Weekly report

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24/June/2021 RBRC weekly meeting

Inclusive double differential cross section meas.

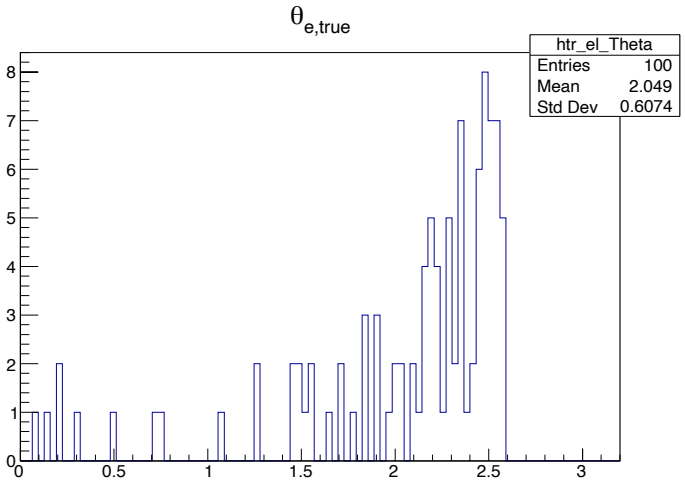
- Generation of DJANGOH MC events
  - Need of high-Q^2 MC samples for NC cross section measurement at high-x.
  - Full simulation needed for study of hadron side either.

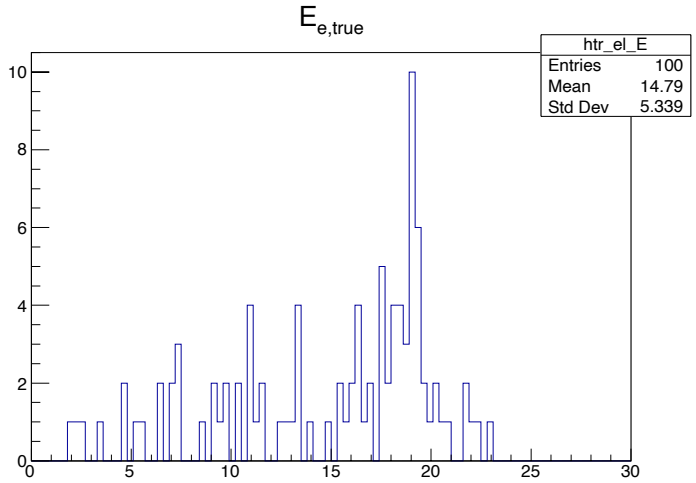
  → Check the statistics on the kinematic plane. (Another file)

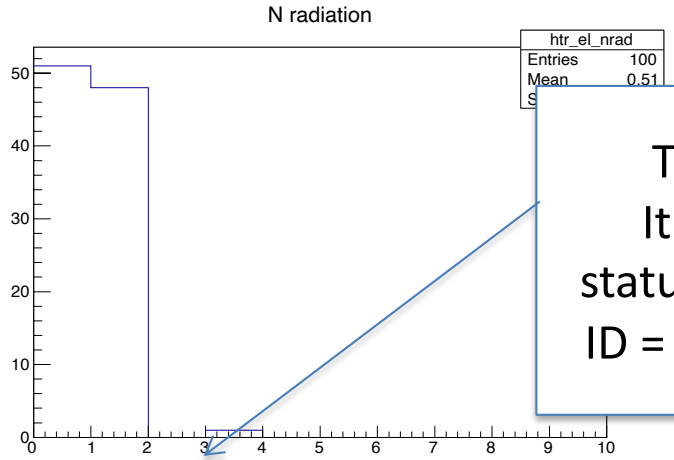
- Study of 100 events after the detector simulation.
  - Looking at calorimeter clusters.

100 events analysis of NC $Q^2 > 100\ GeV^2$

- Truth electron distributions



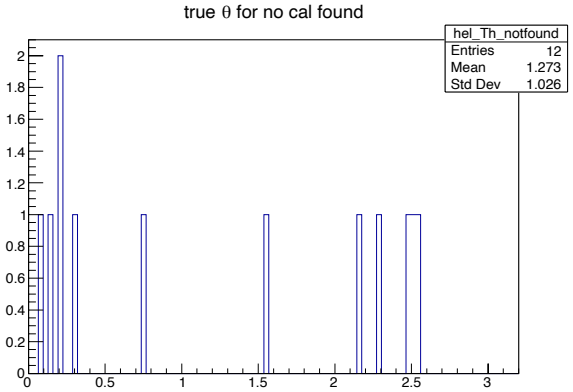




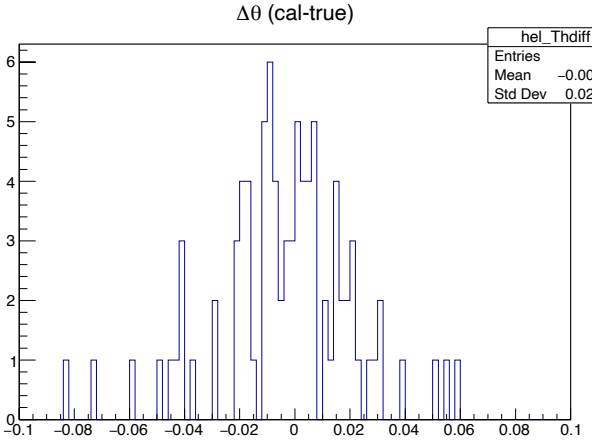
This one is not yet understood.
It contains particles with hepmc status=1 (final state particle) but PDG ID = 2 (u-quark) and 90 (MC internal).

