Update on SVT Mechanics

F. Bosi

Activity

What we are doing:

- Modelling Ribs for L1-5
- Modelling Fanouts for L1-5
- I.R. general layout /quick demounting

- QMUL : working on the space frame dimensioning
- Milan : working on modelling connectors/ cables of the L0 Hybrid

SVT L1-5 Layout design

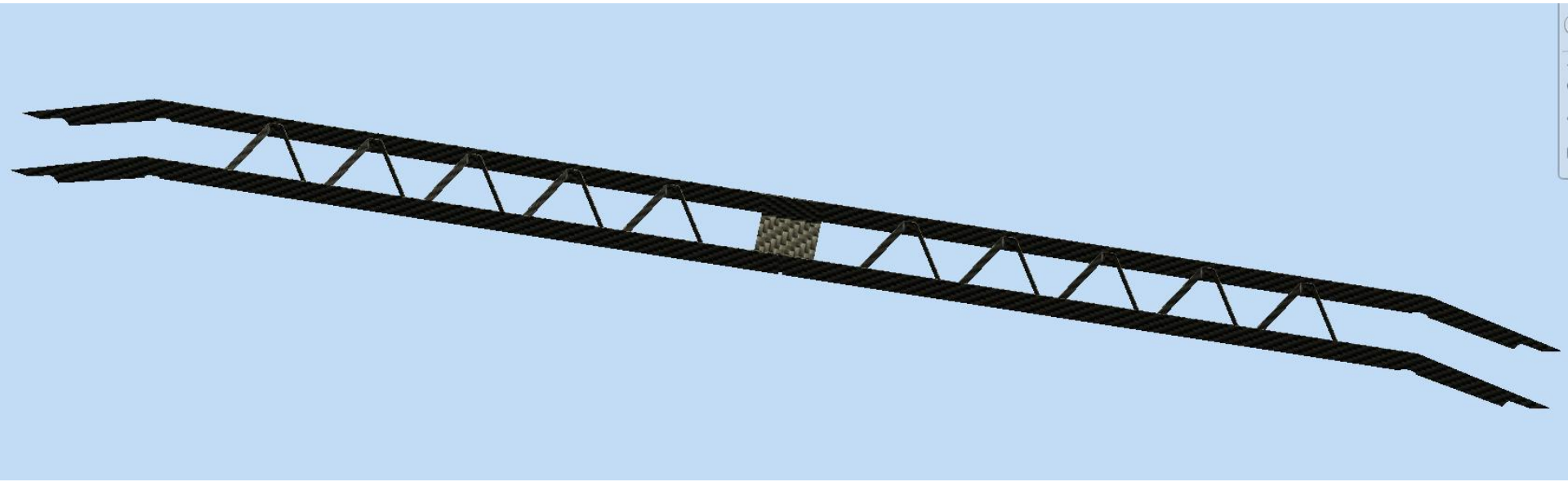
Modelling ribs for Layer 1-5

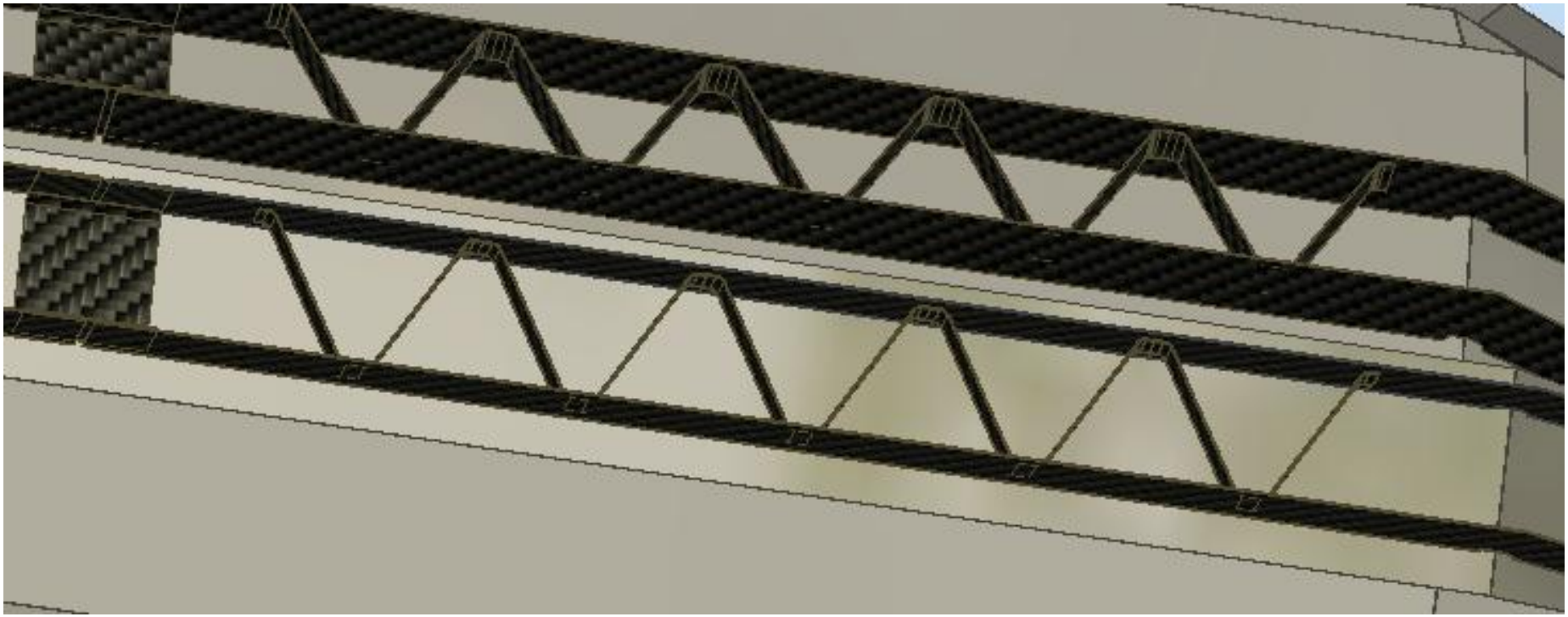
1) L5B longer about 230 mm respect Babar dimensions

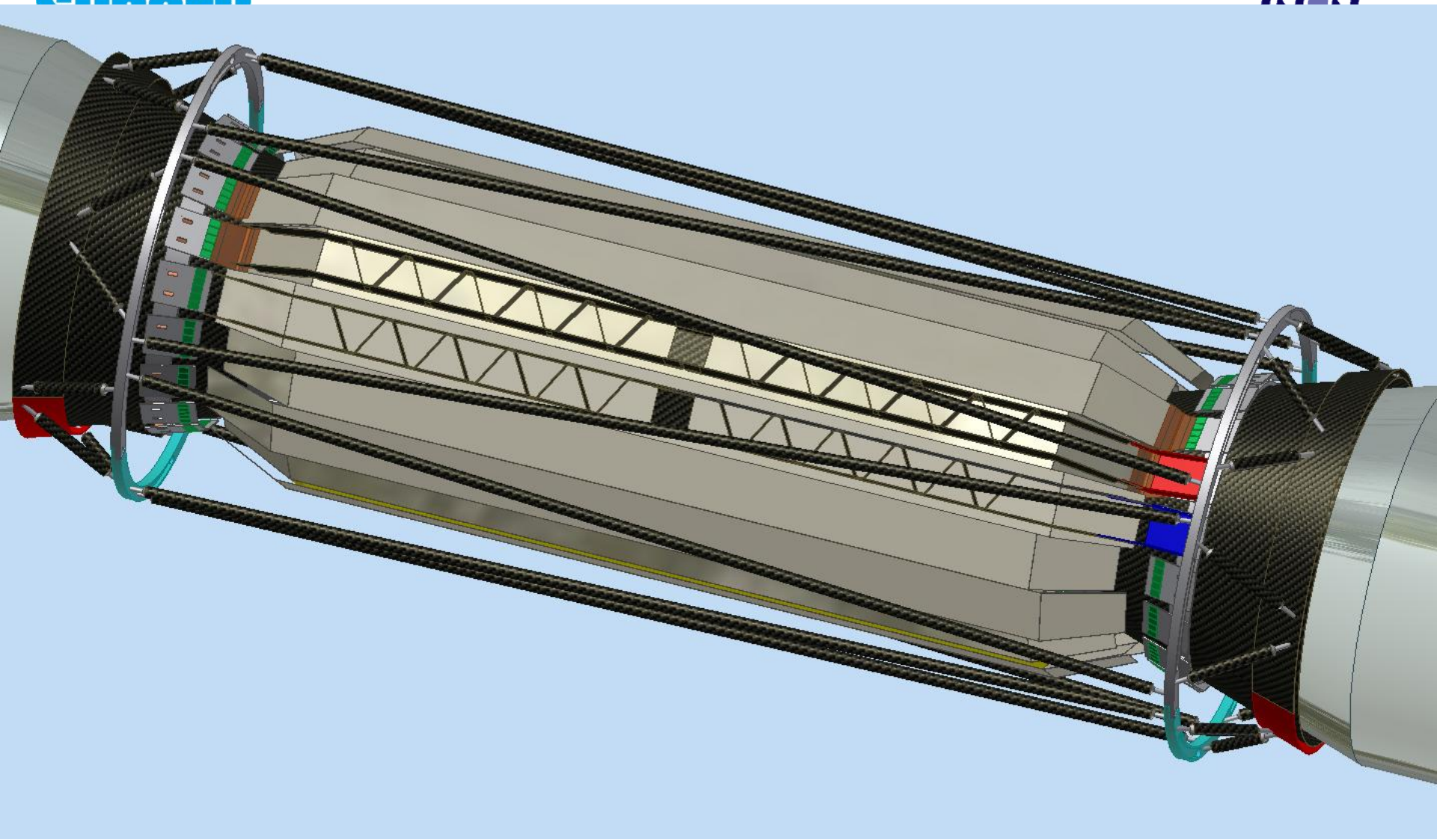
(L5B total lenght about 760mm)

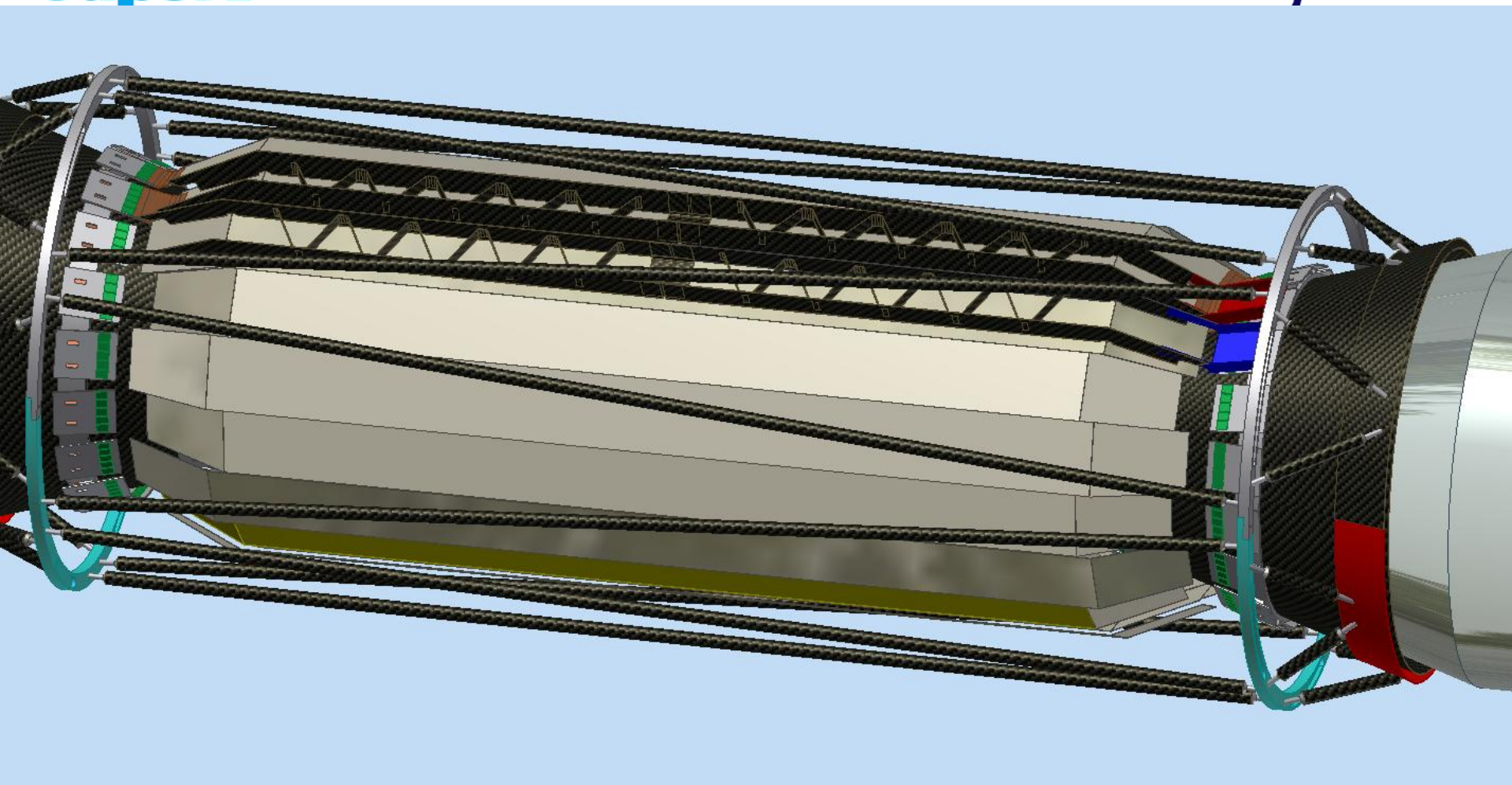
2) Need ribs more height and also with a reinforced profile along the barrel sensors (soon structural simulation to dimension the right height !)

Actual design rib h=18 mm and snake reinforcement h=10mm , dimensions respectful of spacef rame design (clearance of few mm)









SVT L1-5 Layout design

Modelling ribs for Layer 1-5

1) L5B longer about 230 mm respect Babar dimensions

(L5B total lenght about 760mm)

2) Need ribs more height and also with a reinforced profile along the barrel sensors (soon structural simulation to dimension the right height !)

