Cryomodule Integration Plans

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On Behalf of the Cryomodule Design Team

26th LARP Hi Lumi Collaboration Meeting, 19th May 2016

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- Top Plate Assembly
- Support & Alignment
- Thermal Shield Assembly
- Warm Magnetic Shield
- Vacuum Vessel Integration
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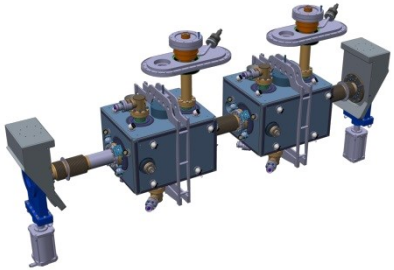
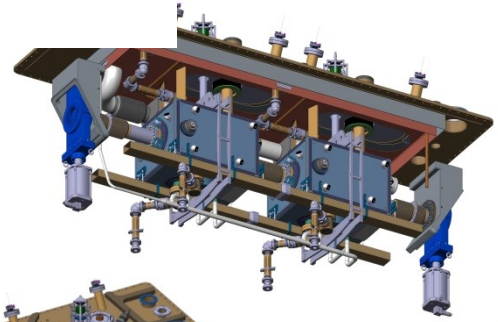
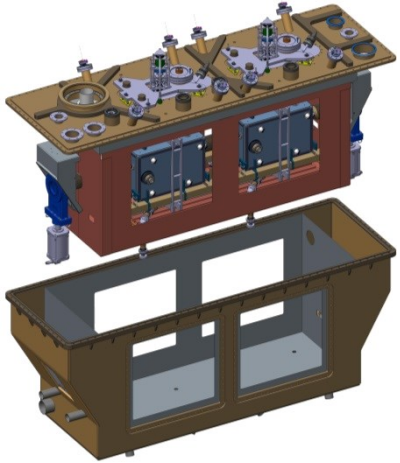
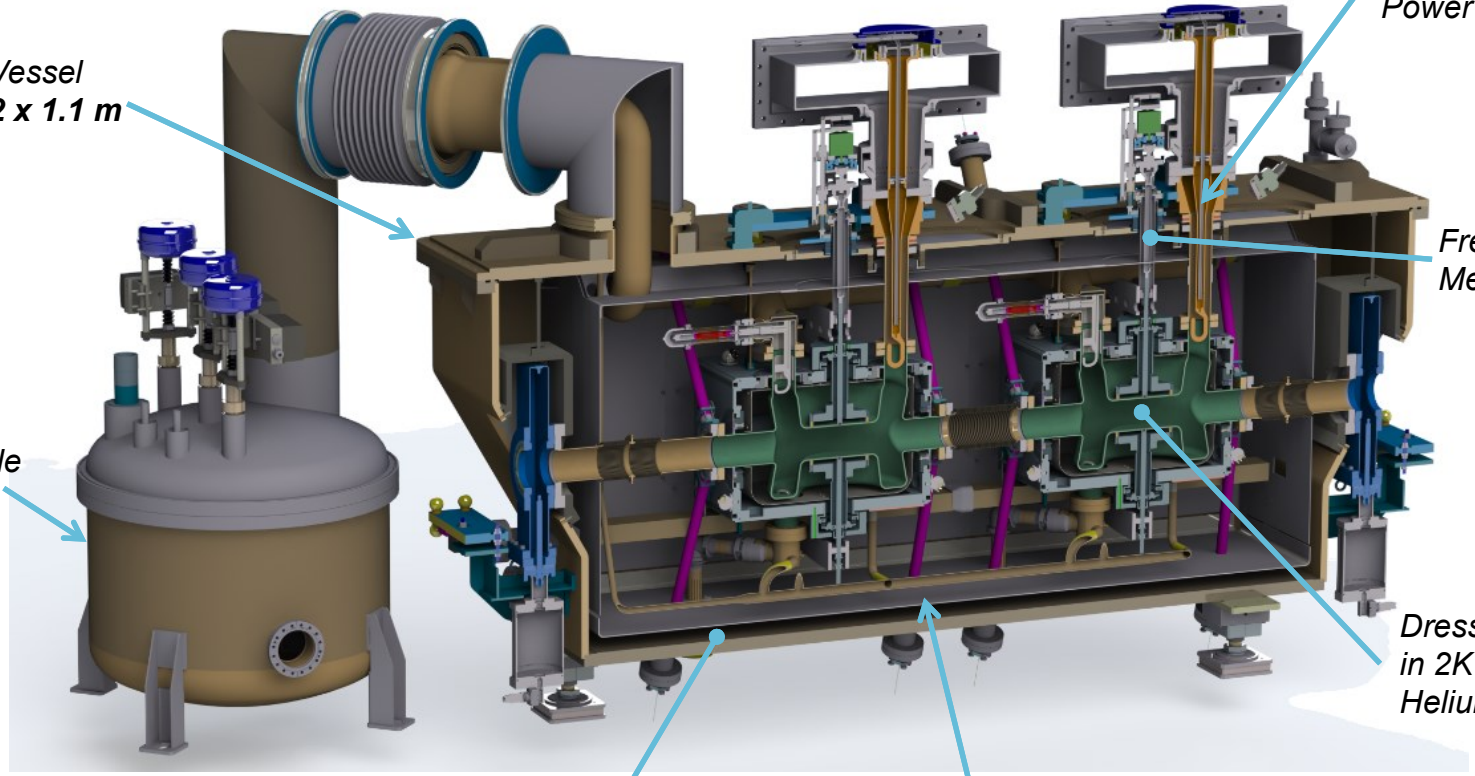


