NPS detector Ansys model in NX12

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This month I used NX12 to develop models of the individual components of the NPS detector and enclosure. Each component was made by studying the features and dimensions of the NPS model used for manufacturing and determining what was needed for thermal analysis. Then I made each part with the necessary features.

The new model will provide accuracy for the Ansys mesh while minimizing the analysis load to the process. I then only included features needed for analysis. Some of the features not included are hardware and hardware mounting holes. Some of the features added to the model are the actual shape of the enclosure instead of a box, the man access door, and the printed circuit boards without the board components.

Figure 1. Model of NPS with parts needed for thermal analysis

- Develop a solid model to accurately represent the NPS enclosure and detector components

- The model components should provide more effective surfaces for Ansys mesh work during analysis
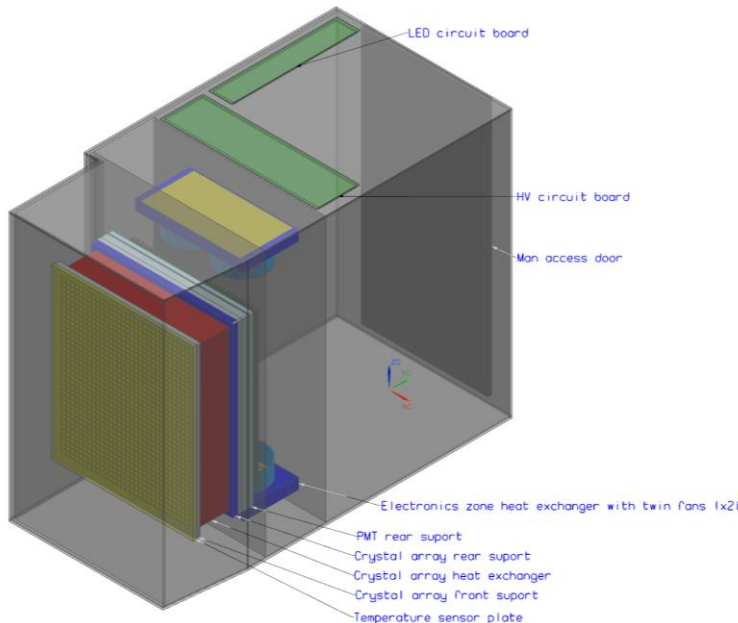
I also developed a PMT model to replace the one from the original model. This new model includes all the needed components, such as the light guide, mu-metal wrap, and cookie. I did not include the connectors or cables. This version provided the ability to make a full array of 1080 PMT, which is not in the old model.
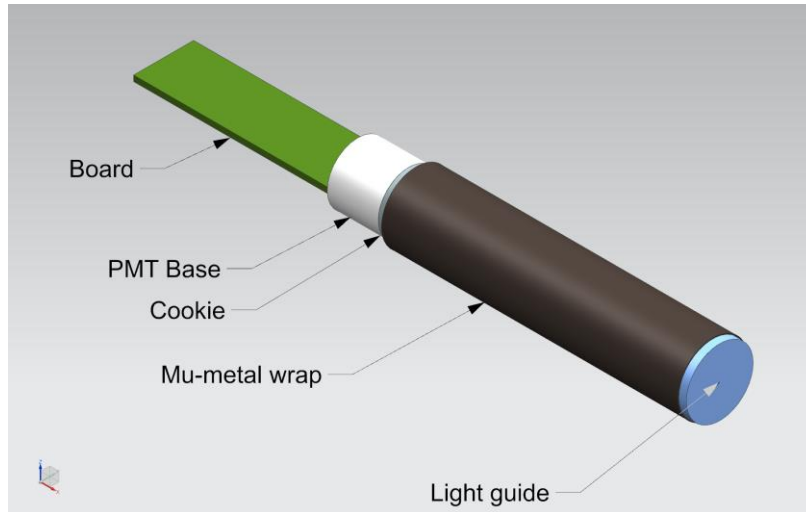

Figure 1. The new PMT model and its components labeled

In conclusion, a thermal analysis will be run on the model to project the temperature at different locations. The model will help determine if the heat exchange design is effective and what modifications are needed to achieve the specified temperatures internal to the detector enclosure.