DPDF Meetings

OCT. 14TH

Follow ups

- Email Alex to make sure that info I read for Far Forward detectors is correct.
- He said the info is right, but the resolution looks unnaturaly bad (as we discussed last time).
- Response and reminder sent. (see next slide)

Question:

- '*t*' distribution overall resolution seems funny
- I also asked Oliver Jevons: (response today)

Hi Hadi,

From what I've got from Alex Jentsch, it looks like the RP resolution has been made artificially poor whilst the team works on the reconstruction algorithm. Hopefully, a first pass at a better algorithm should be available in EICrecon either now or soon. For now, don't worry too much about it.

Cheers,
Oliver

Task:

- Create new sample w/ and w/o rad. corrections.
- New 100k samples with the agreed steering cards
- Newest EICRecon software 1.29….
- Afterburner and ddsim steps done
- The reconstruction step remains (~24 hrs)

EICrecon branches needed

- MCParticles:
  - Contains all MC truth particle information – AFTER THE AFTERBURNER HAS BEEN APPLIED
- ReconstructedParticles:
  - Contains most reconstructed particle properties – everything from the central barrel,endcaps and low-Q2 tagger
- ReconstructedTruthSeededChargedParticles:
  - Information about charged particle tracks, reconstructed with truth seeding – NEEDED FOR B0 PROTONS
- FarForwardRomanPotRecParticles:
  - Information for tracks detected within the Roman Pots.
- ReconstructedParticleAssociations and
- ReconstructedTruthSeededChargedParticleAssociations

Undoing the afterburner

- First species looked for should be the beam particles (generatorStatus == 4).
  - The boosts and rotations used for removing the afterburner effects are calculated using the beams.
- Procedure:
  - Start by assuming perfect beams from file (electron – only down z-axis; proton – 25 mradrotation in the x-component).
  - Boost into centre-of-mass frame of the beams → CoM boost vector
  - Rotate this 2 beam system to align along the z-axis → Rotation matrix (x); Rotation matrix (y)
  - Boost the beams back to the head-on frame (to make the beam momenta correct) → HoFboost vector
  - Modify mass of final vectors to match input vectors.
- Process for applying to other particles: CoM boost → Rotation X → Rotation Y → HoF boost →fix mass.

Dealing with reconstructed particles

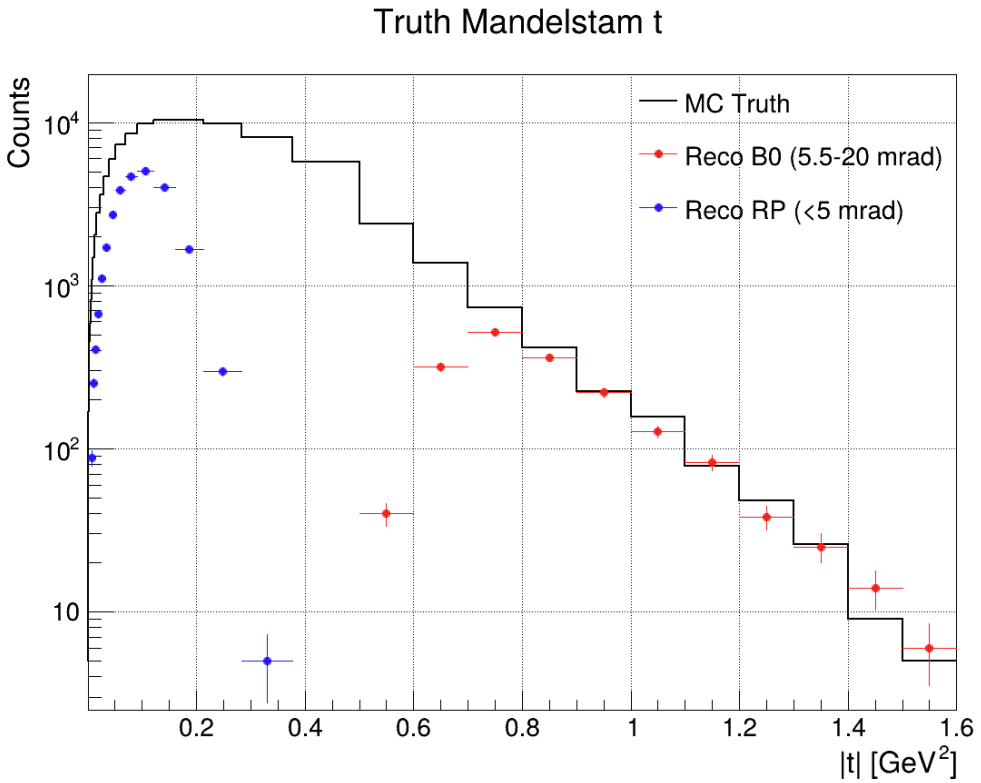
- ReconstructedParticles.PDG branch contains simulated ePIC PID response.
    - Still needs a LOT of work → better to do another form of PID for now.
- Roman Pot particles do not need to have the afterburner removed!
- What people suggested:
    - Using charge of particle (valid if not expecting more than 1 of given charge)
    - Using calorimeter cluster information (to identify electrons)
    - Using exact matching to MC partner particle.