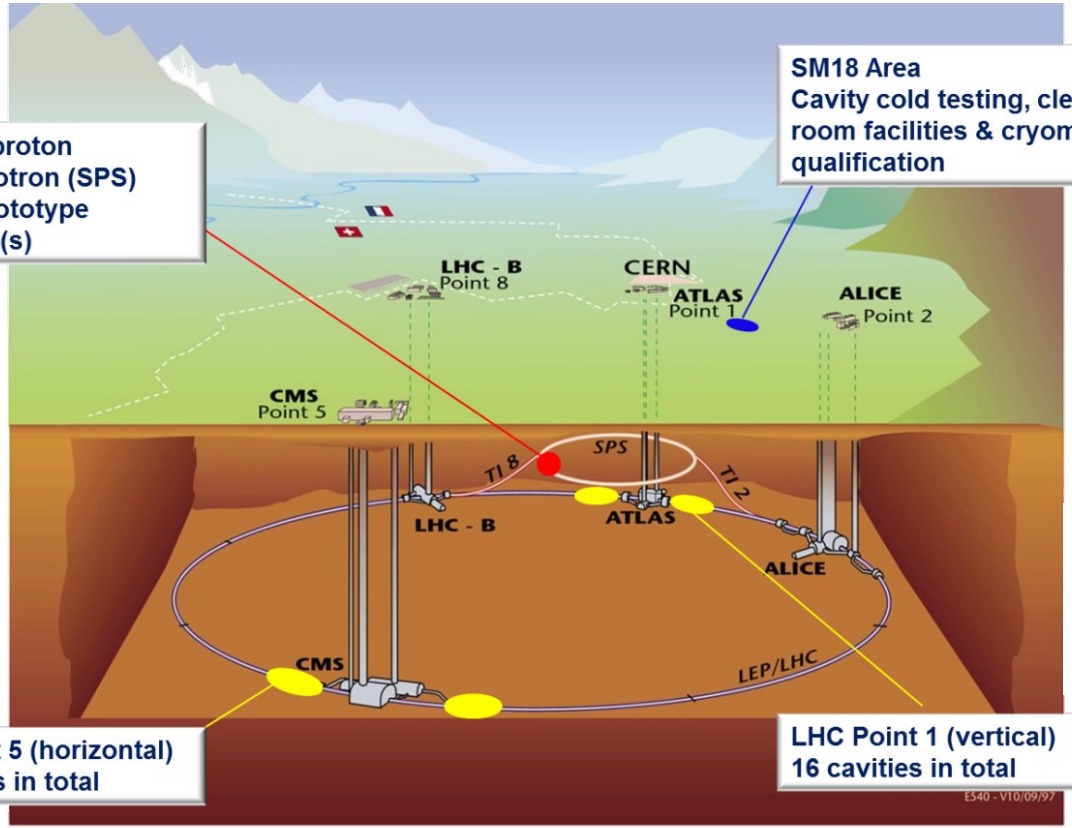




SPS Test Prototype Cryomodule

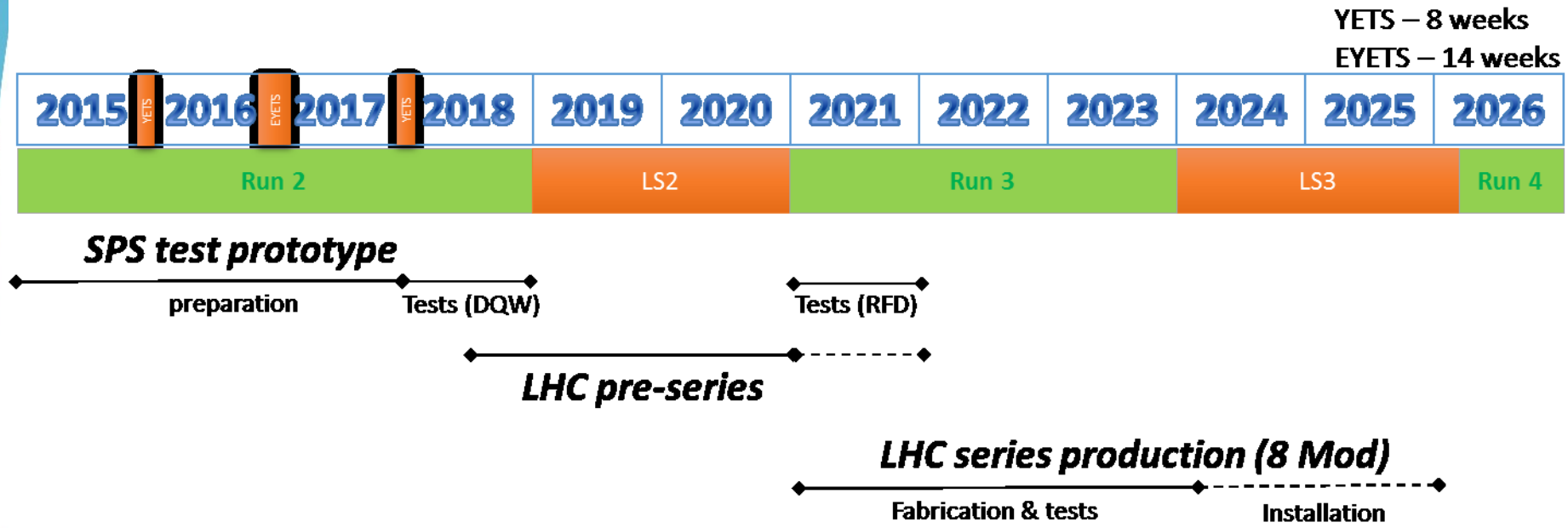


Build, Test & Installation



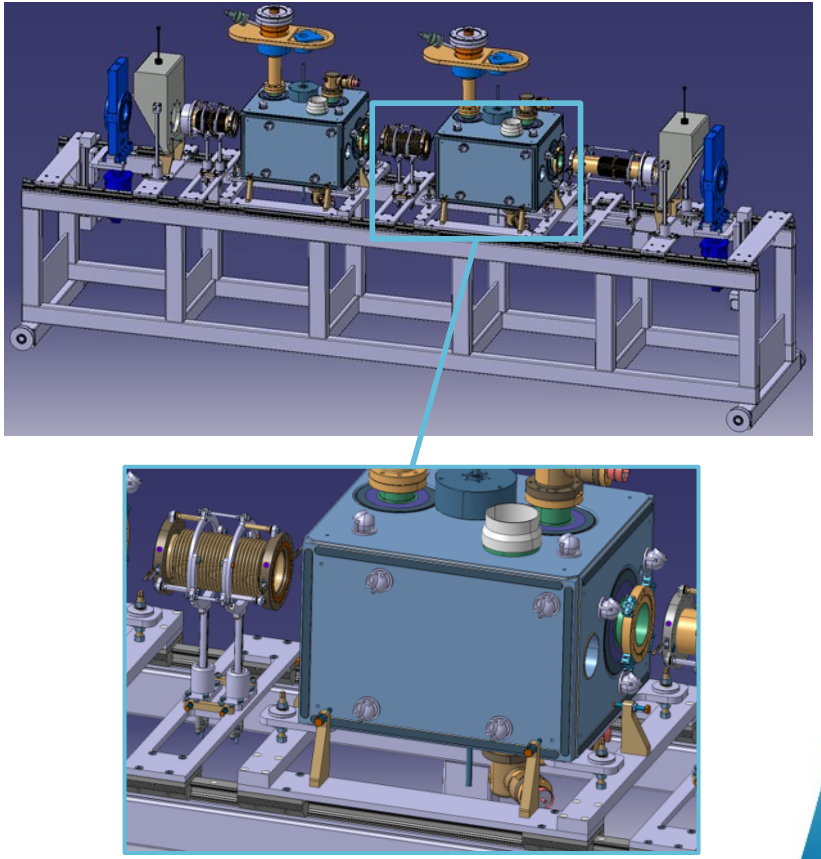
Revised Planning

- *First Re-Baselining after C&S Review I*
  - *US cavities delayed*
  - *CERN cavity production (DQW) for SPS is adopted as baseline*
- *Impact on SPS is significant*

