Update on the Far Detector Geometry in LArSoft
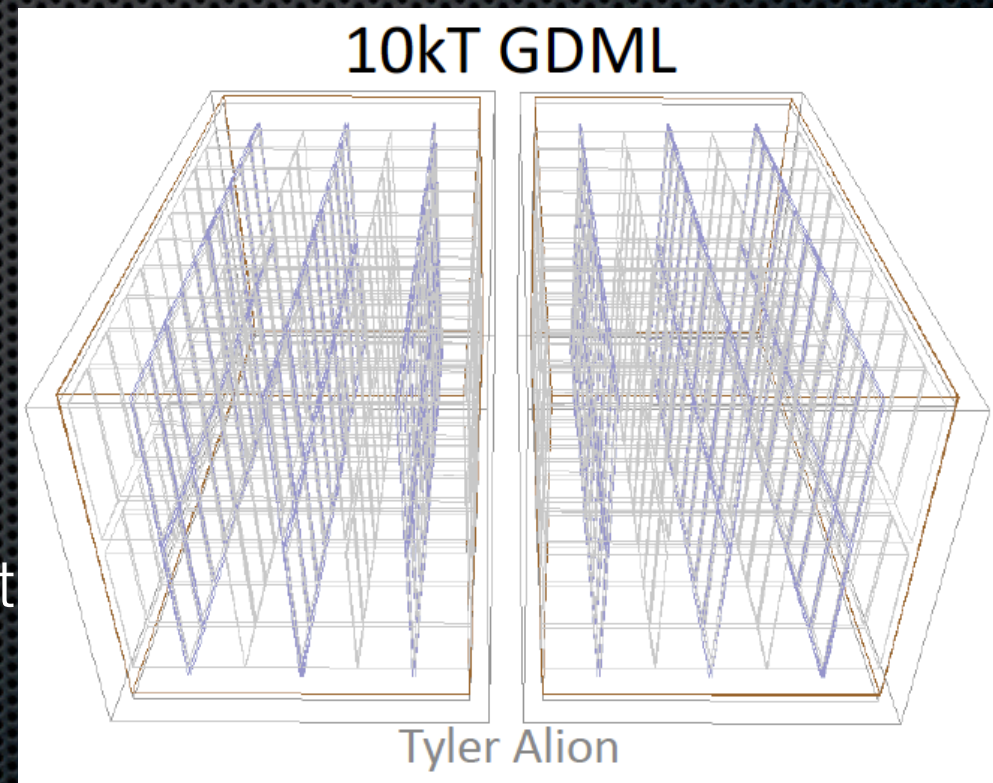