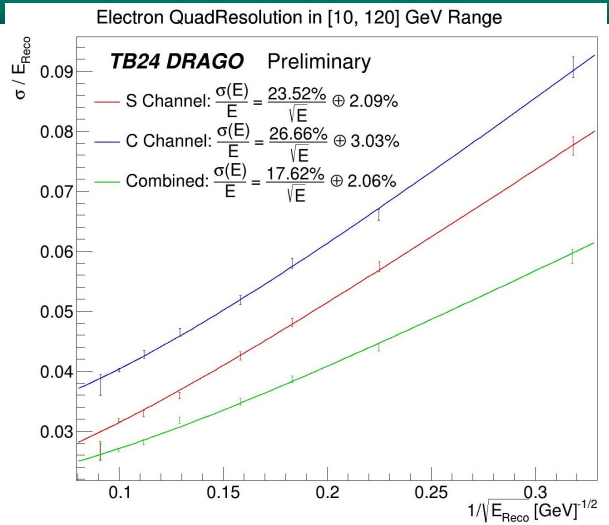


1% spread



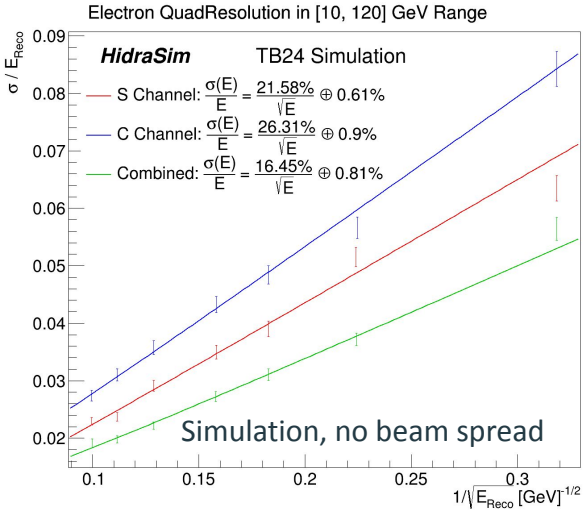
2% spread

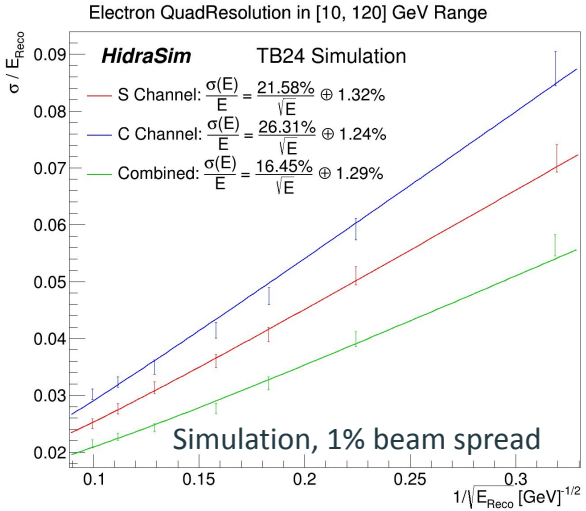


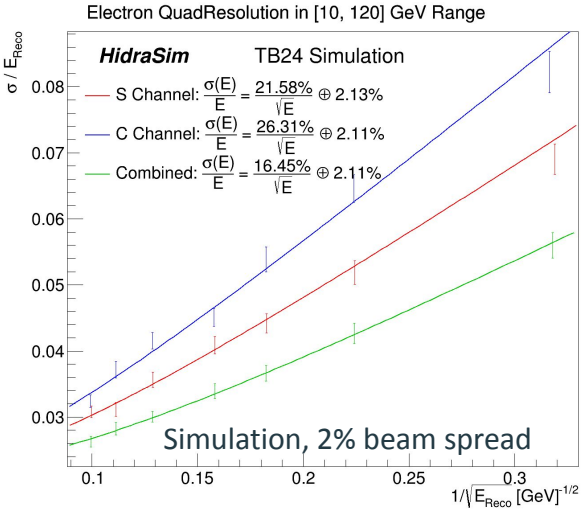


Test Beam data

Forcing the same parameter for stochastic term as the one with zero beam spread







