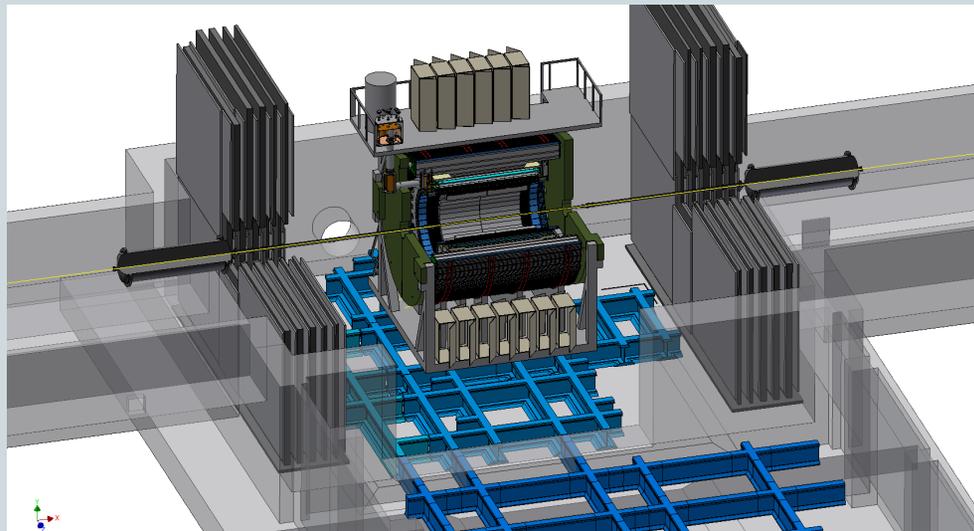


# sPHENIX Engineering Meeting



**DON LYNCH**  
*NOVEMBER 6, 2014*

# AGENDA

2

- BABAR Magnet Update
- Global Design Concept – Update
- Outer HCal Structural Analysis (2<sup>nd</sup> pass)
- sPHENIX Project Management

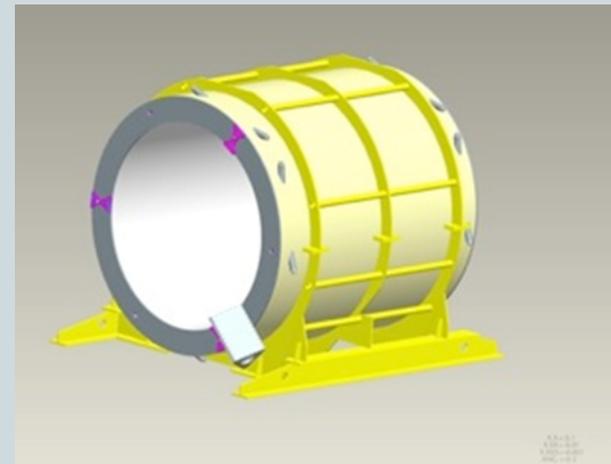


November 4, 2014

# Present Magnet Status

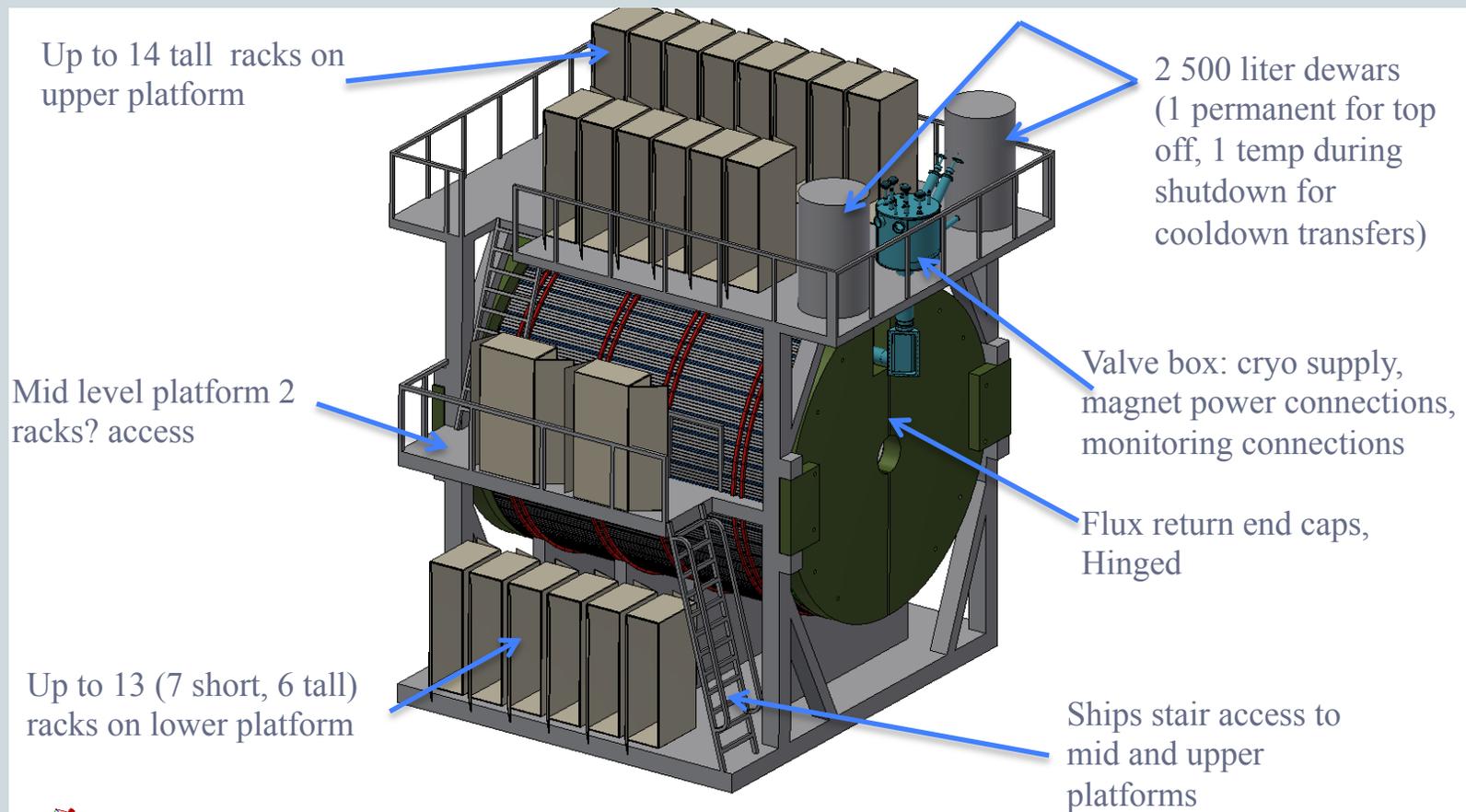
3

- SC Solenoid Magnet is at SLAC
- Ready for shipment, expect to be on the road 11/10 and arrive at BNL 8-9 days later
- Valve box is at SLAC
  - Valve box will ship with magnet
- Other ancillary equipment is crated, will ship separately (note: R. Than needs transfer line ASAP)
- Still planning for ~May 2015 cold, low current test
- Planning for a full field test at some point
- Magnetic force calculations soon