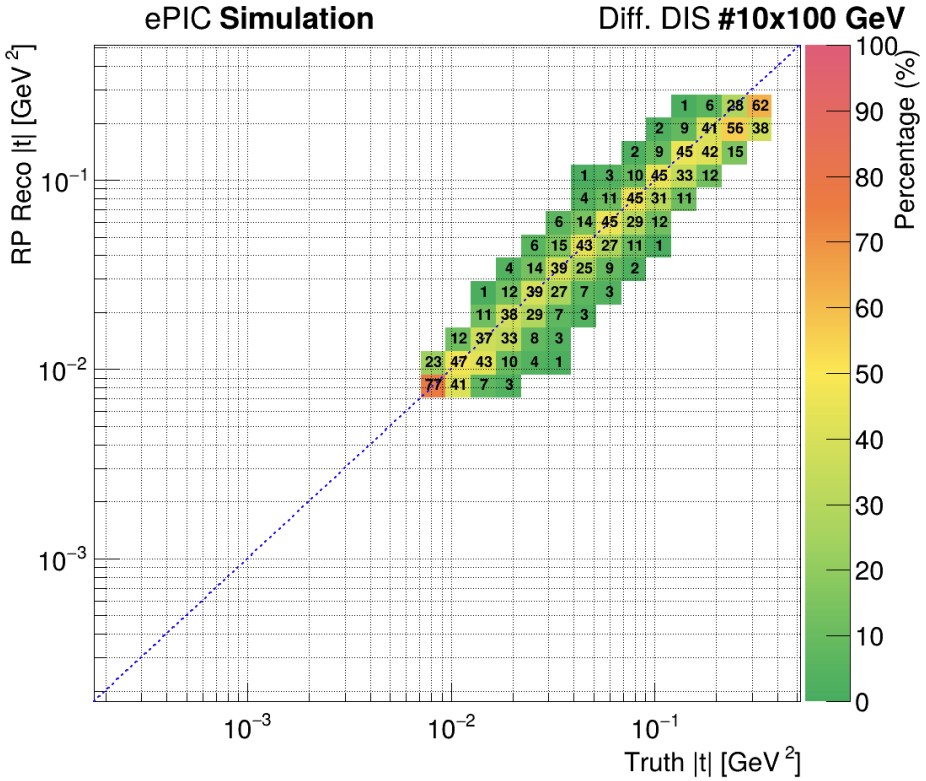
Exact MC matching

- ReconstructedParticles.recID contains 1 entry for each object in ReconstructedParticles.
- ReconstructedParticles.simID[rec_index] gives the index in MCParticles of the matching MC particle object.
- Can use mc_pdg[sim_index] to get PID code of associated MC particle – can use this to identify the species for the reconstructed particle object.

Task:

- 't' Res. Mat. With more 't' bins in low 't'





Task: Sigma method

Next:

- I'll work on the plot like the one Stephen Maple showed (low priority)
- I have to make sure the 't' distribution is right, it is the most important kin. variable in this analysis.