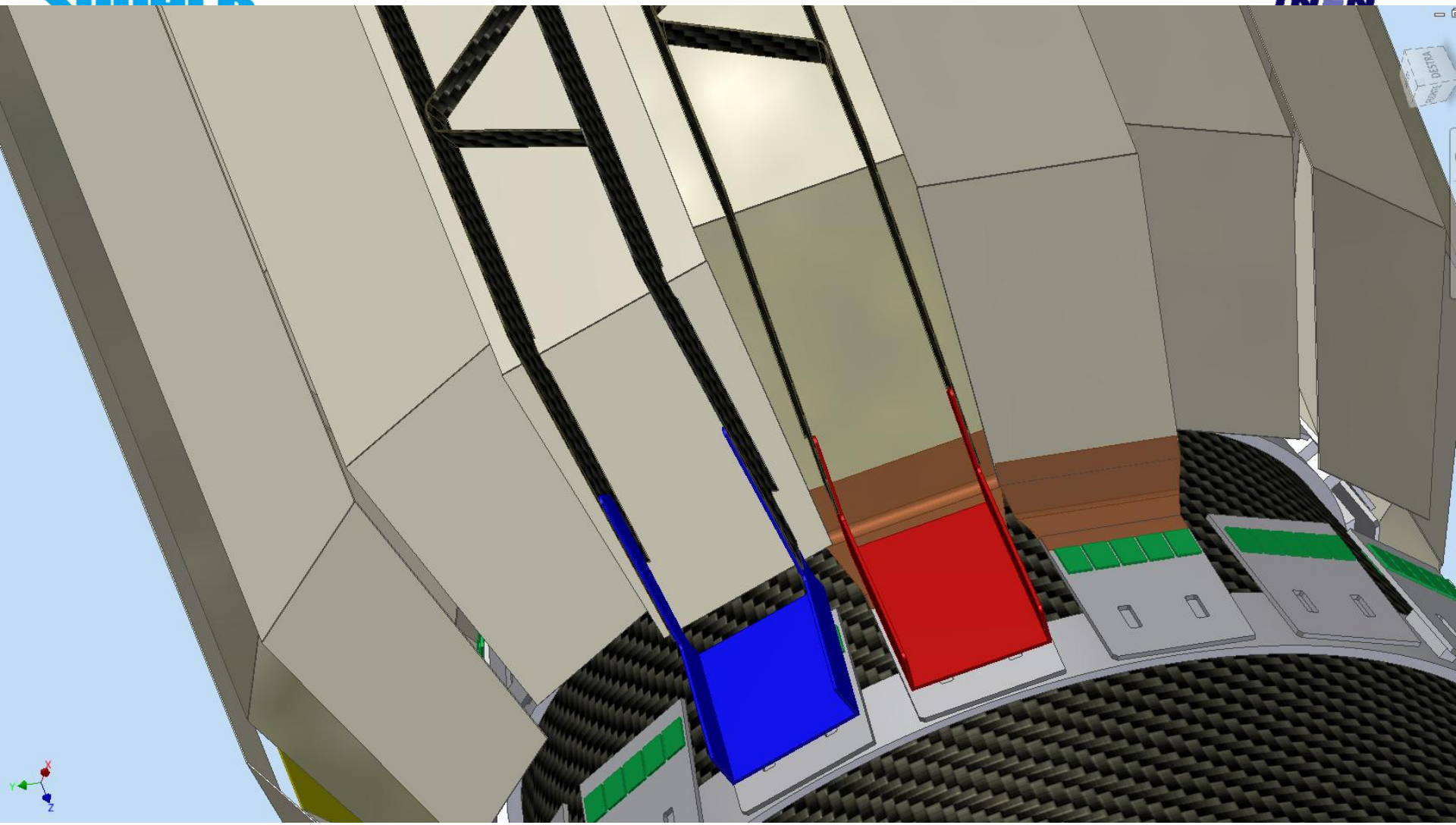
Actual design rib h=18 mm and snake reinforcement h=10mm , dimensions respectful of spacef rame design (clearance of few mm)

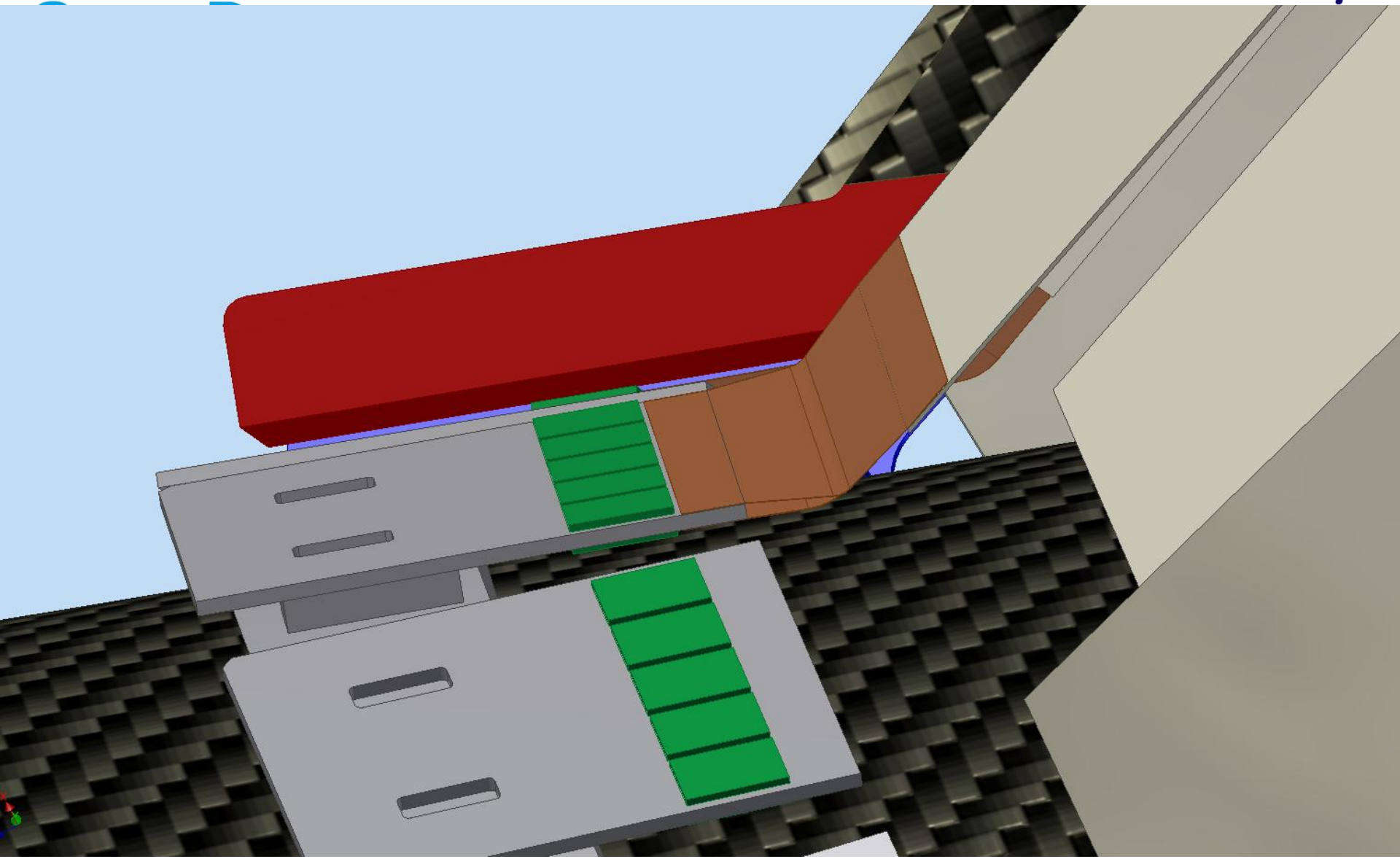
SVT L1-5 Layout design

Modelling fanouts for L1-5

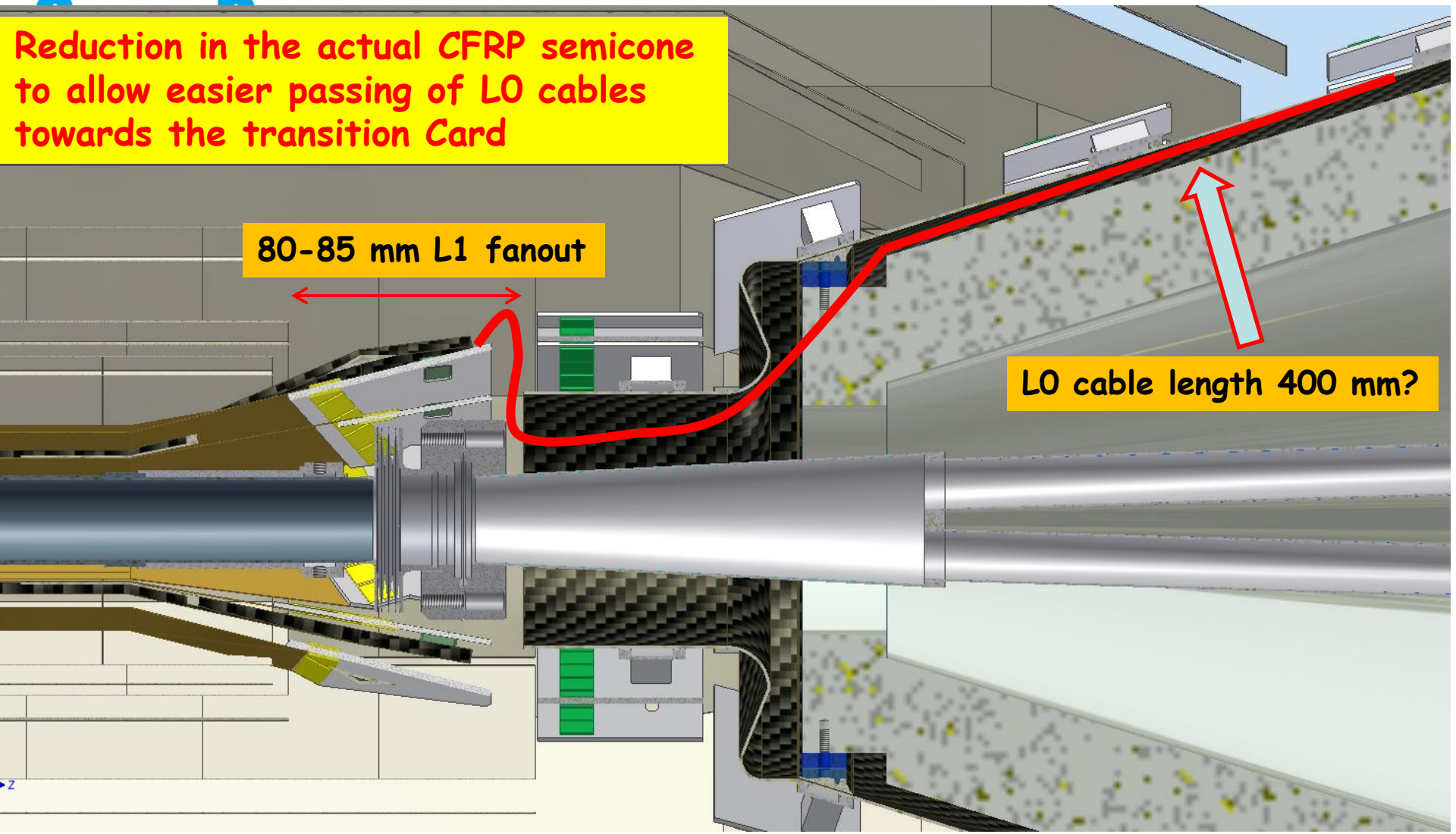
1) L3-4-5 fanouts not particular problems

2) L1-2 fanouts shape very peculiar (need to round around the L0 Hybrid and probably ribs will be used like constrain to hold the fanout on the right shape…)