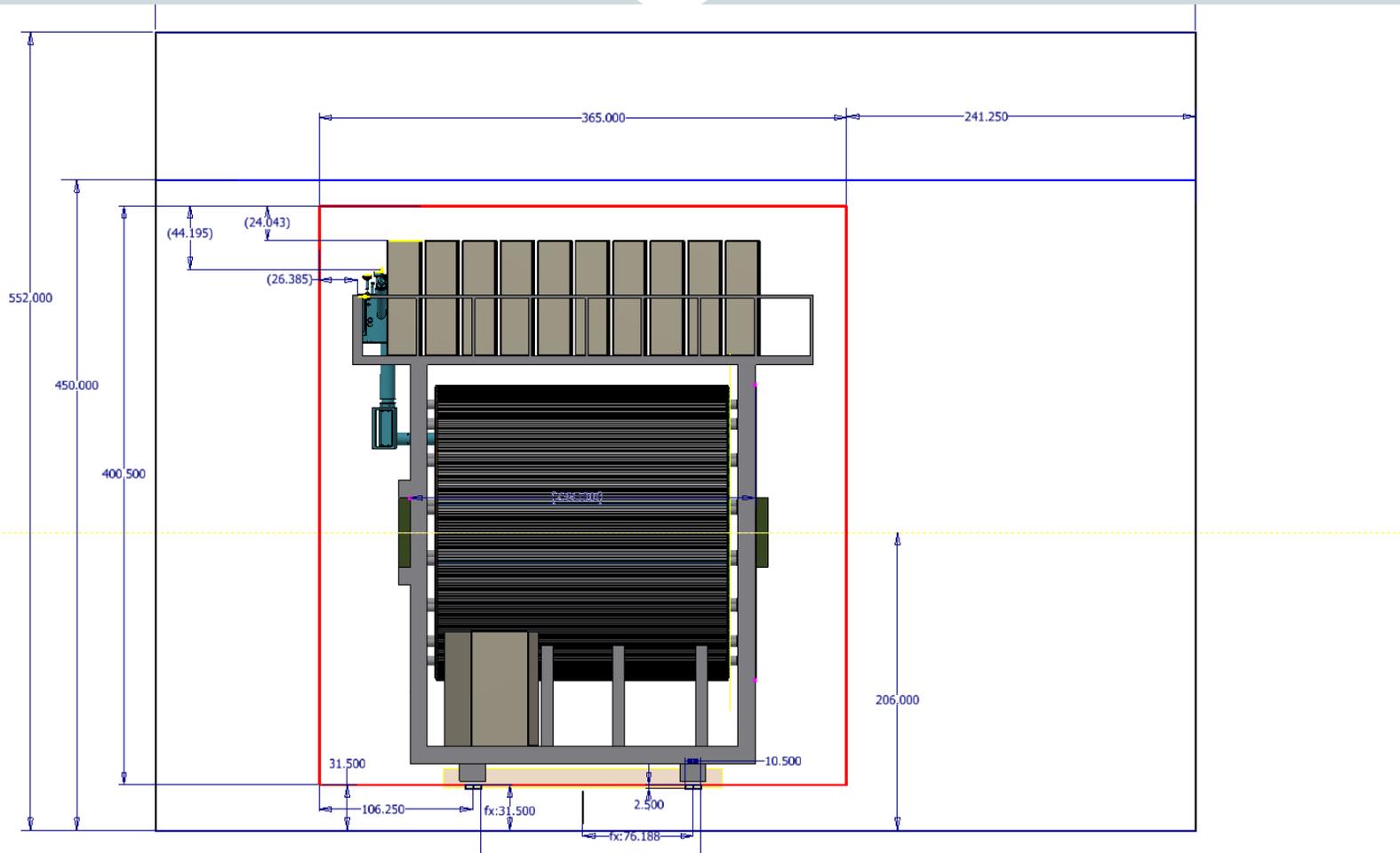
# sPHENIX Global Design Concept

4



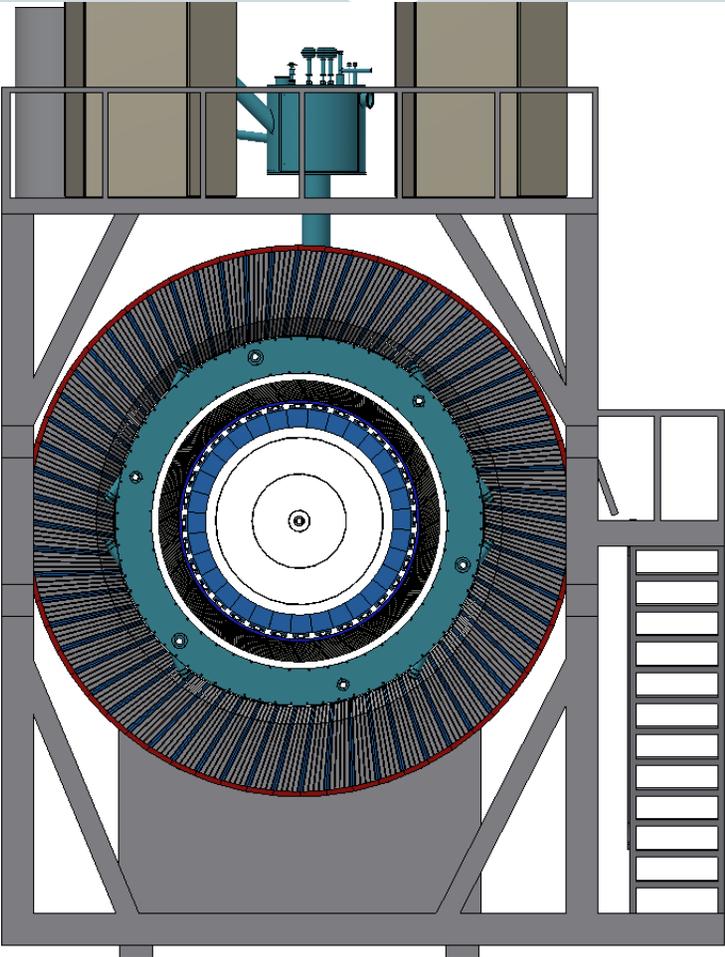
# Current sPHENIX model fits through shield wall opening