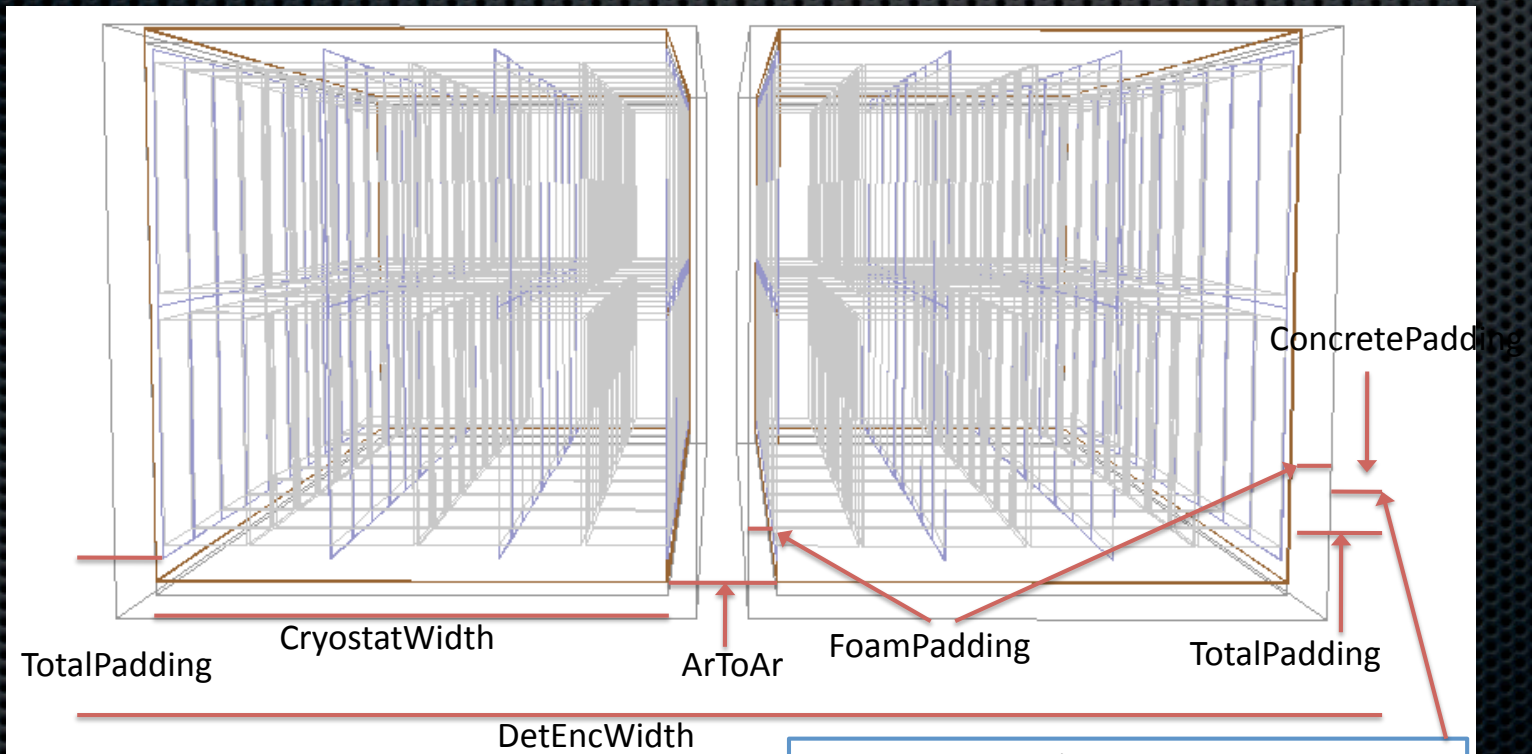
Mike Kirby
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Motivation