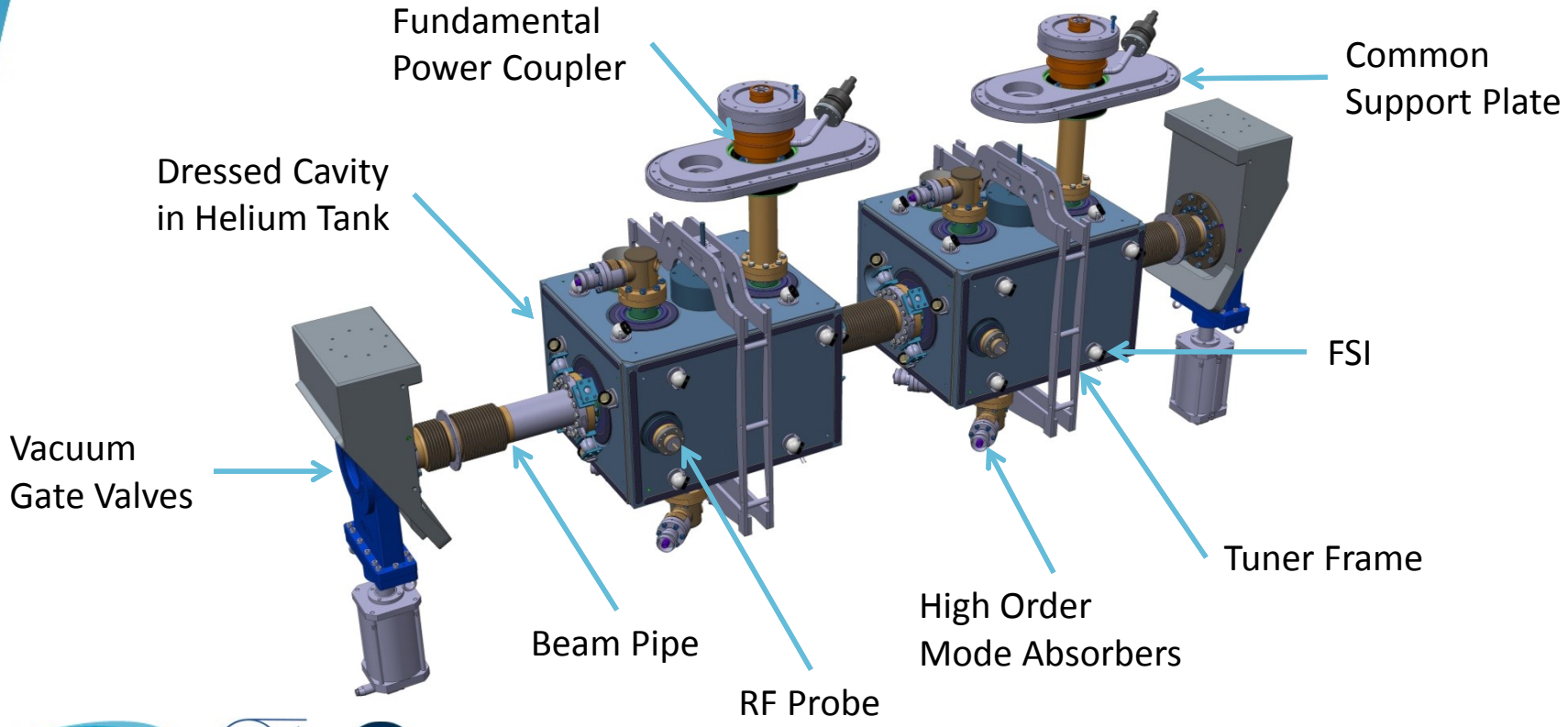


Cavity String Assembly

- Assembled in SM18 ISO4 Clean Room
- 9 Cavity string components loaded on to assembly trolley using manual crane
- Components are individually positioned and aligned
- Sequential positioning with respect to pervious flange
- String is closed (aligned in Z direction)
- Gate valves closed for Cryomodule integration

