



June 3, 2020 LArSoft Steering Group Meeting Notes

Attendees:

Bob Wilson, Tom Junk, Erica Snider, Katherine Lato

Update and discussion about the 2020 LArSoft work plan.

Some things noted:

1. Thread safety - There is a push to get everything running in thread safe mode.
 - a. Addresses some common concerns across experiments in LArSoft, and some short term needs
 - b. Work is progressing at expected modest pace, but is making steady progress
 - i. Have recently delivered on several important services that were critical to completing work on multiple production workflows. Some important data preparation modules for ProtoDUNE have been delivered as well. [Not mentioned during the meeting.]
 - ii. They also provide the model for how to proceed with similar services
 - c. Trying to work on most important code first
 - i. Things running in production, or in response to specific expt requests
 - ii. Working closely w ProtoDUNE and ICARUS / SBN
2. Migrating to a new build system - SPACK -
 - a. Important to modernize the build systems to something more portable, aligned with industry standards, community supported
 - b. Required getting changes into core product to support the use case of our development environment
 - c. A major hurdle that has held progress for the past year has been cleared. See evidence that there will be substantive progress in the near future. Will bring details as soon as available.
3. Not sufficient progress yet on incorporating pixels, though some low-level geometry work has been done by collaborators at SLAC
4. Event display: have several alternatives developed by various people/groups. We will facilitate integrating them with LArSoft so people can use the one(s) they like. Existing options (from previous notes):
 - a. LArSoft Event Display (ROOT based)
 - i. In principle can display everything both in 2D and 3D
 - ii. Very slow for large detectors.
 - iii. Works for all detectors. Can display multiple data items and labels at once
 - b. TITUS (Qt based)
 - i. Combination of python (3) and C++ and is based on the PyQt5 interface.
 - ii. Updated version (by Marco Del Tutto and Gianluca Petrillo) of the event display originally authored by Corey Adams (QT based) for MicroBooNE
 - iii. Runs in gallery. Being used by ICARUS. Works for MicroBooNE, ArguNeut and possibly DUNE.
 - iv. Native 2D displays of low-level data
 - c. WebEVD (using three.js/WebGL for access to OpenGL)
 - i. Chris Backhouse developed
 - ii. In use at ProtoDUNE. Has been updating based on feature requests.
 - iii. Runs in LArSoft & Gallery.

- iv. Doesn't have a native 2D display.
- v. Requested to be a UPS product distributed with LArSoft.
- d. EVE based for SBND
 - i. Umut Kose developed.
 - ii. 3D Oriented,
 - iii. Study of using EVE for event display started after SBN workshop in 2019 at Fermilab. It aims to provide the functions of 3D and 2D projection views, animations, interactive display for users.
 - iv. Eve is a ROOT module based on experiment-independent part of the ALICE event display developed in cooperation between ALICE offline project and ROOT.
- e. Bee event display (based on WebGL)
 - i. Developed by Chao Zhang for use with wire-cell.
 - ii. 3D oriented.
 - iii. Uses three.js.
 - iv. Doesn't run in LArSoft and Gallery, uses wire-cell data format, so requires conversion step
- 5. For DUNE, there is apparently still some work needed by ProtoDUNE DP to accommodate vertical drift direction. The project will be following up with them.
- 6. Not planning a workshop this year.
- 7. Talked about how priorities are set throughout the year.
- 8. Round table:
 - a. ICARUS:
 - i. expect to be taking data soon, if circumstances allow. This will drive needs that affect areas of data production and online monitoring.
 - ii. Using a lot of the shared code base, and seeking to have a thread-safe production workflow for processing of high-density data
 - iii. Are there tensions between the goals in the work plan?
 - 1. We (LArSoft project) have generally found ways to solve these without serious disagreements or delays, but experiments have mostly not overlapped in data taking so far. There were a few issues to navigate when both ProtoDUNE and MicroBooNE were both in major production campaigns last year, but we believe these were resolved satisfactorily
 - b. DUNE
 - i. Does wanting recent GENIE versions run amiss of SPACK plans?
 - 1. Good question. Do not know, so will look into it. No one has mentioned this possibility.
 - ii. Level 1 managers for GIT Hub. Are there enough? There is some strain at L2 in DUNE
 - 1. At L1, it seems to be working as far as the project can tell. The experiments should let us know
 - 2. We do see that code is getting more scrutiny before being allowed to merge. That appears to be lengthening the time it takes to get some commits merged. But we're also testing before code gets merged, so many delays are related to getting code past the tests.
 - 3. To deal with L2 workload, other experiments (eg, CMS, CDF in the past) distributed L2 responsibilities to domain experts, each of whom have a limited scope of code they monitor and approve. Not currently an easy solution at DUNE.

