SolidXL with incorrect LGC cut-out
Jay Benesch

Abstract

I notched the steel above the downstream coil collar with dimensions eye-balled from Whit Seay's slides for the 2/20/17 meeting. The notch is 14.79 cm deep and runs from R220 to R250 cm. It should probably run from R230 to R270, but no matter. This document was created to house plots which attempt to answer some of the questions asked at that meeting.
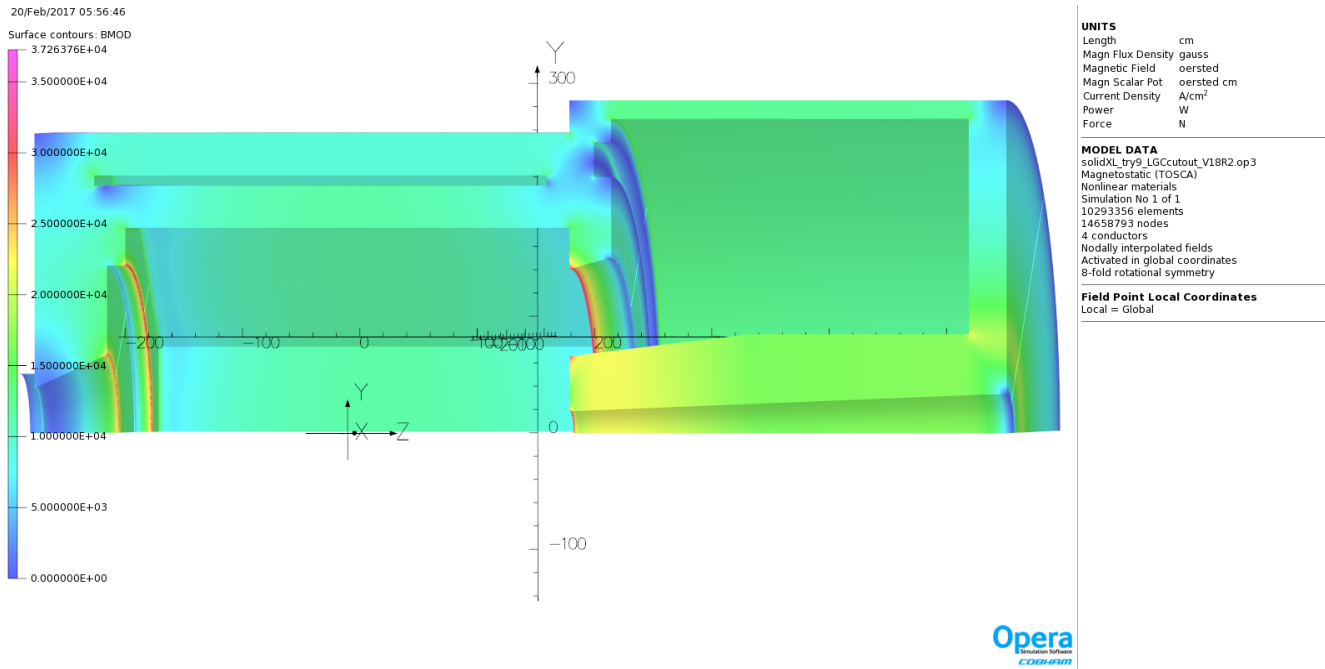
Figure 1. Plot of Bmodulus on the surface of the model. This model differs from previous models in that all the 4" spacer bars are used between the 14" thick octagons instead of just one set and the notch.
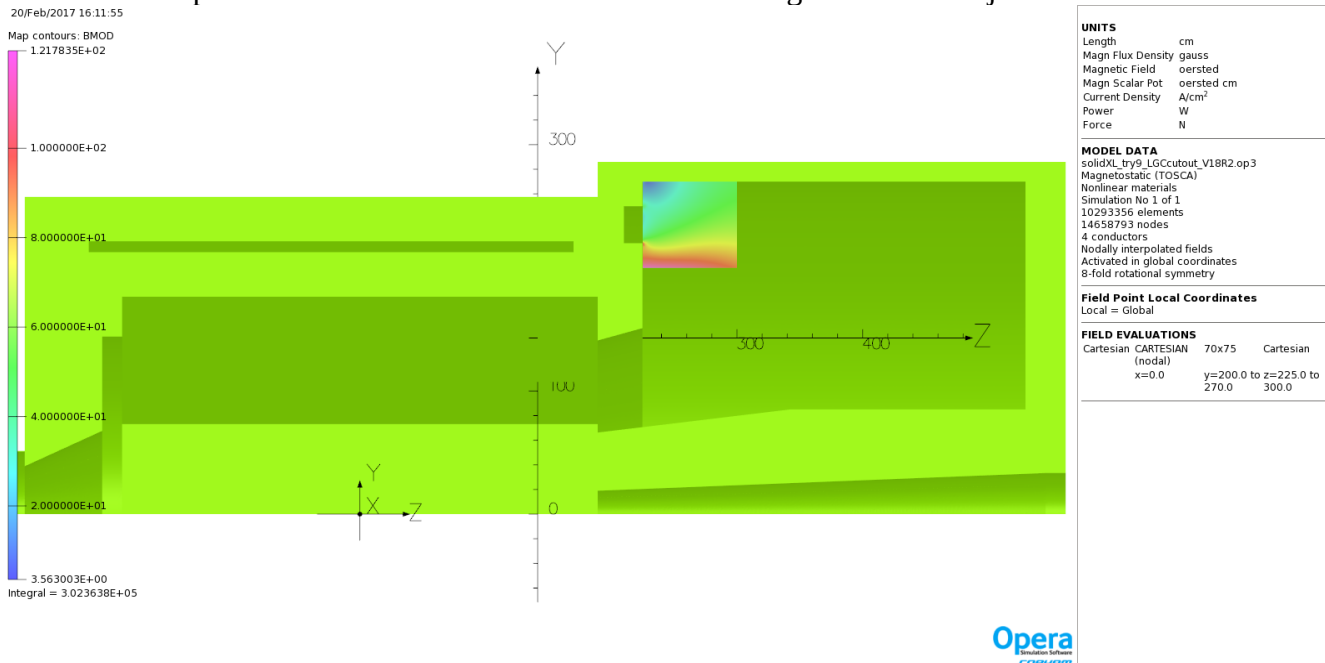

