Minutes of the Depth Task Force – P Cushman – Feb 1, 2013

Our next meeting is NEXT WEEK, Thursday, Feb 7 at 3:30 pm central time. We expect to have much of the writing described below done by then, as well as a start on the LAr MC.

We will skip the week after that.

On Jan 31, we went over the outline of the White Paper in some detail. Writing assignments and written sections are all found at https://zzz.physics.umn.edu/lowrad/dm_task_force/whitepaper

Much is already complete on II: Existing N-Bkgd Measurements, but we need

1. Vitaly to complete a section on EDELWEISS

2. Andrew to complete a section on SNO (as much as we have plus place-holders for new stuff if necessary)

3. Tony to complete the Borexino part (again, it is important to describe the setup and accessible observables, even if you don't have final numbers to include)

In Section III: The Simulation Challenge B = Muon Flux

1. Let's start with a description of the Groom Parameterization since it provides a good introduction to the overall muon flux wrt depth.

2. Andrew will flesh this out by providing a description of the parameterization generally and the choice of parameters used by M&H and why.

3. Chao needs to summarize muon measurements done at Homestake.

4. Vitaly needs to describe how MUSUN works and some results (how did overburden and rock composition change it – what uncertainties are there)

5. Angie needs to compare and contrast Parameterization and MUSUN at Soudan (and Homestake if available)

6. Chao has to improve his section on muons thru geant4, as discussed.

In Section III: C

1. Andrew has to flesh out his outline and describe the M&H FLUKA program and the what was fit and the scaling of energy and multiplicity issues called out.

2. Melinda, Angie, Prisca, Toni, and Anthony need to reorganize and iterate to get a good description of the new advances in Geant4 and the Fluka separately and then add in the bits from the comparisons. A single paragraph from Toni explaining new

advances from FLUKA would be useful, perhaps it can be partly stolen from our proposal for Integrated Tools.

NEXT we discussed the simulation work. The LXe is at 7.9 live years. There is still a discrepancy between the 2 LXe studies – at the moment, Monica is getting 3 times more NR than Angie. Once that is understood, then the Ge MC can run. Chao will start the LAr right away. We will compare NR above 5 keV deposited energy for all 3 technologies, but then we have to make analysis cuts.

1. Angie and Prisca will derive threshold, singles, fiducial, yield, and veto cuts for Ge

2. Monica will discuss with LZ and get threshold, singles, fiducial, ROI, and veto cuts of LXe

3. Andrew will give us the same type of information for LAr – He can wait until we get ours defined, in order to compare and decide.

Whew! I think that is it for now. I do hope we can get some of this work done this week, so that by next week we will be ahead.

Thanks, Prisca