

Cryomodule Shielding Update

Niklas Templeton

08/02/16

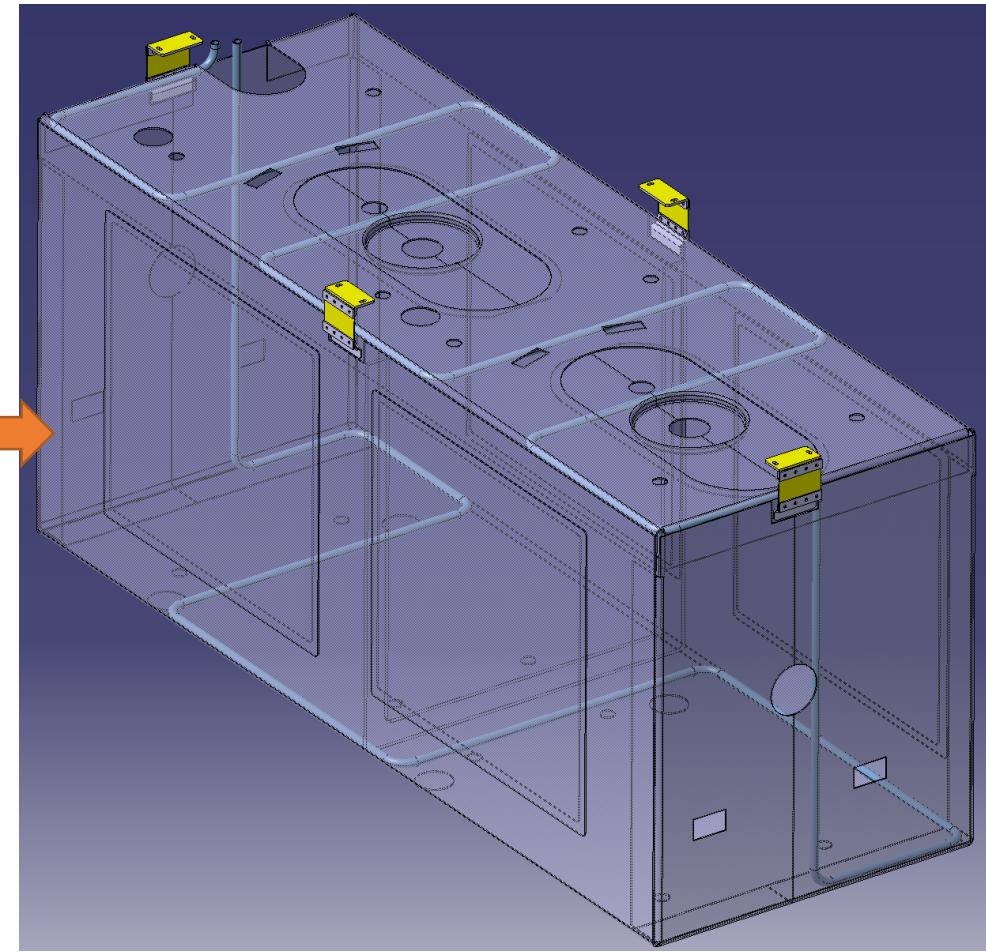
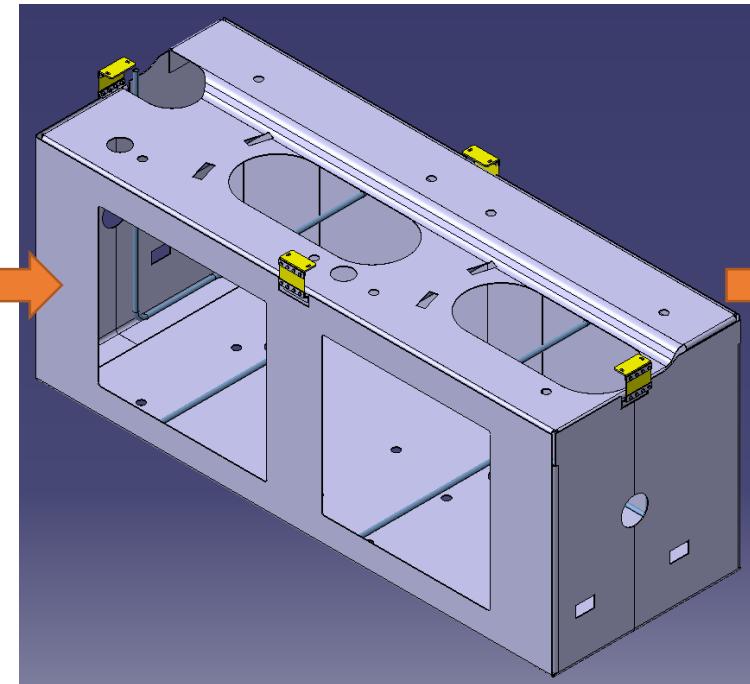
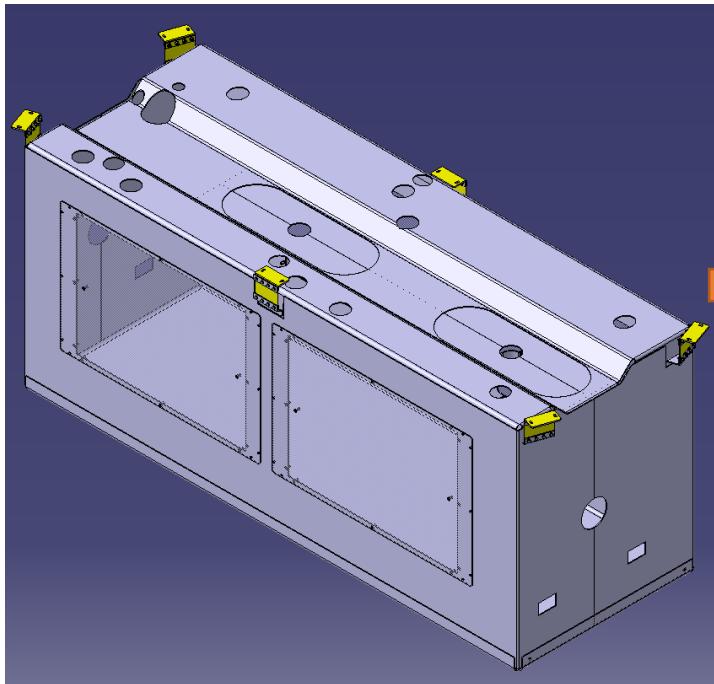
Cold Magnetic Shields