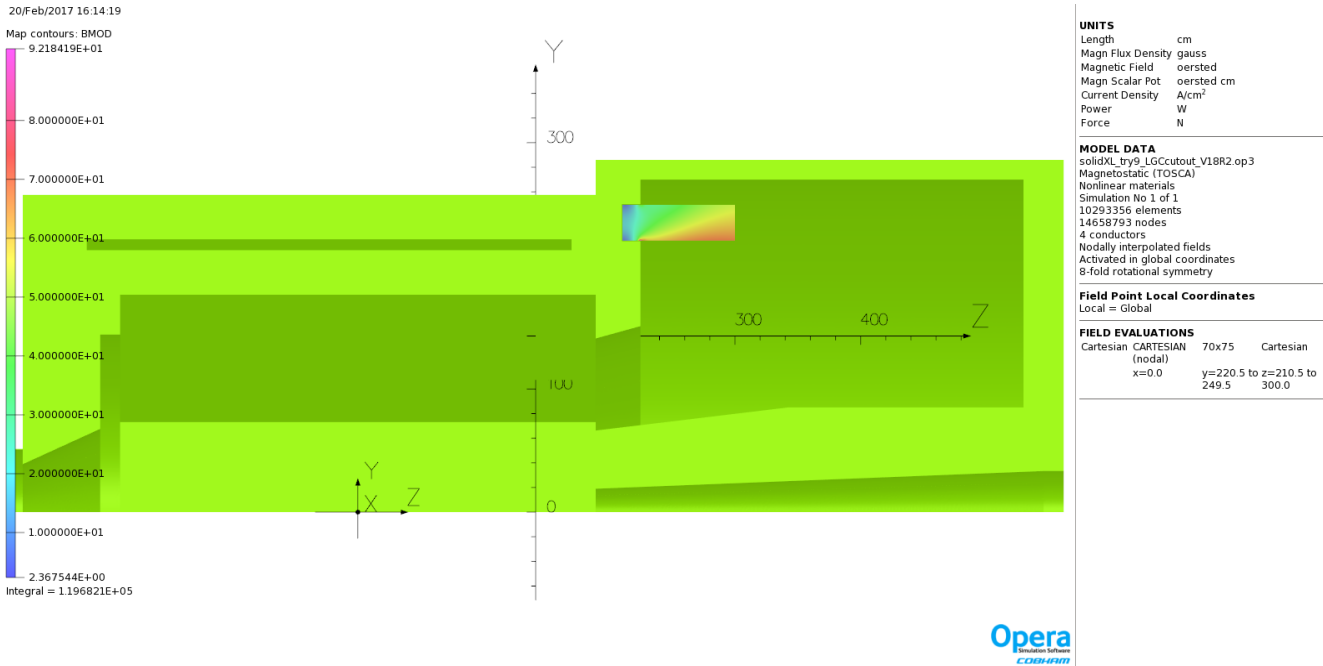Figure 2. Stray field in LGC corner - over 100G at lower edge.