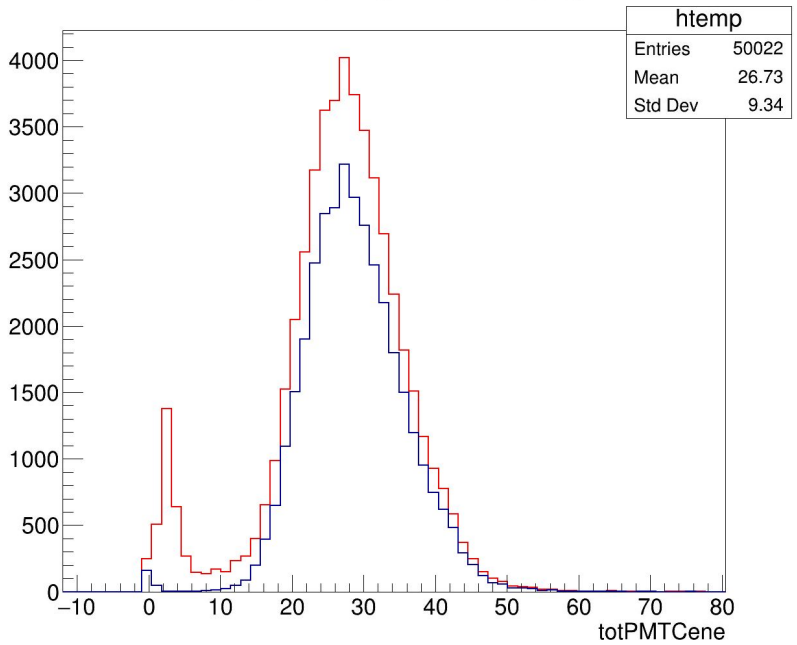
A first look into pions

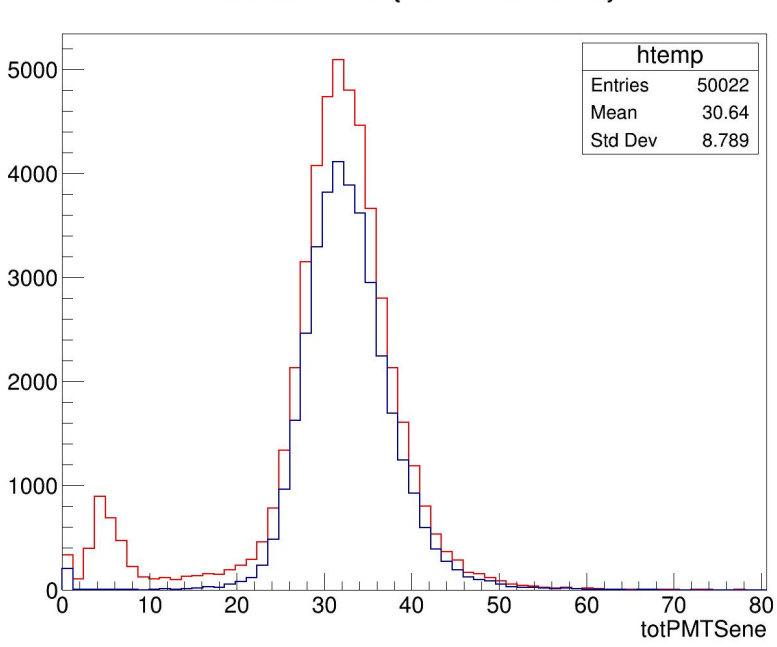
Starting from first pion runs (old HV), runs = ["0714", "0715", "0716", "0717", "0718", "0721"]

Using cuts: "(abs(XDWC2 - XDWC1) < 5) & (abs(YDWC2 - YDWC1)<5) & (totPMTSene>0) & (PShower<500) & (TailC<400) & (totLeakage<7000)"

