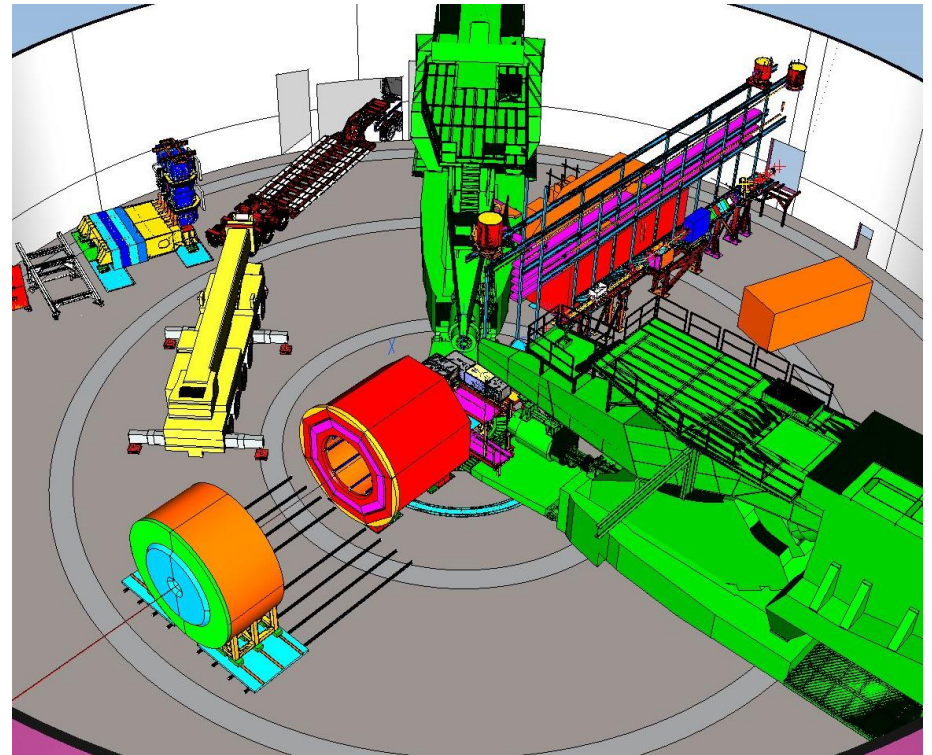


SoLID Collaboration Meeting

Magnet Test & Detector Support



Whit Seay

June 21, 2024

Presentation Outline

Latest updates:

- 1) Next steps for CLEO II testing
- 2) Engineering and design support - CAD model updated
- 3) Update on engineering and design support for FY25
- 4) JLab Open House 2024

Magnet – Low Current Test – Next Steps

- Finalize data analysis and present conclusions to division and collaboration.
- Verification of JT valve seats and bullets required to investigate leak by on some valves and calculate flow rates.
- Considering options for further investigation of thermal short and repair of vacuum leak.
- Options include removing transfer lines and pressure testing He and N2 circuits to verify leak tightness after cold test.
- Fix vacuum leak in service turret and search for any additional leaks on cryostat.
- Develop plan based on the above options with labor and cost requirements to present to physics management for approval.
- Make improvement to instrumentation and controls.
- Provide a report of any new findings from follow up testing
- Provide cost/labor estimations and planning input for full current test in the future.

Magnet – Engineering and Design Support

After consulting with SoLID Collaboration work will focus on the following priorities:

1. Produce SoLID cad model matching latest magnet design from Jay Benesch.
2. Coordinate with the LGC group to update tank design, specifically focused on how the LGC interfaces mechanically with the greater SoLID assembly and accounting for all expected necessary attachments and cabling from the LGC and other components/detectors that require space in the vicinity of the LGC detector.
3. Coordinate with EC group to have a conceptual design to mount EC shower, pre-shower and SPD for both forward and large angles.
4. Coordinate with HGC, baffle, GEM and MRPC groups to have a conceptual design to mount them.

