

LArSoft minutes, 12-Oct-2011. -- Eric Church

LArSoft minutes appear at <https://cdcvs.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 26-Oct-2011. It will be back in the Racetrack, 7X0. We'll hear at least from the Handscanners and their competitive smackdown.

There are 2 pdfs from Ben on the Documents link on redmine today.

Ben gave a nice summary of how PhysicsLists work in Geant4 and LArSoft. I defer details to his talks. Everything is templated so in principle it's easy to turn on/off desired physics processes. We have for now the QGSP_BERT list in. Ben claims that for LAr purposes we have all needed EM physics details in our simulation. He suggests that the main reason one might change anything in LArSoft is to turn on/off Optical processes. Ben discussed how to add processes, nevertheless. It has been expressed by Bruce that the 10-MeV-ish beta decay physics list ought to be vetted in anything we're doing for SuperNova detections. He rightly asserts that there's no terribly clear summary in G4 documents as to what individual physics lists do. Brian suggests that it would be nice if some LArSofter would undertake to document the various choices of physics lists and what precisely they do. Ornella wishes we could do neutrino final state interactions in FLUKA. In view of some recent dialog we've had with Costas, the GENIE author, we discussed that we should have the mechanism in place, at the least, for users to re-weight GENIE's "cascade" models to characterize FSI systematics.

Ben then presented a 2nd talk, where he showed some LArG4 optimization he's done. The biggest recipient of modifications is NearestChannel(), a function we've agonized over many times, and known to be a cpu hog. Ben has replaced searching all wires for the one closest to the drifted charge with a calculation of wire number. ChannelToWire(), PlaneWireToChannel() SimChannel() all are now changed similarly. All rests on a reasonable presumed hierarchical counting of wires. Ben also advocates a wireless geometry, which gives mainly a big boost in start-up performance. Ben gets a x10 improvement in LArG4 for muons in uBooNE and Brian reports a x2 speed-up in Genie events. So, non-trivial performance boost.

We discussed a bit about valgrind, the profiling tool. Ben never got it upgraded to 3.6 from our 3.2.1. Bill says 3.6.1 is necessary. The appropriate request will be made to CD today.

Jen gave a quick handscan report. The LBNE design-assumed 80% nue CC efficiency seems to be about right, she said, but perhaps is an over-estimate at low energies. Jen demurred when pressed for early background rejection estimates. Watch this space next week!

Details for the next meeting:

>>> video: 85LARSW

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

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