

LArSoft minutes, 1-Feb-2012. -- Eric Church

LArSoft minutes appear at <https://cdcv.s.fnal.gov/redmine/projects/activity/larsoftsvn>. (The location presumably at which you found these!) For further details of matters reported here drill down into the wiki, etc, at that redmine site. Everyone is welcome to attend the bi-weekly meetings. Next meeting will be 15-Feb-2012. It will be back in the Racetrack, 7X0.

There are pdfs from Herb and Ornella and Brian on the Documents link on redmine today.

Watch for a potential LArSoft 1.5 day tutorial upcoming at FNAL. Leading candidate dates right now are 3/8-9. Nothing's formalized yet.

Brian reported on the impending code cutover to Associations. No date has yet been assigned for this. The current ART release supports this new feature that allows us to do PtrVector-to-PtrVector associations. Brian's begun implementing it in some algorithms and urges all algorithm authors implement it in their algorithms. An example of the usefulness of Associations is the creation of clusters. Currently we instantiate a clusters object with the hits which comprise it. Thus, it's easy, once we grab a cluster to find the hits belonging to it, but not so easy with a hit to know which particular cluster it belongs to: that requires a loop on all clusters until one finds the hit pointer identifying the hit in hand. Associations eliminate the need for that loop. Similarly for, say, tracks/vectors, tracks/spacepoints, etc. Brian will send an email providing tips/guidance soon.

Ornella walked through a nice study that demonstrates a big improvement in the LArSoft simulated energy deposition. A factor of the liquid argon density in the denominator of Birk's Law had been missing in our implementation in the code. The effect was to give far too little charge to, particularly, heavily ionizing tracks like protons, especially as they stop. Efforts to fix it had involved an unsatisfying and mysterious ad hoc scale factor in the numerator that no one understood the need for, and which, further, didn't give the correct answer. Ornella's presentation shows the now-marvelous agreement between expected proton dE/dx vs residual range for protons and the simulation and NIST data. This bears on all the LArSoft experiment simulations.

Herb reported that Georgia has checked in SimWireMicroBooNE code that uses his new service for the calculation-on-the-fly of the FFT "kernel" for the uBooNE electronics simulation. This way of doing things ensures a consistent treatment of convolution and deconvolution without the need of keeping response files around and worrying about mismatched versions of these. This completes a lot of hard work by those two people to get a functioning uBooNE electronics system. Georgia points out that there is still a need to refine the field response functions (which currently have sharp edges and lead to those small undershoots one sees in the deconvoluted signals) and the noise creation (which really ought to be done in the signal creation and not tacked on after deconvolution).

We claim that these last two pieces of work along with the existence of a not-entirely-slow cpu time per event now in the uBooNE simulation represent huge strides. They set up the possibility of a new LBNE hand scan study of GENIE events that will lead to results which may well get closer than previously to the advertised detector responses that everyone expects of liquid argon detectors. Further, they set the table for really making some reconstruction progress over coming months and a Fall generation of usable uBooNE MC samples. ArgoNeuT will benefit in

its CCQE studies which are already well underway and for which this work is a big shot in the arm.

Details for the next meeting:

>>> video: 85LARSW

>>> phone: 510 423 9220 (ID 85LARSW)

>>> final location: Racetrack, 7th floor x-over