- Magnetic Test Reports:
 - ✓ Received and approved (see Carlo's slides)
- Dimensional Reports:
 - Received and approved (provisionally)
 - Awaiting further feedback
 - Querying a few dims
- Titanium mounting bracket fabrication:
 - Ongoing...



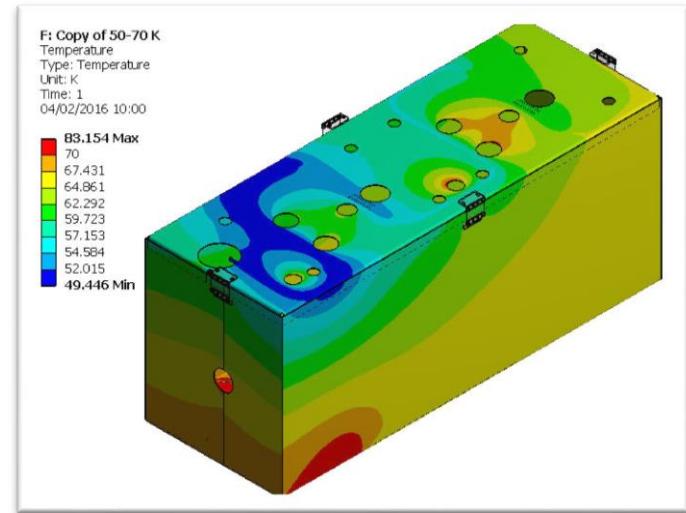
Sample Inspection Report									
Customer:	Part Name:	UNIVERSITY OF LANCASTER	MO:	Date:	Report Generated By:	Quality Assurance Engineer:	ADAM PRIOR		
Part Number:	Design Internal Magnetic Shield	Ref:	02111	20/01/2016	Signature:	Signature:			
Unnumbered	Drawing Dimension	Design Tolerance & Tolerances General Specification	020 2780 m	Measured size	Difference to 020 2780 m	Difference to 020 2780 m	Measured size	Difference to 020 2780 m	Difference to 020 2780 m
1	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
2	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
3	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
4	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
5	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
6	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
7	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
8	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
9	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
10	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
11	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
12	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
13	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
14	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
15	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
16	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
17	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
18	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
19	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
20	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
21	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
22	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
23	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
24	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
25	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
26	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
27	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
28	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
29	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
30	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
31	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
32	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
33	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
34	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
35	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
36	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
37	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
38	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
39	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
40	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
41	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
42	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
43	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
44	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
45	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
46	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
47	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
48	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
49	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
50	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
51	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
52	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
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55	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
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57	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
58	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
59	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
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61	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
62	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
63	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
64	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
65	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
66	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
67	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
68	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
69	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
70	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
71	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
72	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
73	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
74	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
75	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
76	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
77	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
78	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
79	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
80	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
81	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
82	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
83	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
84	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
85	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
86	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
87	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
88	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
89	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
90	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
91	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
92	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
93	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
94	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
95	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
96	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
97	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
98	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
99	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
100	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
101	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
102	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
103	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
104	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
105	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
106	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
107	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
108	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
109	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
110	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
111	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
112	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
113	110.0		110.0	110.0	0.0	0.0	110.0	0.0	0.0
114	100.0		100.0	100.0	0.0	0.0	100.0	0.0	0.0
115	110.0		110.0	110.0	0.0	0.0	110.0		