PORTE DESTRA

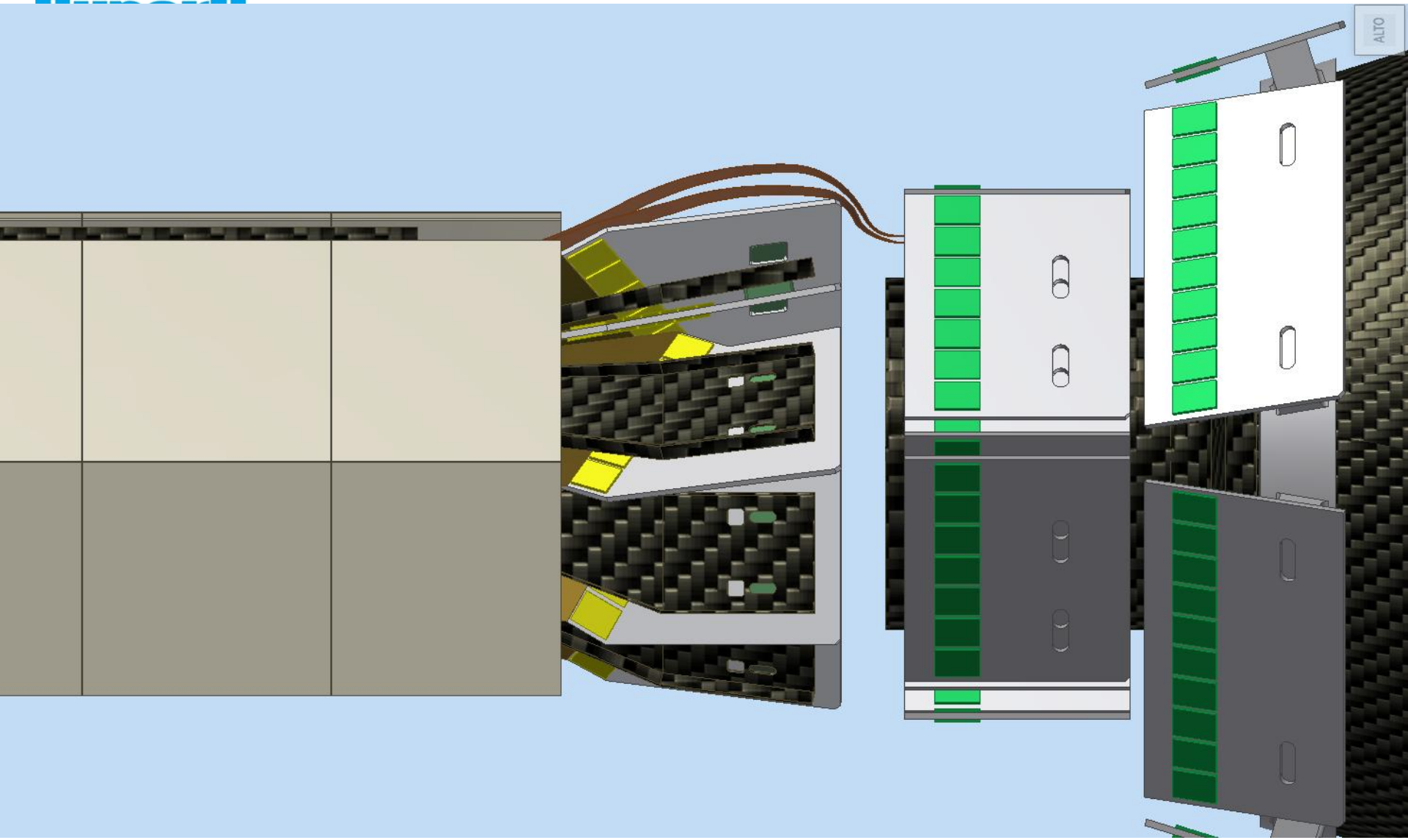


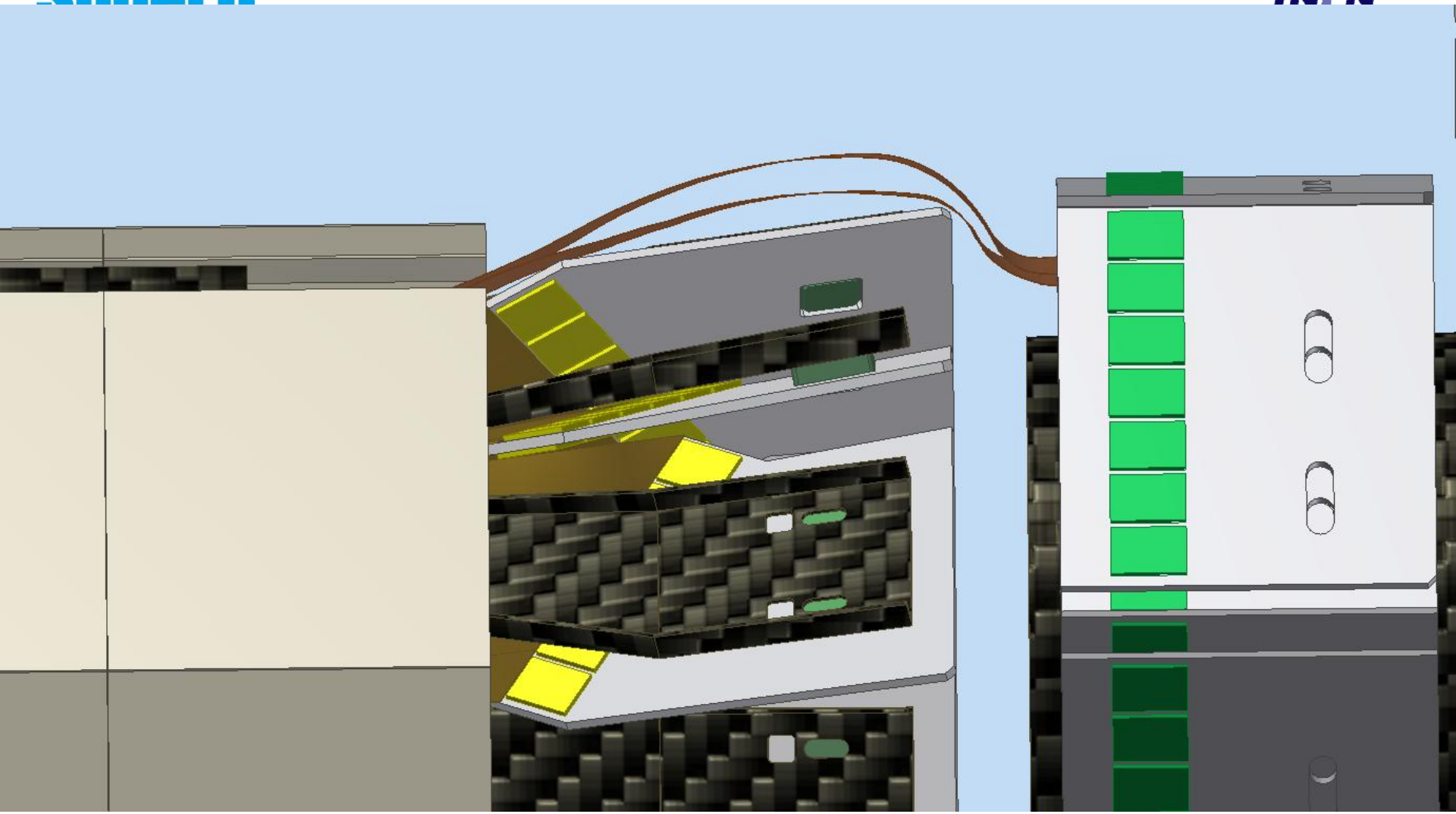
I.R. Layout

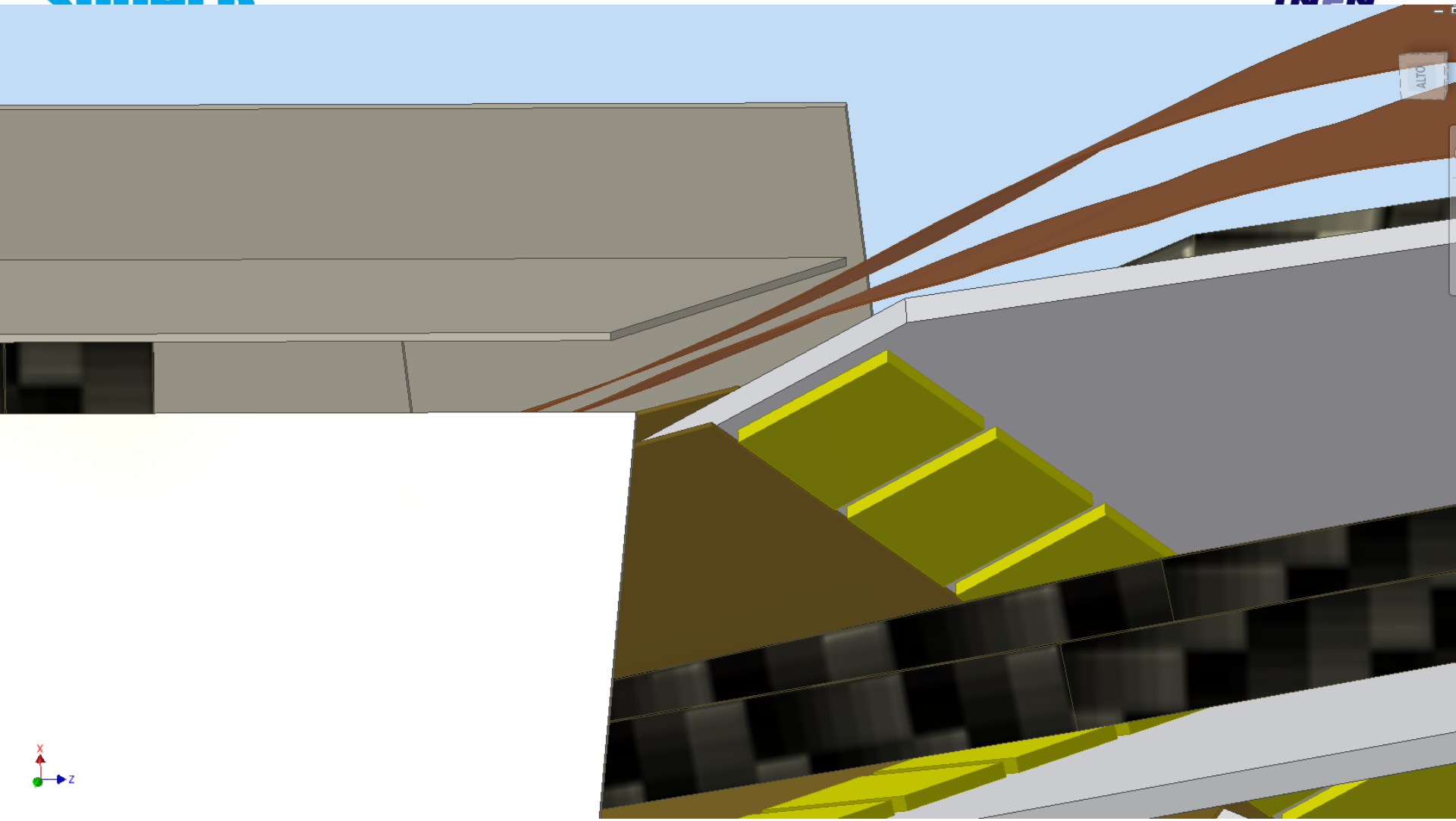


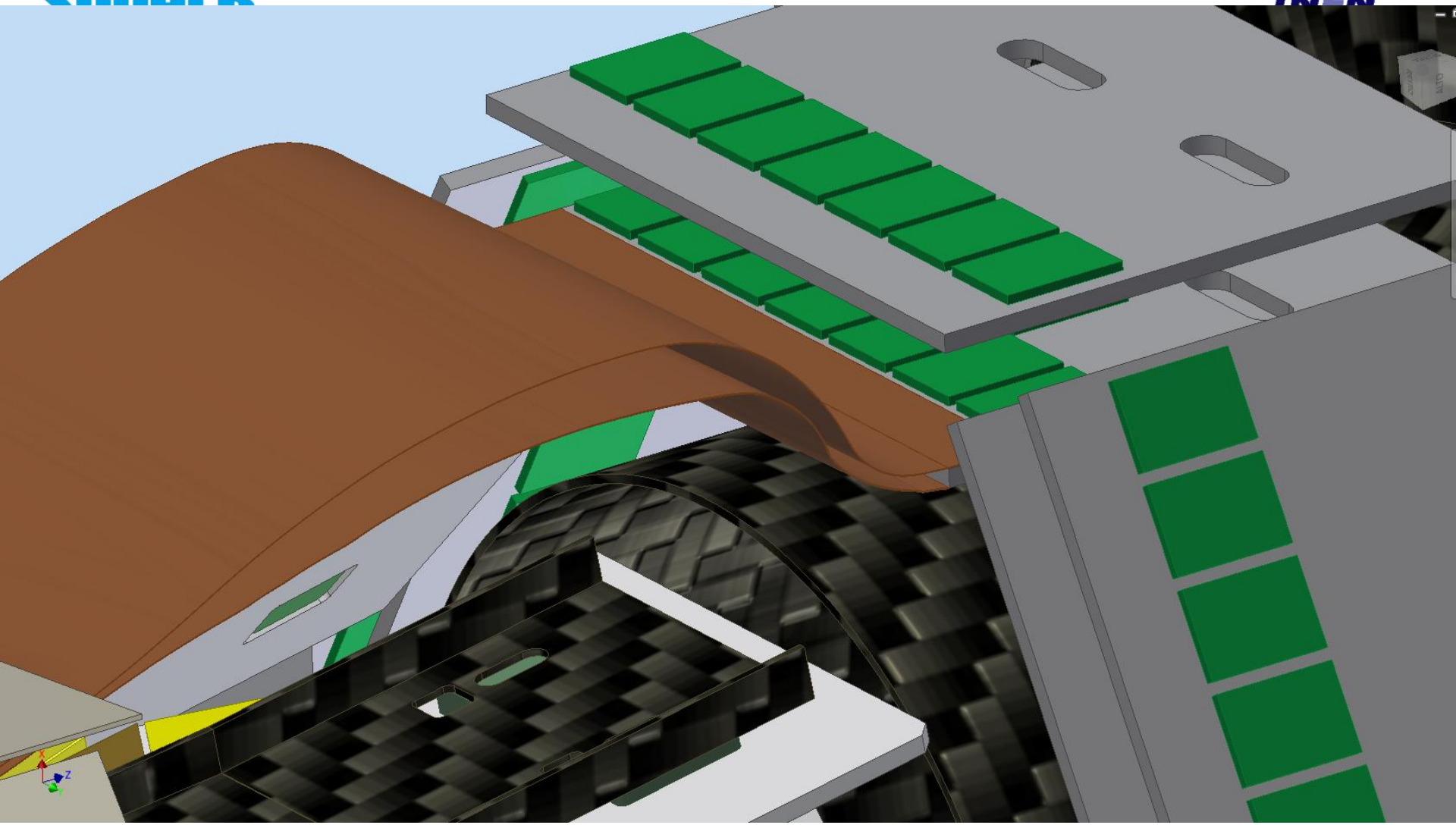
Design of gimbal ring/conical-shield to allow L0 cable to reach transition cards

(Old slide for semicone design)


ALTO

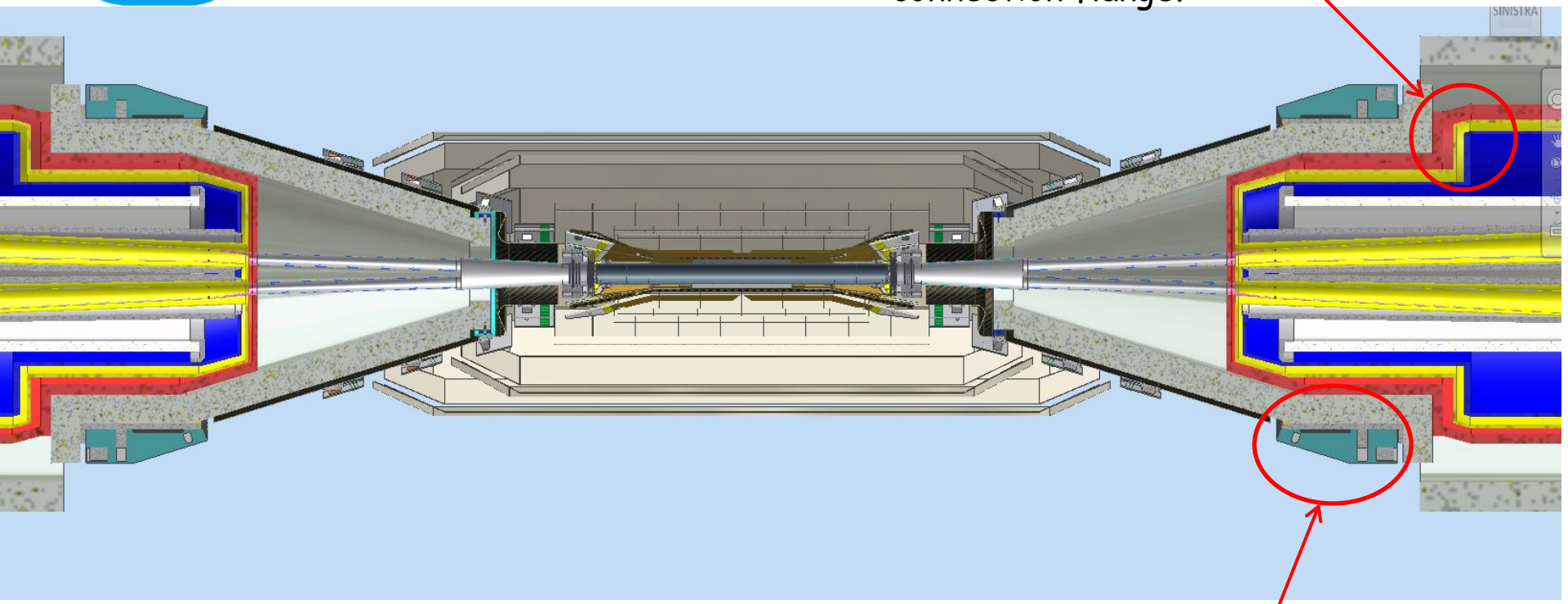






I.R. Layout

It's sufficient move back 50 mm the connection flange?



•Transition card dimensions : important to know dimensions asap in order to modify the criostat vessel to transfer to fabbricatore……

I.R. Architecture/quick demounting

- Present I.R. design has the goal to assume W conical shield independent from cylindrical shield to move less mass for quick demounting operation (all SVT components have minor diameter respect to W conical shield int.diam.) .

-In this configuration, criostat forw/back+SVT+L0+Be pipe+conical shield forw/back are one body (like in BaBar) but, in SuperB, to gain in X0, is not present the C.F. BaBar supporting tube and the Be pipe and SVT are the weak part of the mechanical chain .

