FCC calorimeter jets

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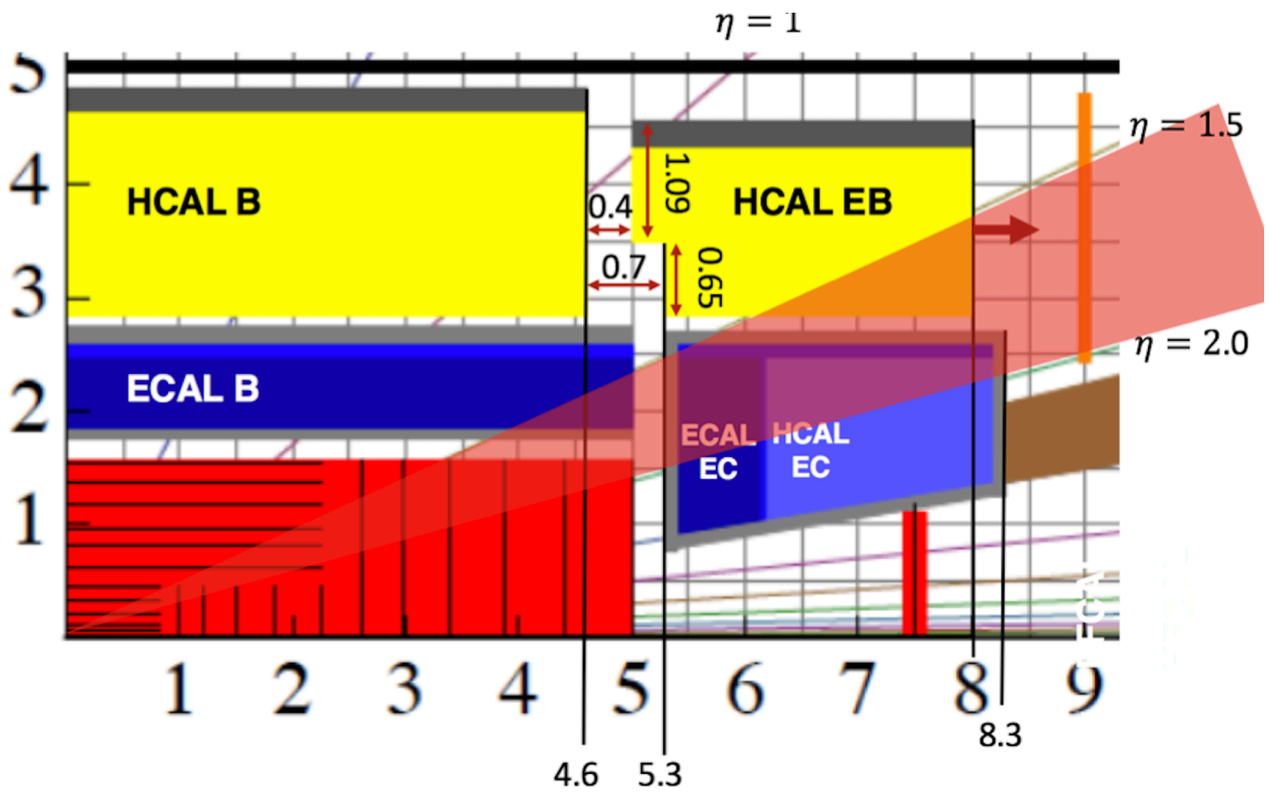
Outline

- Goal:
  - study of **jet performance** using ECAL/HCAL barrel digitised calibrated (EM scale/upstream material corrections) cells as input
    - no electronic noise, no pile-up

- List of studies:

  - Jet response/resolution (reco/gen) as function of p_T
  - Longitudinal jet energy profile
  - Radial jet profile as function of depth