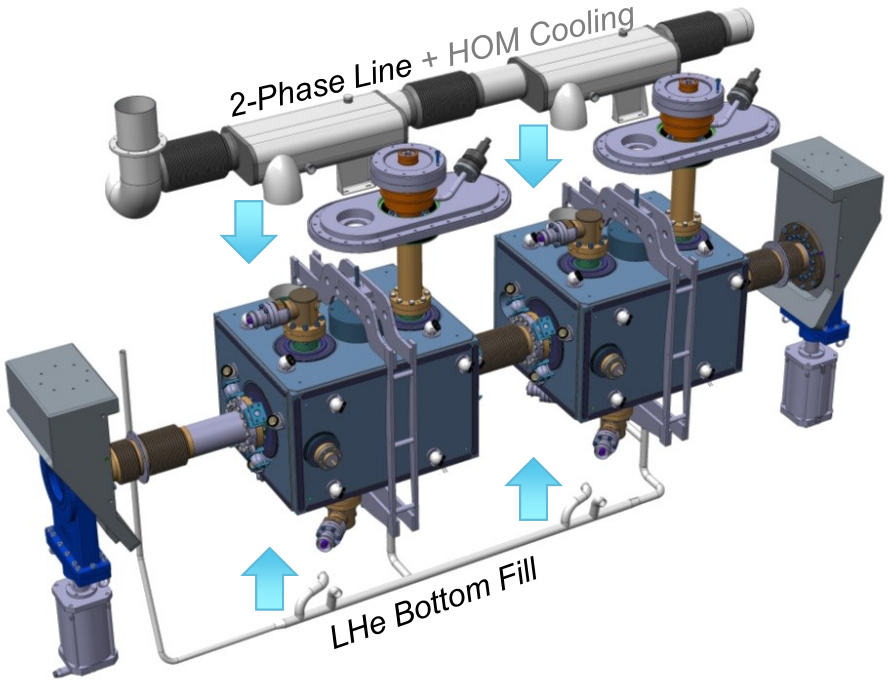


Assembled Cavity String

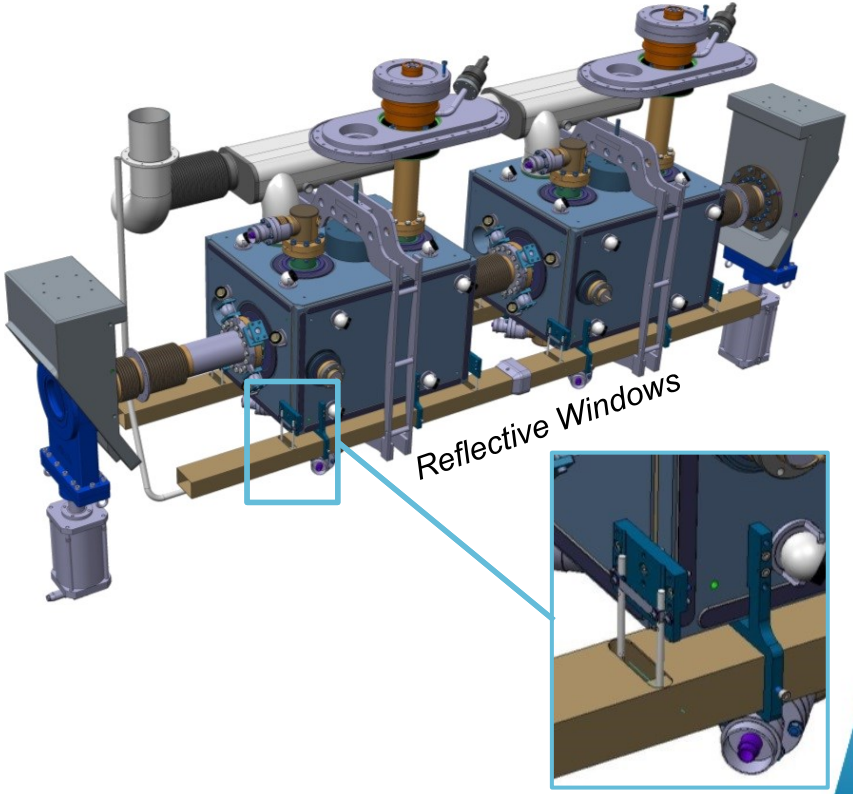


Cryomodule Assembly

Welding of Cryogenic lines

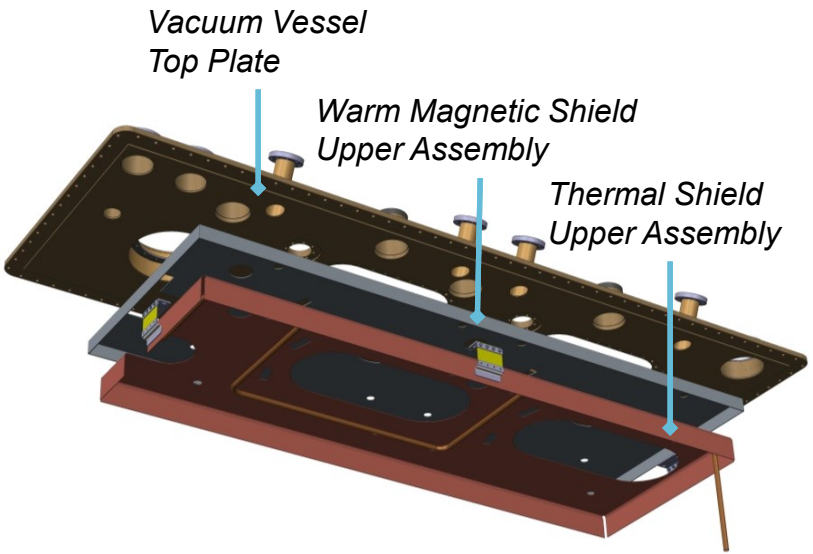


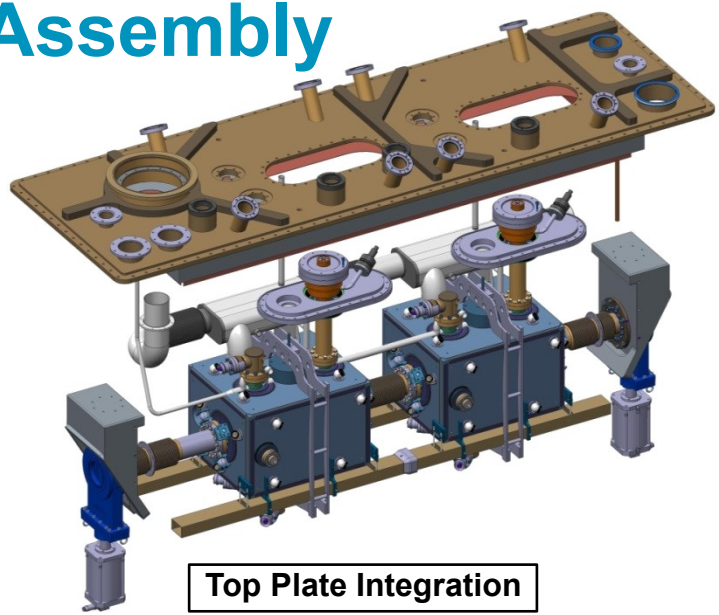
RCAM Assembly



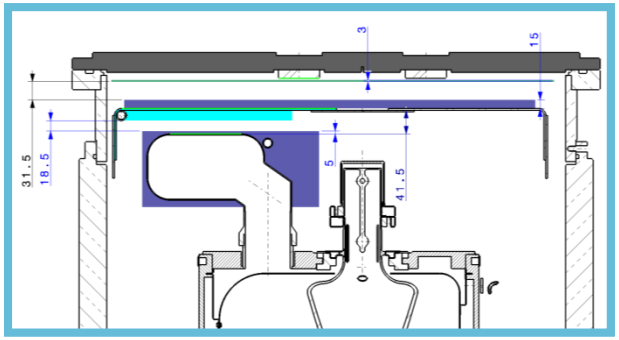
Cryomodule Assembly

Top Plate Assembly



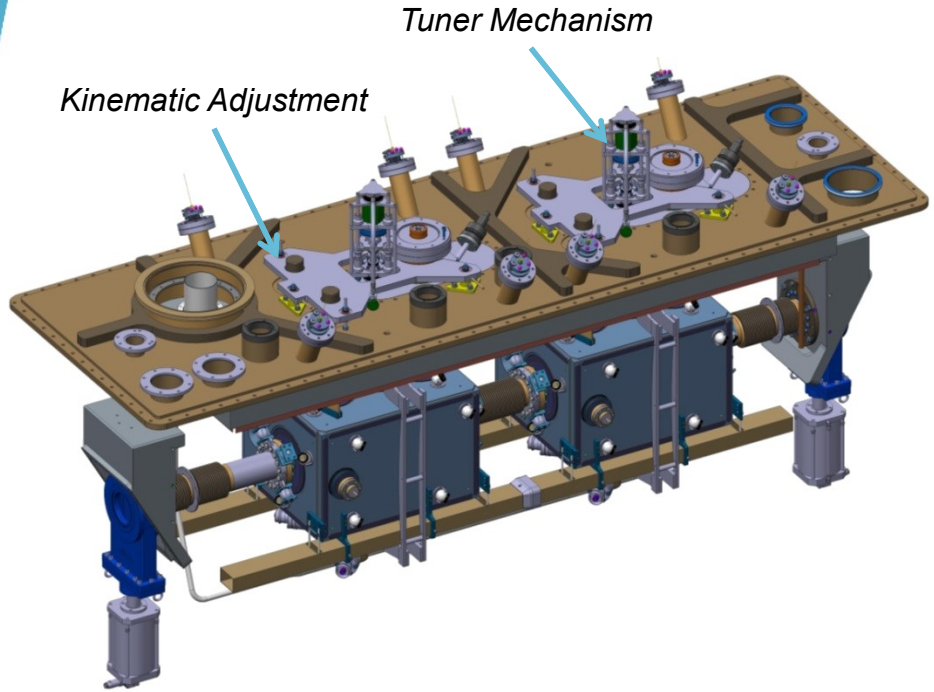


Top Plate Integration

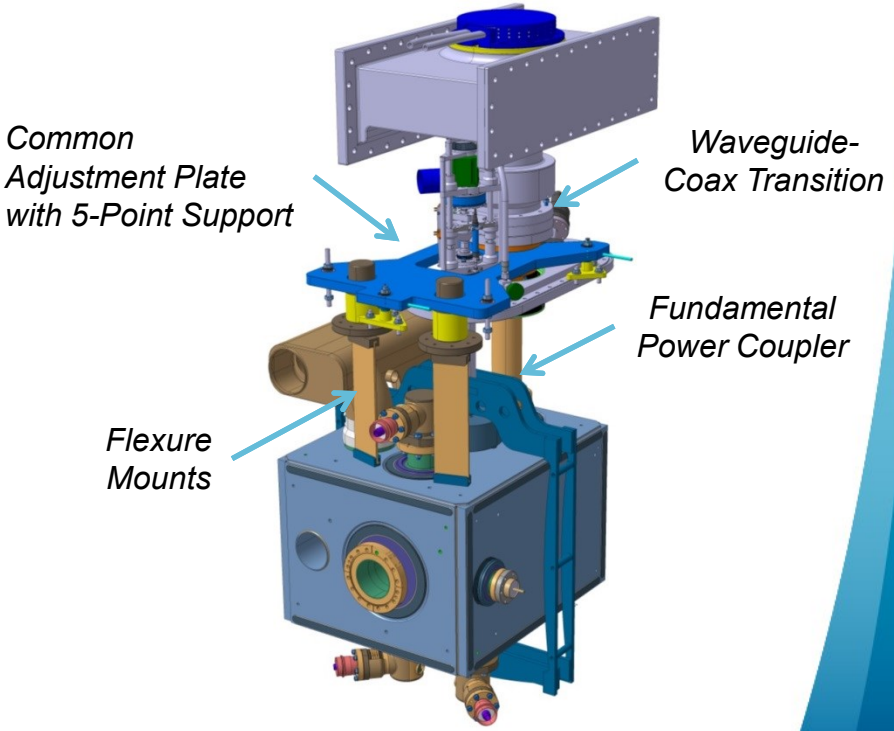


Cryomodule Assembly

Cavity Support & Alignment

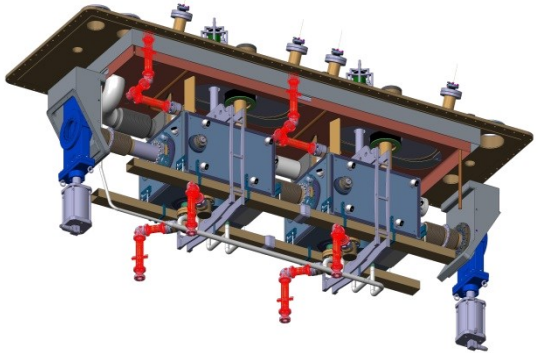


Dressed Cavity Support System