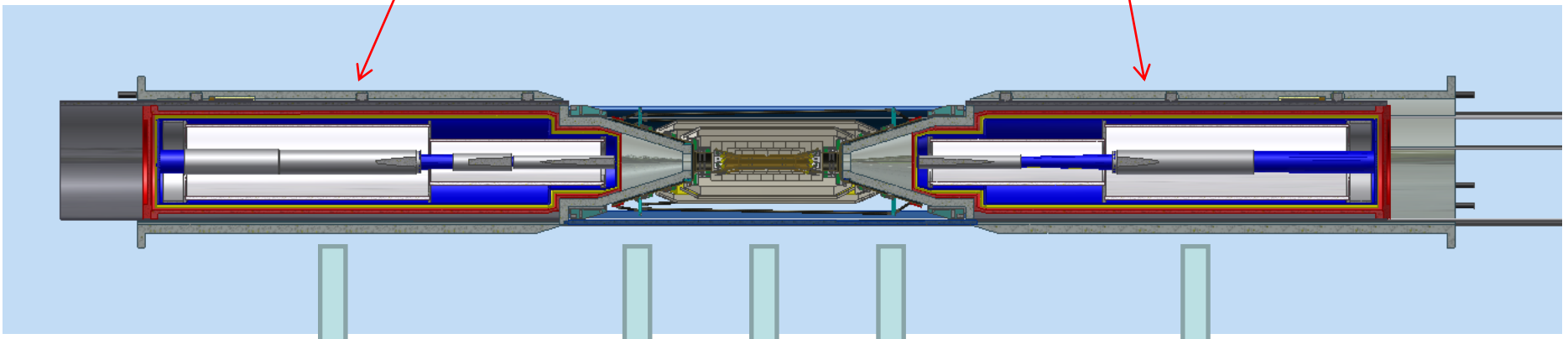
-Quick demounting plans to insert-remove a temporary cage to make rigid SVT /Be pipe during sliding operation to replace L0 in short time.

-Has been asked to assume R=245 (+10 mm respect now) as internal diameter of D.C. in order to have minimum radial space to design the mechanics of operation.

-The temporary cage should put together the two opposite W conical shield from a remote region (FCAL) previous blocking the external tube forw/back to the internal part of cylindrical W shield.

Cylindrical Shielding 1300 Kg

Cylindrical Shielding 1300 Kg



250 Kg + 150 Kg + 50 Kg Criostate + External tube + Cables

200 Kg Conical Shielding

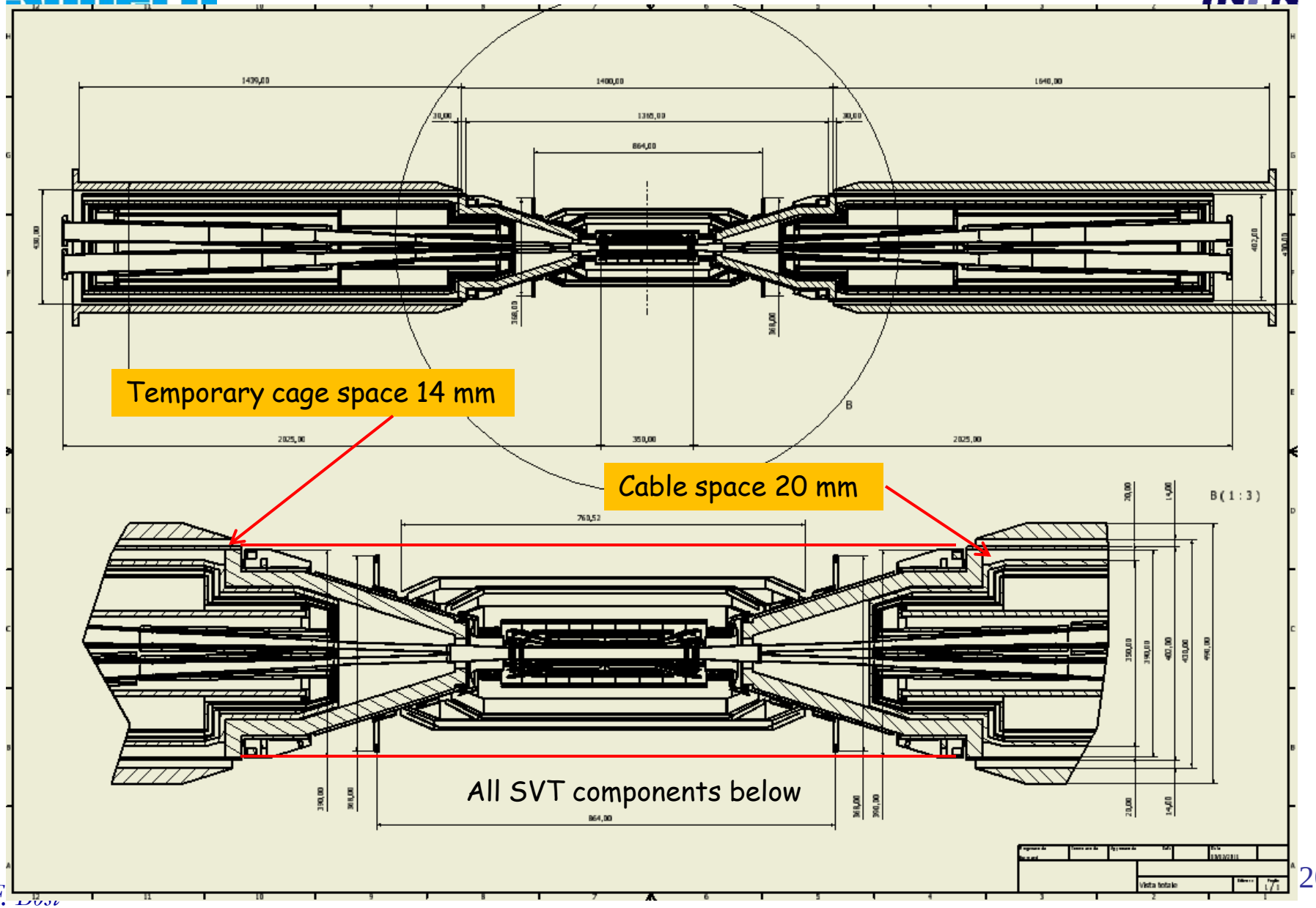
50 Kg + 50 Kg SVT + Temporary Cage

200 Kg Conical Shielding

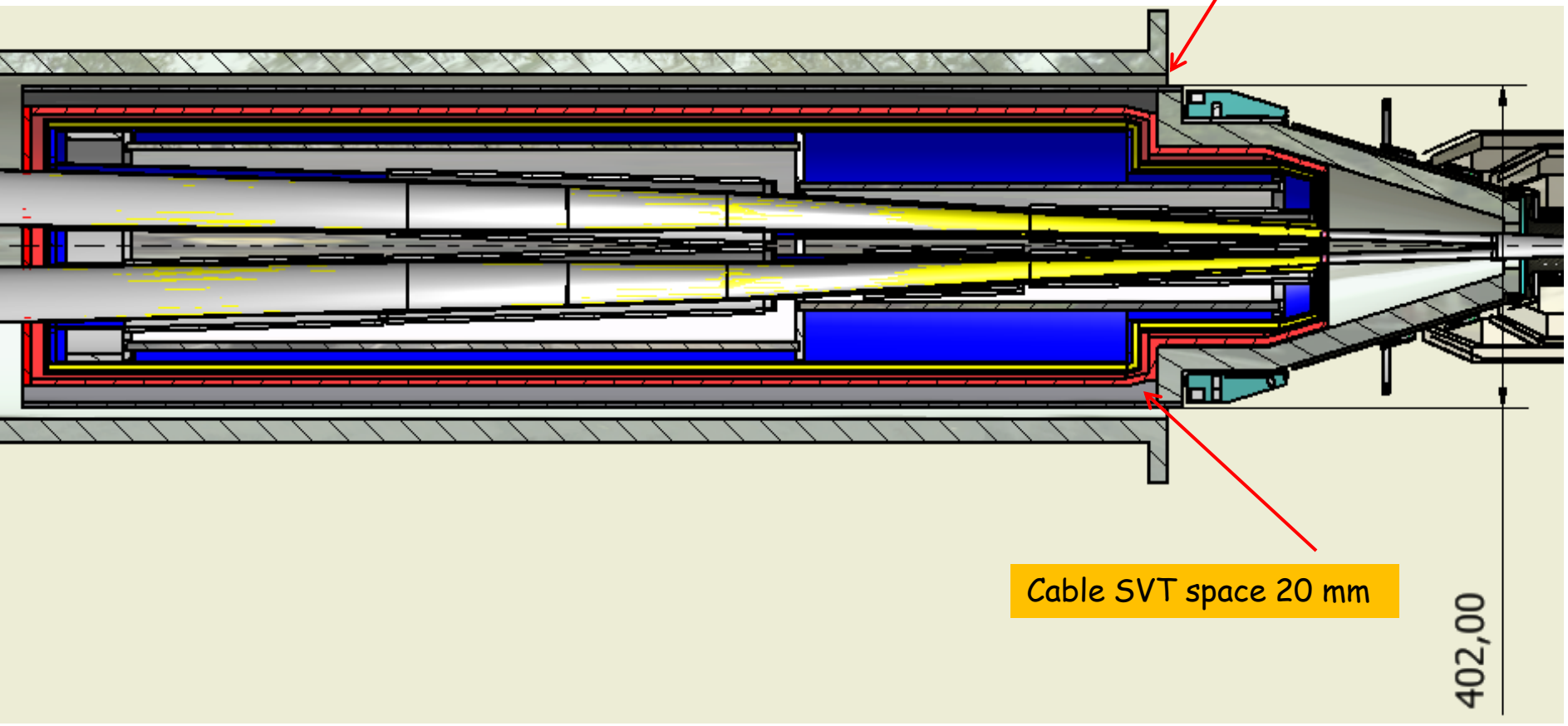
250 Kg + 125 Kg + 50 Kg Criostate + External tube + Cables