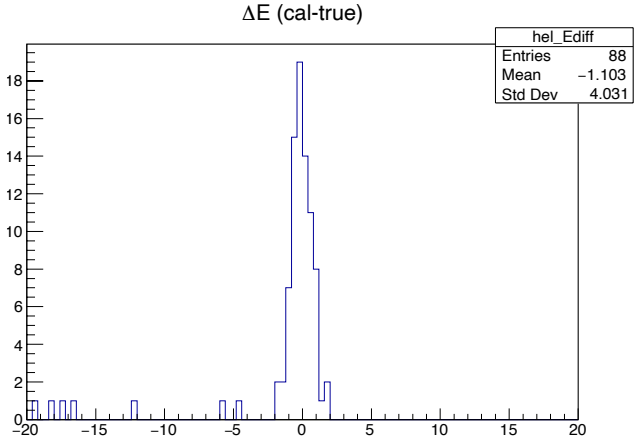
Electron matching to calorimeter clusters

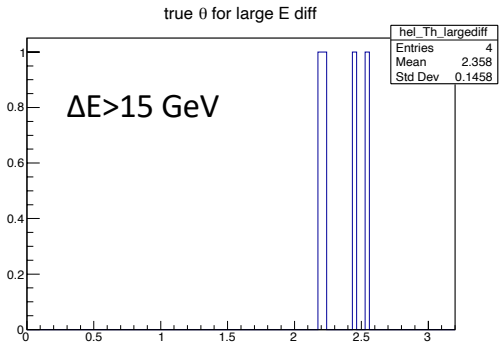
- Calorimeter clusters in a (η, ϕ) cone of 0.1 from the truth electron are considered as electron candidates.
  - 12 events fails matching.
    - If truth electron is in forward, matching fails.
    - All of them have a radiated photon.
      → Next plan:
      Correct the angle of truth electron, for radiative photon



  - A few events show large energy difference between the candidate and truth electron.
    - These events don't contain clusters with E>10 GeV, while $E_{e,\,truth}$~18 GeV.

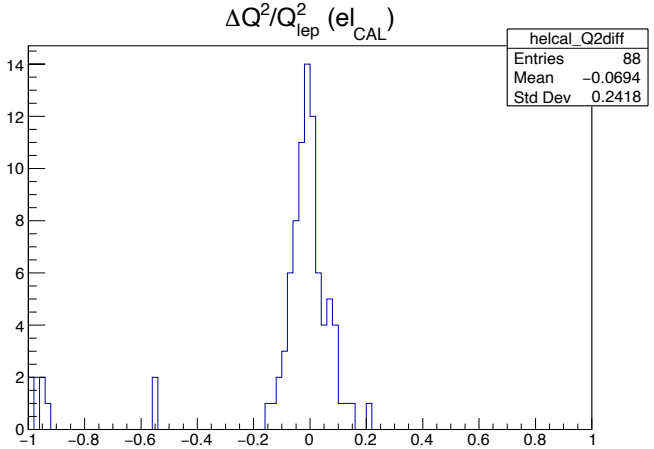


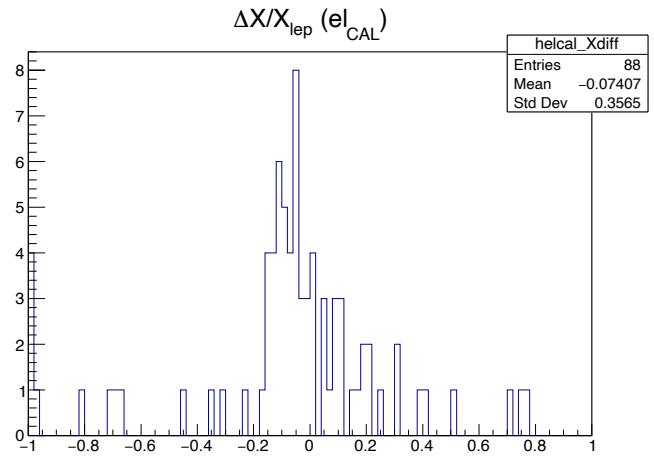


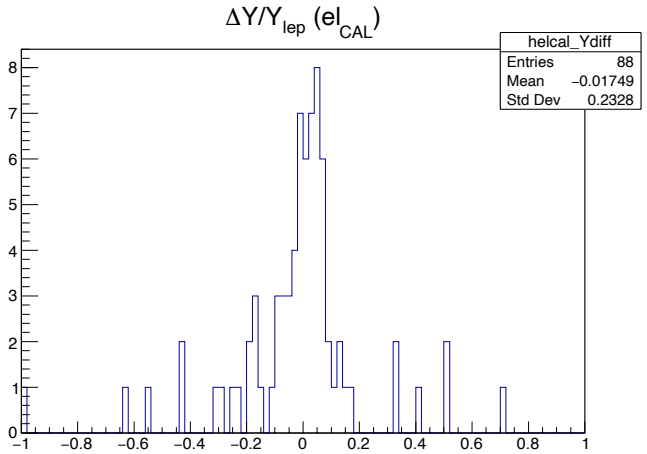


Electron method vs true leptonic kin. variables

- Electron method is applied for found electron candidates, i.e. calorimeter clusters.
  - Not bad as a first trial.







Plan: Look into hadron side.

1. Calorimeter-base study:
   Consider unmatched calorimeter clusters as hadrons.
   Backsplash? Mass?
2. Particle-base study:
   Can I make use of “trueID” of calorimeter clusters?