Red histogram without cuts (only S signal >0); Cerenkov counters cut tested but mostly reduce signal under peak (work ongoing)

40 GeV pions, run 0715



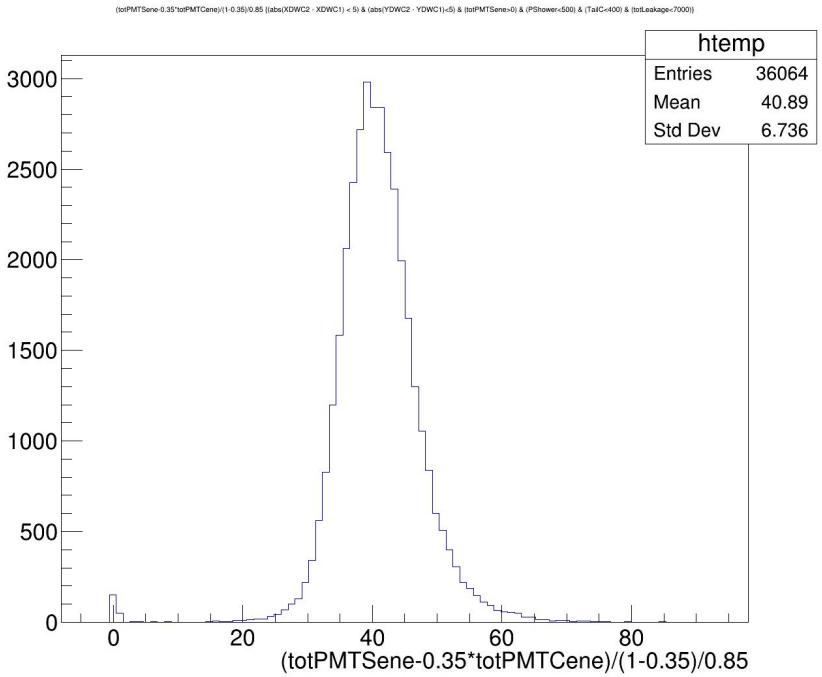


A first look into pions

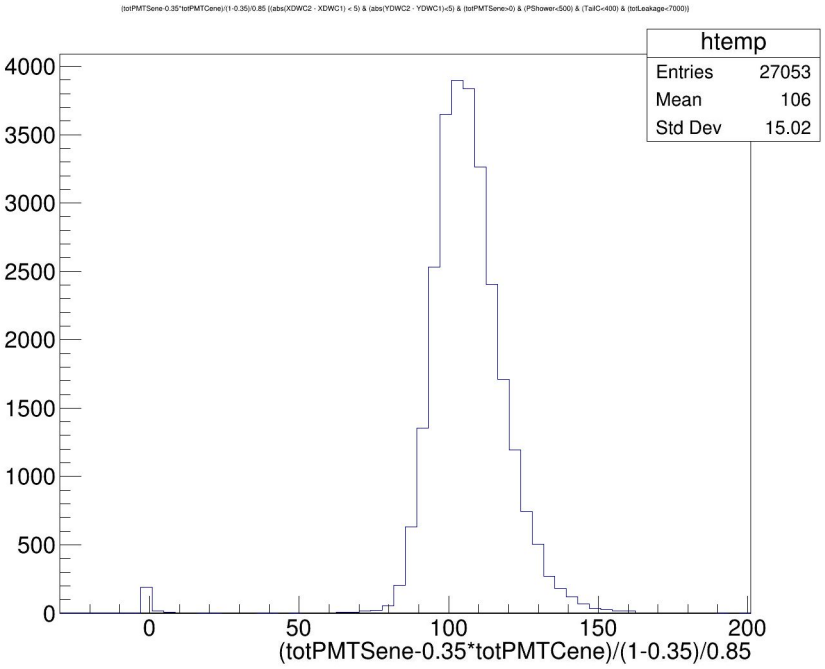
From DRAGO simulation studies: chi = 0.35, containment = 0.85