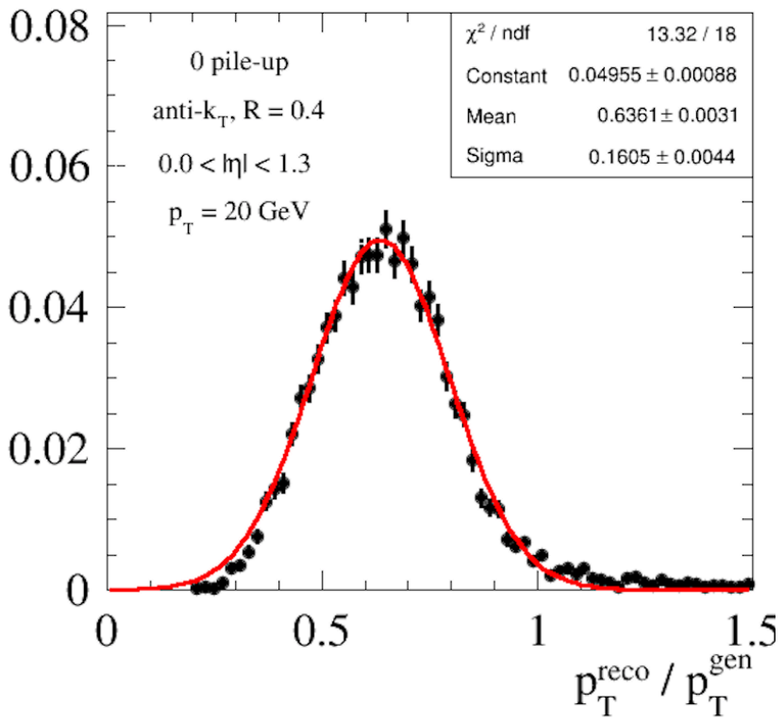
Context

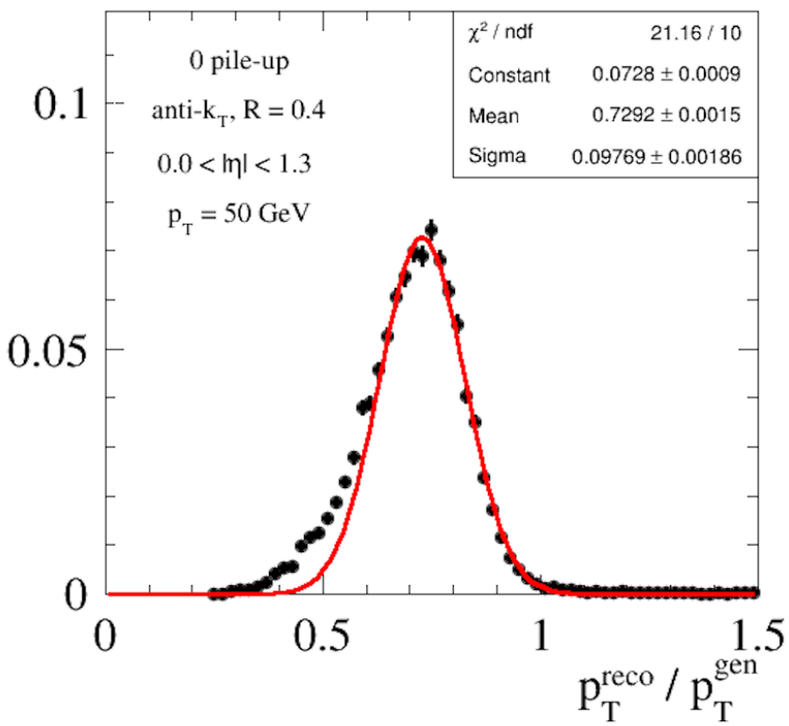


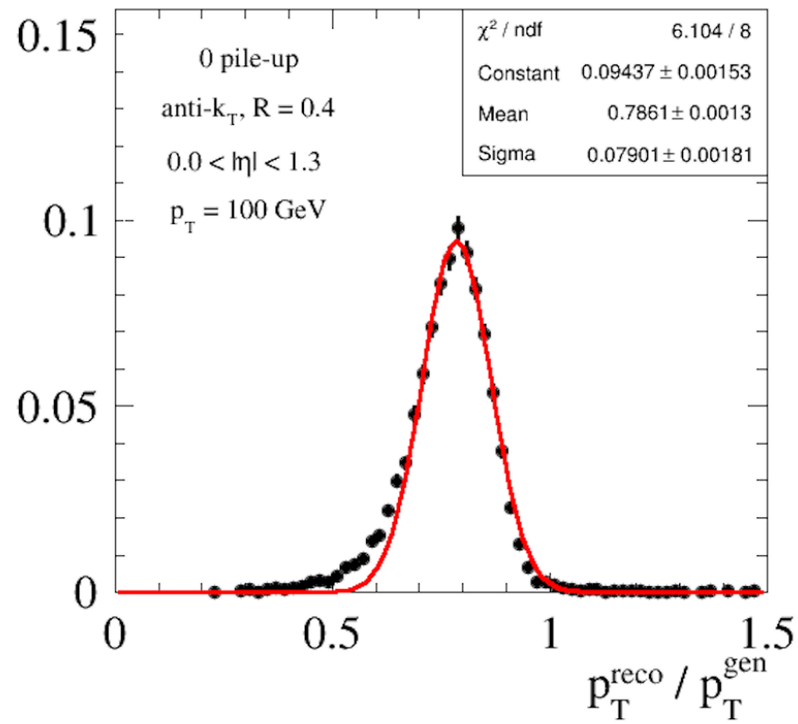
- Samples produced with FCCSW:
  - QuarkDijetPt*GeV, * = [20,50,100, 200, 500, 1000, 2000]