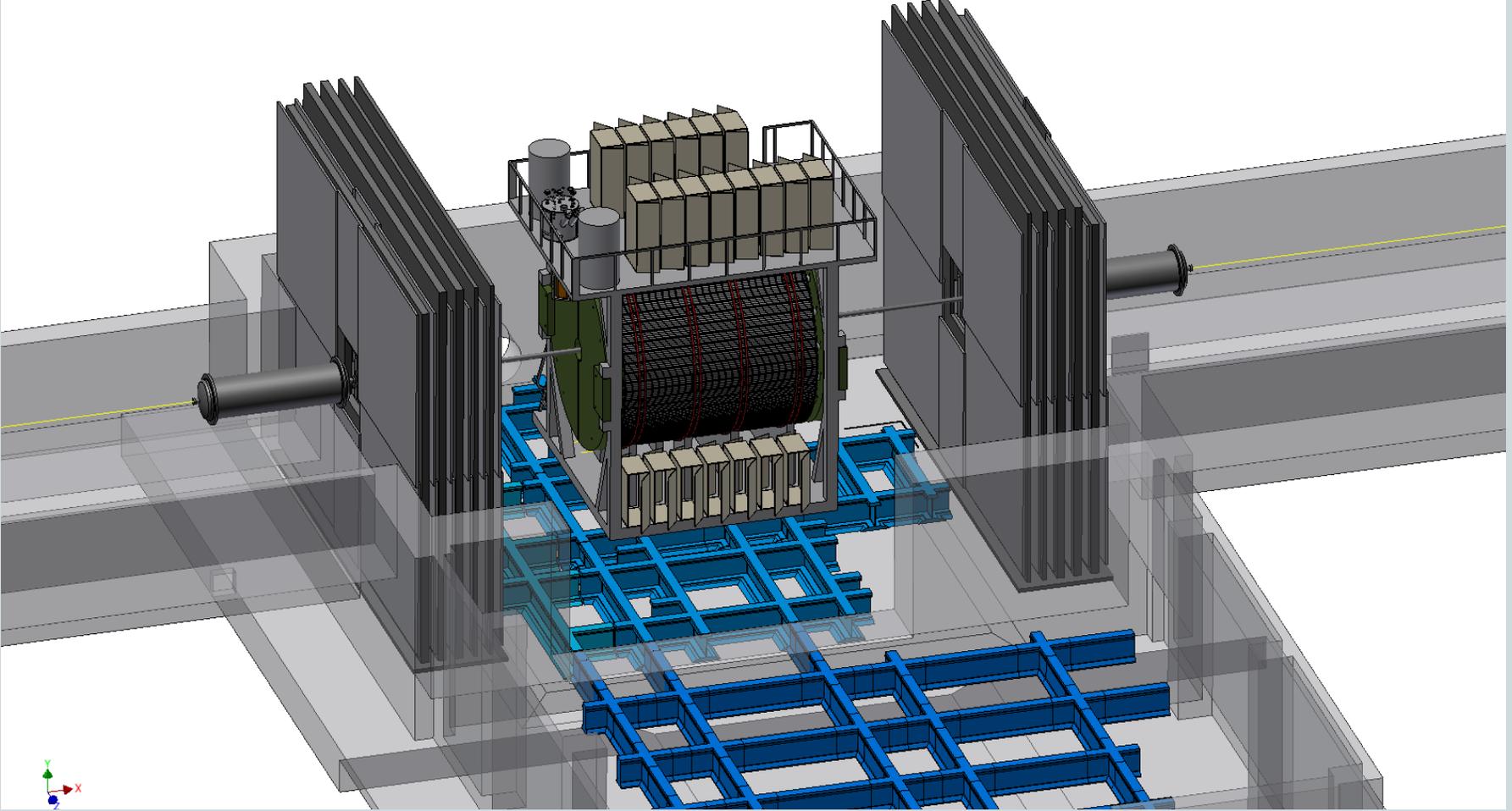
5



# End View (without end plates & support ring)

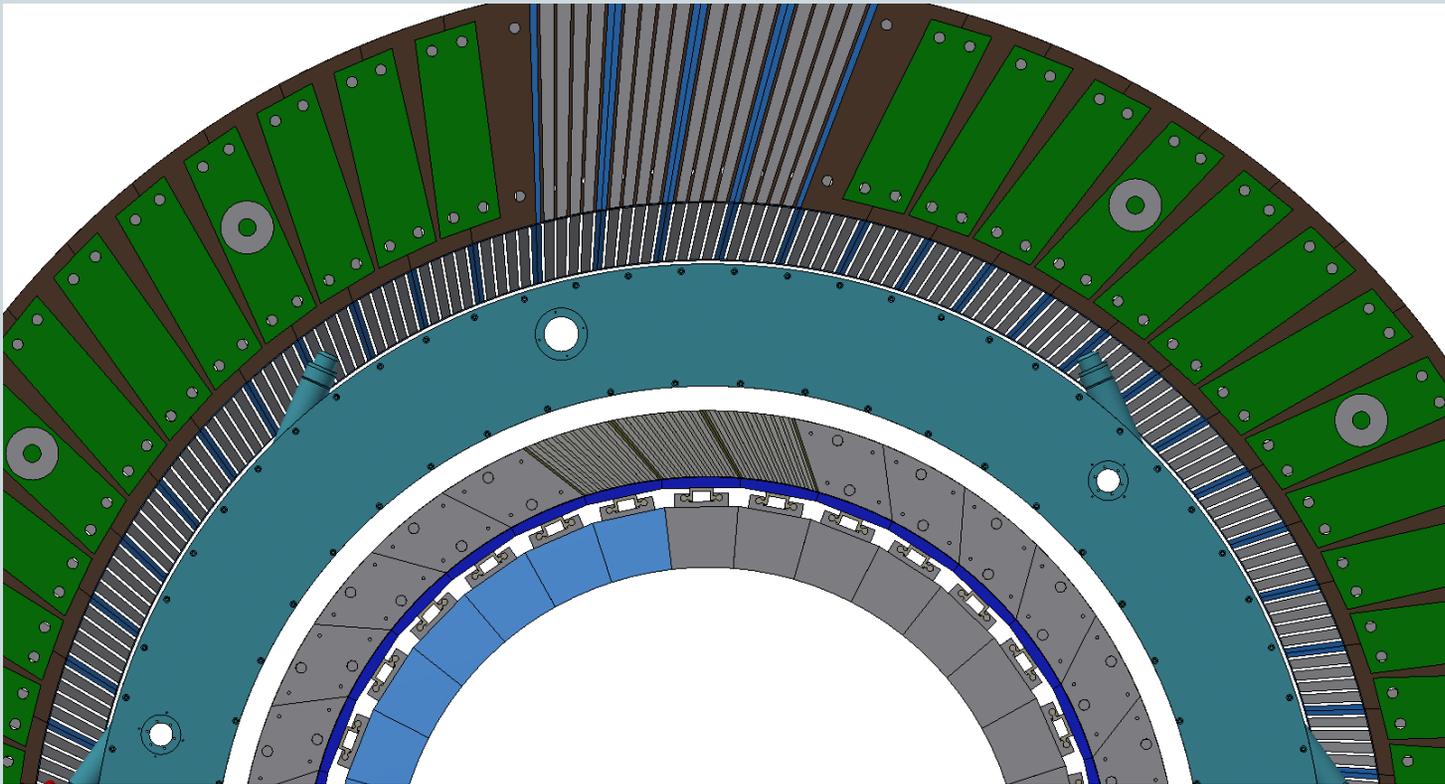