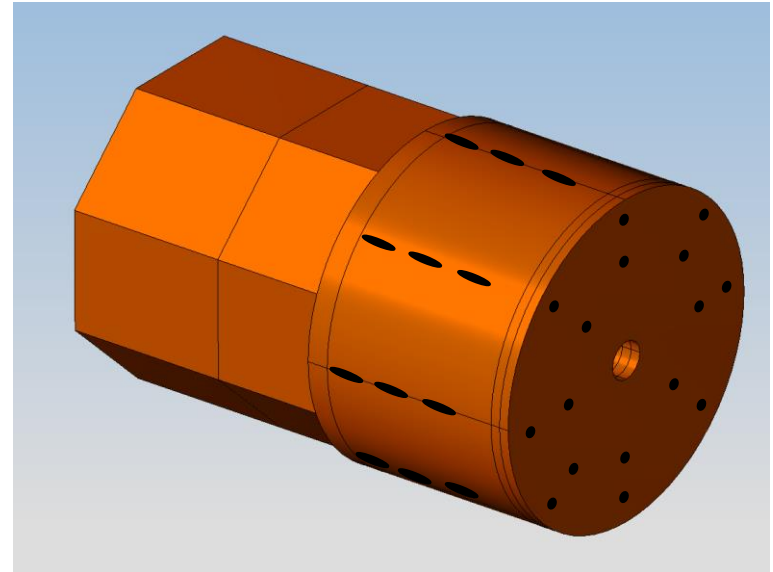
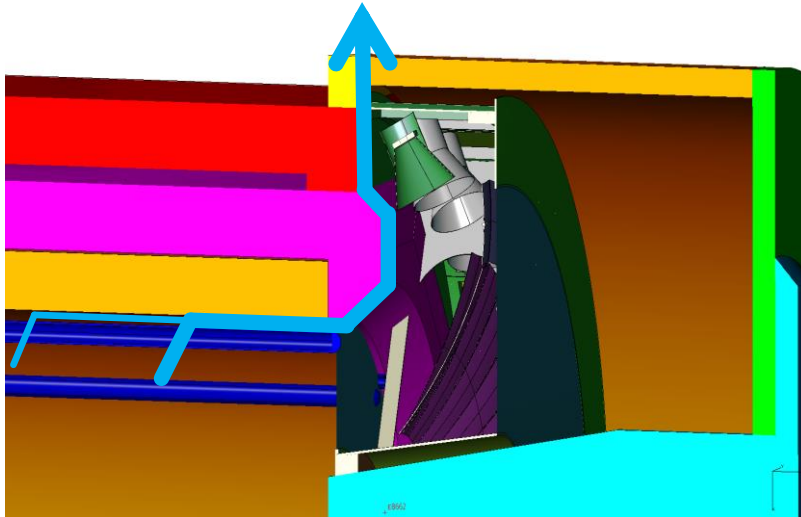
Magnet – Engineering and Design Support

Priority:

1. Produce SoLID cad model matching latest magnet design from Jay Benesch.

- ✓ Match geometry of magnet steel
- ✓ Add details of axial and radial support mechanisms
- ✓ Add some of the required details to assemble magnet. Mounting hardware, etc
 - Further the design concept for detector support rails inside magnet and endcap
 - Develop details for cable routing – access holes in steel, etc

Design work listed above will help prepare for priorities 2 thru 4.



Magnet – Engineering and Design Support

Hall A Eng/Des group lost one of our designers at the end of October. (New designer hired 6/24)

Designer - ~50% from Sept to Dec

Engineer – <25% from Sept to Dec

The design effort on priority #1 produced the following:

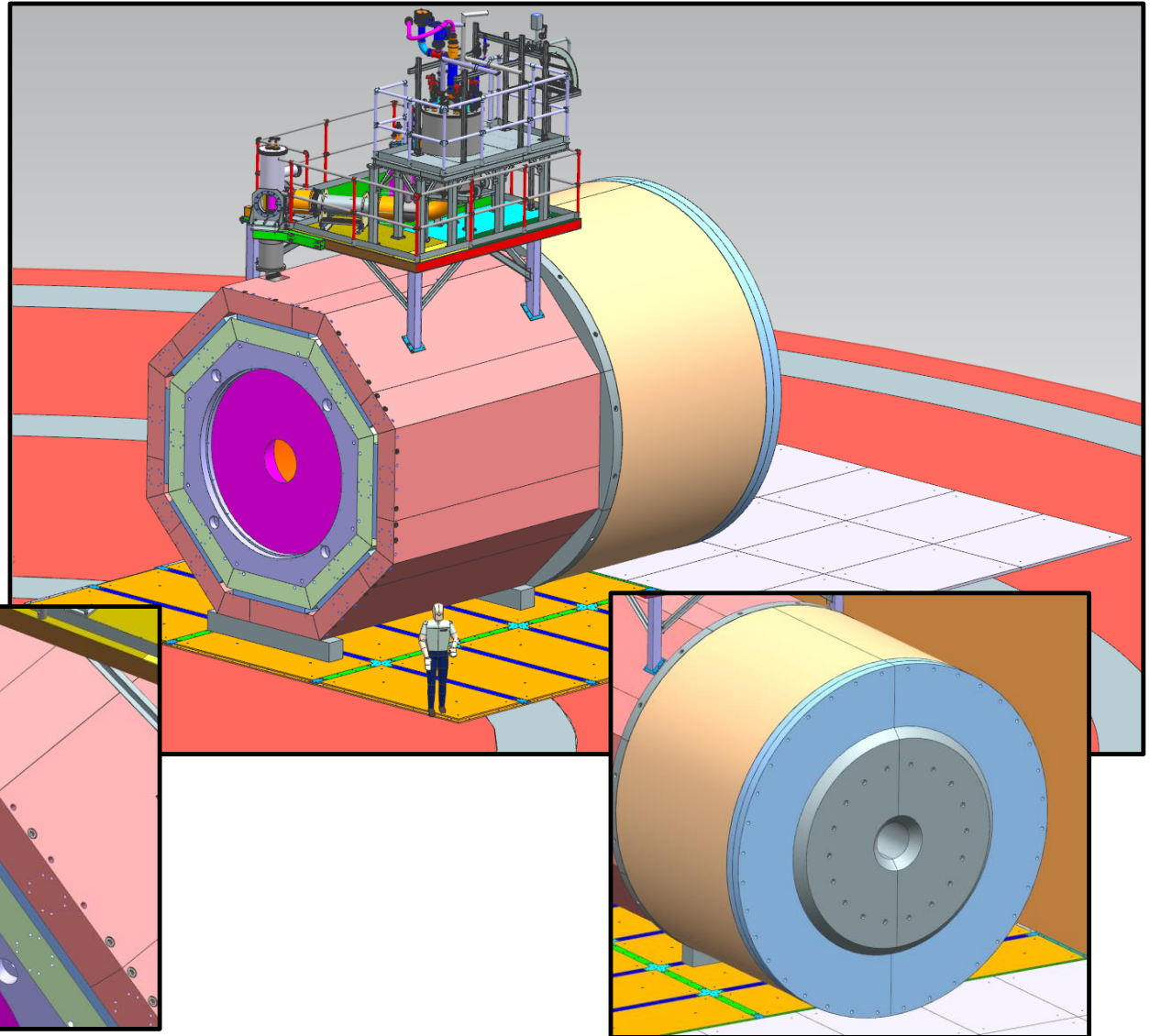
1. Cleaned up the existing NX CAD model. A lot of “mock-up” out of date geometries removed. This brought the structure of the CAD model more in line with our group’s standards.
2. Created detailed model of the existing return steel with all cutouts and threaded holes.
3. Created the cuts to match the latest return steel geometry. Add conceptual mounting holes for new return steel (endcap) interface to look for interferences with existing holes.
4. Add cryogenic platform on top of magnet
5. Updated endcap cone geometry of production model to match Jay’s TOSCA (Spring 24)

Magnet – Engineering and Design Support

All known existing holes in the steel have been modeled.