- Reconstruction:
  - input from flat ntuples:
    - all barrel **digitised cell** (no noise threshold) for **reco-jets**
    - stable pythia8 particles (no neutrinos) for **gen-jets**
  - clustering algorithm:
    - fastjet3.3.0 python AK jets, R = 0.4

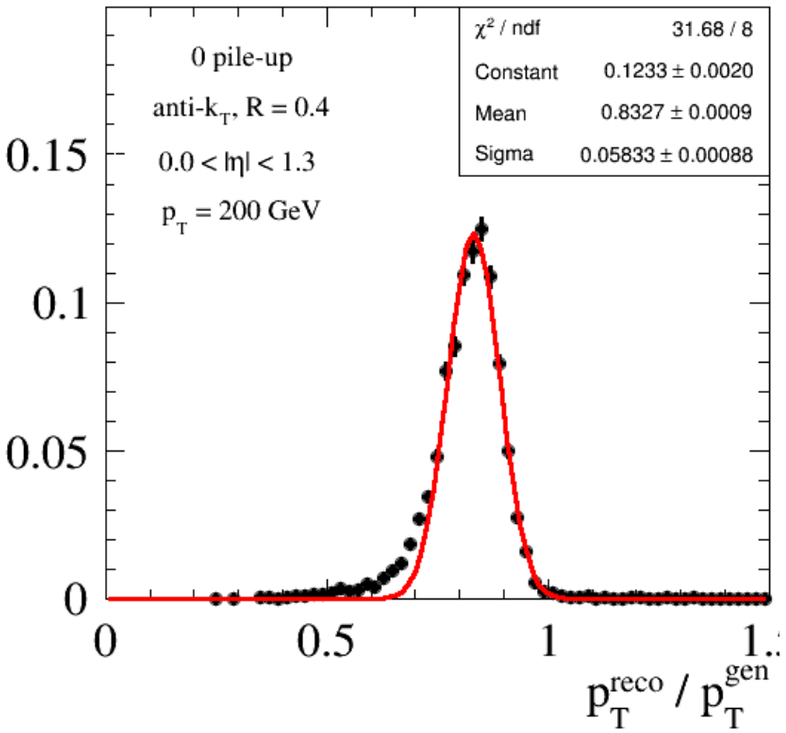
Jets pT response - 20-50-100 GeV

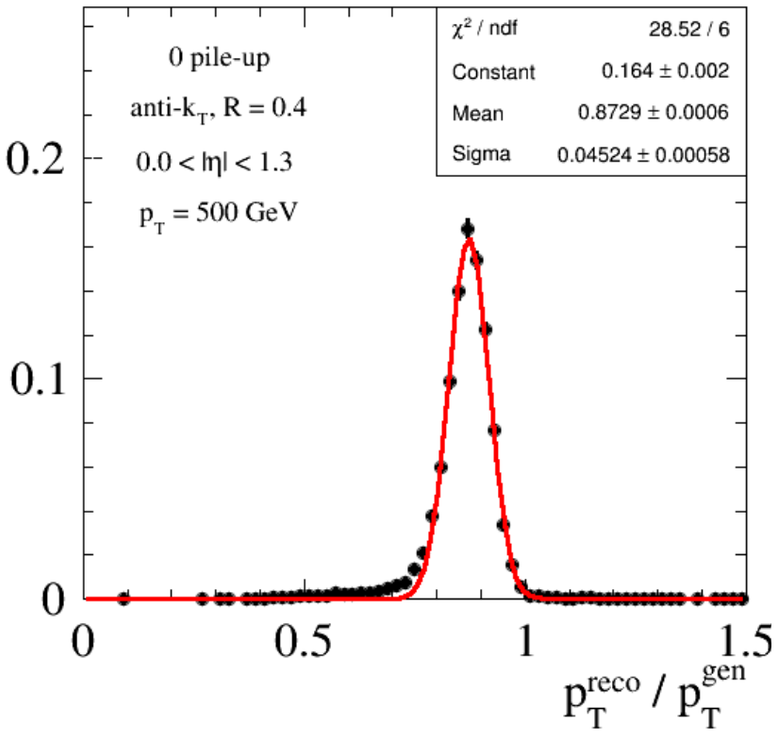


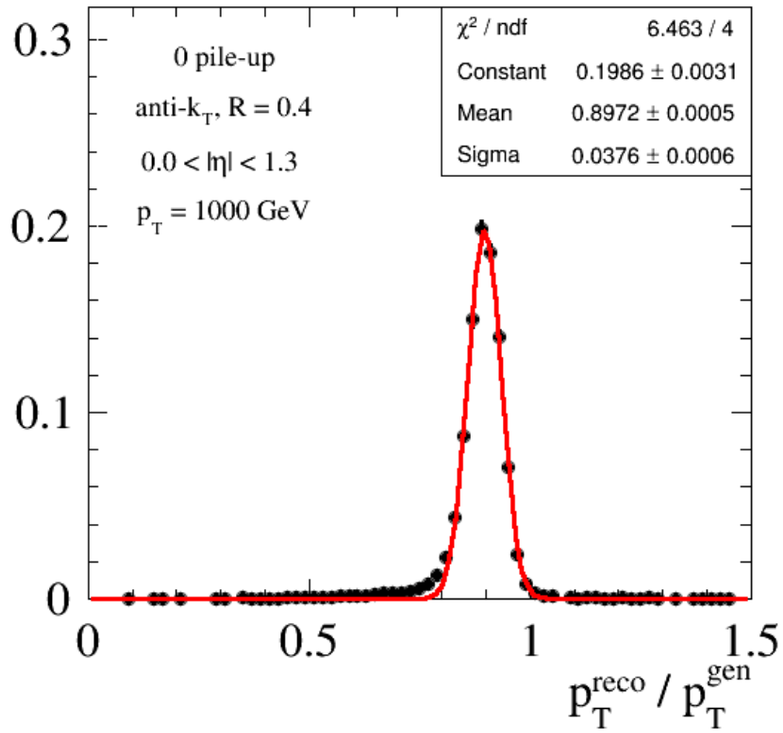




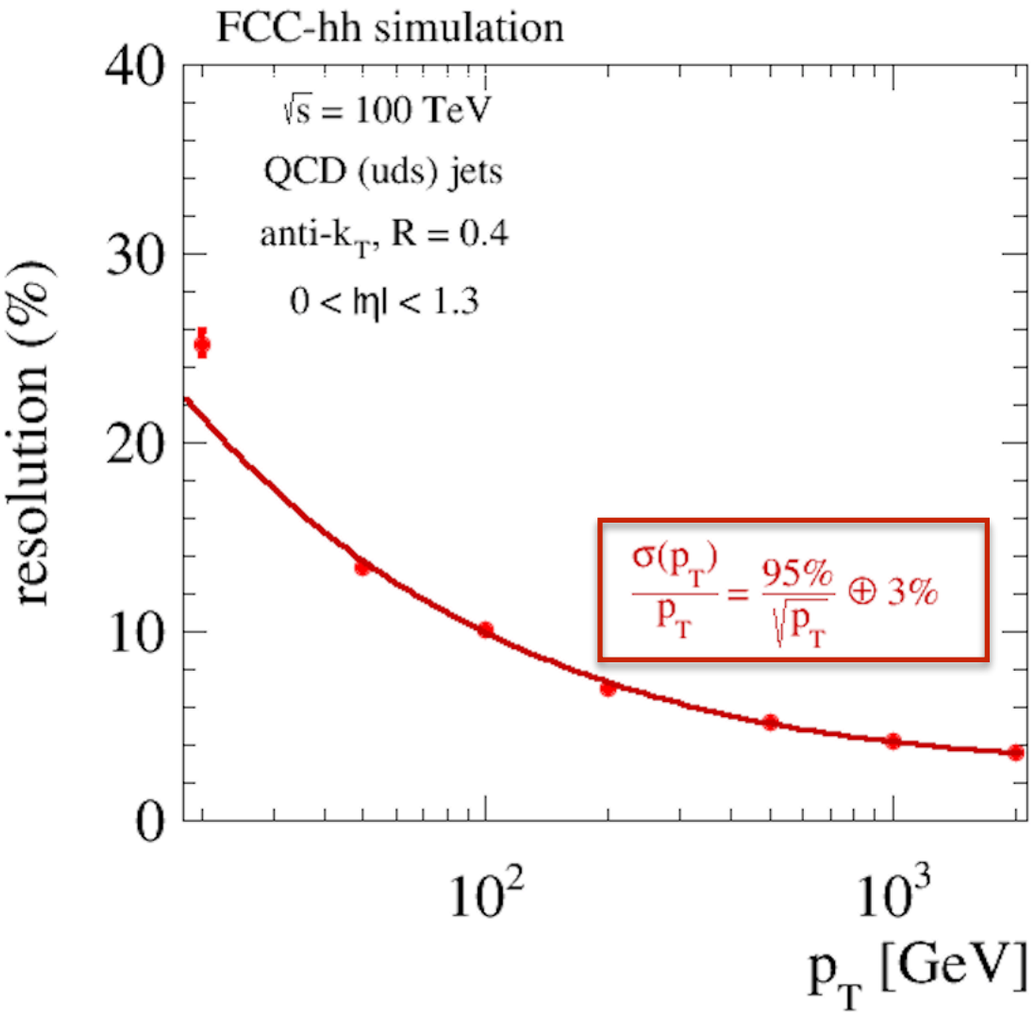