6





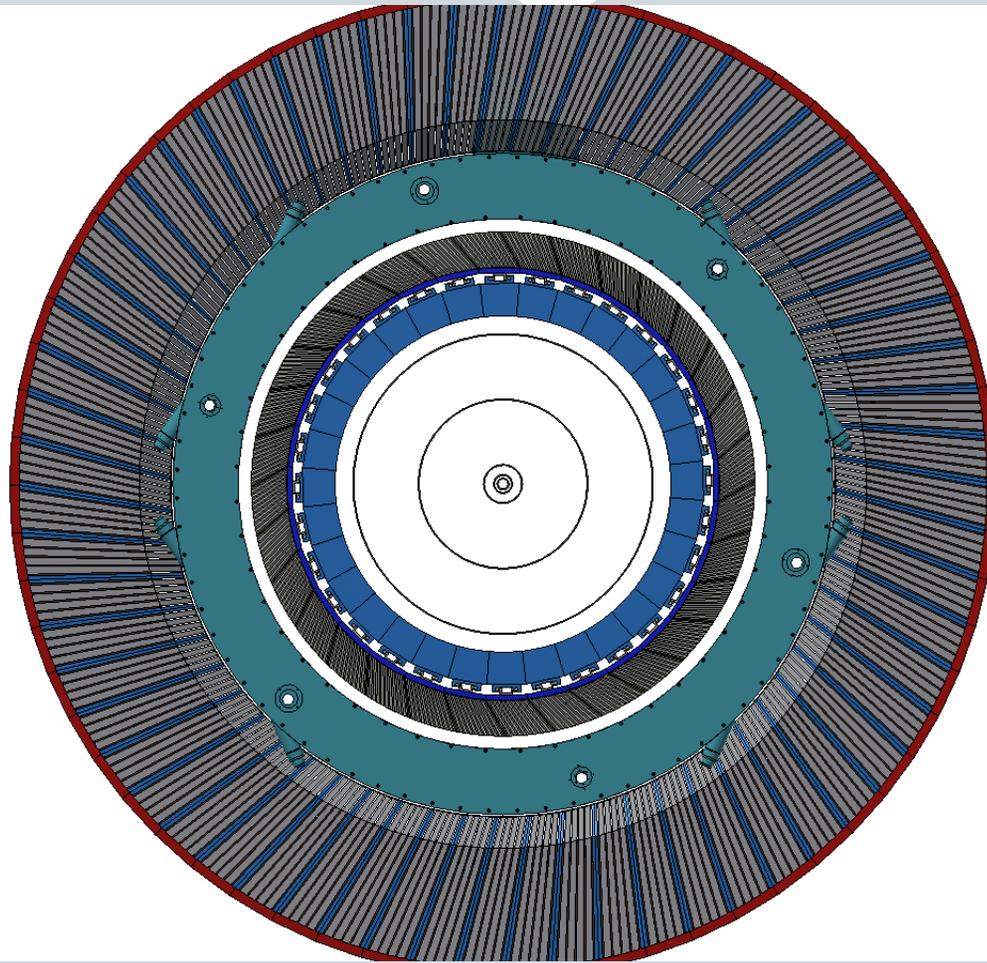
# Partial End view

8



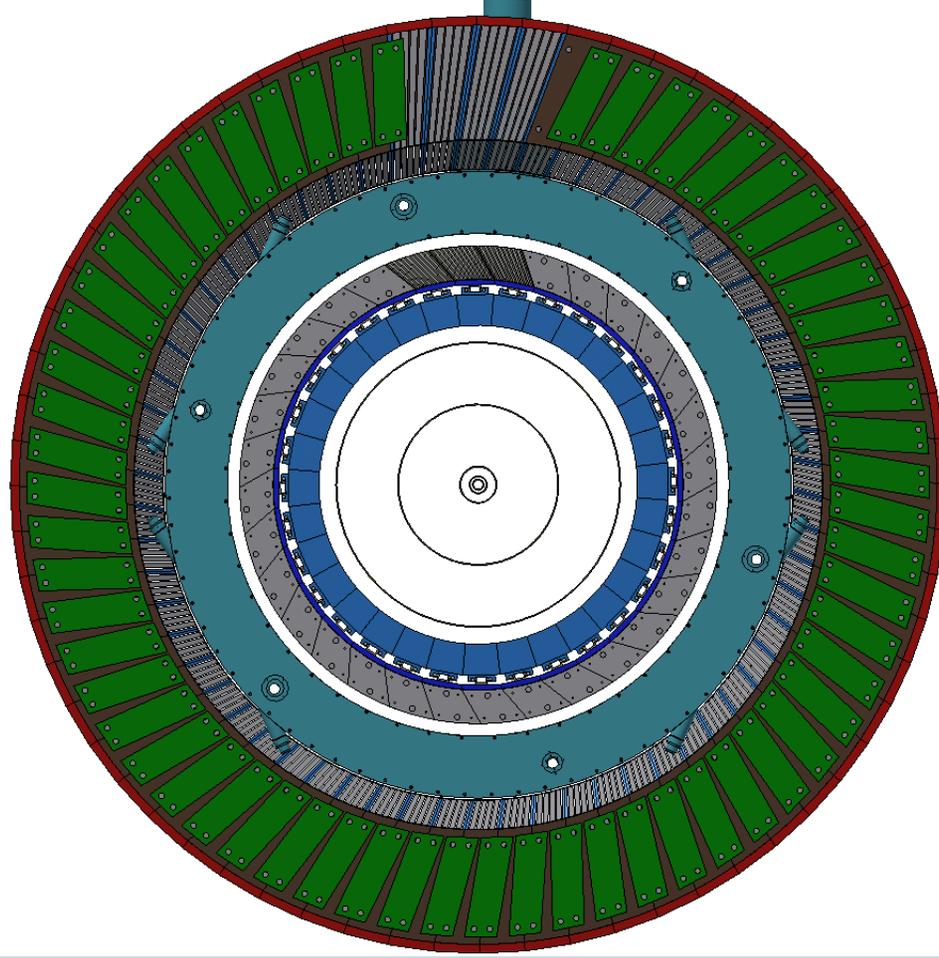