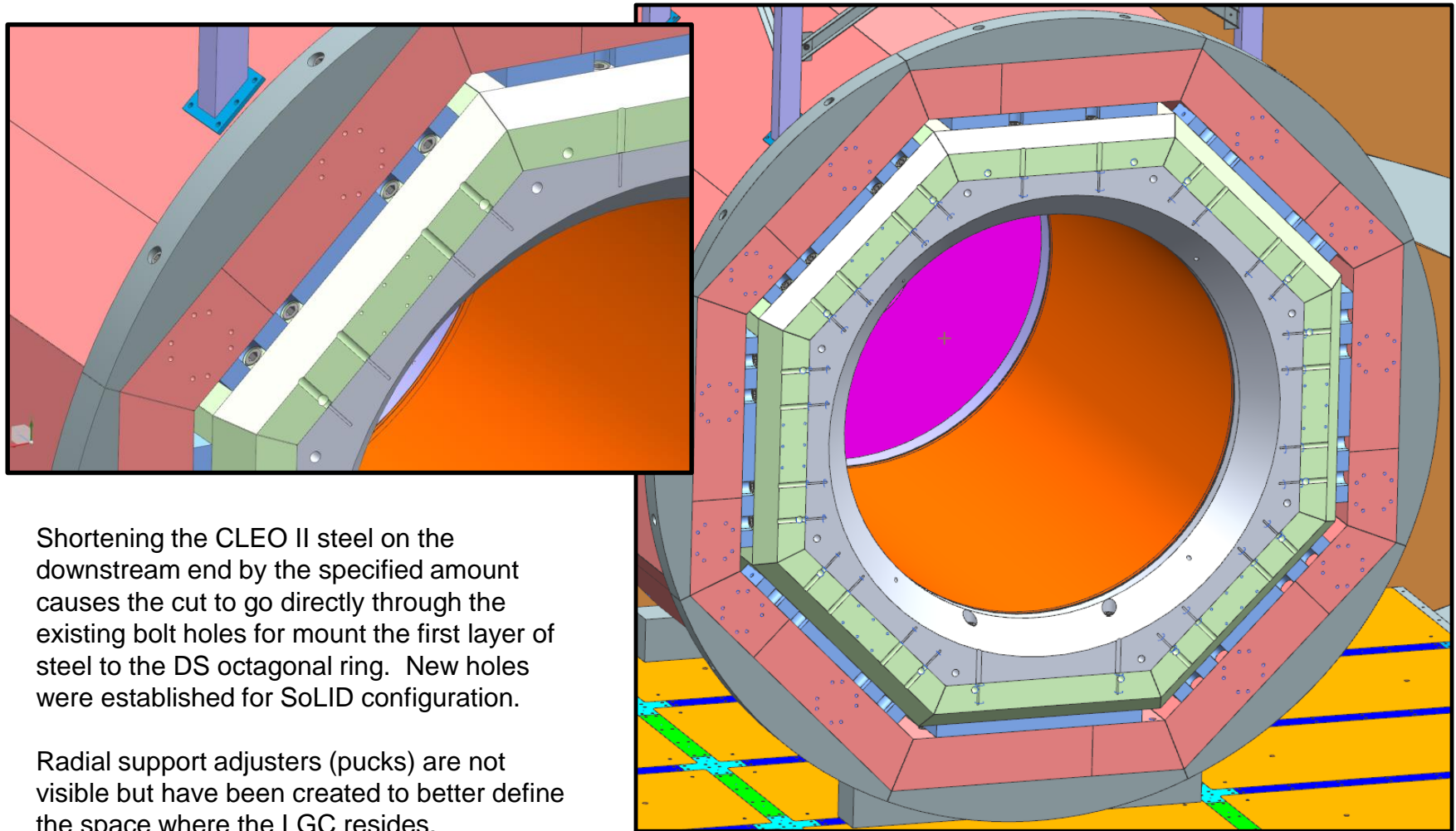
Mounting hole concept established on the endcap.

Added service turret and CCR components along with access platform on top of the magnet.



Magnet – Engineering and Design Support

Downstream end of the magnet – endcap removed



Shortening the CLEO II steel on the downstream end by the specified amount causes the cut to go directly through the existing bolt holes for mount the first layer of steel to the DS octagonal ring. New holes were established for SoLID configuration.

Radial support adjusters (pucks) are not visible but have been created to better define the space where the LGC resides.