Thermal Shield Design



Thermal Shield Design

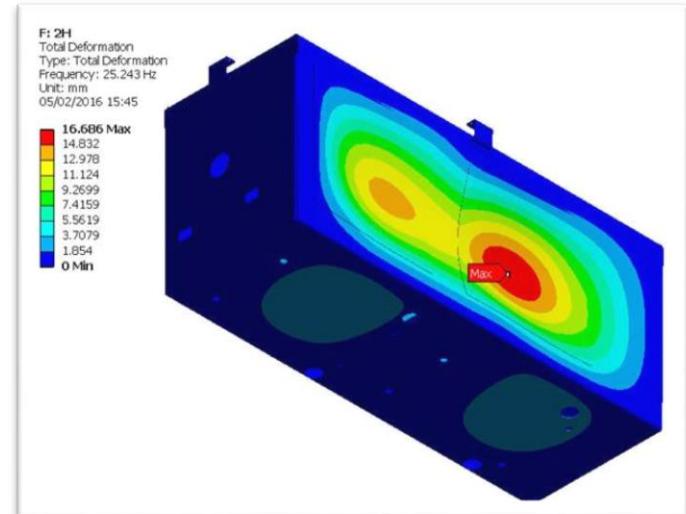
✓ Cryomodule integration with MLI



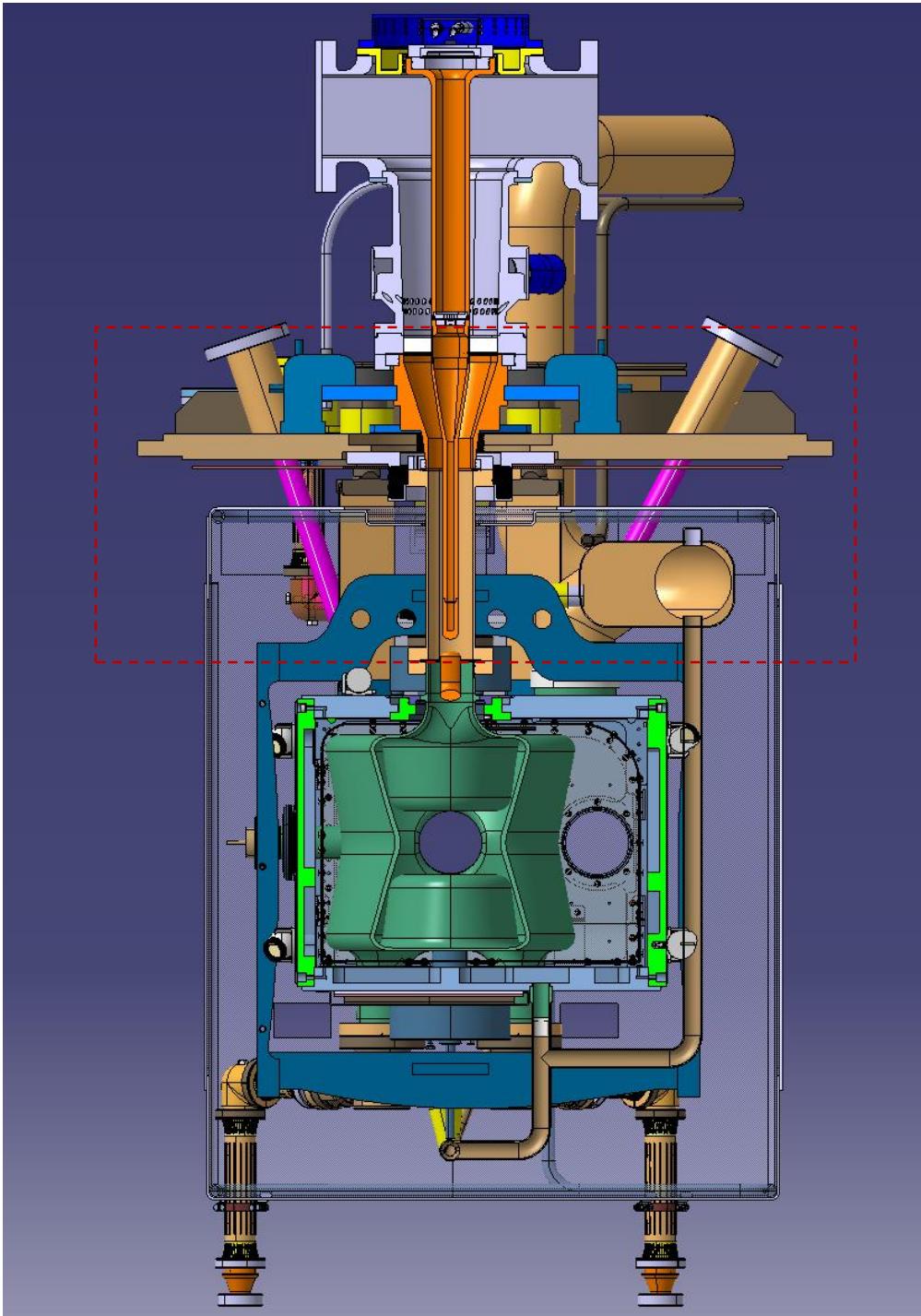
✓ Cooling Analysis and optimisation