Figure 3. Stray field inside notch and out to Z=300, under 100G throughout. So field beyond R220 is likely low enough for LGC PMTs.
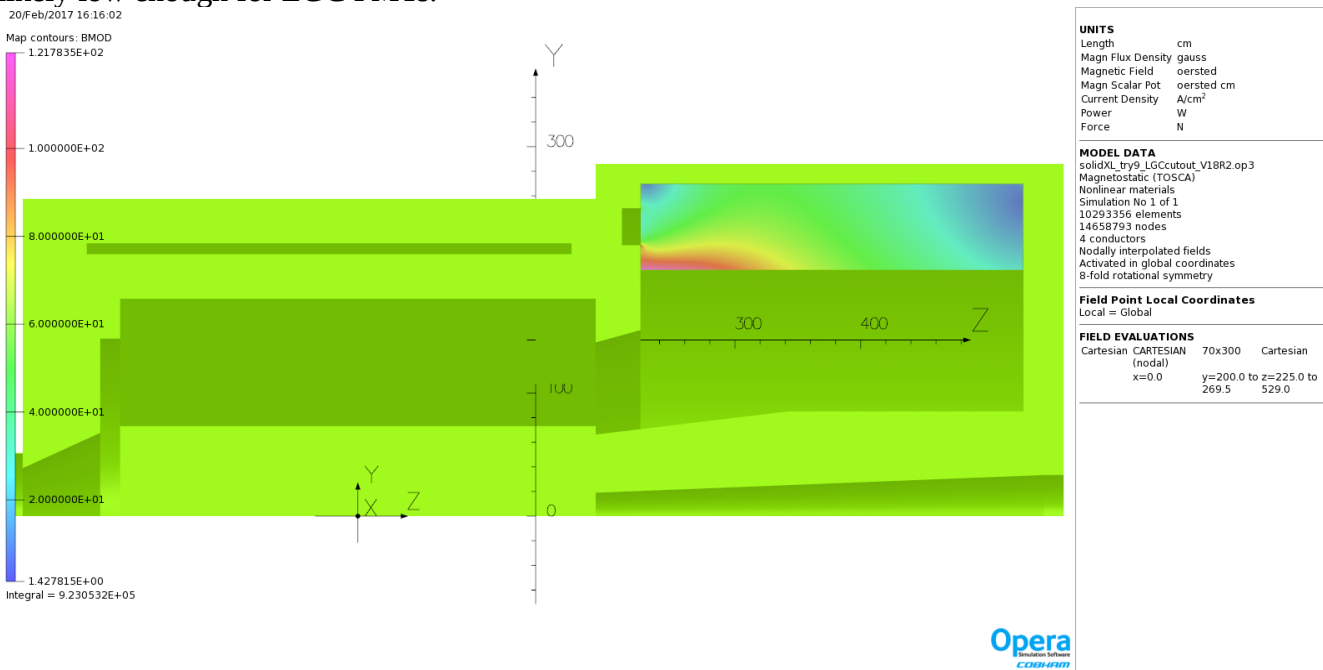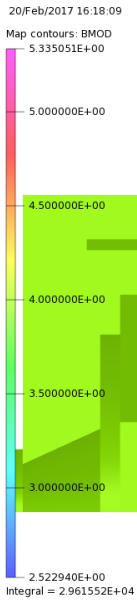

Figure 4. Stray field from R220 to R269.5 along full endcap. Above 50G up to Z400.