Jets pT response - 200-500-1000 GeV

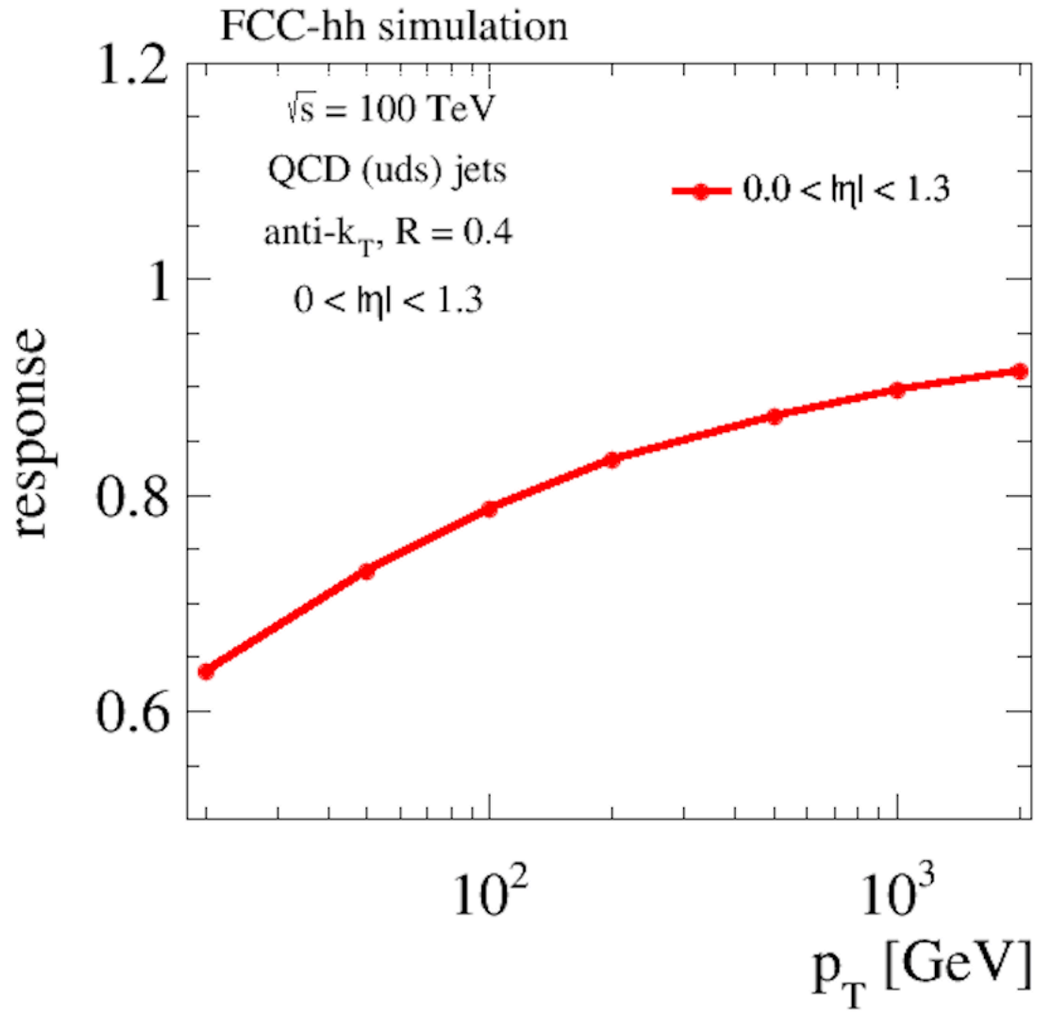






Jets pT resolution/response

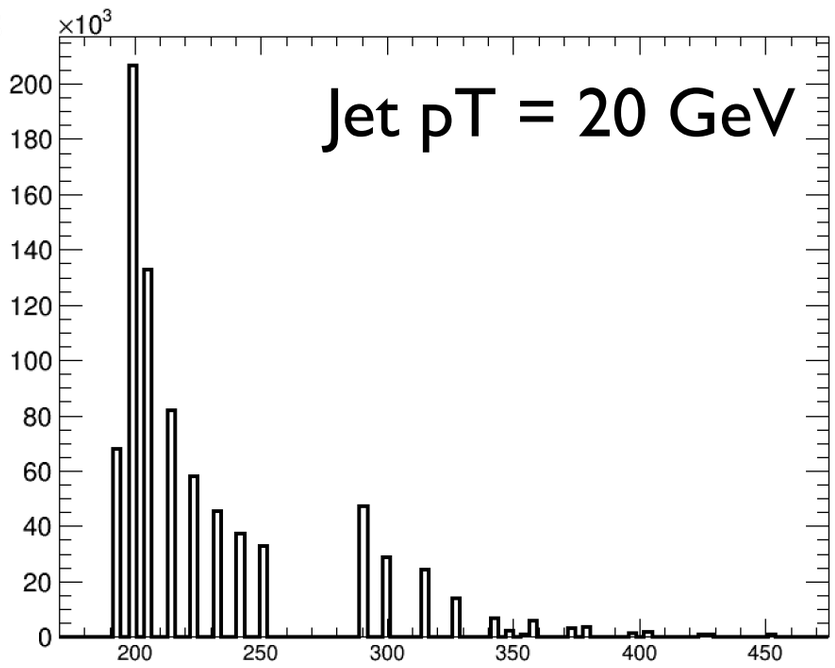




FCC calo jets

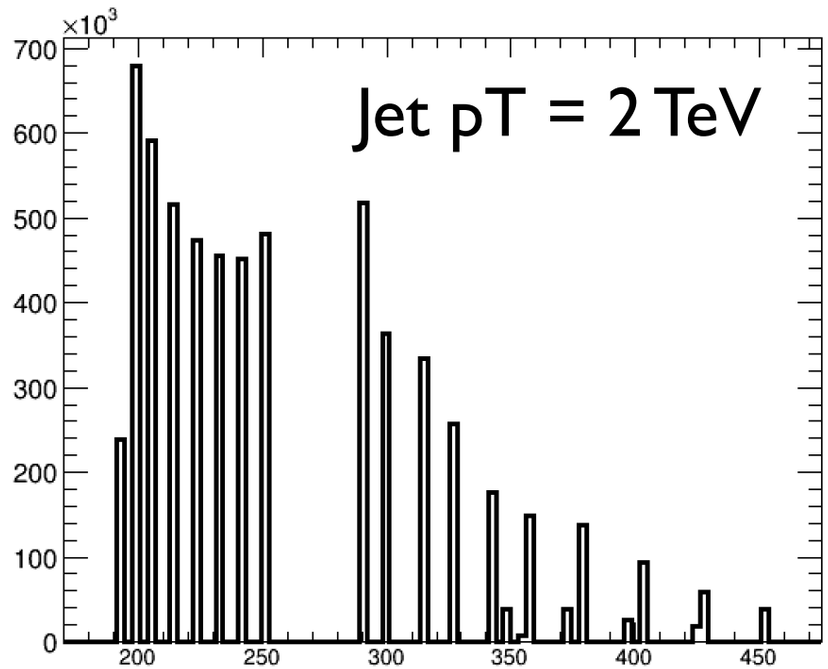
Longitudinal Jet Energy profile

rechits

