

News

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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.

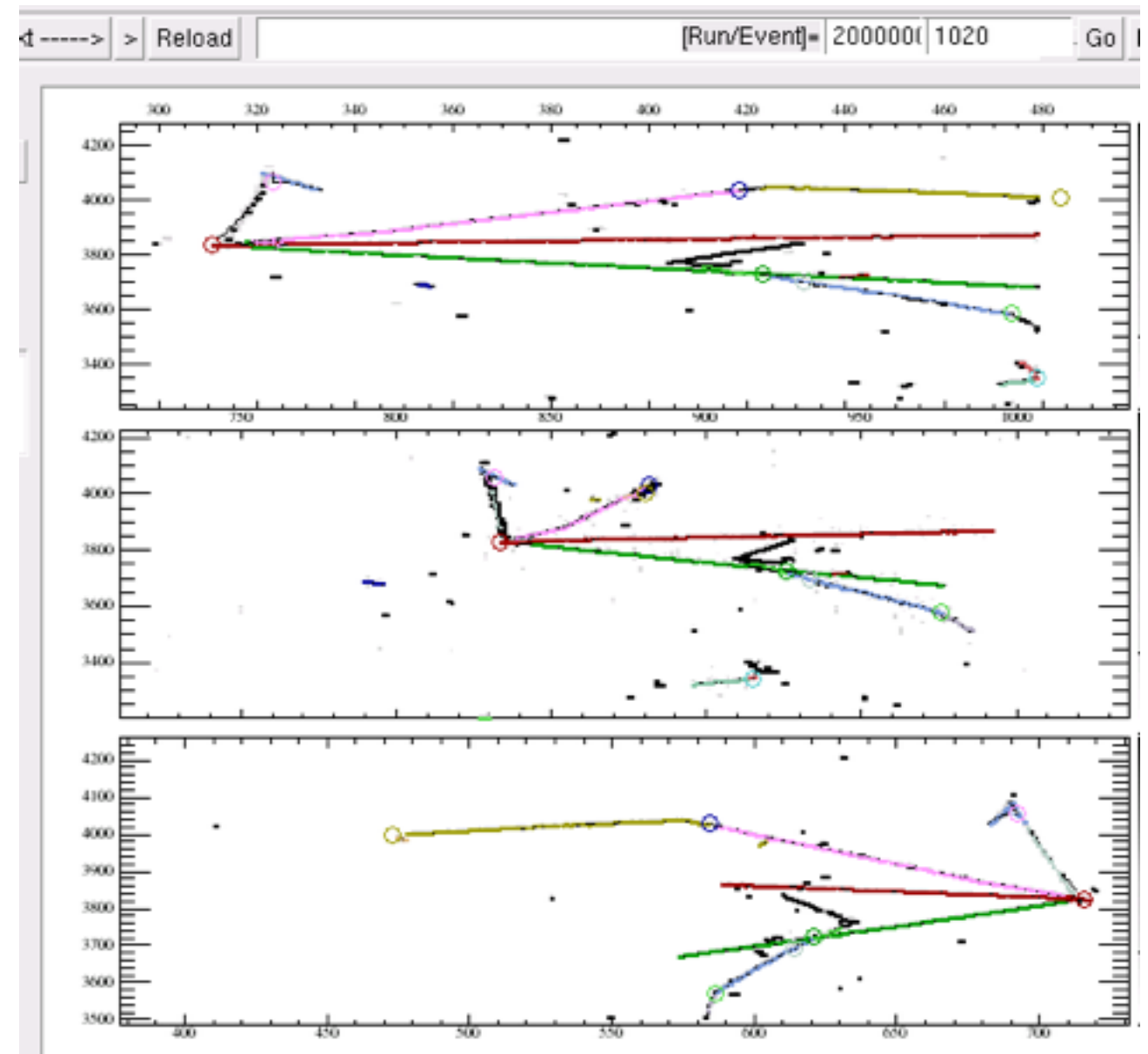
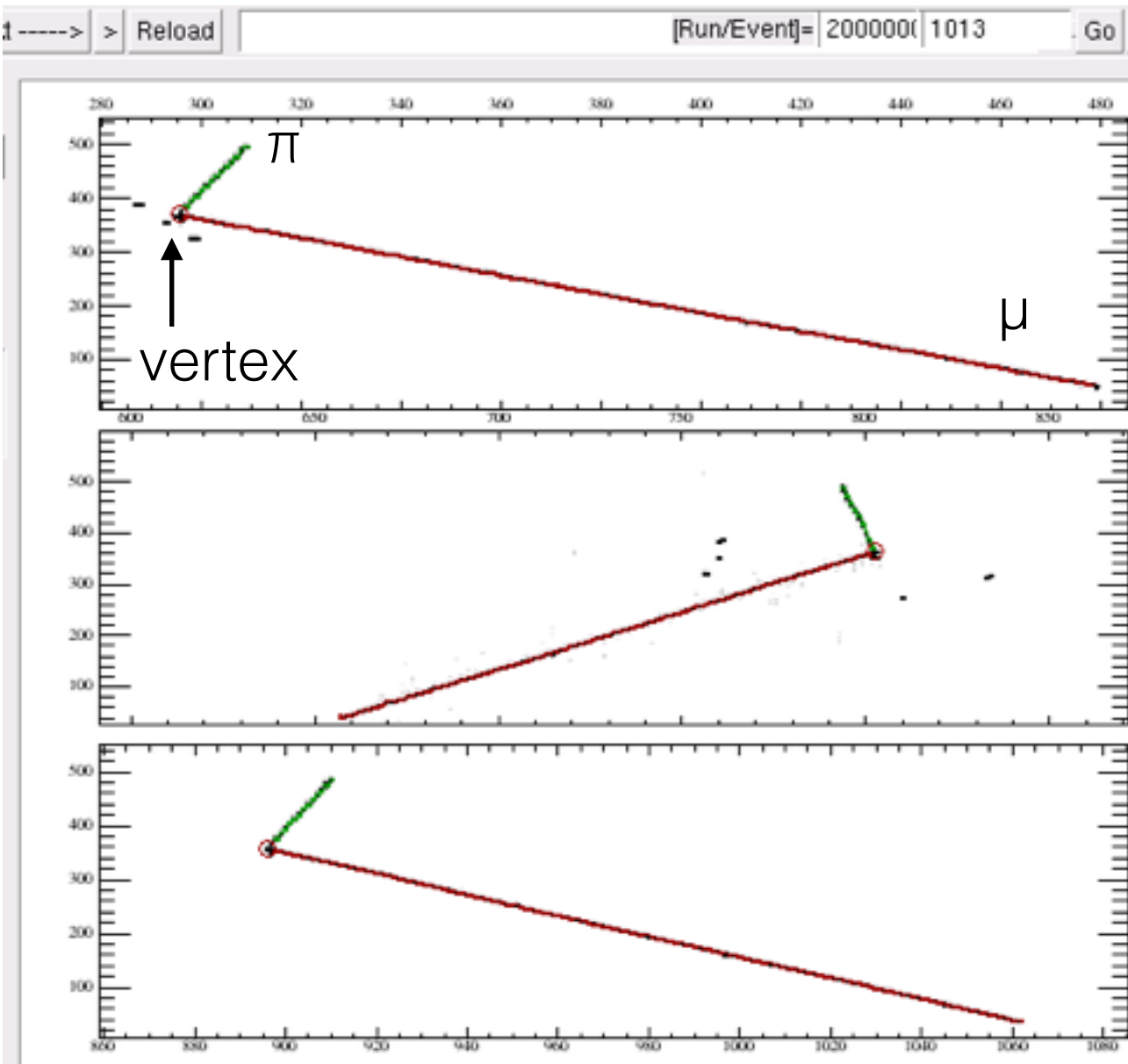
Samples