Total weight to move for quick demounting ≈ 1400 Kg

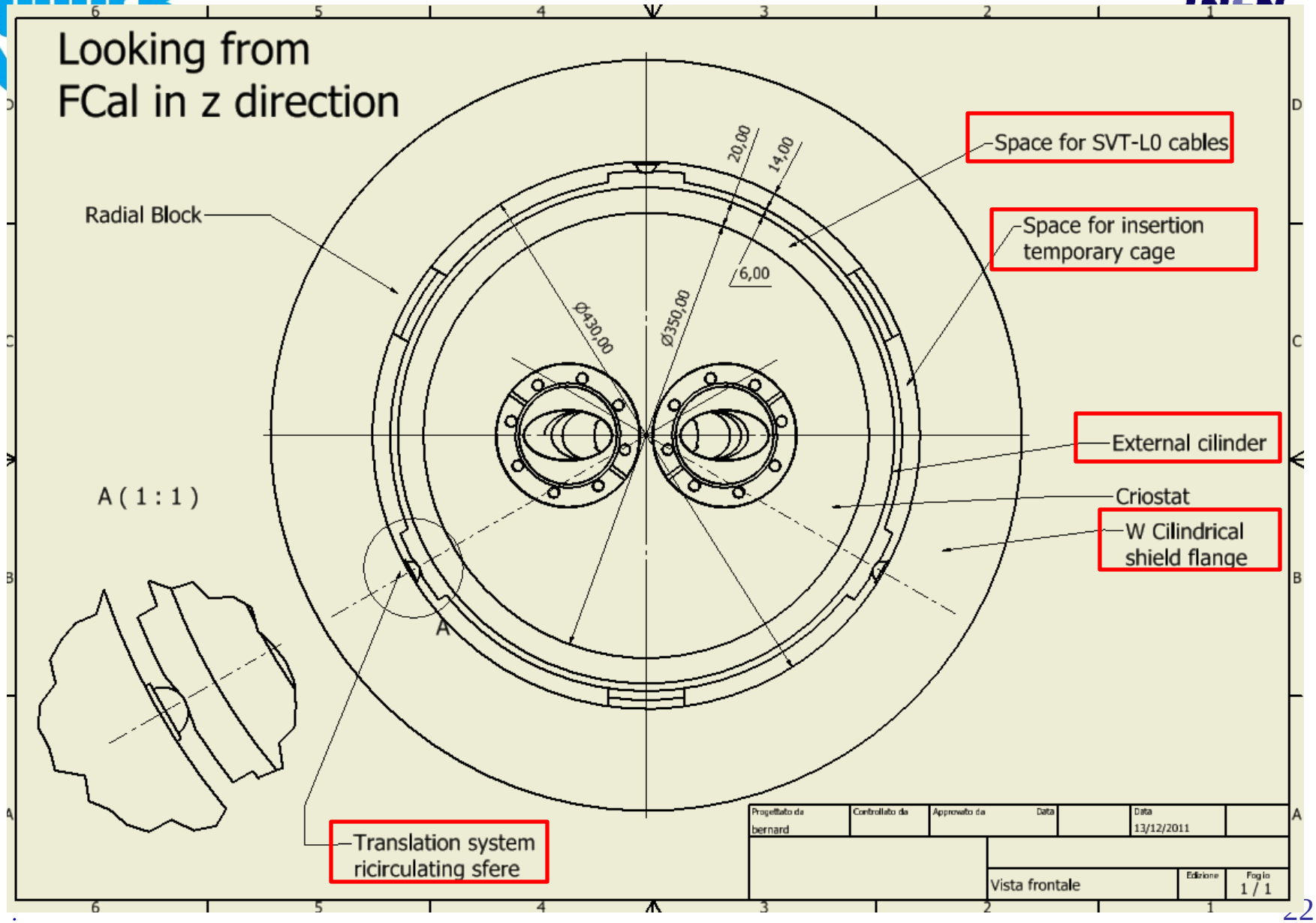
Quick demounting

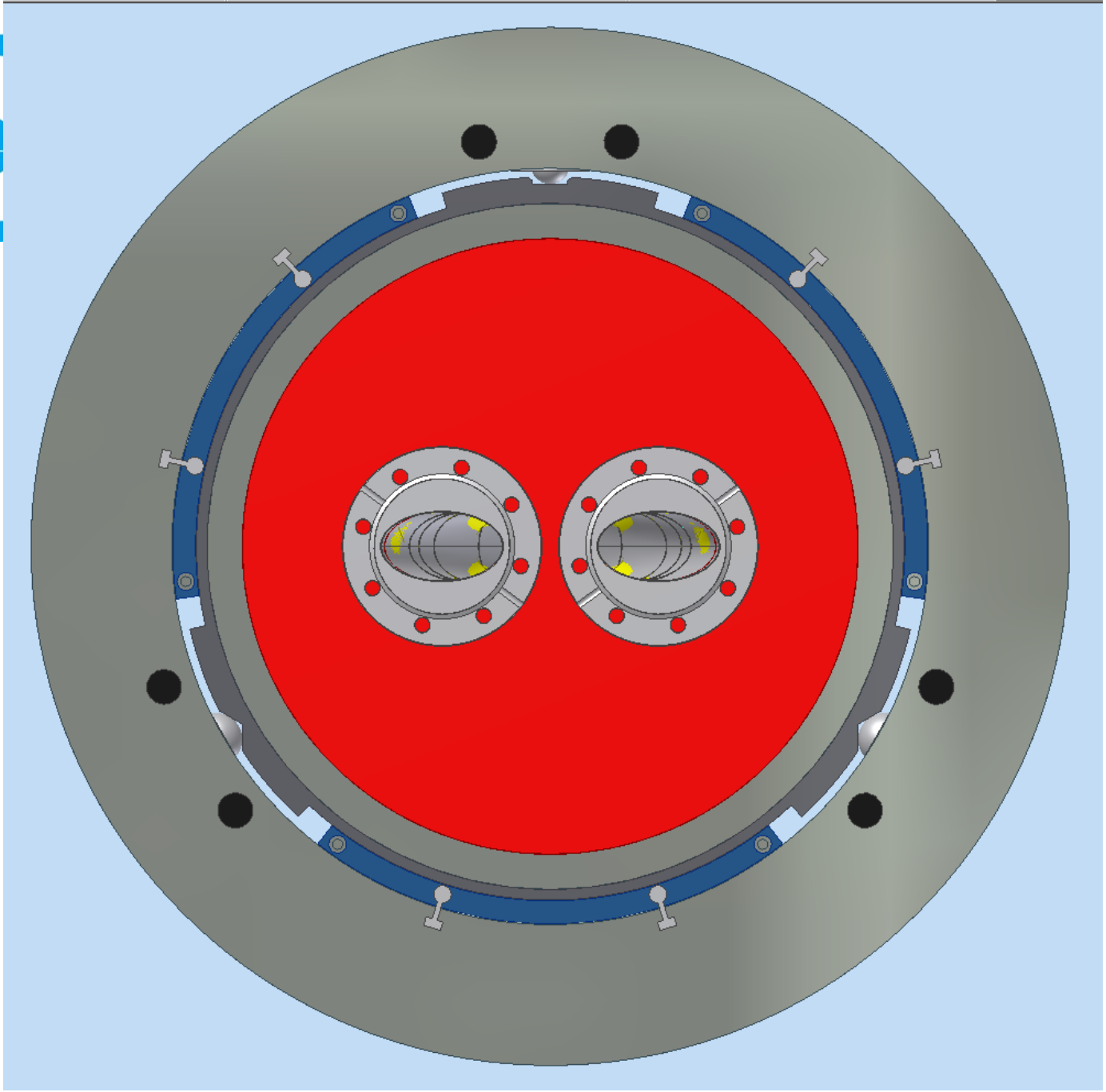


Quick demounting

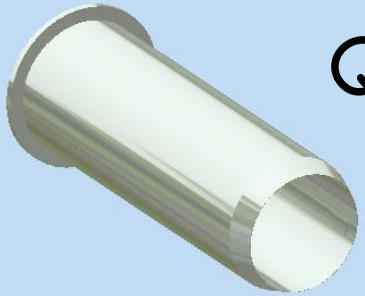


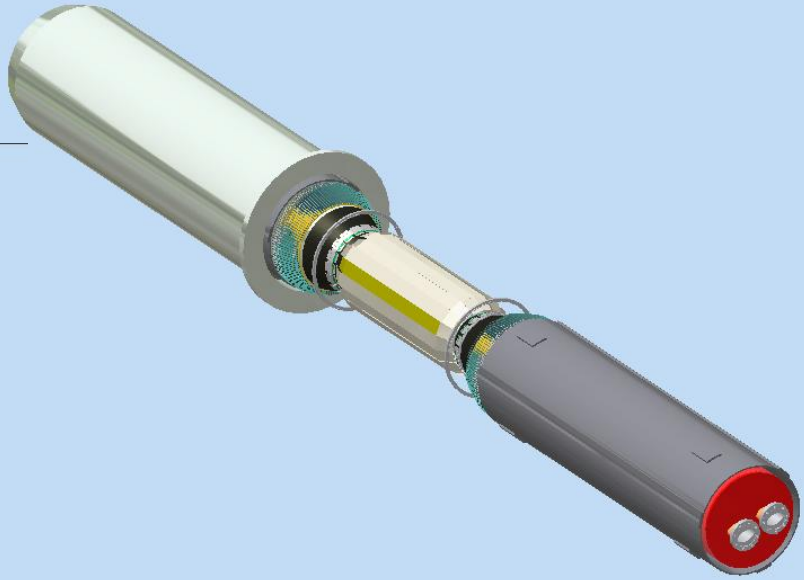
Quick demounting