# End View 1 (no end plates on outer)

9



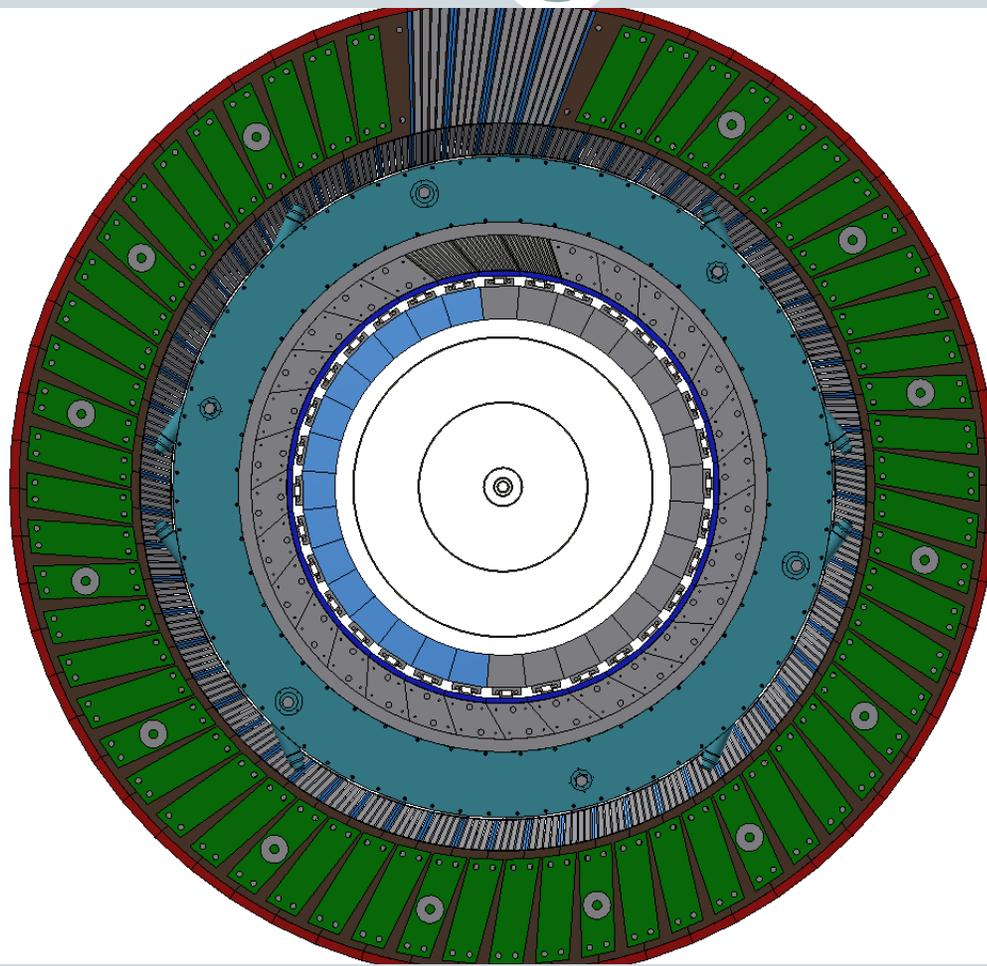
# End View 2 (most end plates)