- Currently do not have detailed GEANT4 simulation of the 10 kT baseline detector design

- in order to achieve CD-2 approval, detailed studies of detector design will be needed

- critical to understand acceptance, reconstruction efficiency, and background estimates

- non-trivial task of developing simulation and reconstruction algorithms for wrapped APAs

how to quickly build a detector

- the APA designs appears to be stable (2.5m x 7m)

- want to quickly build up gdml files for different cryostat configurations

- South Carolina group has written perl scripts along with xml files for LBNE within LArSoft

- allows the input of the number of cryostats and APA configuration

10kT GDML

Tyler Alion

double cryostat

ConcretePadding

CryostatWidth

TotalPadding

ArToAr

FoamPadding

TotalPadding

DetEncWidth

ConcretePadding doesn't draw, because it is not an actual volume. volDetEnclosure's material reference is concrete, so the concrete is there implicitly. The volumes within are placed so that the ConcretePadding dimensions are correct.
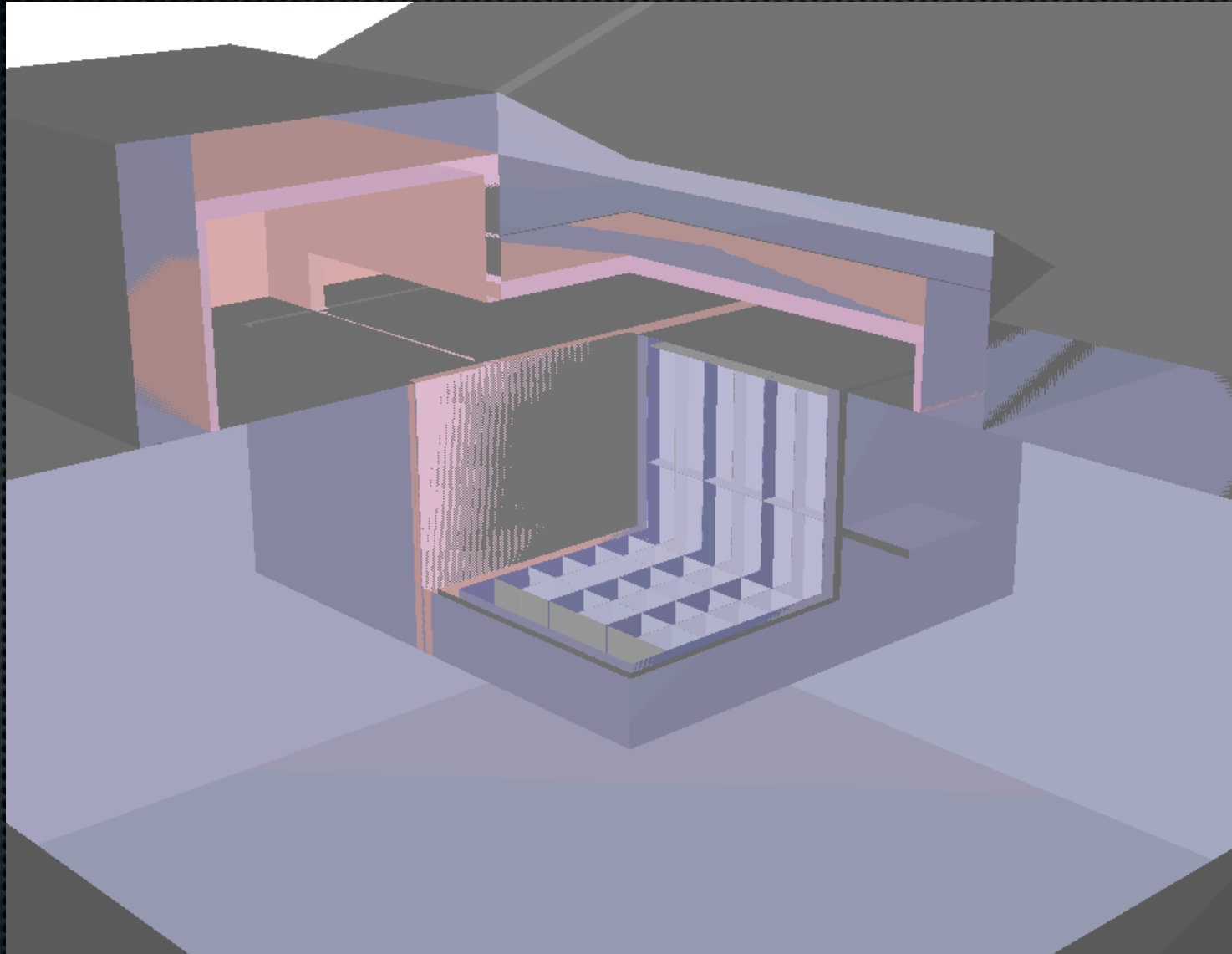
FiducialWidth = nAPAWide*APAWidth

ArgonWidth = FiducialWidth + 2*SpaceCPAToCryoWall   ← Remember, extra space doesn't draw

CryostatWidth = ArgonWidth + 2*SteelThickness

DetEncWidth = 2*CryostatWidth + 2*TotalPadding + ArToAr

The part of ArToAr that isnt FoamPadidng is concrete.