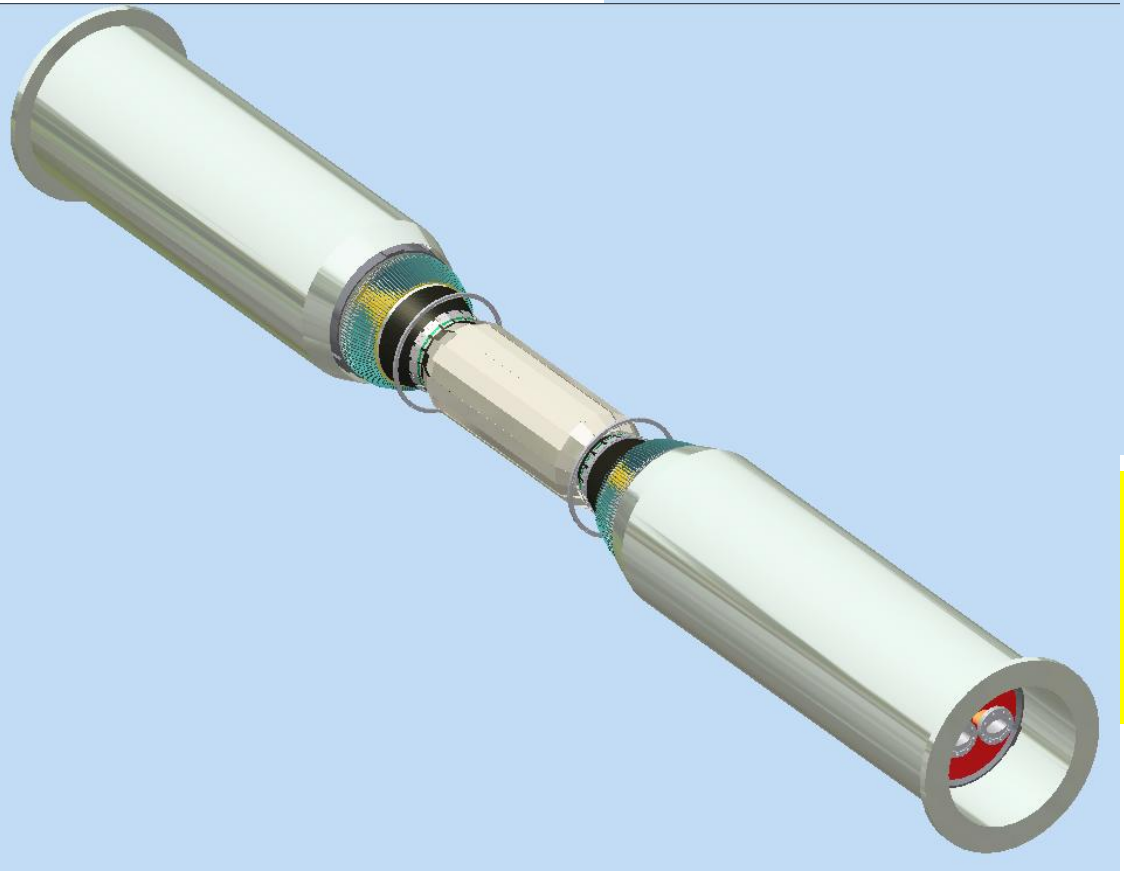




Quick demounting

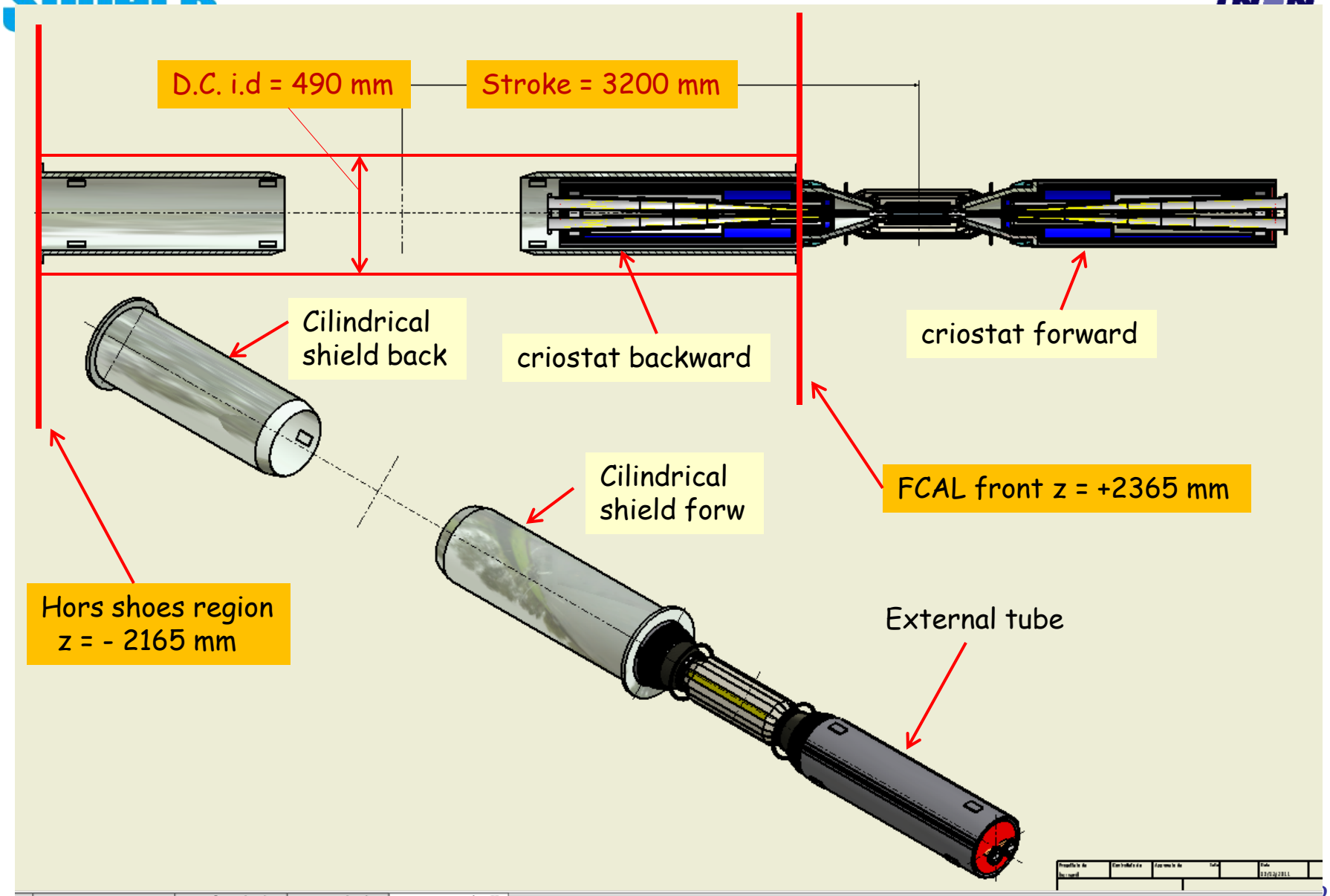


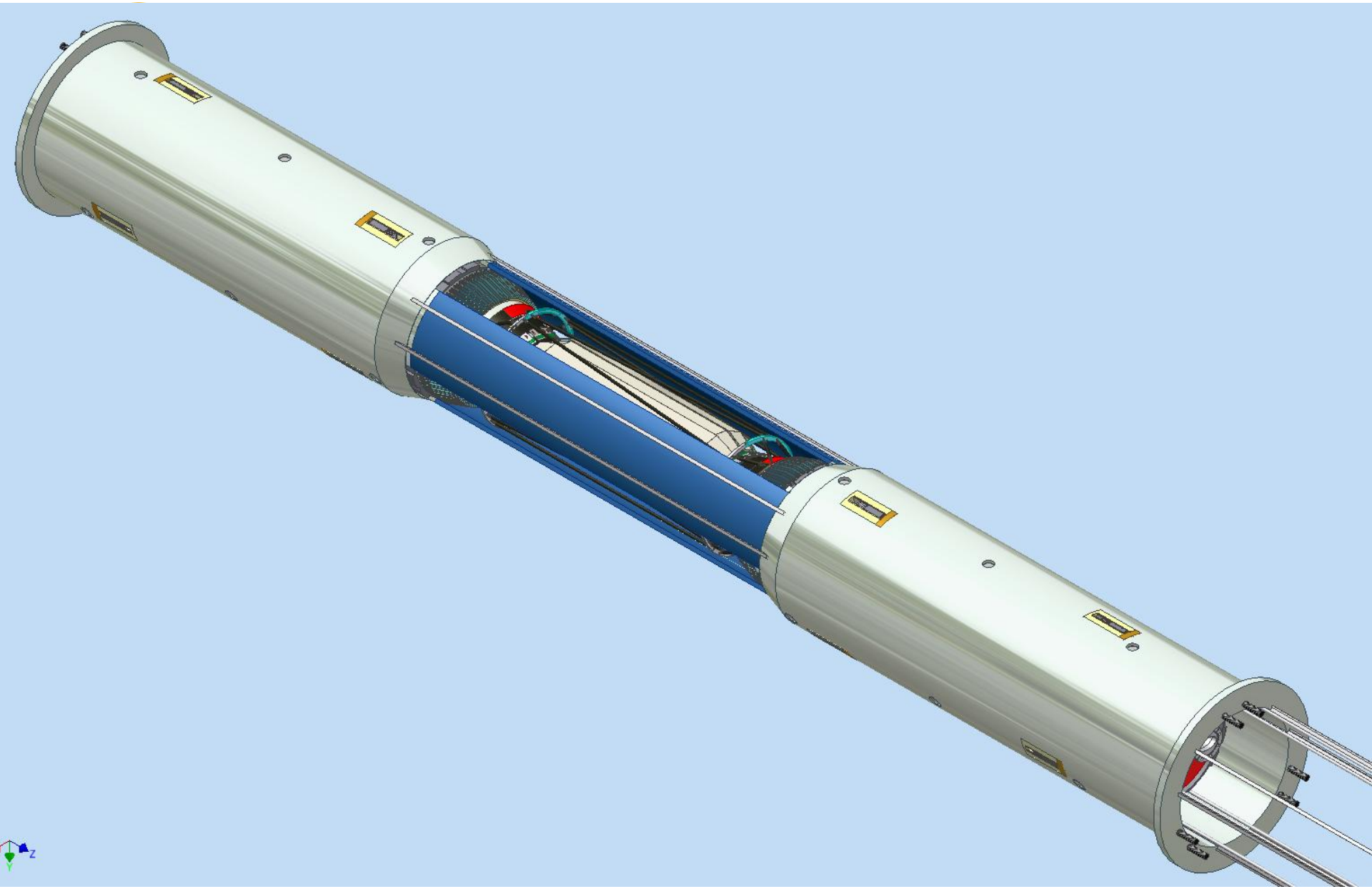


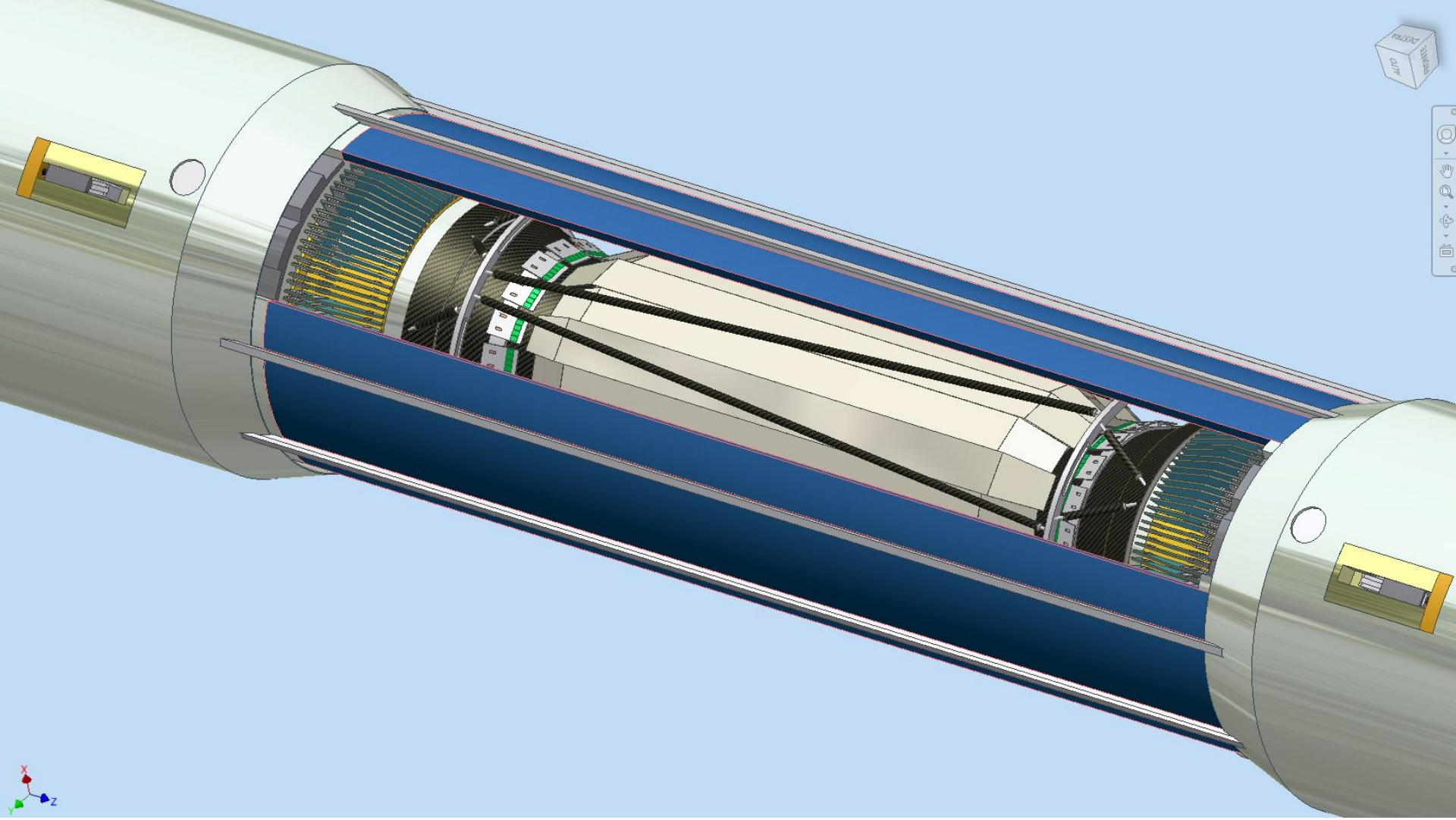


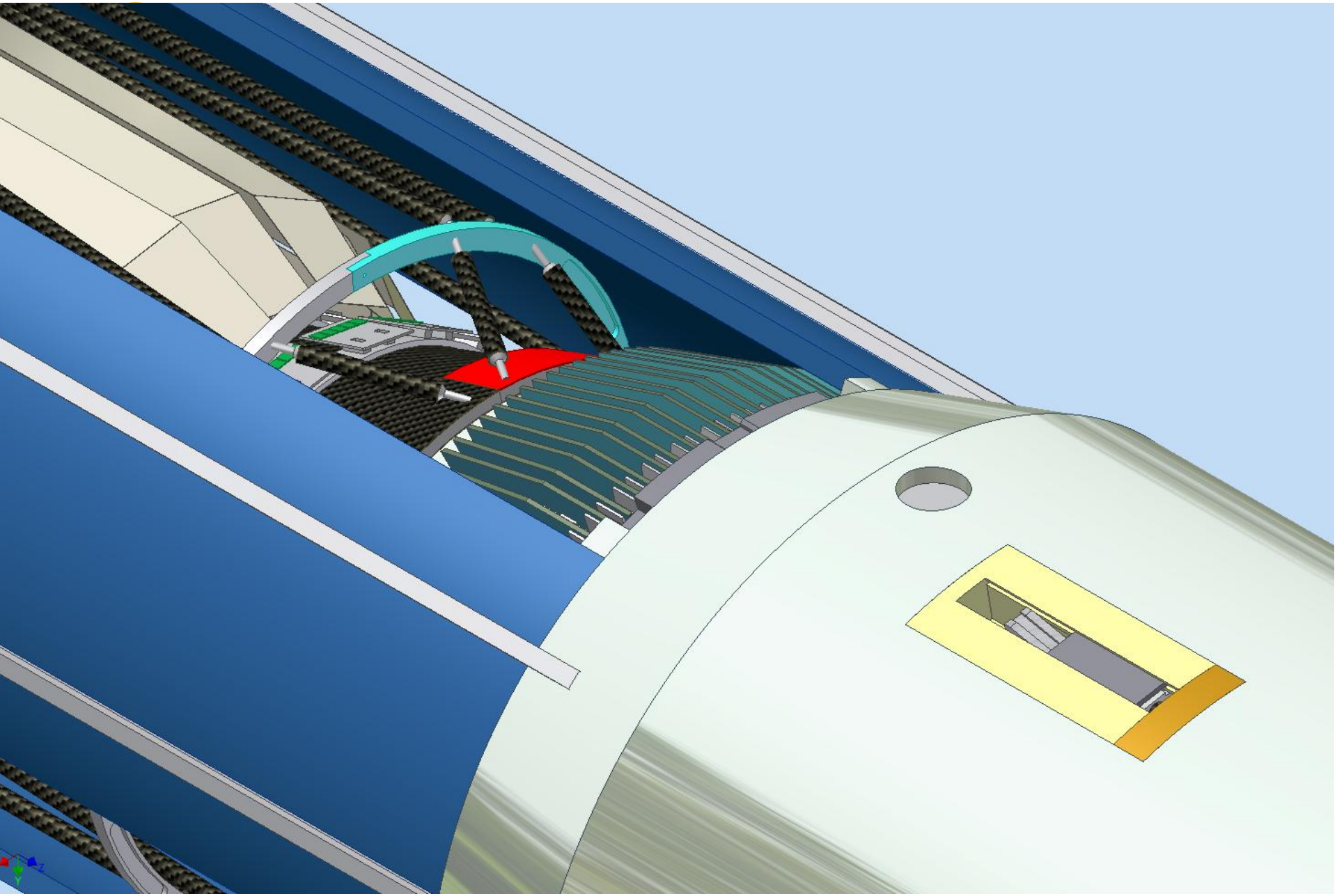
SVT
1) In experimental condition
2) In removal condition at the end of stroke