10



# End View 3 (added standoffs)

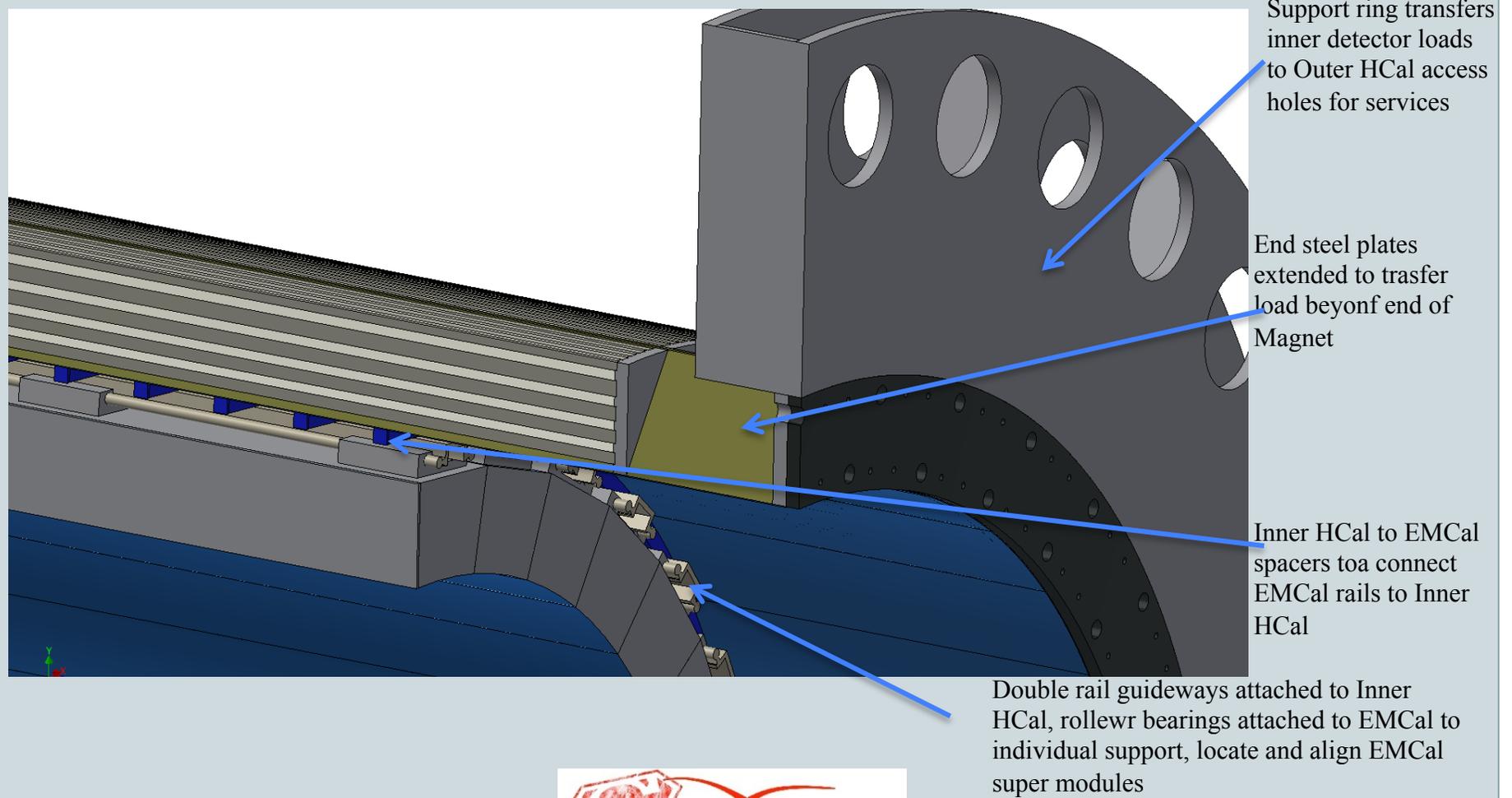
11



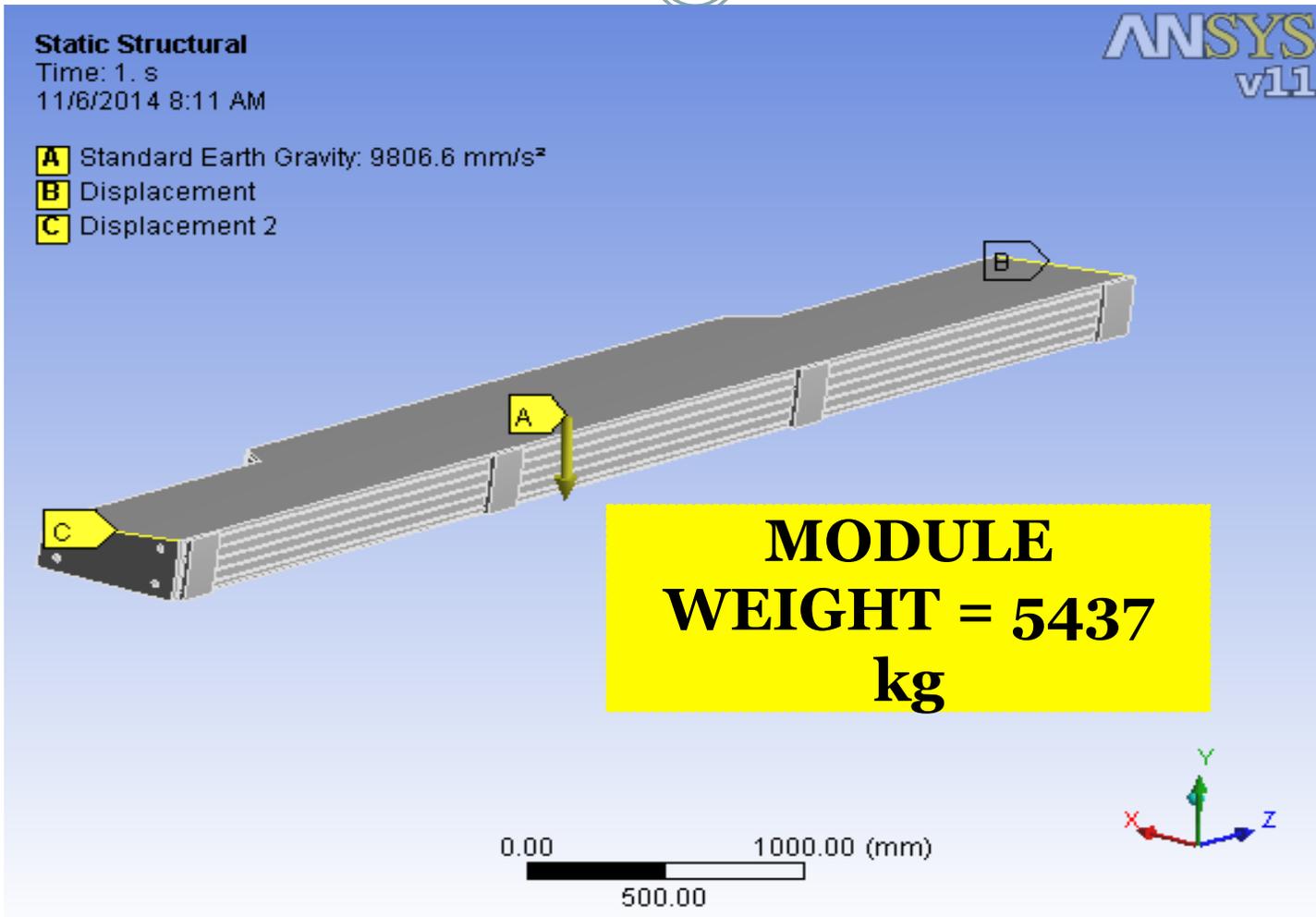


# Inner HCal & EMCal Support Concept

13

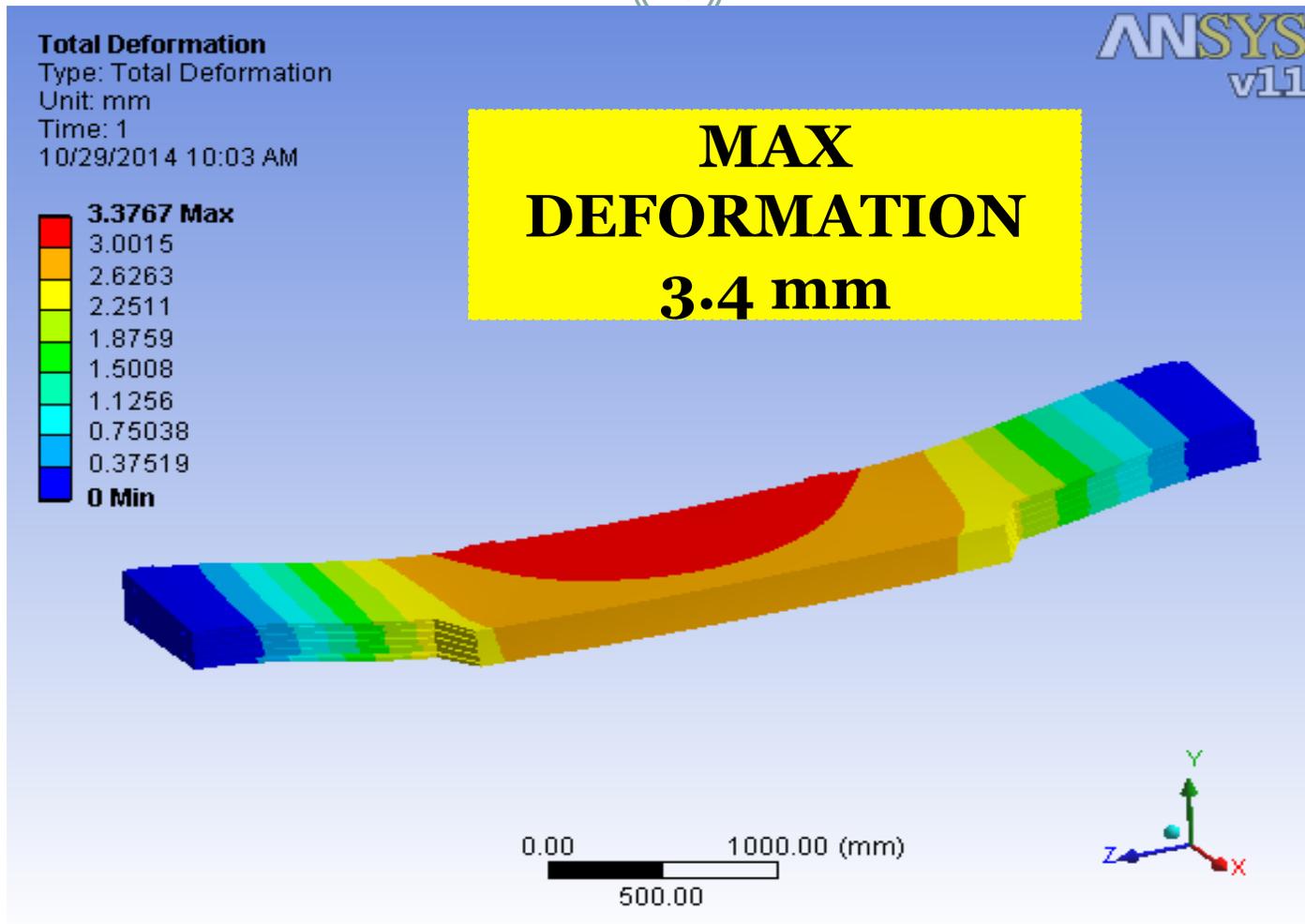