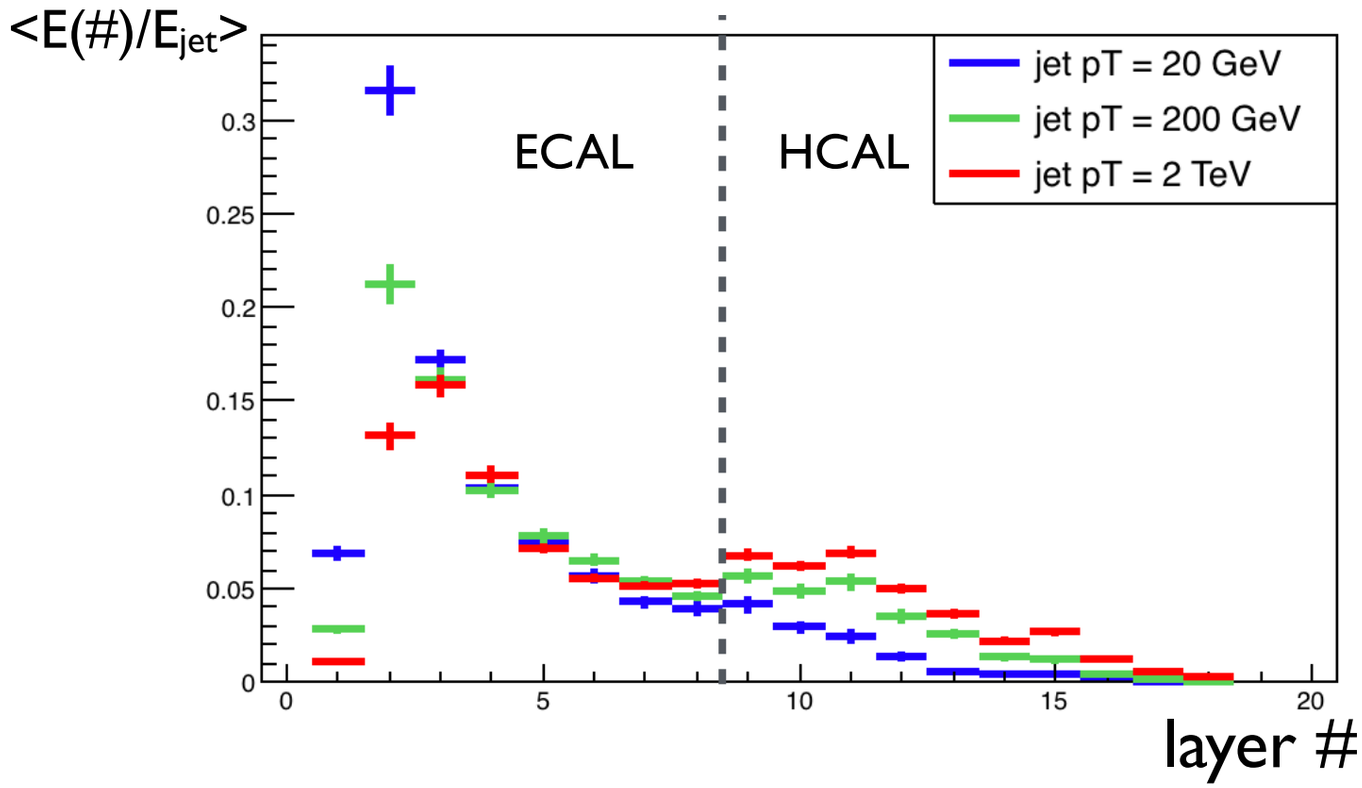


r(m)

rechits



r(m)



layer #

Conclusions

- First combined jet reconstruction using ECAL/HCAL cells has been performed with no PU
- Jet response/resolution have been studied over wide energy range
- Excellent performance has been observed : ~ 3% at high pT
- Further studies can be easily performed:
  - jet substructure observables
  - topo-clustering as input (when ready)
  - impact of pile-up on performance and rejection