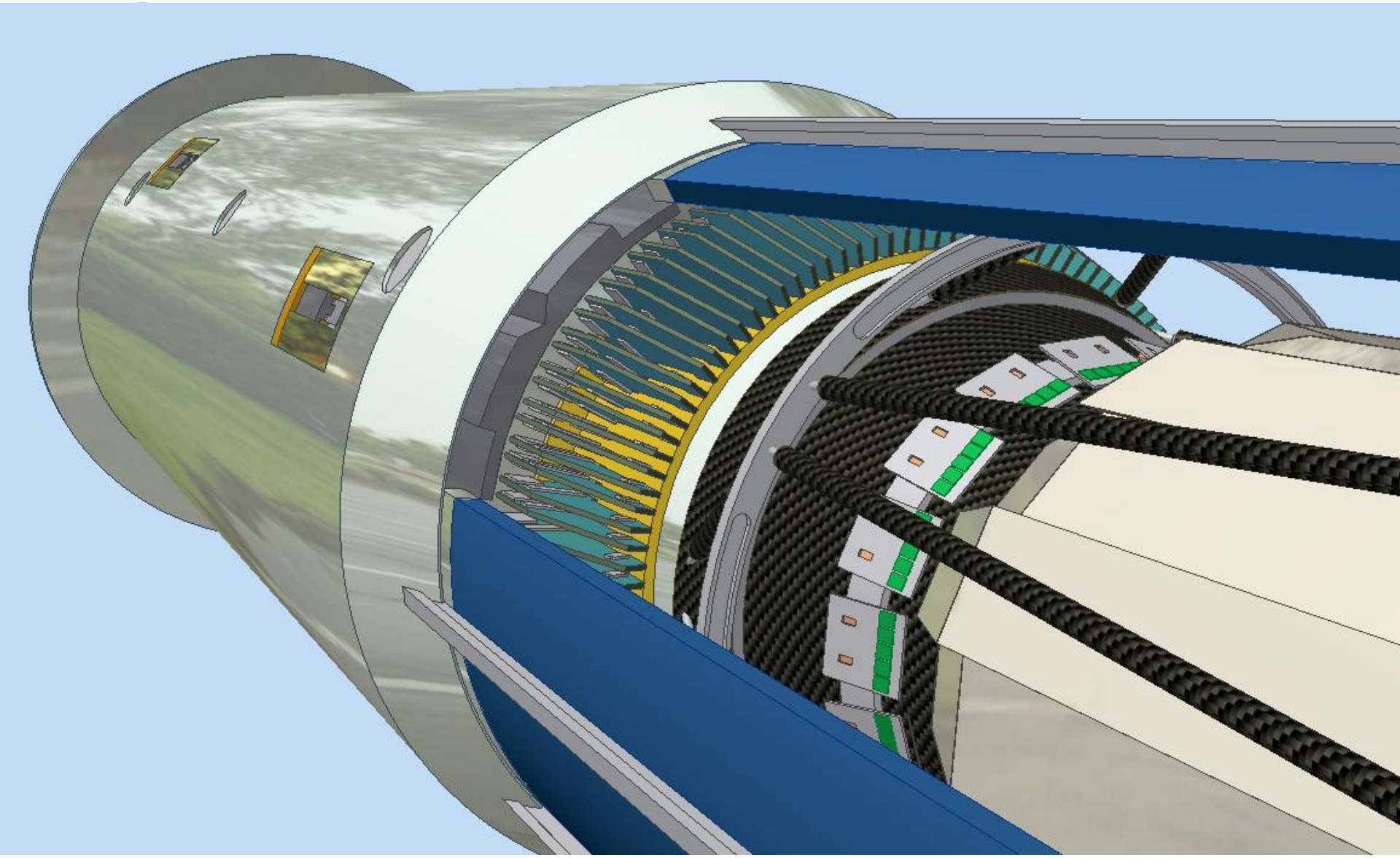
Quick demounting

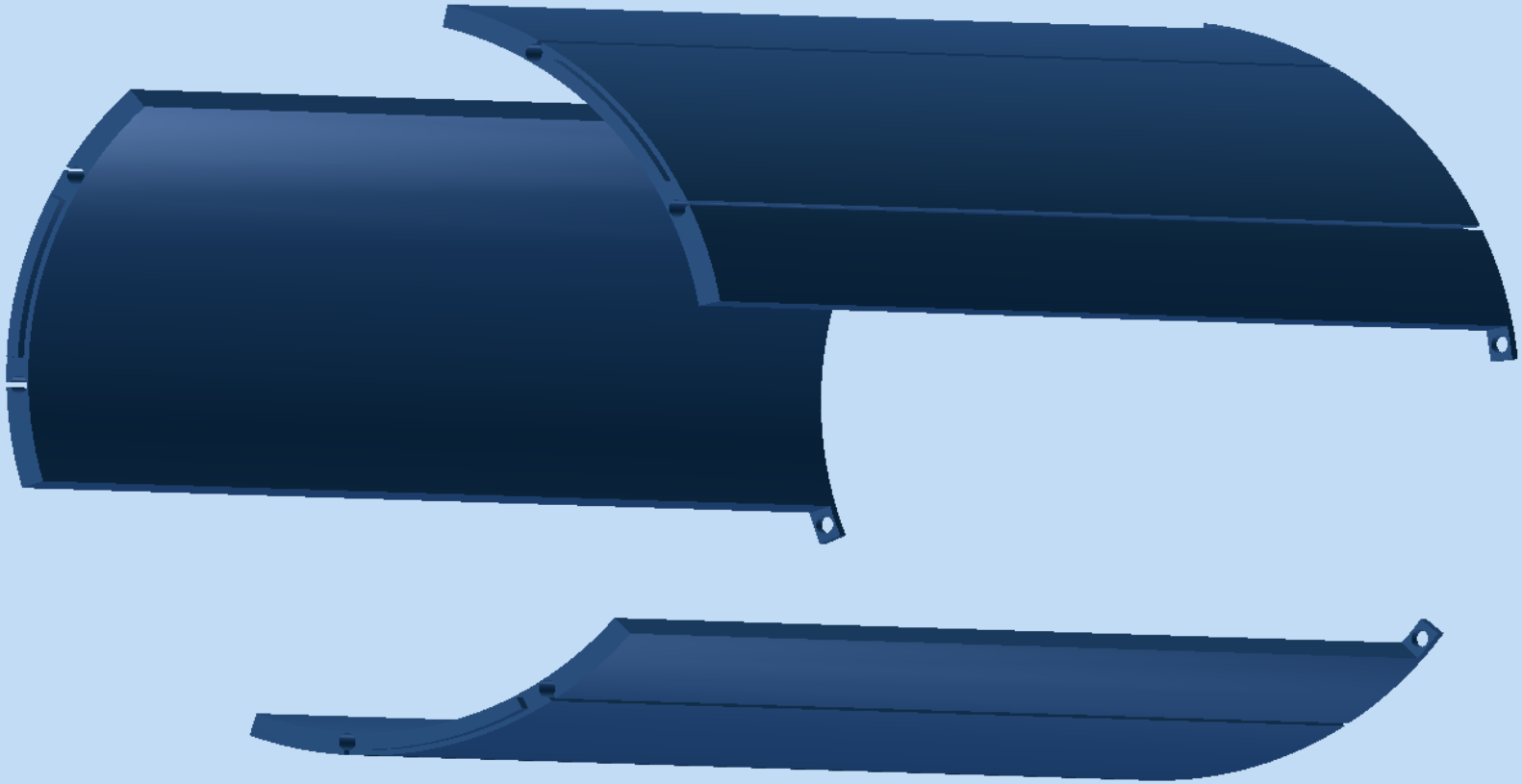


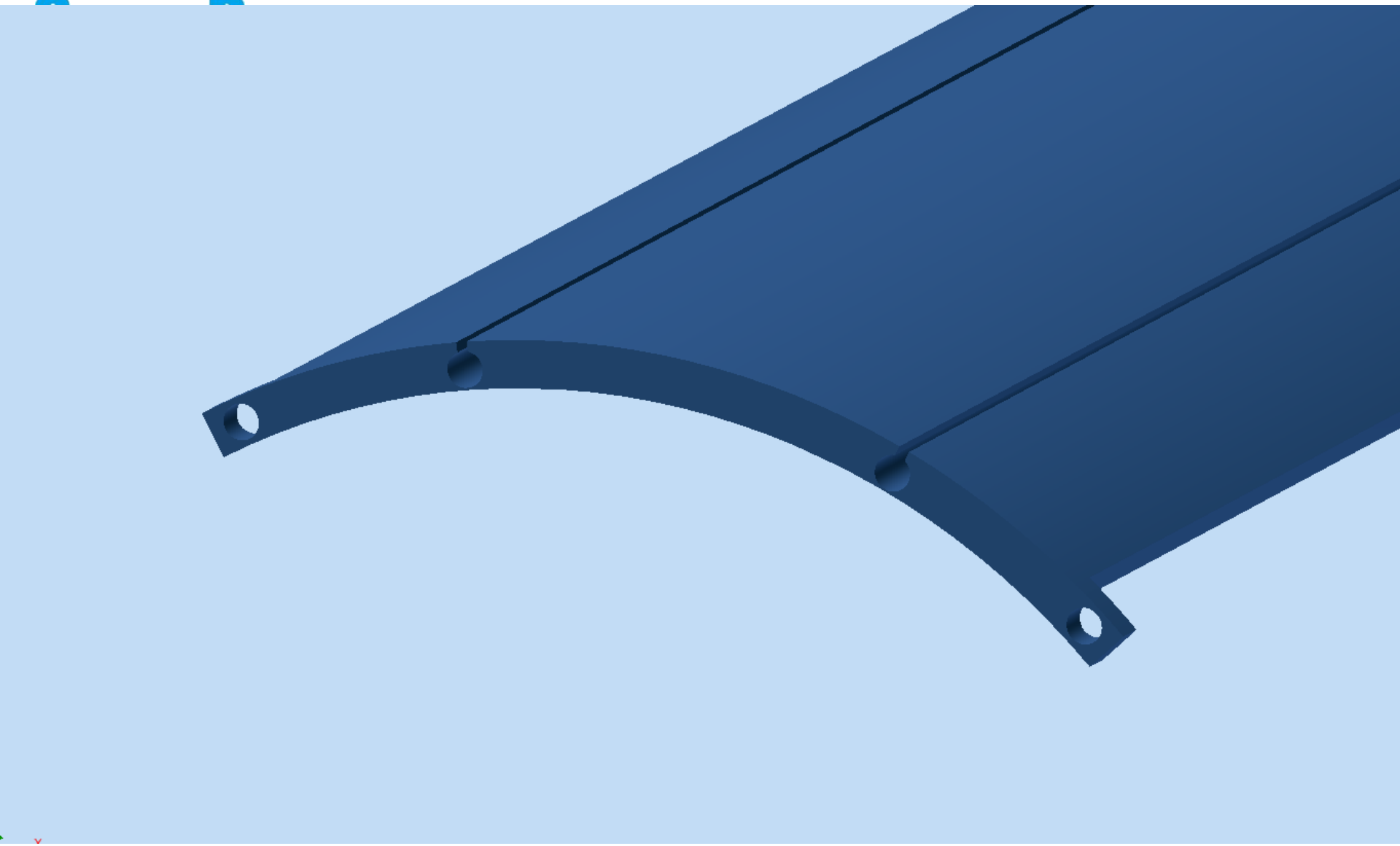


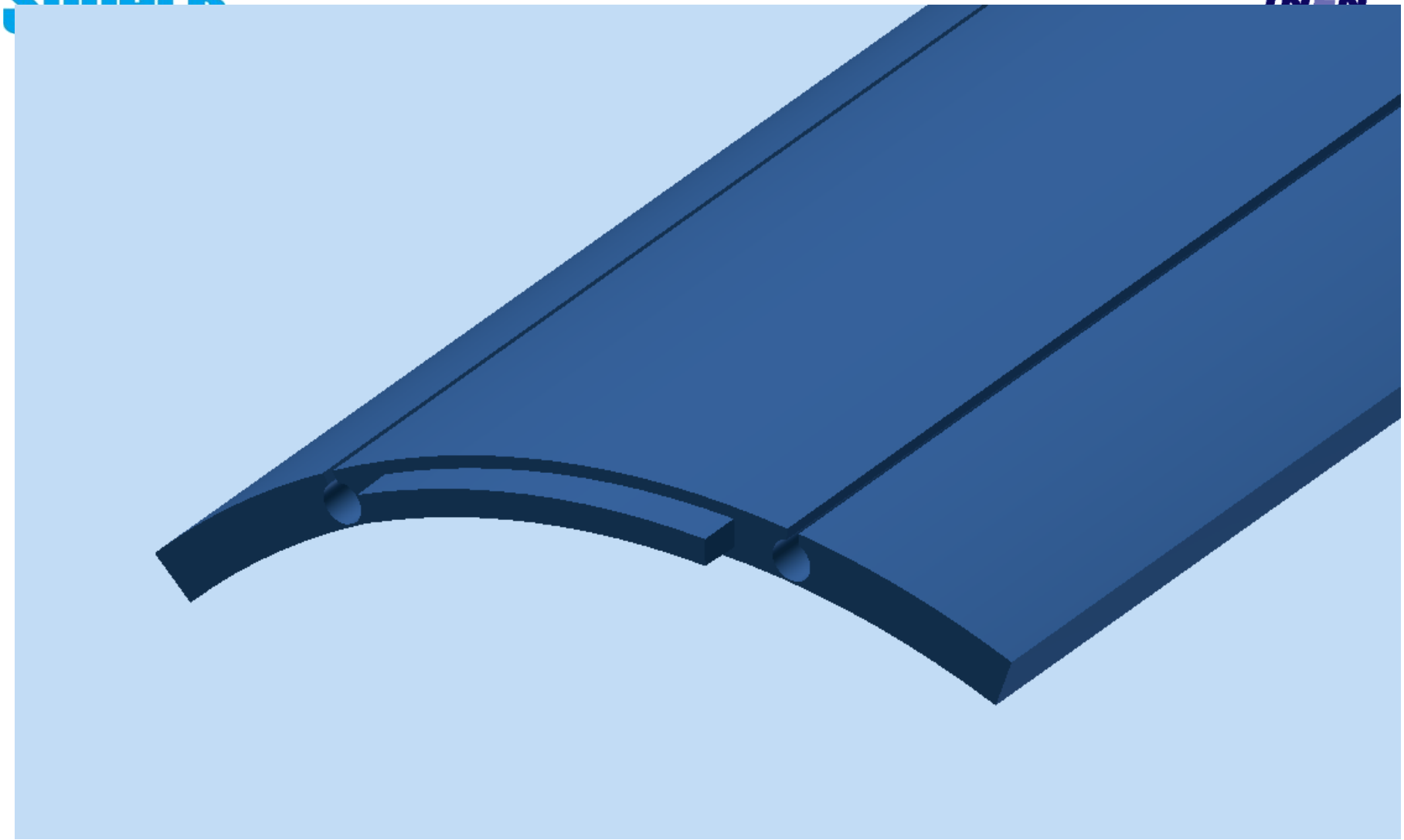


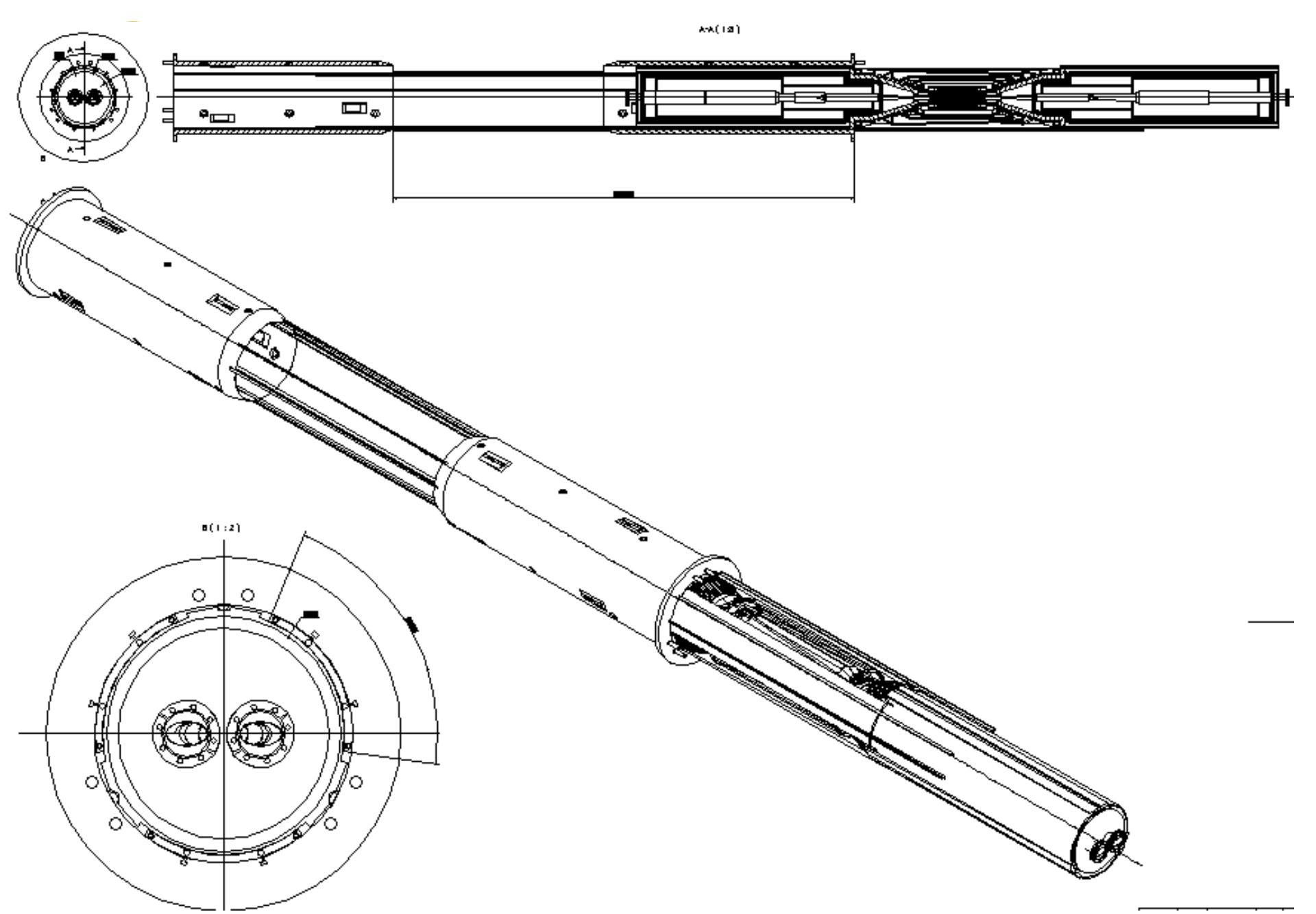