Reco E = (totPMTSene-0.35*totPMTCene)/(1-0.35)/0.85

40 GeV pions, run 0715



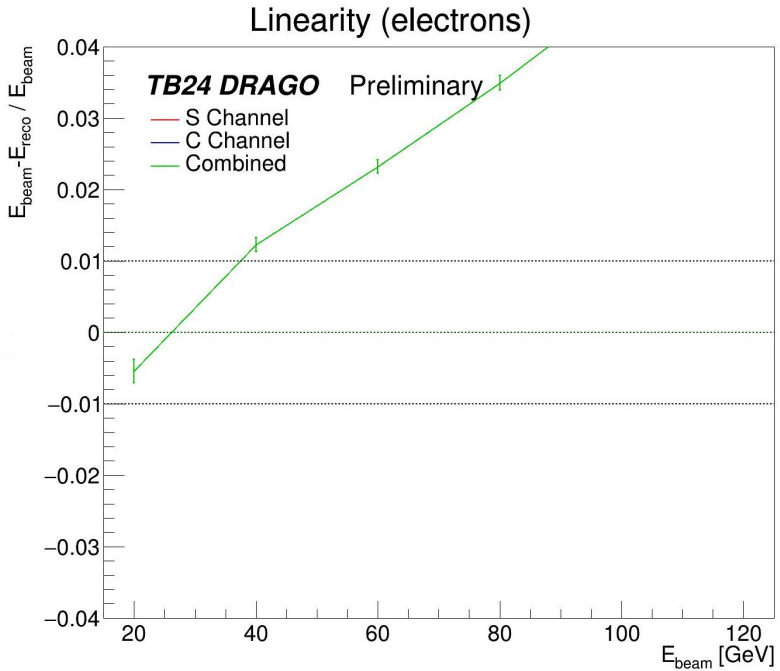
100 GeV pions, run 0718

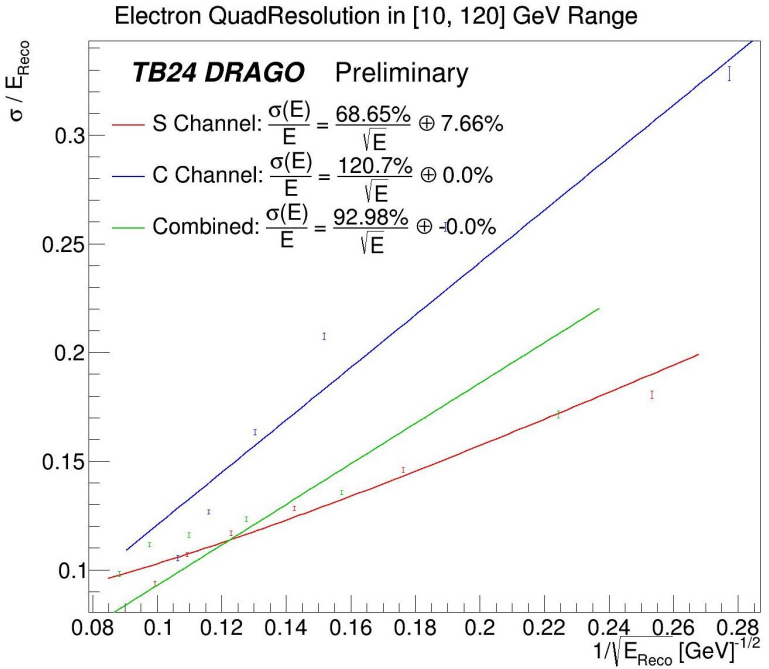


A first look into pions

From DRAGO simulation studies: chi = 0.35, containment = 0.85

Work in progress :)