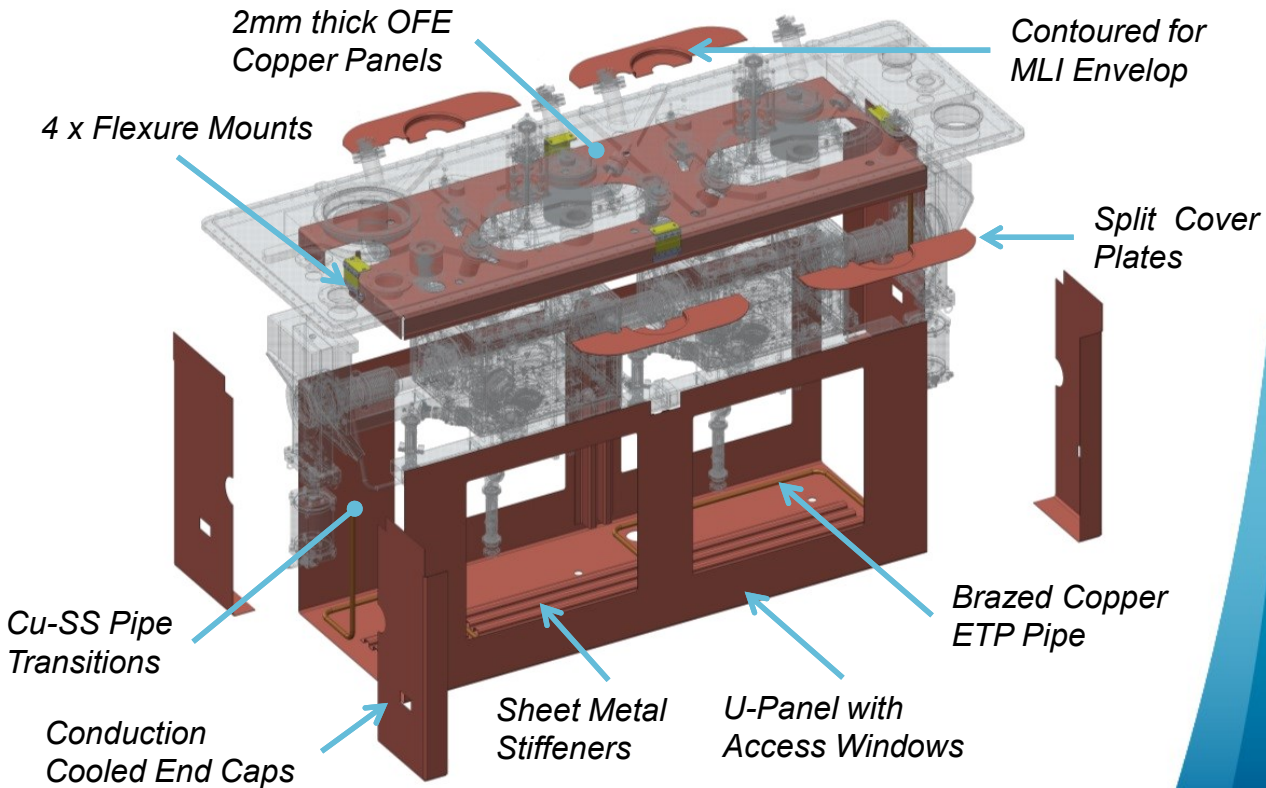
Cryomodule Assembly

HOM Coaxial Connection



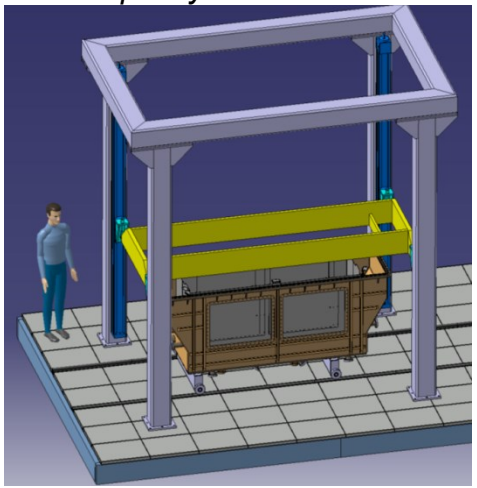
6 x HOM Coaxial lines with thermal intercepts

Thermal Shield Assembly

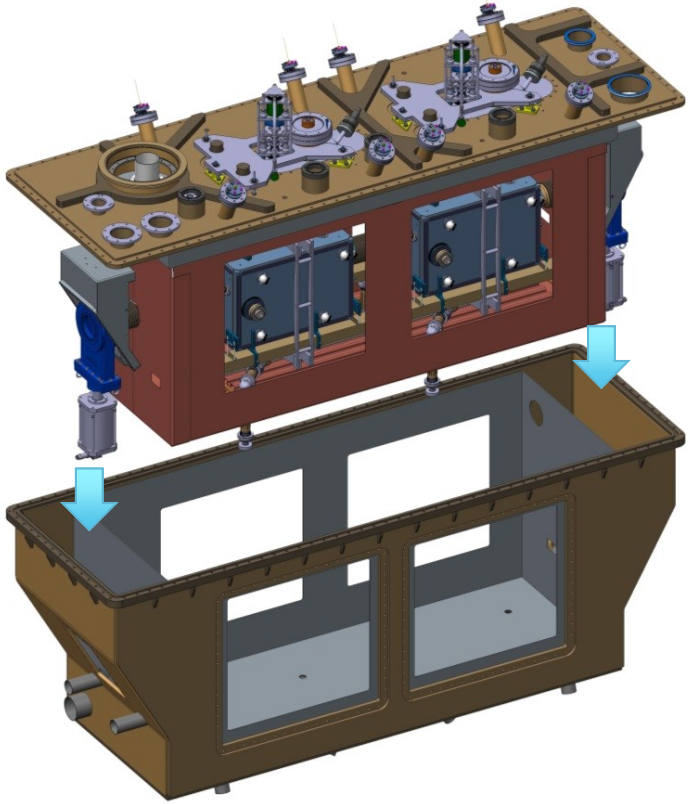


Cryomodule Assembly

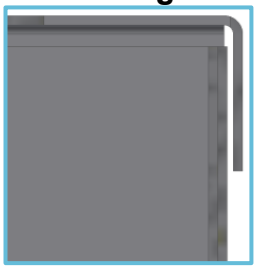
Lifting Frame with 2000 kg capacity – 3 m stroke



Drop Down Assembly



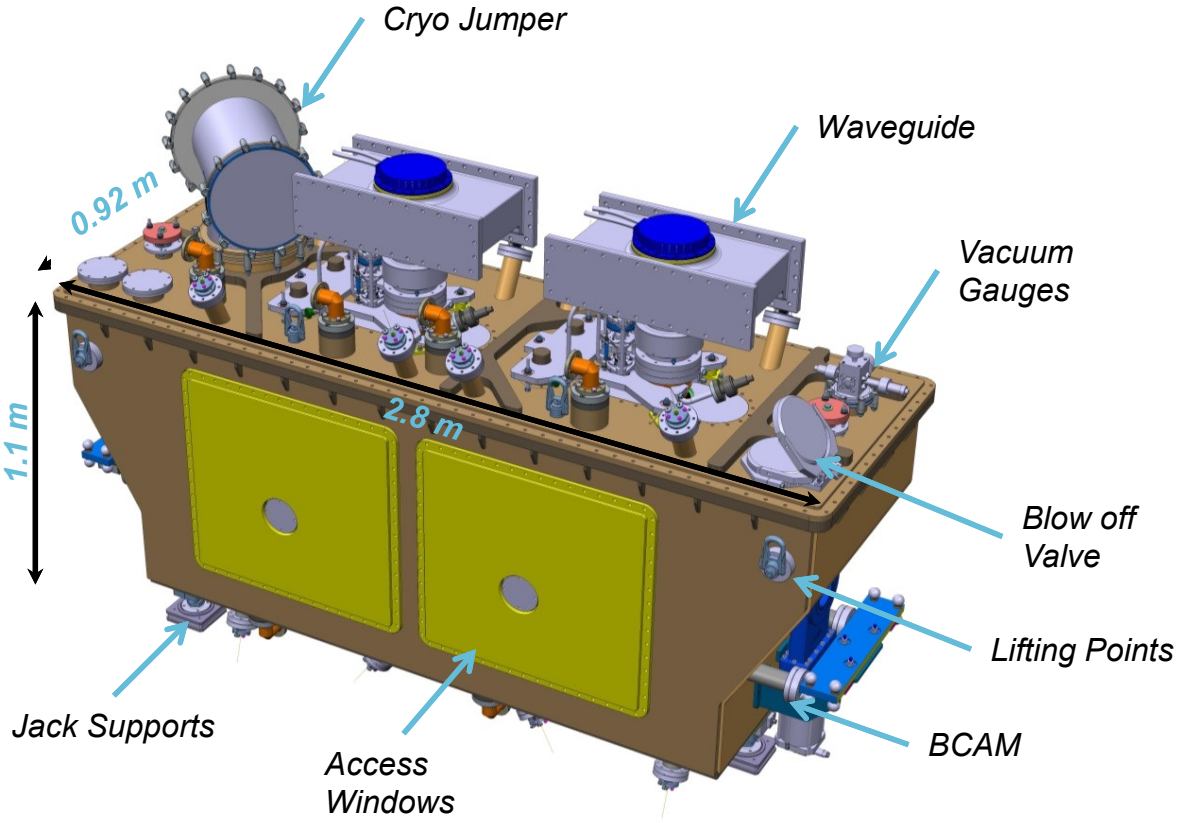
Warm Magnetic Shield Integration



- *No connection possible between upper & lower MuMetal assemblies*
- *Shield relies on loose contact and overlapping joints for field attenuation*

