News

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Dec. 7, 2015

Outline

- MCC5.0 status
- WireCell Workshop

MCC 5.0 Status

- MCC 5.0 was launched last week using larsoft/dunetpc v04_30_01.
- Plan to generate 38 samples with the help of OPOS.
- 21 samples have been finished.
- Thanks to many people's efforts to make the production a success.

- Robert Sulej and Mike Wallbank were tirelessly debugging their code until the last minutes before tagging the frozen release (right before thanksgiving).
- Dominic Brailsford generated both neutrino and antineutrino flux ntuples.
- Karl Warburton and Gleb Sinev implemented cosmogenics and supernova generators.
- OPOS interns submitted and monitored all the jobs and gave us very useful feedback.
- Many people contributed.

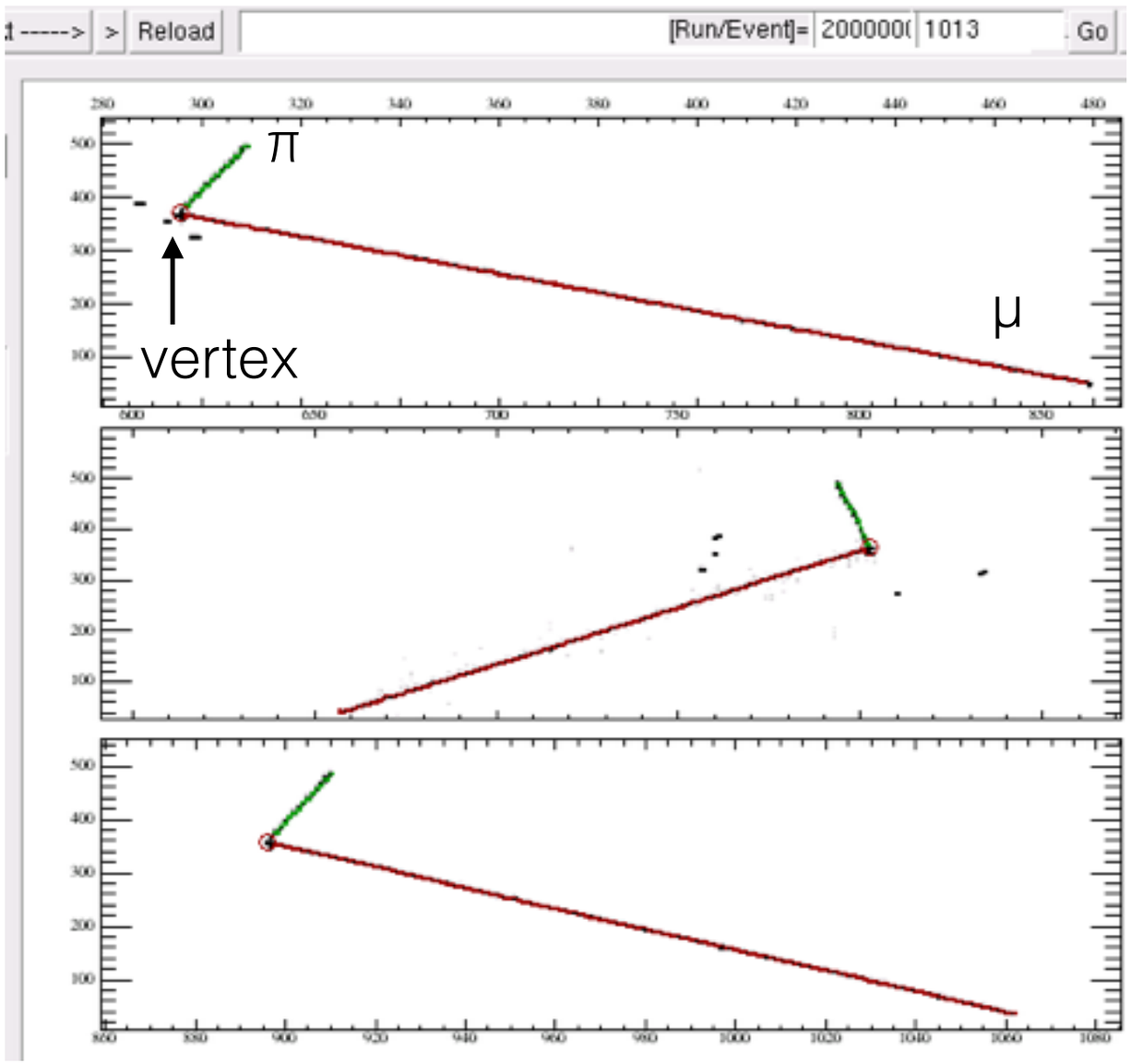
Samples

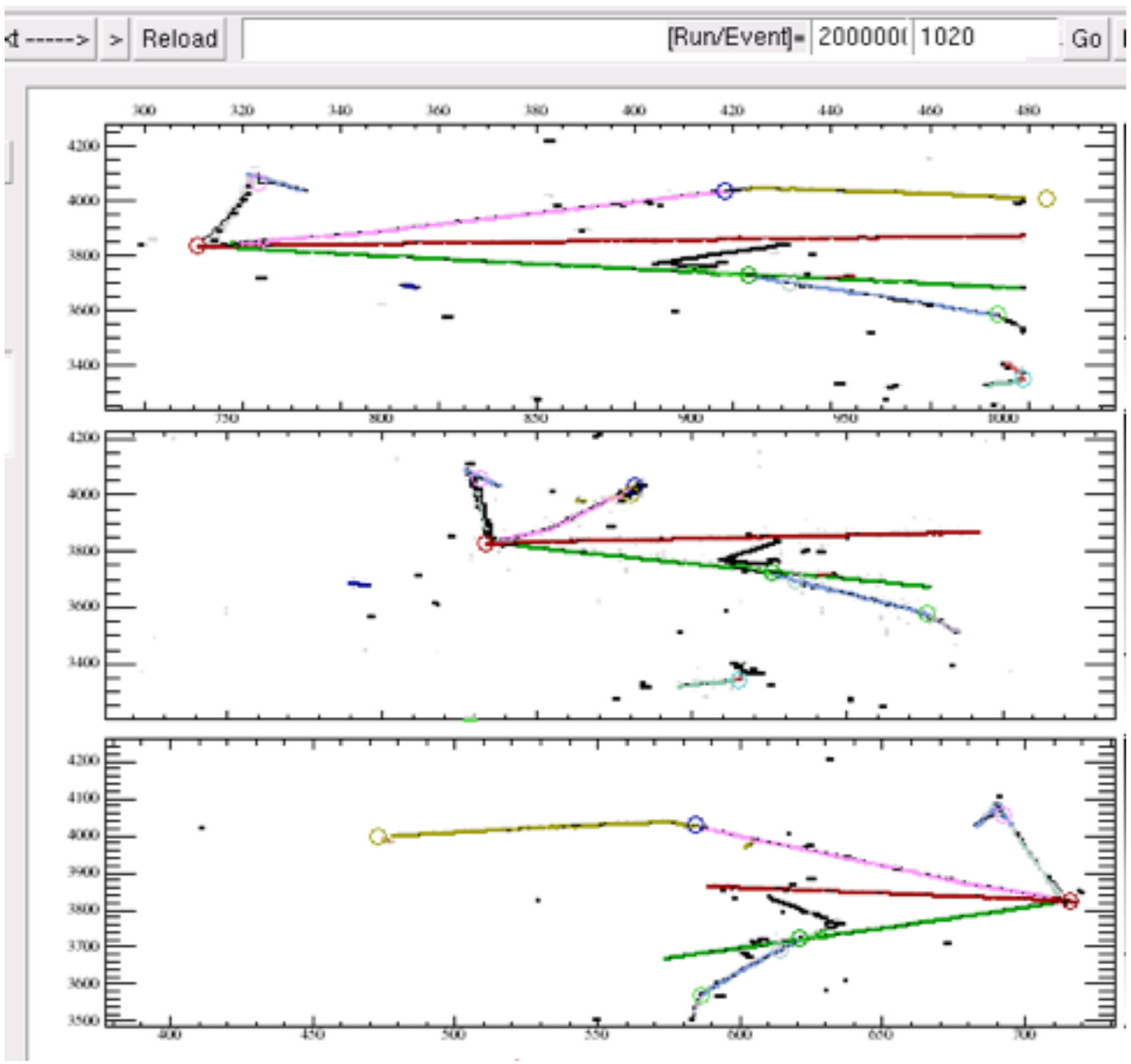
- 35t single particles: mu+, pi0, pi-, gamma
- FD
  - Single particles: mu-, p, K+, pi-, pi0, e-, gamma
  - Beam neutrinos: numu, nue, and nutau samples
  - Cosmogenics: MUSUN (only detector simulation)
  - Supernova samples
  - Various configurations: wire spacing, wire angle, TPC orientation
- https://cdcvs.fnal.gov/redmine/projects/dunetpc/wiki/MC_Production