Magnet – Engineering and Design Support

Outlook for addressing the remaining priorities:

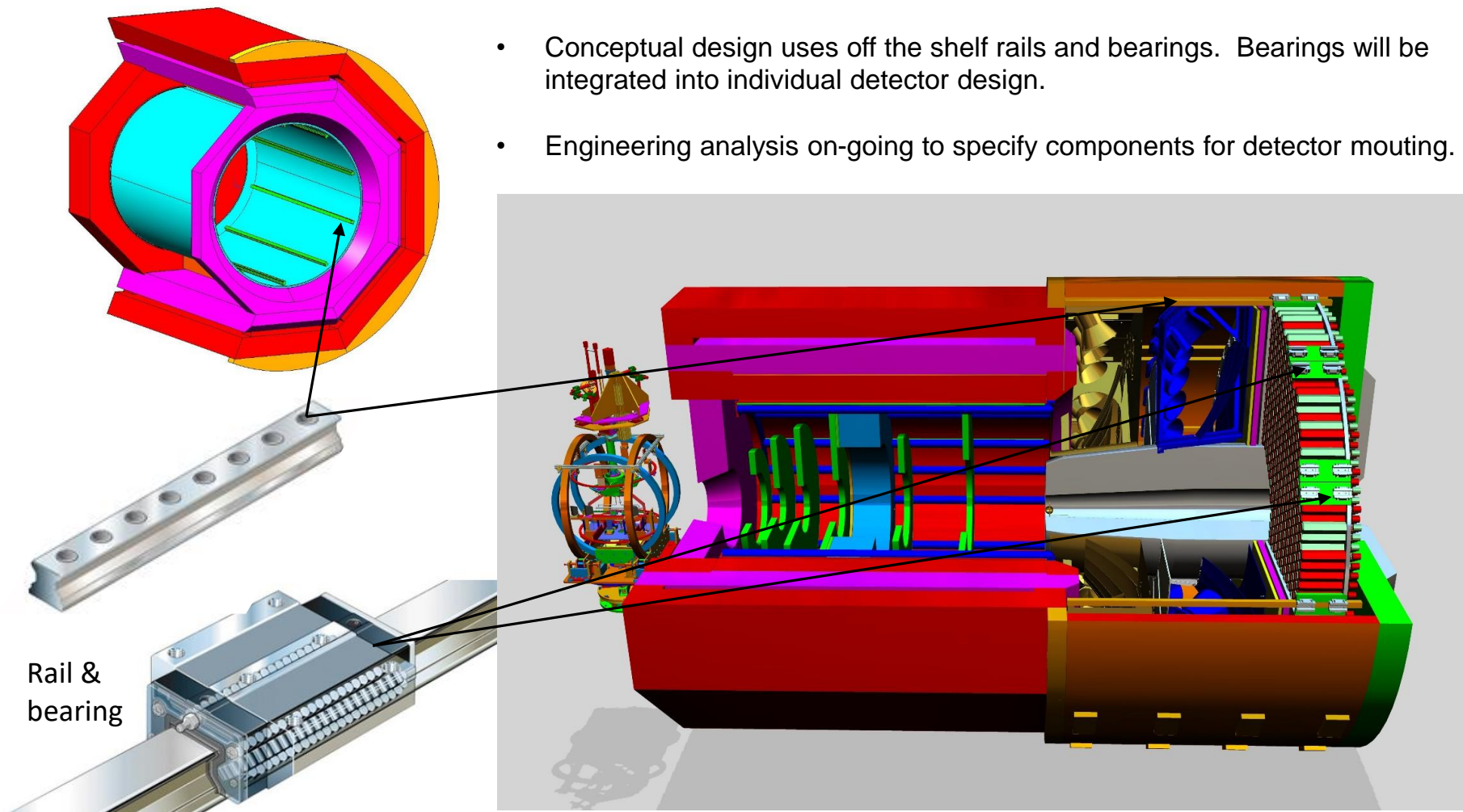
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Starting in Jan 2025 Hall A engineers and designers will become more available:

- 3 designers
- 1.5 engineers

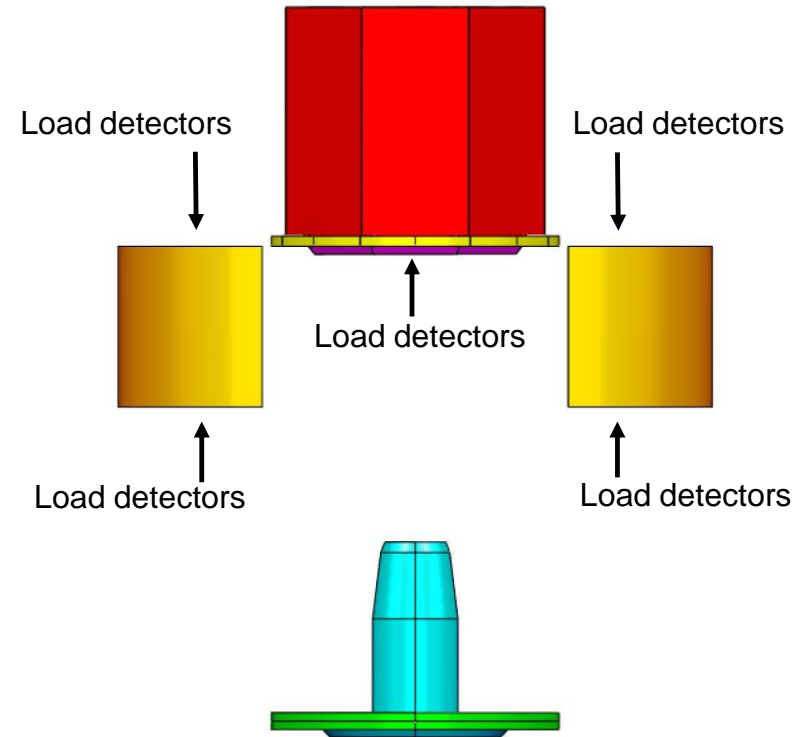
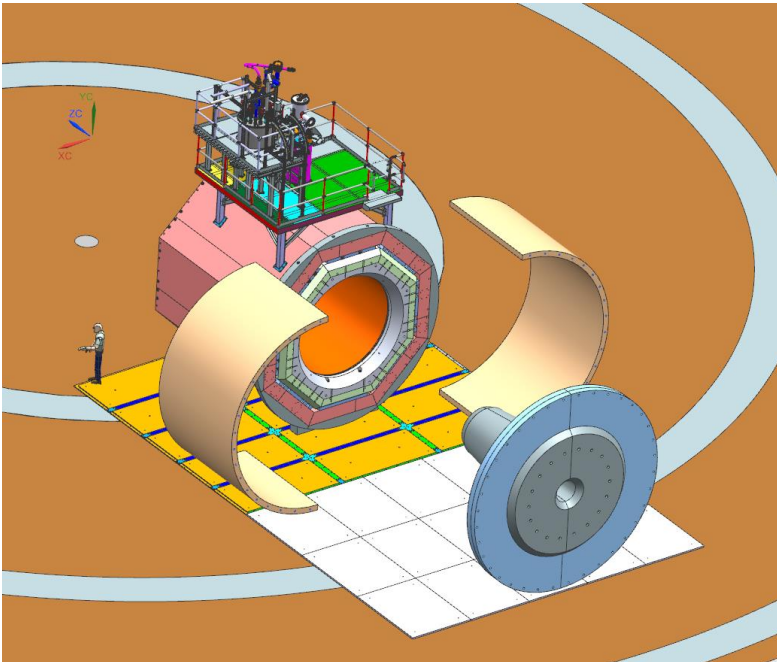
Magnet – Detector Support Structure

- Provide a universal mounting system that is utilized by each detector group.
- Use the same concept for internal magnet and endcap locations.
- Conceptual design uses off the shelf rails and bearings. Bearings will be integrated into individual detector design.
- Engineering analysis on-going to specify components for detector mounting.



Magnet – Endcap Motion Concept

- Decouples the nose and backplates from the half cylinders
- Provides additional access points for installing and servicing detectors
- Simplifies motion system and tracks mounted to the floor



JLab Open House 2024 – SoLID Exhibit

- Jefferson Lab hosted an open house for the public on June 8th, 2024 to celebrate its 40th anniversary.
- An estimated 9000 people attended the event
- <https://www.jlab.org/news/stories/jefferson-lab-2024-open-house-recap>

Thank you to several collaborators for volunteering at the SoLID exhibit booth! Tian Ye, Steve Wood, Michael Nycz and Whit Seay



Questions/Comments?

wseay@jlab.org