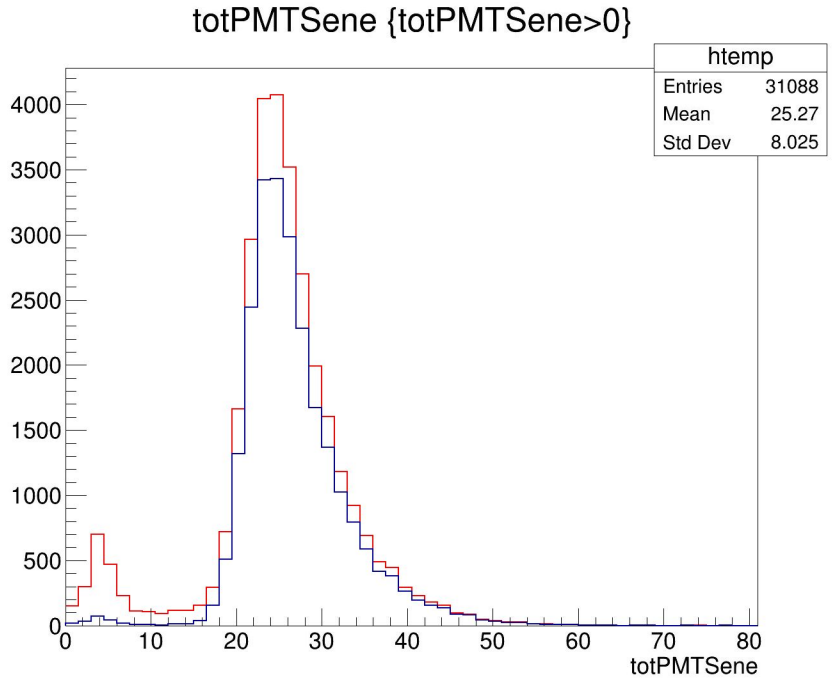


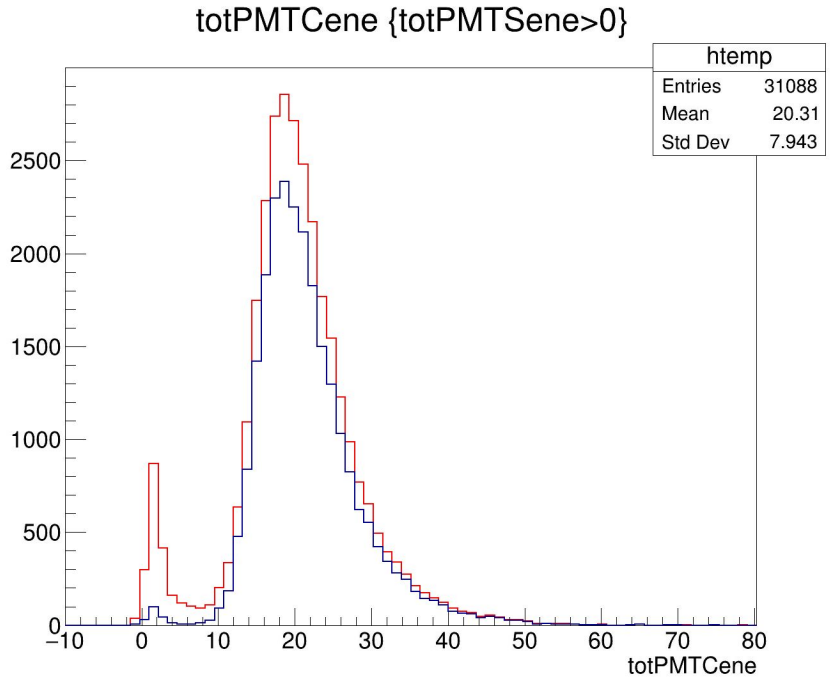
A first look into pions

From DRAGO simulation studies: chi = 0.35, containment = 0.85

Using “newHV” runs = ["0968", "0967", "0966", "0965", "0963", "0962"]

Using cuts: "(abs(XDWC2 - XDWC1) < 5) & (abs(YDWC2 - YDWC1)<5) & (totPMTSene>0) & (PShower<500) & (TailC<400) & (totLeakage<7000) & (MCounter<150)”





A first look into pions

From DRAGO simulation studies: chi = 0.35, containment = 0.85

Using “newHV”

(totPMTSene-0.35*totPMTCene)/(1-0.35)/0.85

Always lower than nominal E -> is calibration correct for these runs?

Important high-energy tail contribution, probably due to short (3.5 m) attenuation length