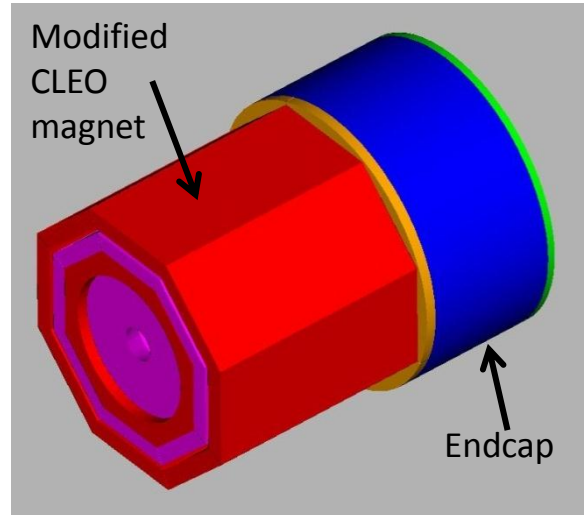
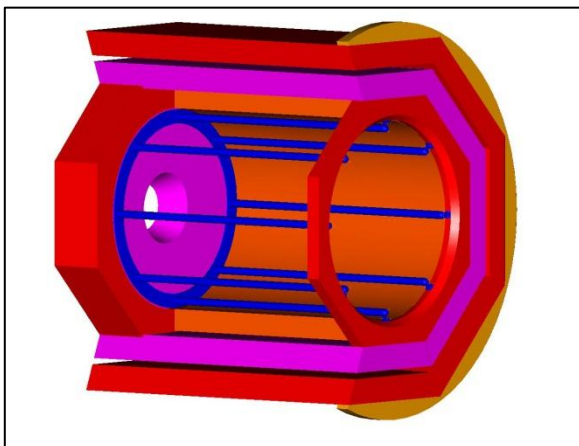
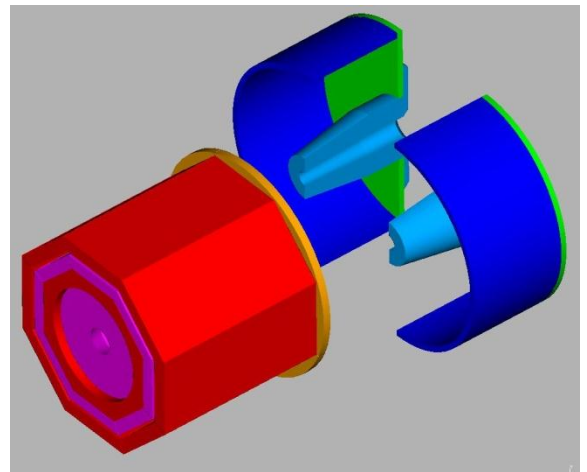


SoLID – Supports and Infrastructure

The **magnet support** will consist of a stationary base frame that distributes the 1000 ton weight of the modified CLEO II magnet safely to the concrete floor with steel floor plates and large steel blocks. 200 ton hydraulic jacks will be used for vertical alignment and shims installed to achieve desired elevation.



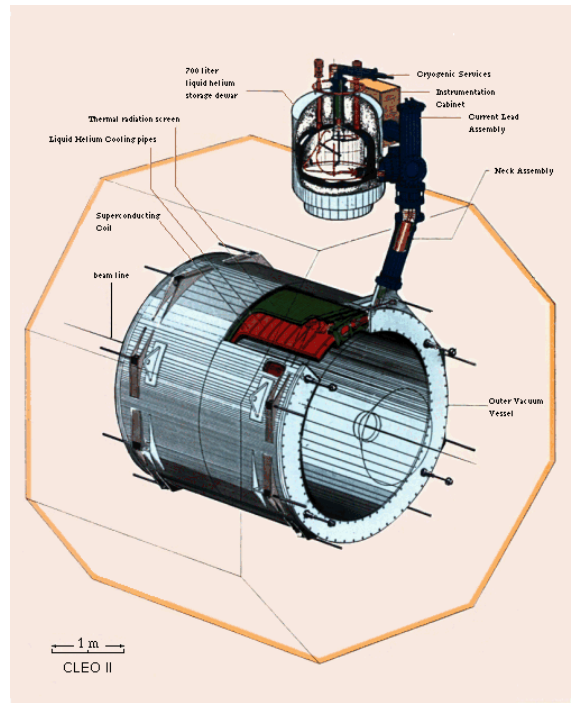
The **endcap support structure** will cradle each half of the cylindrical ring and be integrated into a track system that will allow the endcap to be disconnected from the magnet proper. The endcap will be moved downstream and separated in the lateral direction to allow access for loading/unloading and maintenance of detector packages. This separation also allows for the loading of experimental apparatus inside of cryostat bore.



The **internal support** for equipment loaded inside of the cryostat bore will span the entire length of the magnet and avoid applying weight to the cryostat. Rails fabricated from SS pipe will allow equipment for SIDIS and PVDIS to be loaded from the downstream end of the magnet and be supported by the rails.

The CLEO-II magnet was designed to have a low **cryogenic heat load** with passive cooling. Oxford estimated heat load is 8.3 watts and 14 l/hr.¹ The HRS arms will not be in use during this experiment and therefore enough cooling capacity exist in the hall for SoLID.

The projected **electrical power load** for the magnet is 1.6 MVA at a maximum current of 3300A. A planned upgrade to the Hall A substation is scheduled prior to the running of SoLID and would bring the capacity up to 2 MVA.



| Parameter | Design Value |
|----------------------------|-----------------------|
| Coil Electrical | |
| Operating current | 3300 A |
| Coil inductance | 4.6 H |
| Stored energy | 25 MJ |
| Cryogenics | |
| Coil operating temperature | 4.3 - 4.6 K |
| Coil working pressure | 1.1 - 1.2 bar |
| Refrigeration load | 8.3 watts and 14 l/hr |

Project Status

- Completed basic structural analysis of preliminary design of endcap and magnet assembly. Continuing with 3D analysis as design evolves.
- Completed conceptual layout of experiment in Hall A and draft installation plan
- Developed concepts for detector support and installation
- Implementing Cornell magnet support concept into Hall A infrastructure
- Working with Cornell on disassembly and shipping plan

Last updated February 4, 2015

[1] THE CLEOII DETECTOR MAGNET: DESIGN, TESTS, AND PERFORMANCE, IEEE TRANSACTIONS ON NUCLEAR SCIENCE, VOL. 37, NO. 3, JUNE 1990