- 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://cdcv.s.fnal.gov/redmine/projects/dunetpc/wiki/MC_Production

5 Stages

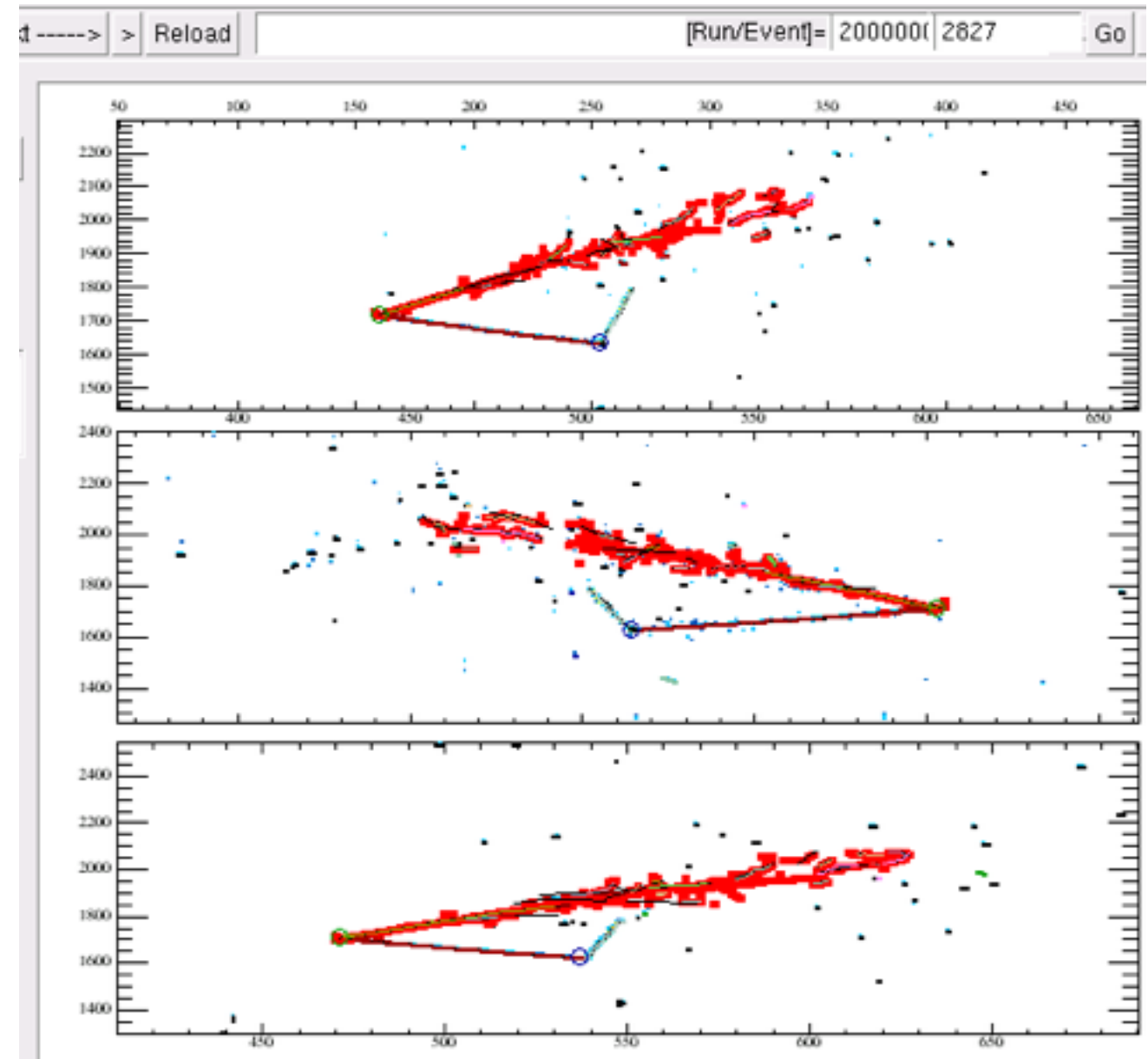
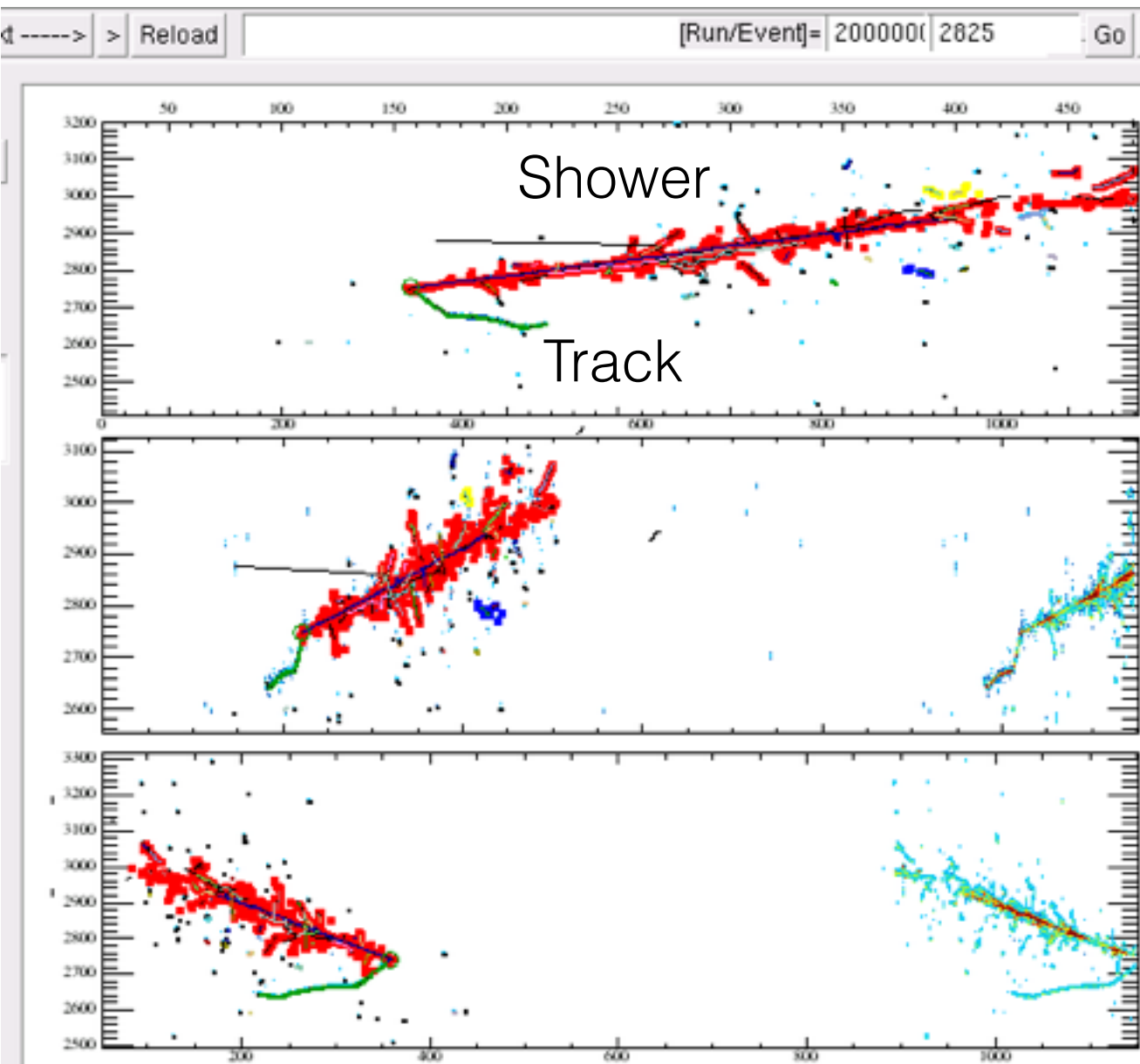
- gen: generator
- g4: GEANT4 simulation
- detsim: digitization
- reco
 - Signal processing: Xin Qian and Leon Rochester.
 - Disambiguation: Tom Junk and Tingjun Yang.
 - 2D hit and cluster reconstruction: linecluster (Bruce Baller) and blurredcluster (Mike Wallbank).
 - 3D track reconstruction: pandora (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://cdcv.s.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