sPENIX OUTER CALOROMETER  
5.625 degree module in horizontal position  
MODULE. VIEW 2



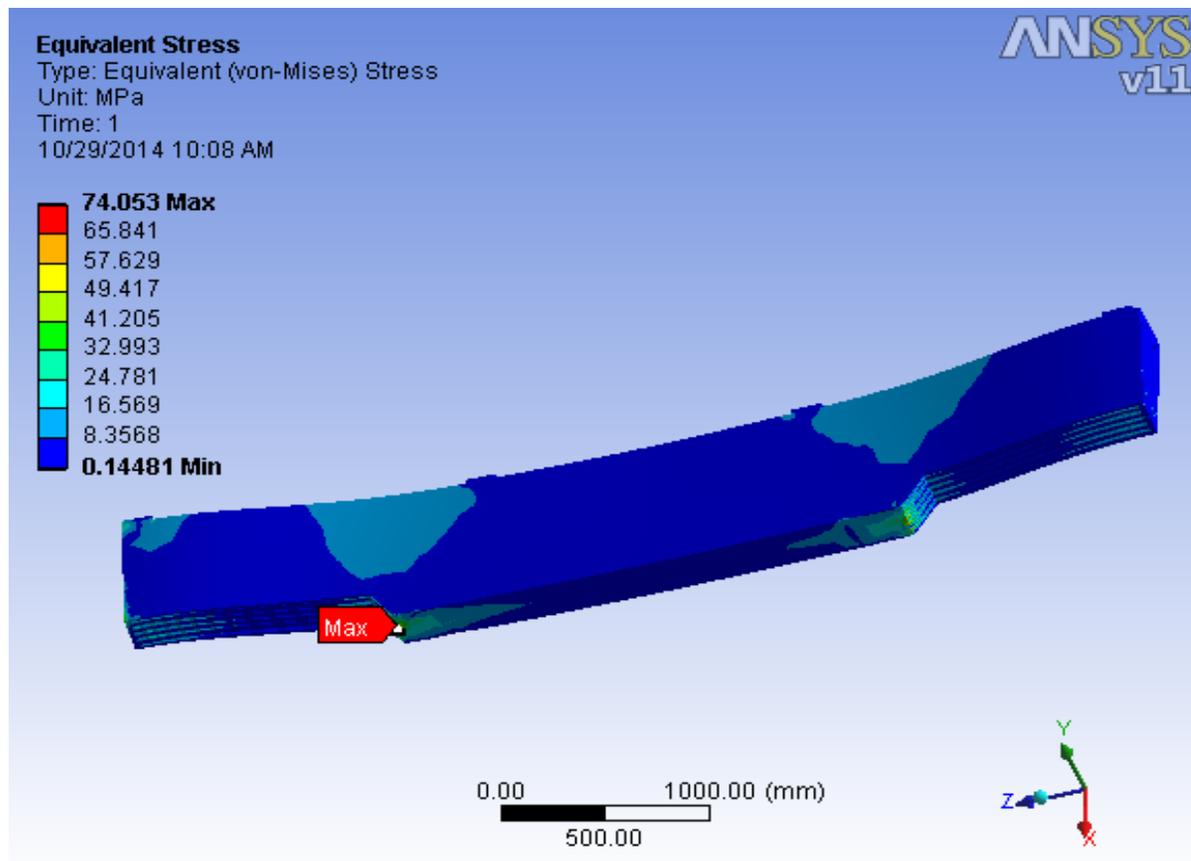
sPENIX OUTER CALOROMETER  
5.625 degree module in horizontal position  
TOTAL DEFORMATION. VIEW 1