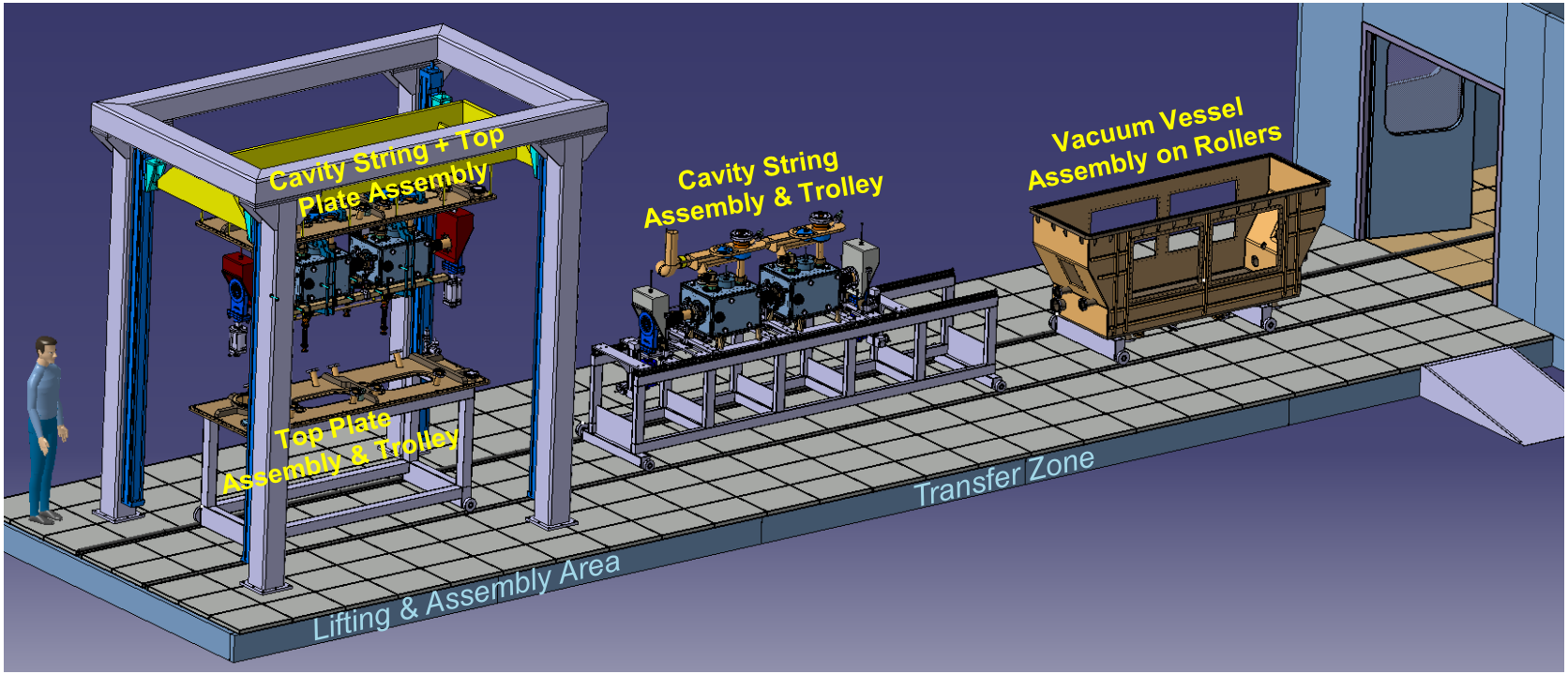
Final Cryomodule Assembly

Top Plate + Cavity String & Vacuum Vessel Assembly

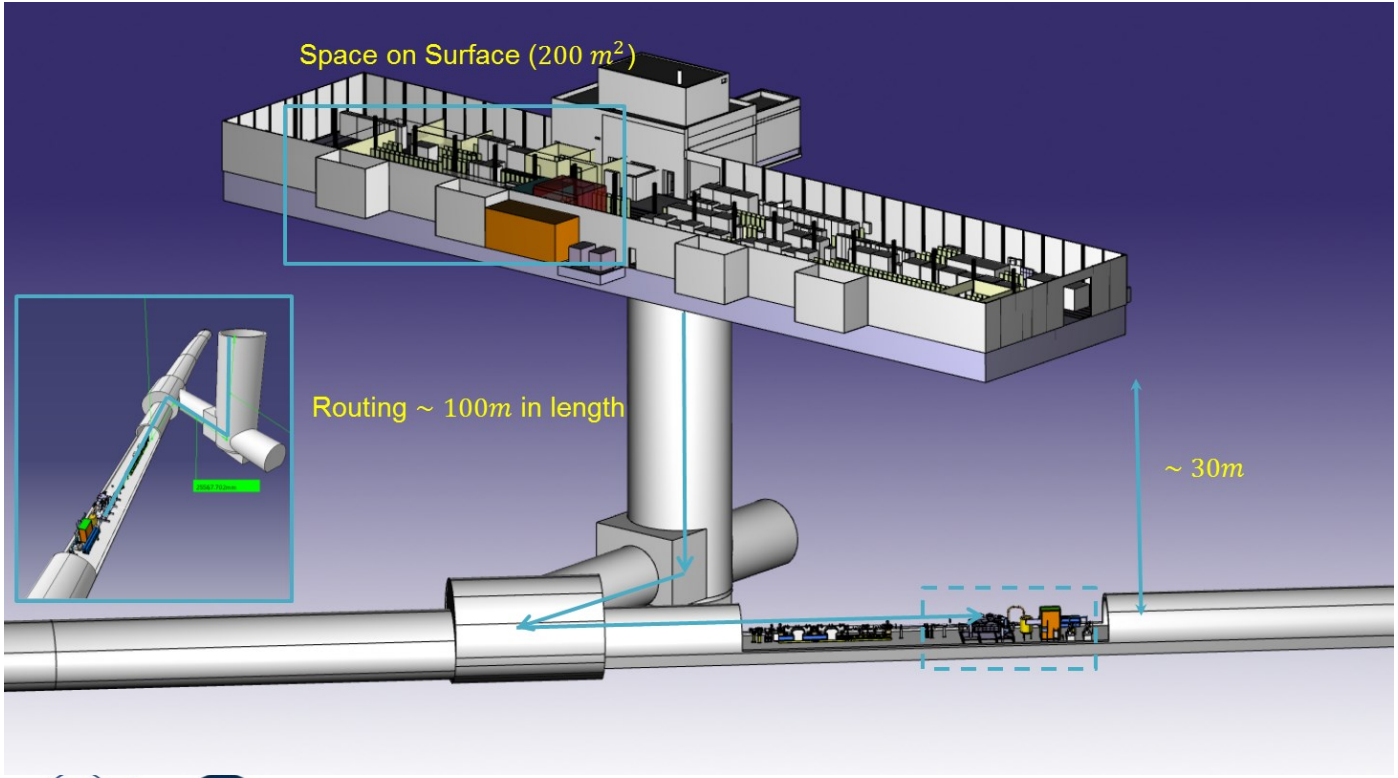


Tooling & Assembly Overview

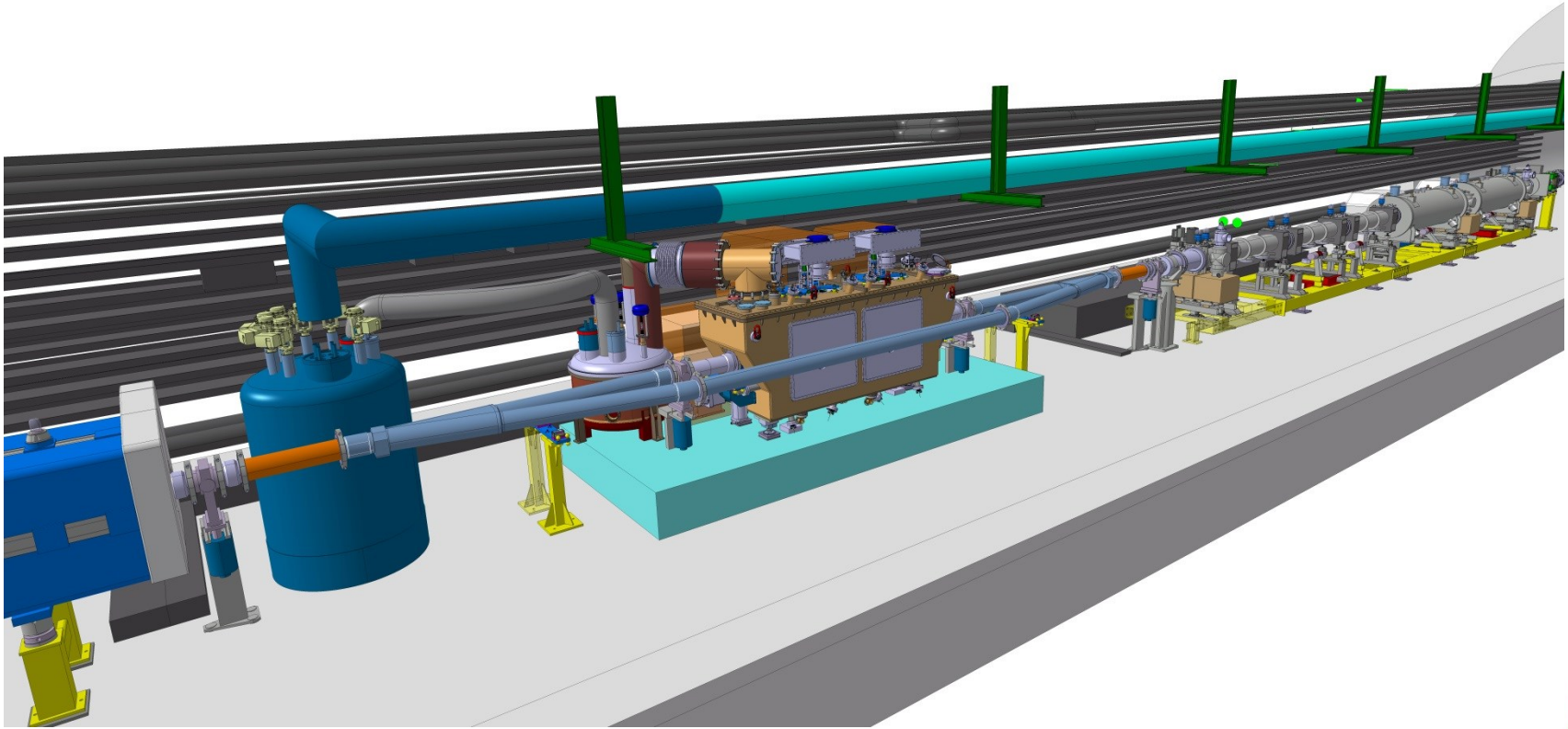