The screenshot shows the project.py application window with several menu items and a table of job status. Annotations provide context for these elements:

- Output menu:** Check, Checkana, Fetchlog, Shorten, Histogram merge, Ntuple merge, Custom merge, Clean.
- Batch menu:** Submit, Makeup, Update, Kill.
- SAM-art menu:** Check Declarations, Declare Files, Test Declarations, Check Dataset Definition, Create Dataset Definition, Test Dataset Definition, Check Locations, Check Tape Locations, Add Disk Locations.
- SAM-ana menu:** Check the ART files, Check the TFS files - histograms, Fetch the log files, useful to see why jobs failed...
- Annotations:**
 - "When want to submit a new batch of jobs for a stage." points to the Submit button.
 - "Want to 'Makeup' reco stage as one job failed!" points to the Makeup button.
 - "Updates automatically, but if want to do by hand" points to the Update button.

| Stage | Exists? | Art Files | Events | Ana Files | Errors | Missing | Idle | Running | Held | Other |
|----------|---------|-----------|--------|-----------|--------|---------|------|---------|------|-------|
| gen | Yes | 100 | 10000 | 100 | 0 | 0 | 0 | 0 | 0 | 0 |
| g4 | Yes | 100 | 10000 | 100 | 0 | 0 | 0 | 0 | 0 | 0 |
| detsim | Yes | 100 | 10000 | 100 | 0 | 0 | 0 | 0 | 0 | 0 |
| reco | Yes | 99 | 9900 | 99 | 0 | 1 | 0 | 0 | 0 | 0 |
| mergeana | No | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Mergeana hasn't been started yet, hence doesn't exist. All other processes have been ran and finished successfully bar 1 job in reco...

Currently there are no running jobs, when there are the RHS updates automatically.

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.