initial service building/ overburden
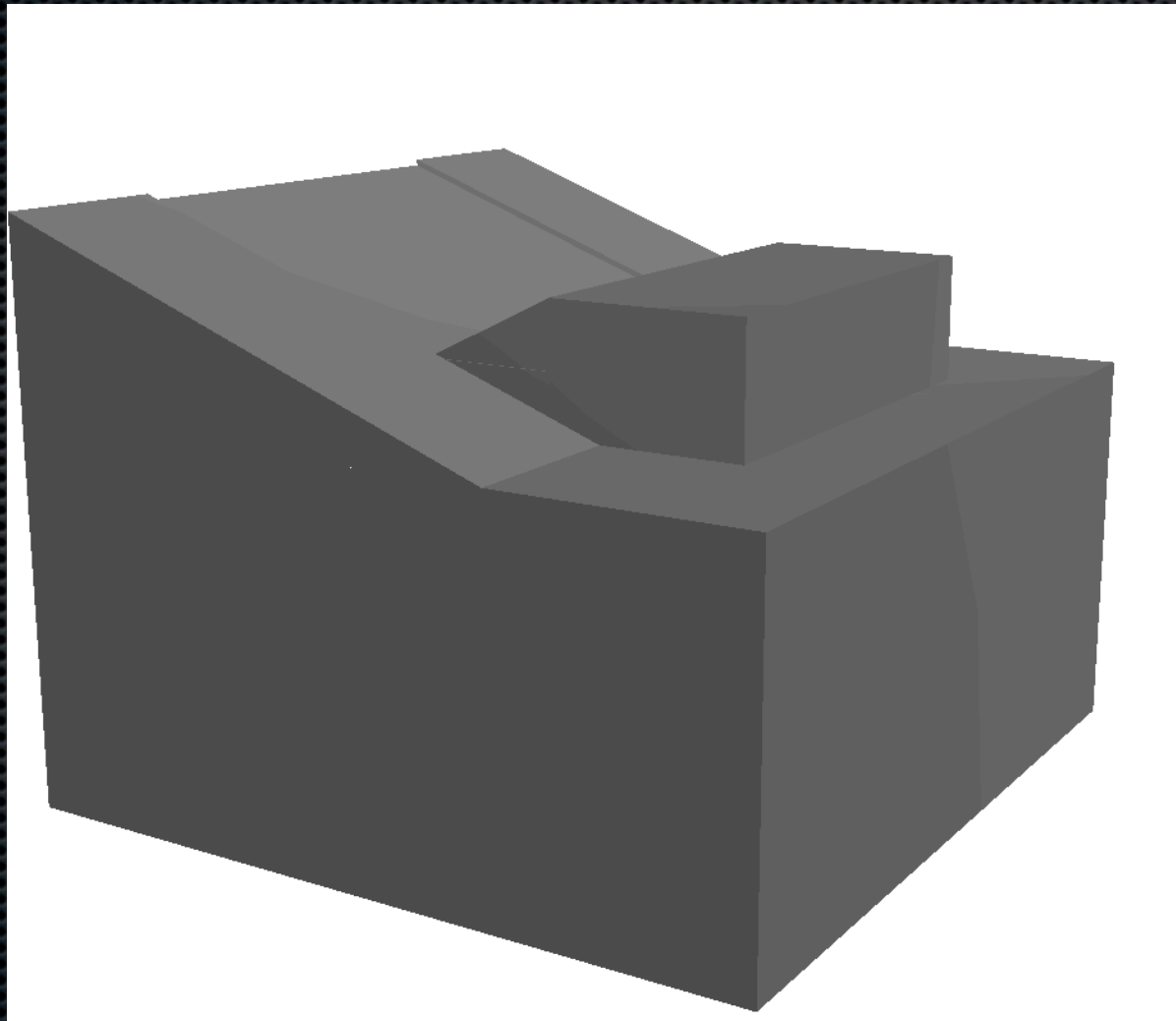
clipped view of the guts

things to do…

* align the hill across the full volume

* separate out the overburden from the service building

* make sure that the dimensions are correct

* build in the possibility of having underground option

  * right now, just make the world volume rock instead of air

* hopefully, submit to the repository within the week