NX12 model of ECAL Supermodule

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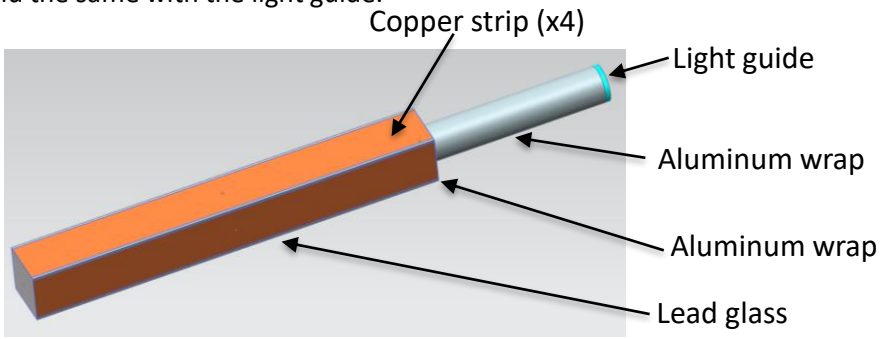
NX12 model of ECAL Supermodule

A model of the ECAL supermodule is needed in order to perform a thermal analysis of the overall detector. My first task was to develop an accurate model of the basic detector unit, the 19.25” long lead-glass/light-guide assembly. To do this I removed all the components from an unused wrapped lead-glass component and measured each component's thickness, length, and width. I used these dimensions to make all the wrapping components in NX12 and assemble them into a lead-glass model. I did the same with the light guide.



Isometric view of a lead-glass/light-guide assembly

After completing the lead-glass/light-guide model, I used the manufacturing drawing to make the components of the supermodule frame. This includes the aluminum flanges, titanium sides, and carbon steel springs. The frame roughly measures 5” x 5” x 21”. For the purposes of thermal analysis, the screws used to assemble the supermodule were omitted. However, the set screws used to tension the springs were included as they would be a part of the thermal transfer.

Lastly, all adjacent component spacing was set to zero, to ensure that all component surfaces were touching.

- Accurately measure the individual parts of a lead glass/ light guide assembly
- Develop a model of the ECAL supermodule with realistic spacing of the components

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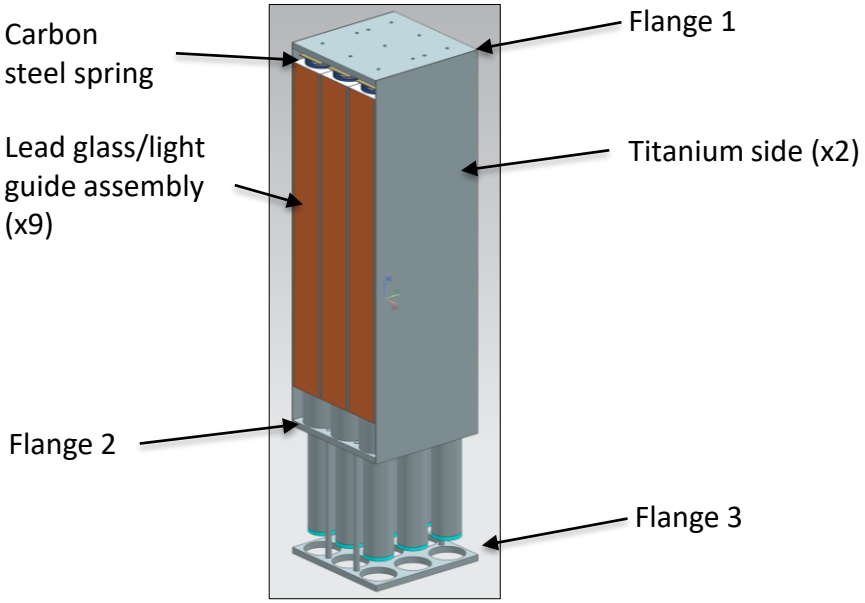

ECAL supermodule with major components

In conclusion, the model has been used as part of the thermal analysis conducted by DSG. This will help understand how effectively the heat is conducted from the source of heat, through the body of the supermodule. Next month a third-angle projection drawing will be completed with dimensions.