5 Stages

- gen: generator
- g4: GEANT4 simulation
- detsim: digitization
- reco
    - Signal processing: Xin Qian and Leon Rochester.
    - Disambiguation: Tom Junk and Tingjun Yang.
    - 2D hit and cluster reconstruction: linecluster (Bruce Baller) and blurredcluster (Mike Wallbank).
    - 3D track reconstruction: pandora (Andy Blake, only for 35t in this production) and pmtrack (Robert Sulej, Dorota Stefan).
    - 3D shower reconstruction: emshower (Mike Wallbank) and mergeemshower3d (Dorota Stefan)
    - Vertex Reconstruction: linecluster, pmtrack.
    - Two versions: one with cheated disambiguation one with disambiguation using reconstruction information.
    - Flash reconstruction: OpFlash (Gleb Sinev and Alex Himmel).
- Mergeana: merge art files and produce anatree files. Merged art files are uploaded to enstore.

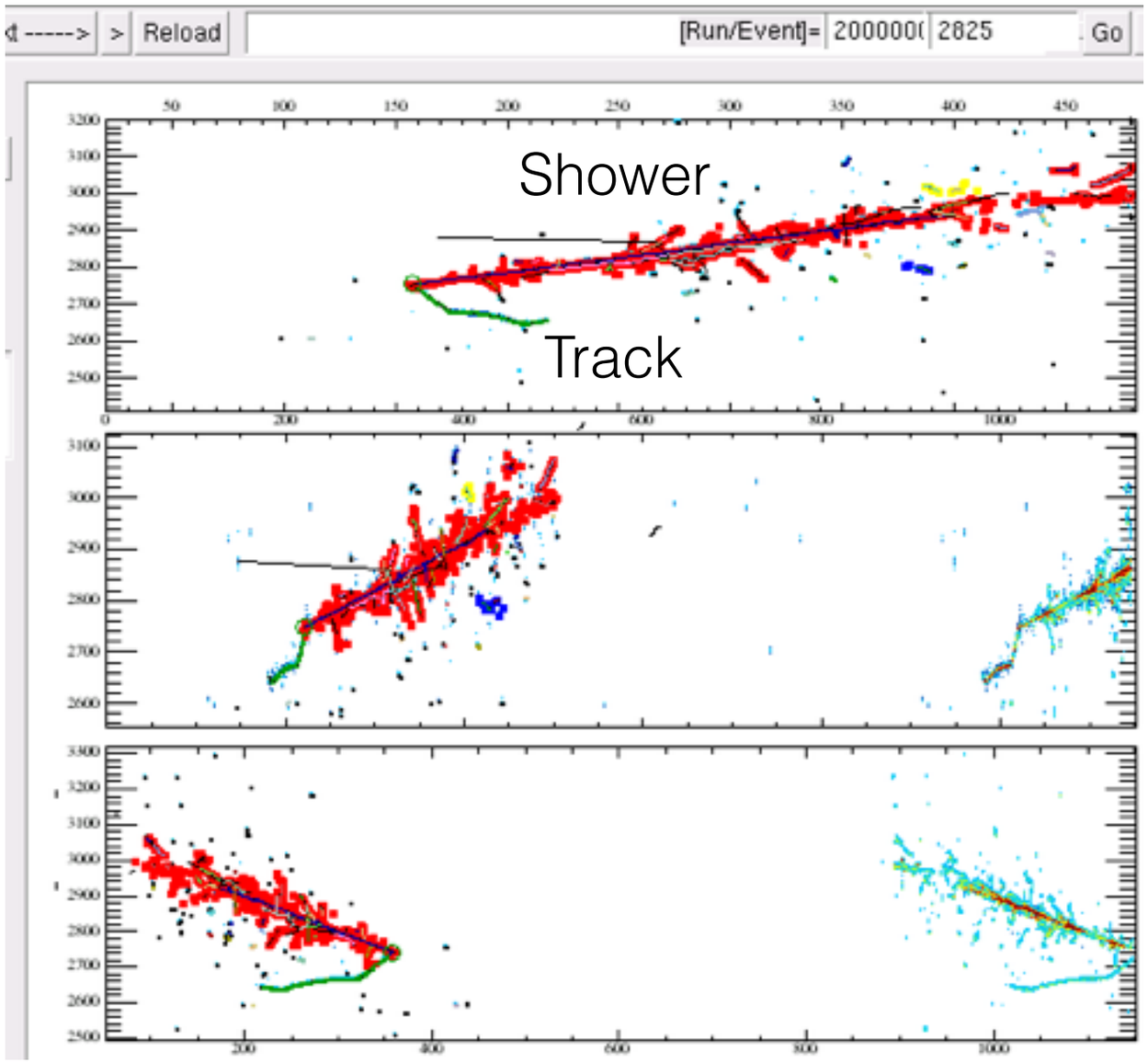
Track Reconstruction

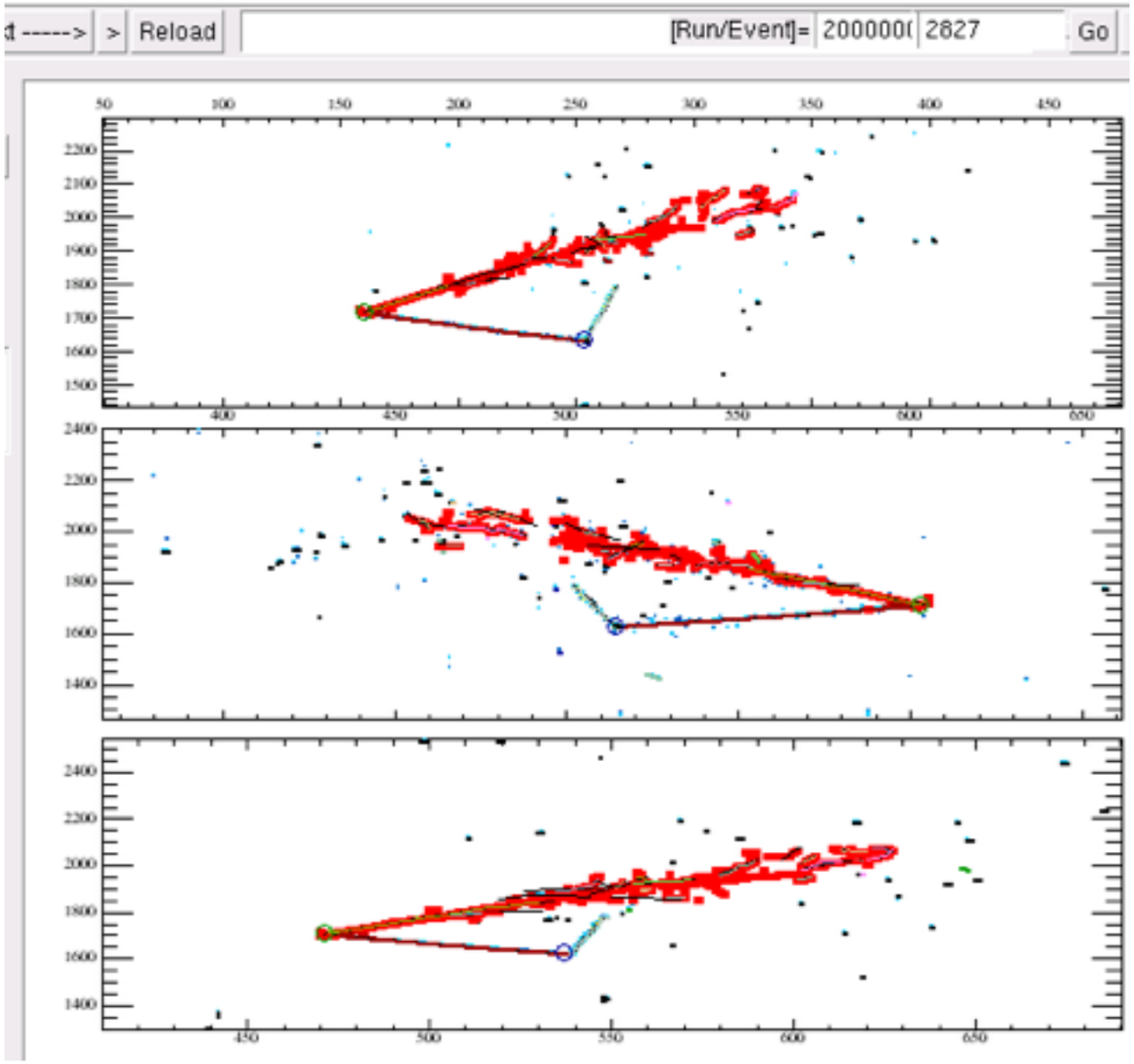




pmtrack

Shower Reconstruction





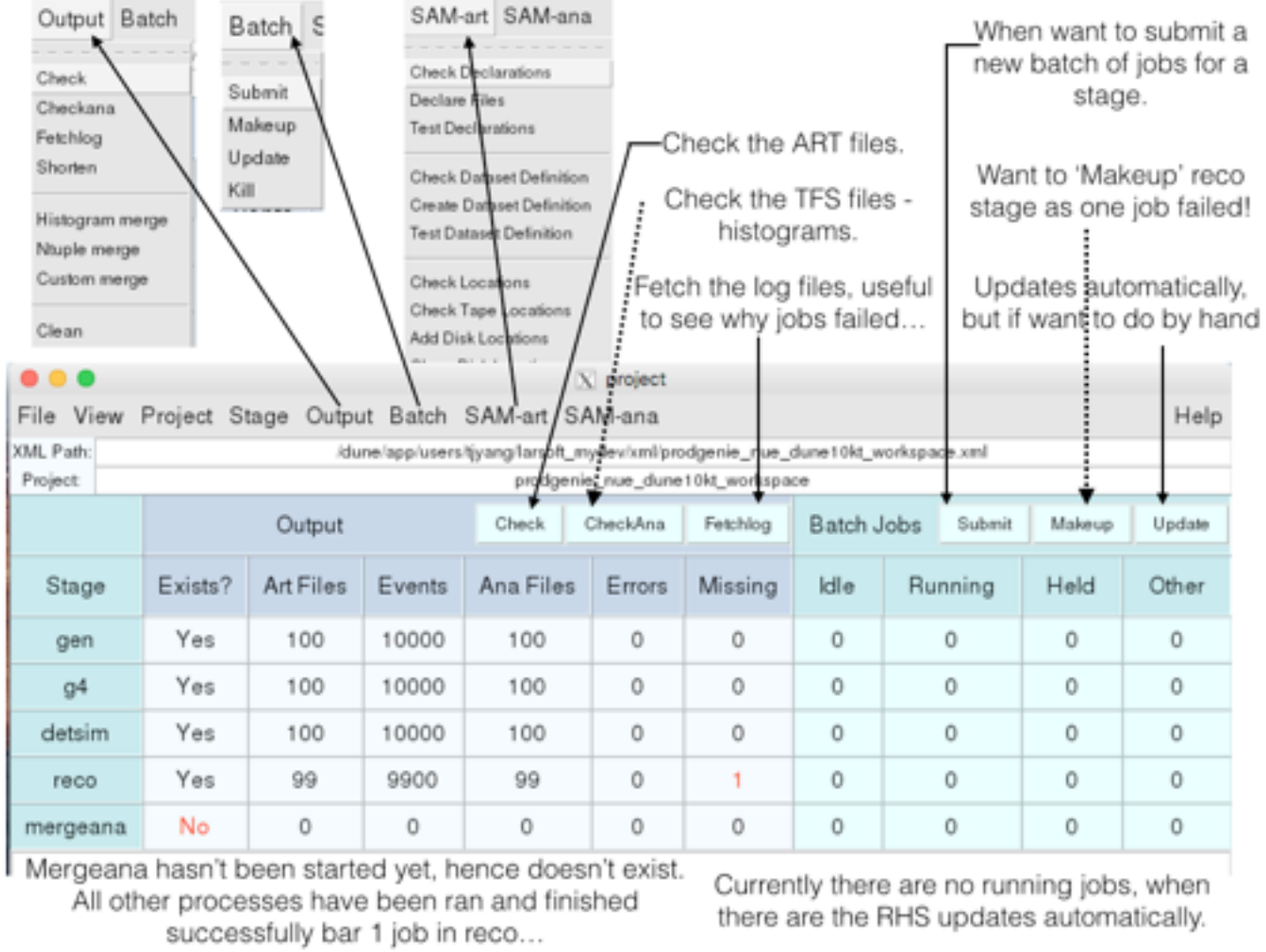
emshower

Files

- When all the samples are finished, I will send out an email to dune-reco@fnal.gov to announce the location of the files.
- Many samples (single particles, beam and supernova neutrinos) are available:
  - /pnfs/lbne/persistent/dunepro/v04_30_01/
- Both art files and anatree files are available:
  - e.g. beam numu sample:
  - /pnfs/lbne/persistent/dunepro/v04_30_01/mergeana/prodgenie_nu_dune10kt_workspace/3820169_0/prodgenie_nu_dune10kt_workspace__20151202T151415_merged.root
  - /pnfs/lbne/persistent/dunepro/v04_30_01/mergeana/prodgenie_nu_dune10kt_workspace/anahist.root
- Details of anatree variables:
  - https://cdcvs.fnal.gov/redmine/projects/dunetpc/repository/revisions/develop/entry/dune/FDSensOpt/NueAna_module.cc around line 100

project.py

- We use project.py to submit jobs and do sam related operations.
- It is very handy to reprocess (e.g. rerun reco) MCC5.0 files.
- Karl Warburton created this very helpful wiki page:
  - https://cdcvs.fnal.gov/redmine/projects/dunetpc/wiki/Using_project_python



Current Focus

- Show people how to use the files to do studies.
- Evaluate reconstruction efficiency.
- Improve reconstruction efficiency and speed.
- Include pandora in the FD reco chain.
- Work on producing proton decay simulation (Gabriel Santucci).
- Need to work on atmospheric neutrino simulation.

WireCell Workshop

- There is a 3-day long DUNE Wire-Cell Reconstruction Summit from Dec. 7 to Dec 9. at LBNL:

  - https://indico.physics.lbl.gov/indico/conferenceDisplay.py?confId=258

- Discuss Wire Cell reconstruction method, its development and application to determine and evaluate requirements for DUNE LArTPC detectors and validating detector designs.

- We strongly encourage people to look at the talks on the indico page to see the great progress on the WireCell reconstruction.