✓ Modal Analysis and Stiffness optimisation

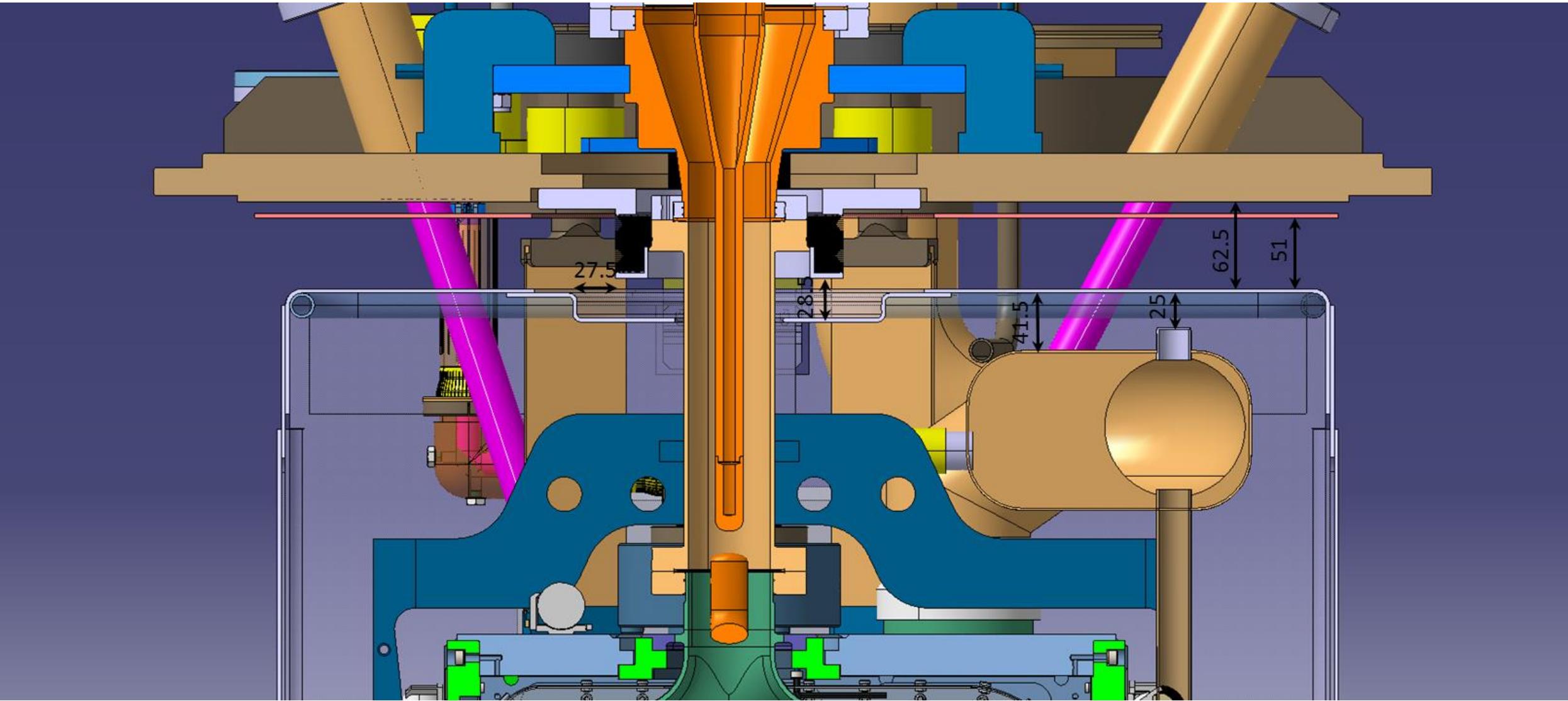
- Connections welds & intercepts
- Design for thermal stress
- Design for manufacture and assembly