15



sPENIX OUTER CALOROMETER  
5.625 degree module in horizontal position  
EQUIVALENT STRESS. VIEW 1

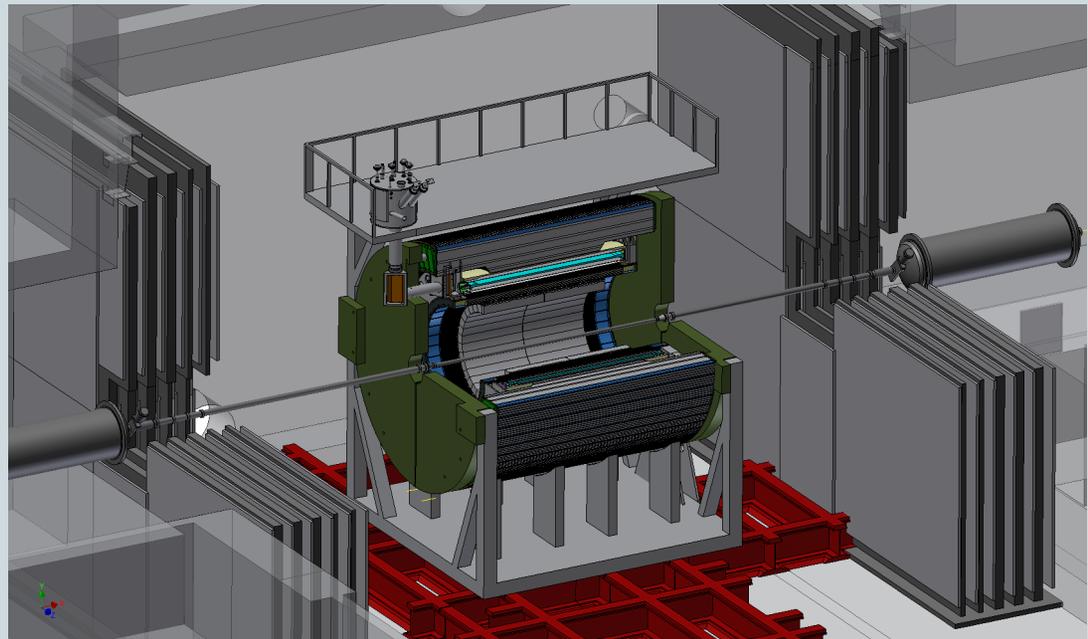
16



# Infrastructure: Mechanical support structures

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- Central pedestal carriage (base)
- CP detector support
- Bridge support
- CP mid platform
- Inner calorimeters support
- Tracking support
- Flux return end caps
- Magnet mounting feet



# sPHENIX Integration Interfaces

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The following is a list of physical interfaces between components and subsystems of sPHENIX that need to be identified, quantified and coordinated between subsystems/subcomponents as applicable

- **Central Pedestal (CP):** CP to rails, CP to driving pistons, CP base to HCal mounting/support, CP to platforms supports, CP power breakers mounting, CP breakers to racks power distribution, electronics water cooling main manifold from cooling water source, main cooling water manifold to rack manifolds, CP rack mountings, CP cryo valve box mounting, CP cryo holding dewars (temporary and permanent mounting), CP platform supports to magnet flux return end cap mounting hinges, CP to safety system mountings, CP to permanent access (NE tower) connection(s)
- **Outer HCal:** Outer HCal to CP mounting/alignment, Outer HCal to Magnet mounting/alignment, Outer HCal to Inner HCal mounting rings and alignment, Outer HCal to Outer HCal control rack power, data, monitoring and control services connections
- **Inner HCal:** Inner HCal to Outer HCal mounting rings and alignment, Inner HCal to EMCAL mounting rails and alignment, Inner HCal to Inner HCal control rack power, data, monitoring and control services connections
- **EMCAL:** EMCAL to Inner HCal mounting rails and alignment, EMCAL to EMCAL control rack power, data, monitoring and control services connections
- **Tracking:** Tracking detector to Tracking mounting rails and alignment, Tracking mounting rails and alignment to Outer HCal , Tracking to Tracking control rack power, data, monitoring and control services connections
- **SCMagnet:** SC Magnet to Outer HCal mounting and alignment, SCMagnet to service stack connections, service stack to cryo supply connection, service stack to power, monitoring and control services connections.
- **Other Interfaces:** HVAC to control systems, electronics cooling water to control systems, electronics control racks to rack room, DAQ, and control systems, safety systems to control and monitoring systems



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# sPHENIX Custom Installation and Integration Tooling and Fixtures

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The following is a list of tools and fixtures expected to be required for integration and assembly of sPHENIX detector and infrastructure subsystems. (Note: fixtures required for module assembly and testing prior to integration and installation of these subsystems away from building 1008 are not included here):

- **Central Pedestal (CP):** (standard lifting tools for CP base and rollers, cradle, support posts, platforms, access stairs), alignment tools for rollers and cradle.
- **Outer HCal:** module holding fixture (4), indexed lifting/installation fixture, alignment tools, temporary inner & outer support assembly fixtures
- **Inner HCal:** module holding fixture (4), module lifting fixture, assembly indexed/rotating fixture and insertion beam and insertion beam lifting fixture, alignment tools
- **EMCal:** module handling fixture (8), rail alignment tool, indexed lifting/installation fixture
- **Tracking:** Handling fixture (2), alignment tool, installation tool
- **SC Magnet:** Lifting fixture (spreader bar), alignment tool, handling/lifting tool
- **Infrastructure:** beampipe alignment tools



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