SM18 External Clean Room Mounting Area



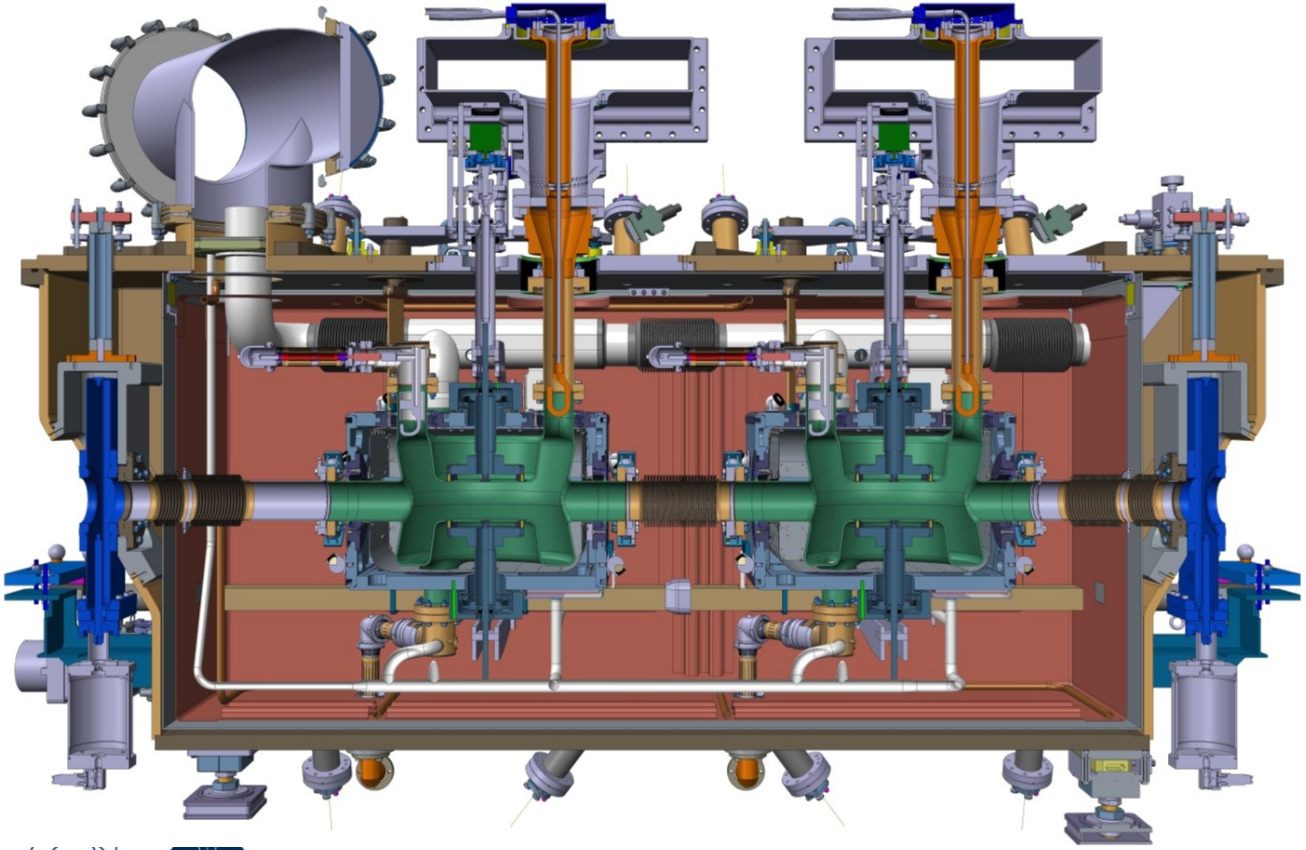
General layout – SPS Point 6



Cryomodule in SPS



Cryomodule Summary

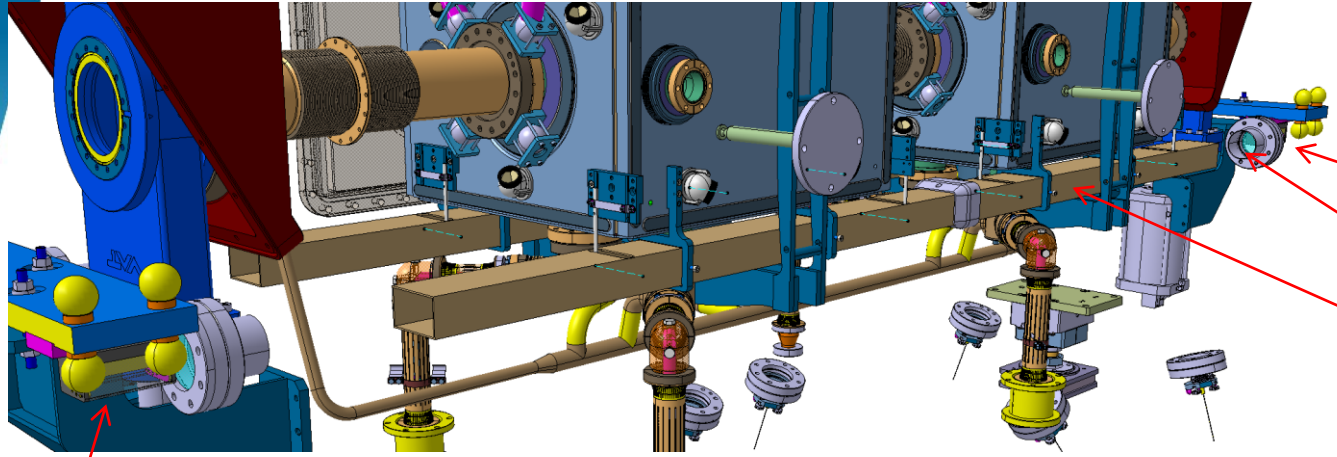


Thank You!

