

# NX12 Model of the SoLID Magnet Voltage Tap Locations

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## NX12 Model of the SoLID Magnet Voltage Tap Locations

This month I used NX12 to design a model of the voltage tap locations on the SoLID magnet. This visual representation can be imported into GUI and HMI screens used to monitor the values of the voltage taps.

I studied diagrams from the operating manual for the CLEO II magnet from Oxford Instruments. Additionally, I met with the DSG engineers to understand how the voltage taps should be represented and determine how to display these positions in the model.

The SoLID magnet has seven voltage tap locations. FIG. 1.

- Developed a NX12 model of voltage tap locations for monitoring displays and documentation

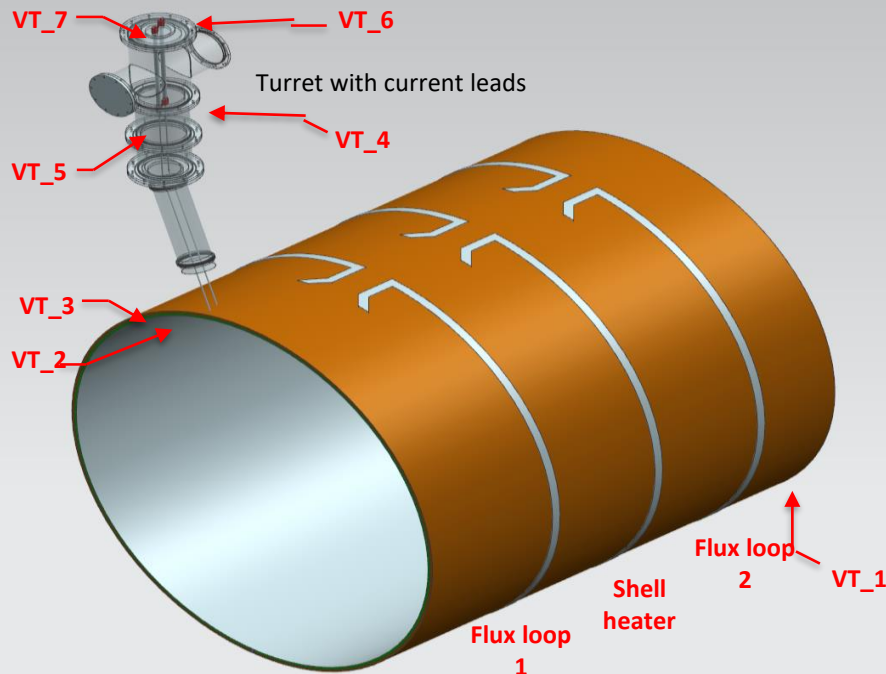


FIG 1. Voltage tap locations of the SoLID magnet

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The first location, VT\_1, is the junction between the inner and outer coils. The voltage tap is accessed at the rear of the magnet. Voltage taps two and three (VT\_2 and VT\_3) are located on the inner and outer coils. I used a green cylinder (VT\_2) inside of a bronze cylinder (VT\_3) and a rectangular bar centered between them to represent the VT\_1 access point at the bottom rear of the magnet coils. The final four coils (VT\_4 through VT\_7) are red shapes in the turret, above and below each current lead stack.

One of the more difficult components to design was the flux loops. This shape was challenging because it is an incomplete loop on the X-Y plane, which has a shape design in the Z-X plane, in a cylinder shape. It took a few different attempts before I decided to make a cylinder and design “cutting tool” extrusions to subtract material from the original cylinder to make the final shape. FIG. 2.

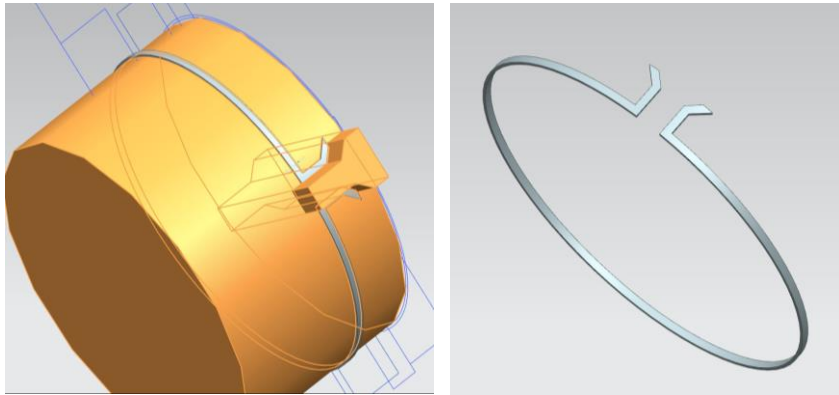


FIG. 2. Flux loop (gray) designed from a cylinder and cut to shape by subtracting “mass” extrusions (orange) from the cylinder material

The model is complete and can be used as a reference for documentation or as a graphic tool for software controls and monitoring.