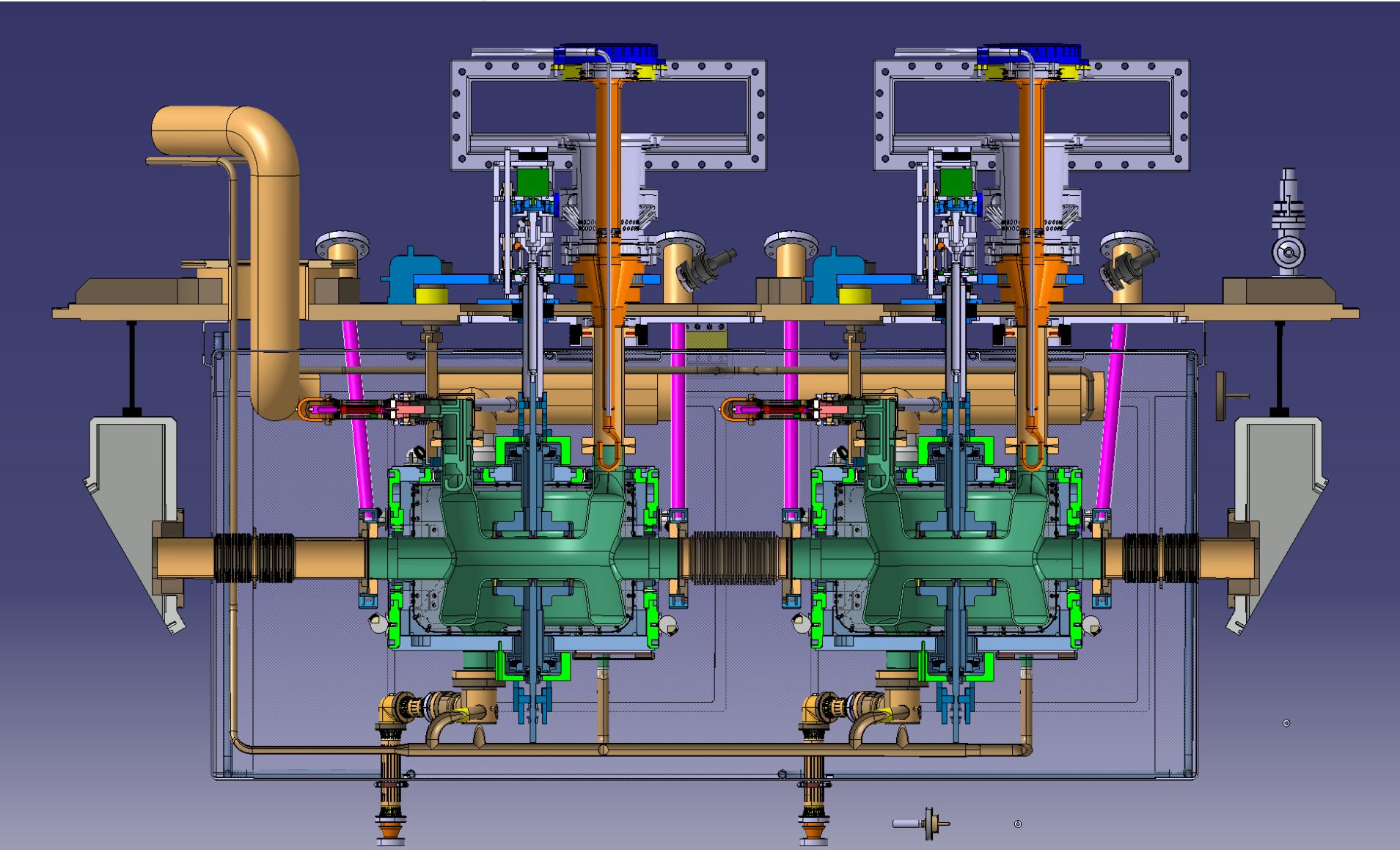
Cryomodule Integration



Cryomodule Integration



Cryomodule Integration



Warm Magnetic Shield Top Plate