Figure 5. Field outside endcap where GEM electronics might go - low enough with 16 cm wall

Figure 6 Field outside end plate where ECAL PMTs are to go. Too high over much of area.
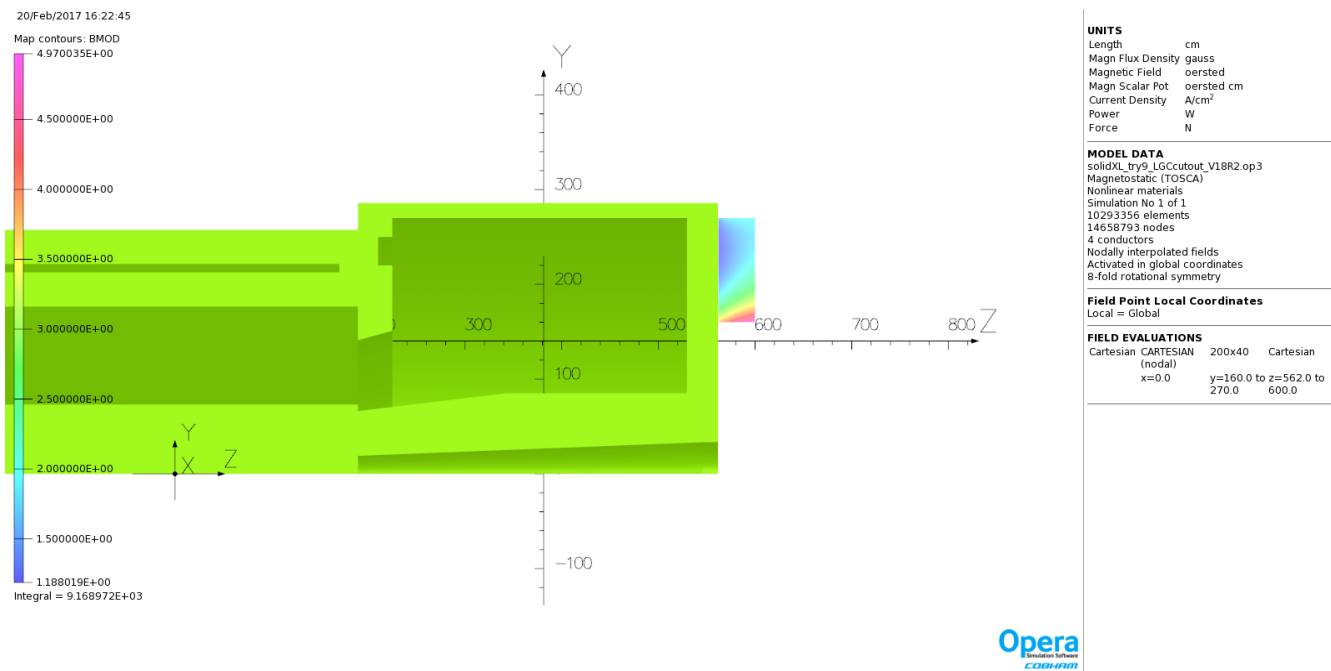
Figure 7. Field outside end plate starting at Y=160 so B less than 5G.

It follows from figures 6 and 7 that the 32 cm end plate needs to be retained outside R160 cm and that it needs to be supplemented inside that radius. From plots I don't show it follows that I can taper starting at R144 from yet another 16 cm of steel I'm going to add.

1637 2/20/17

My next model will:
- move the notch out so it extends R230 to R270 with full 15 cm depth OR
- make notch as input from Whit Seay provides to fit LGC design as he knows it
- extend to lower Z the interface ring from octagon to R270ID cylinder as the notch will take too much out of it. Probably ~15 cm, to ~20" total Z extent outside notch.
- extend the R85 cylinder out to Z577.59, 16 cm beyond what is shown above
- trim overlap between the two 16 cm endplates and the longer R85 cylinder, then union plates
- add a new endplate, IR85 OR160 Z=[561.59, 577.59] Union it with R85 cylinder. Trim overlap with an appropriate tapered air piece representing beam pipe. Chamfer 45 degrees at OD

and then solve. I'm not sure when I'll get started on this, which is why I'm writing this now.