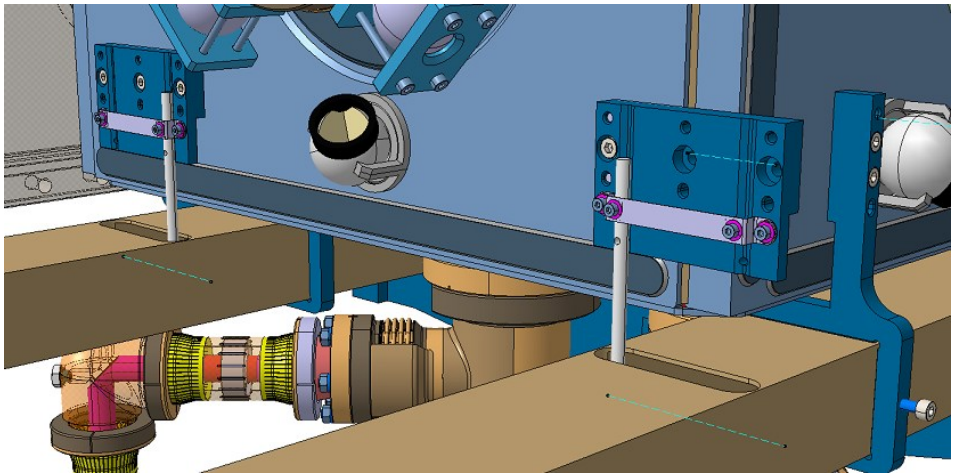
On Behalf of Cryomodule Design Team

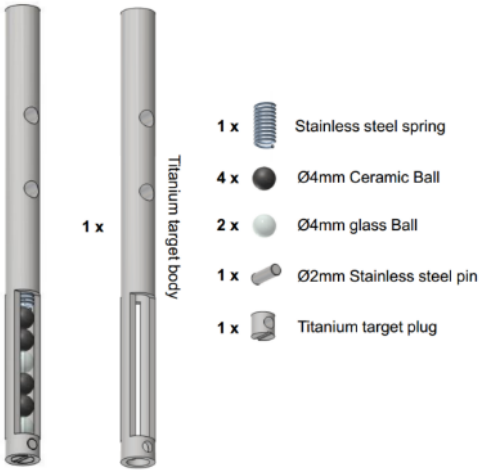
Acknowledgements: R. Calaga, O. Capatina, T. Capelli, T. Jones, P. Minginette, M. Sosin, G. Vandoni, C. Zanoni

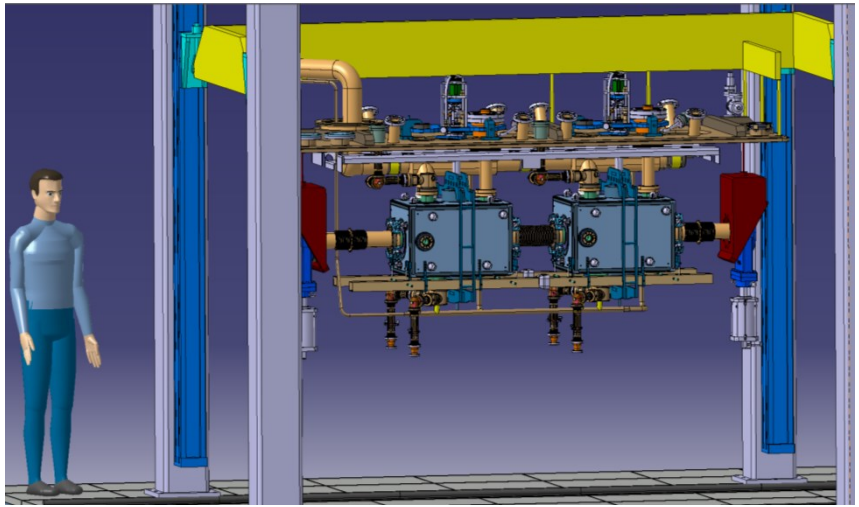
Additional Slides


BCAM
Vacuum viewport
Reflection shielding

BCAM

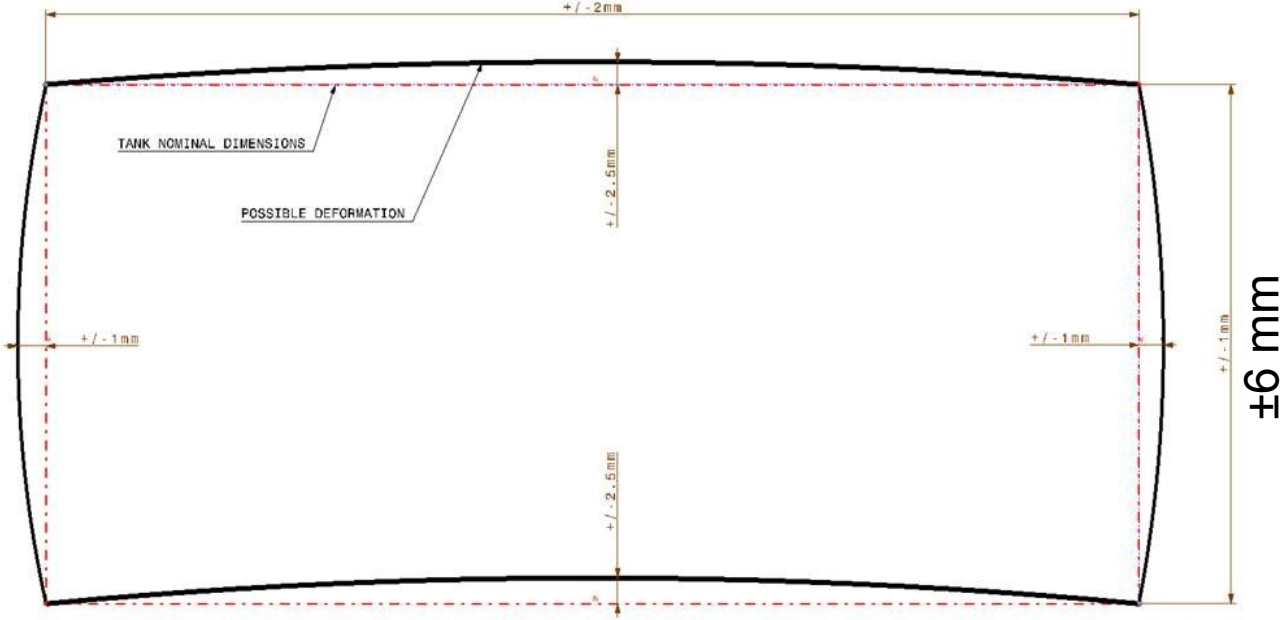



1 x
Titanium target body
1 x Stainless steel spring
4 x Ø4mm Ceramic Ball
2 x Ø4mm glass Ball
1 x Ø2mm Stainless steel pin
1 x Titanium target plug



Vacuum tank Tolerances

±4 mm



±6 mm

Top view

Top Plate Integration