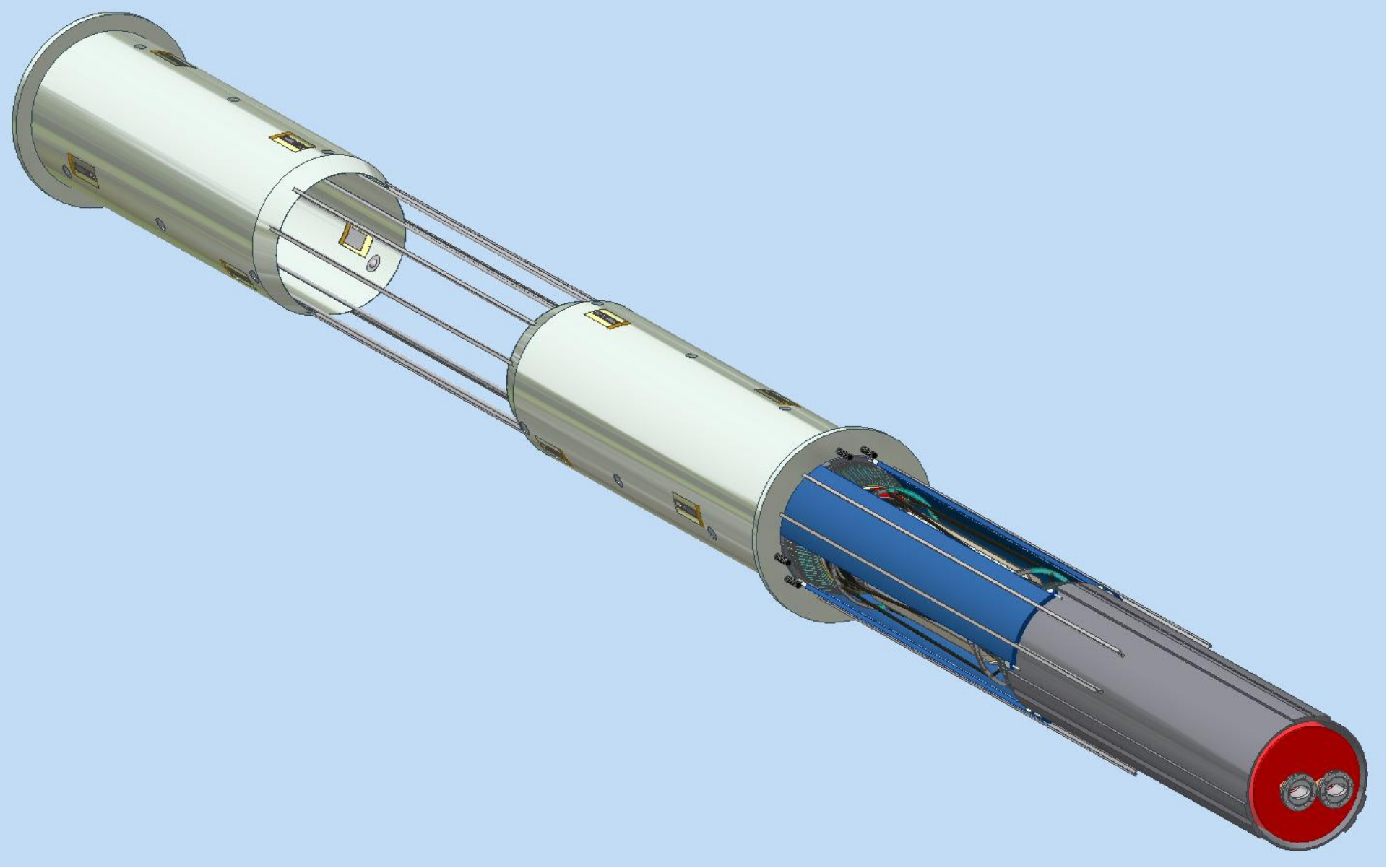


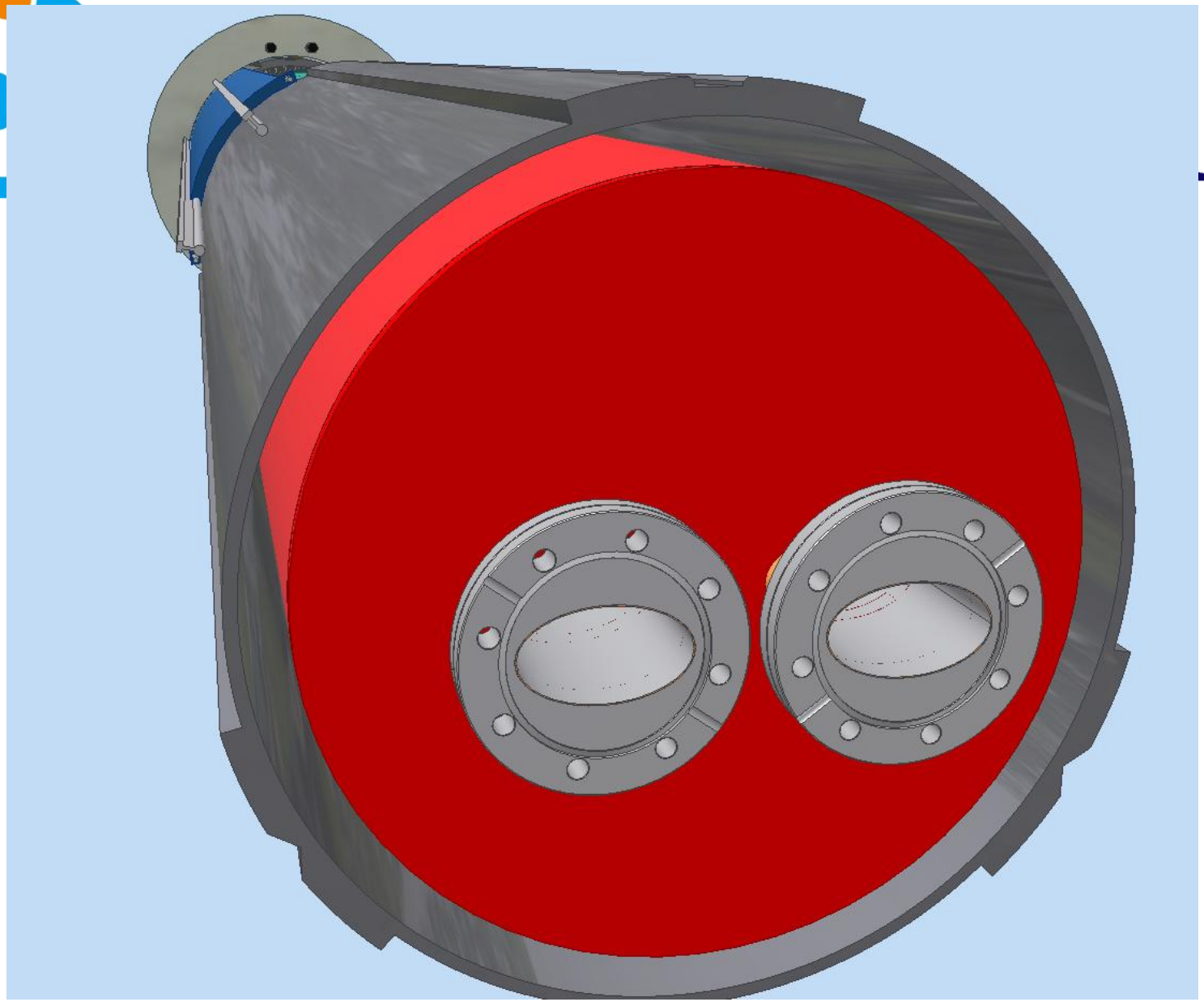


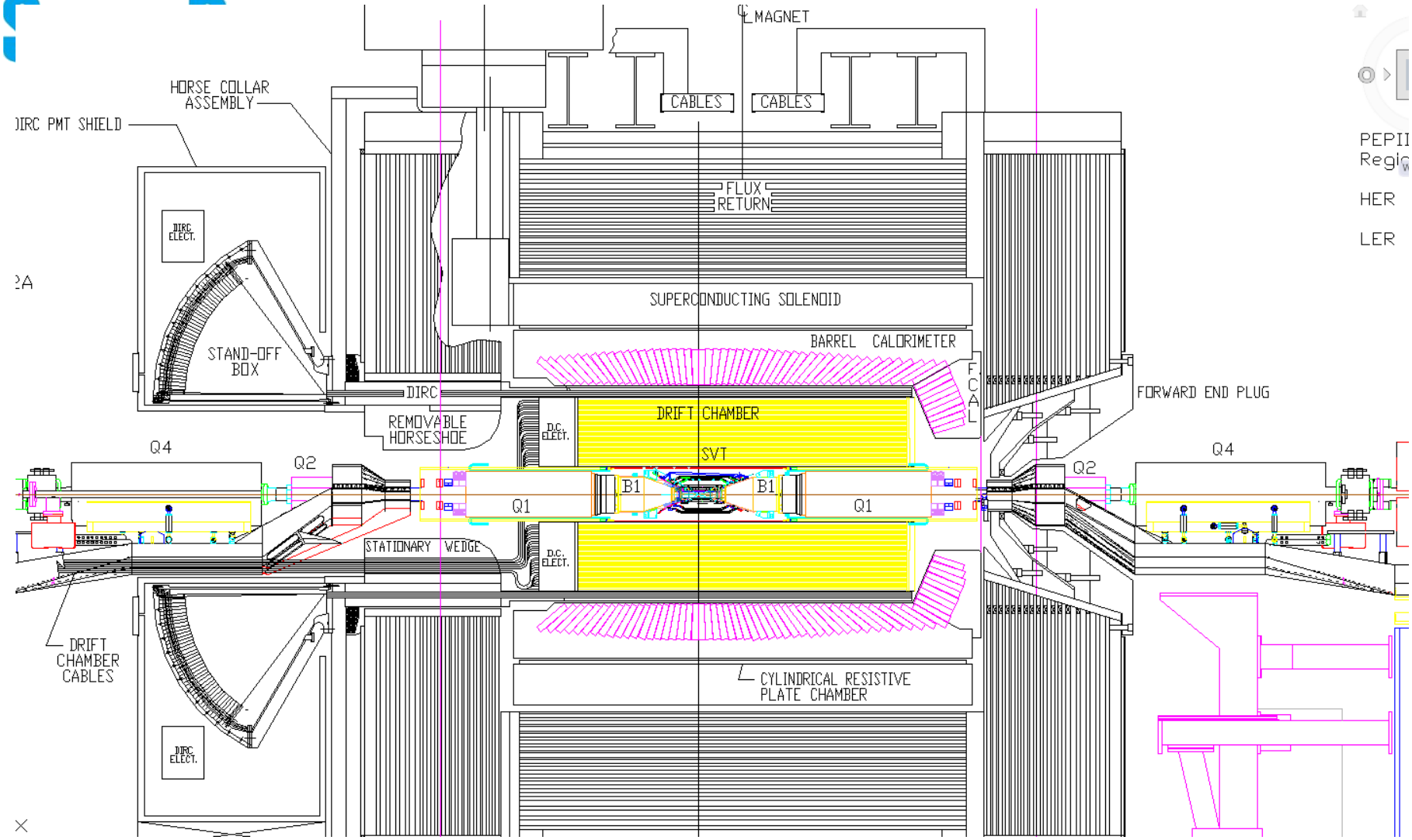


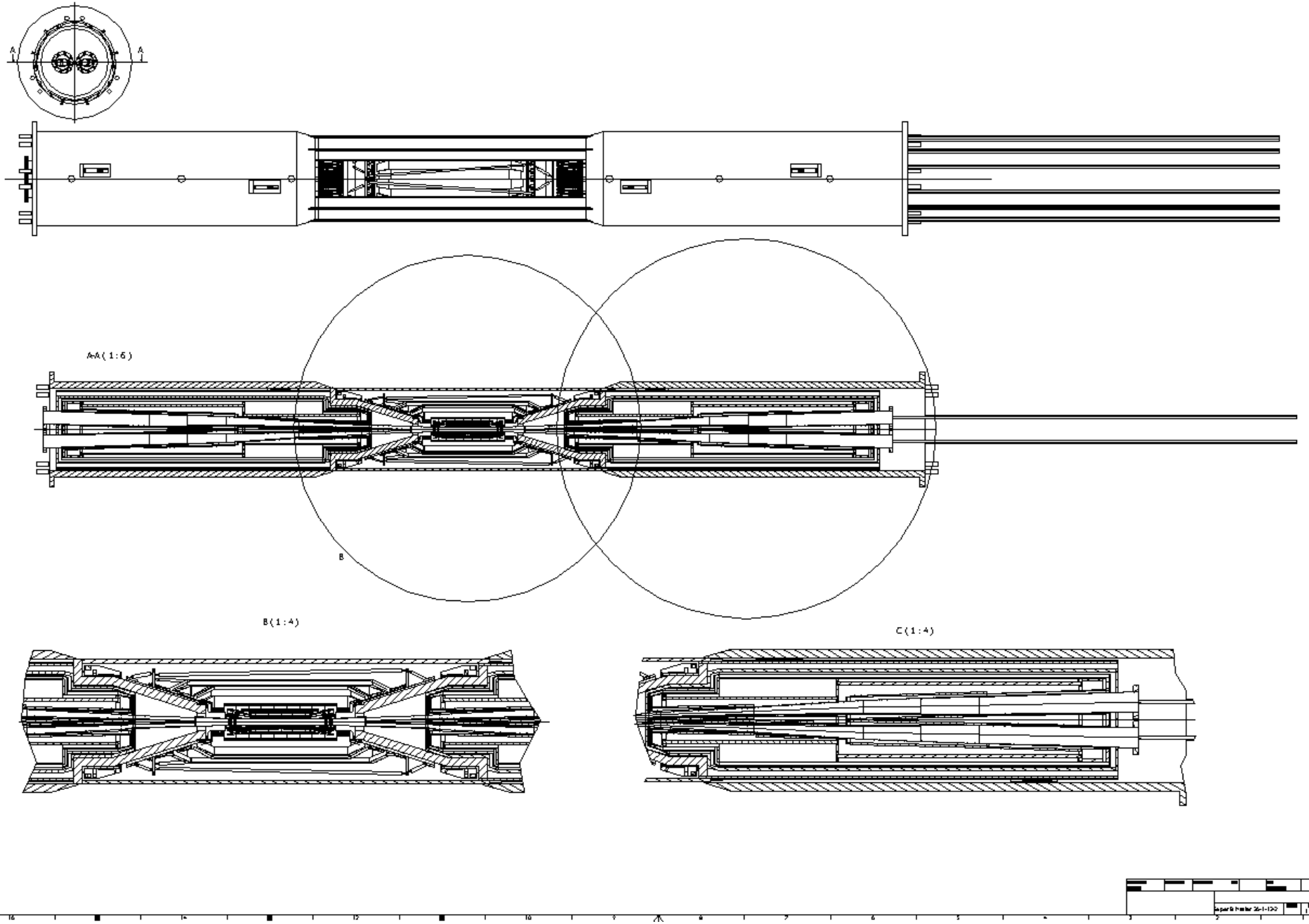


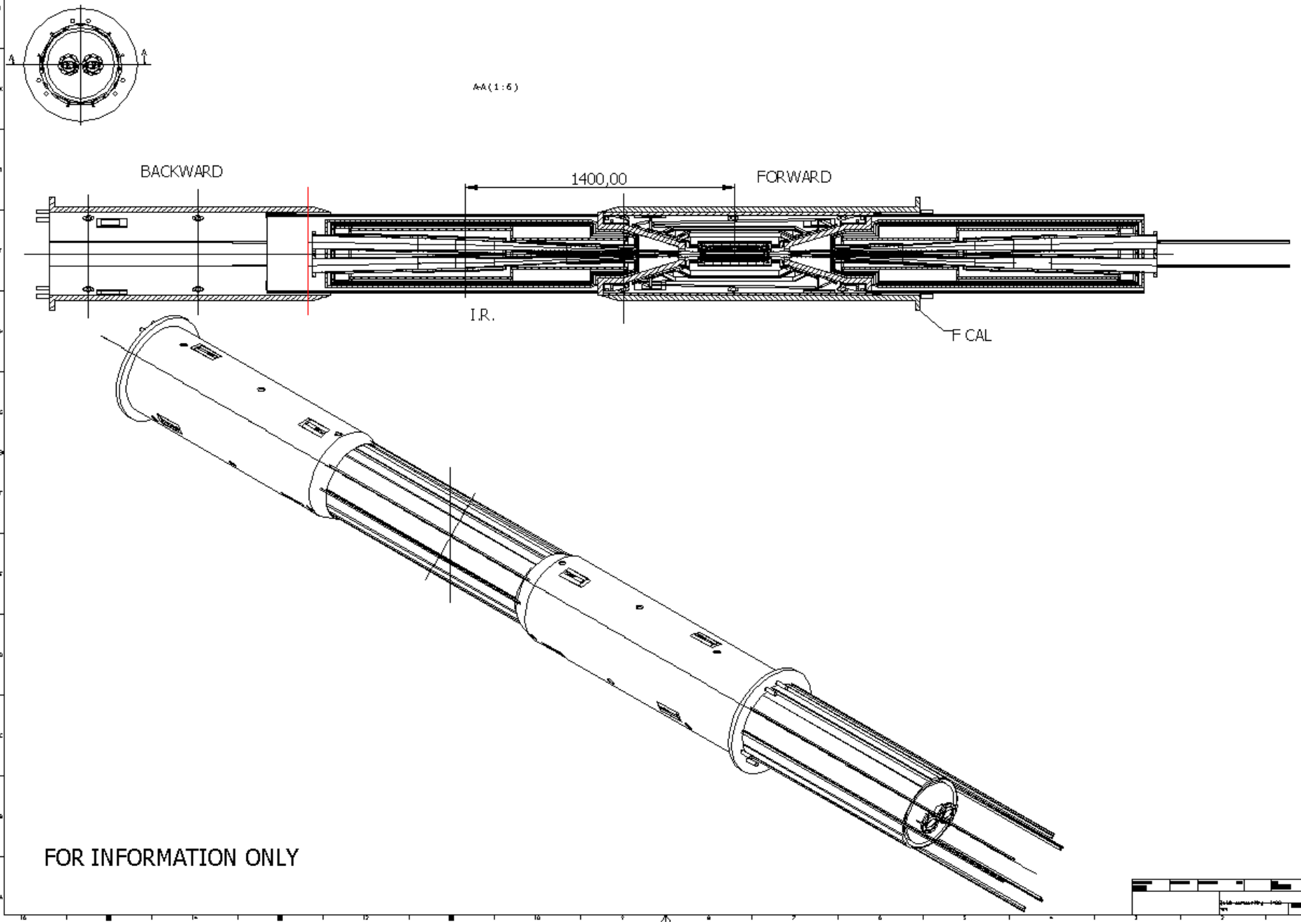


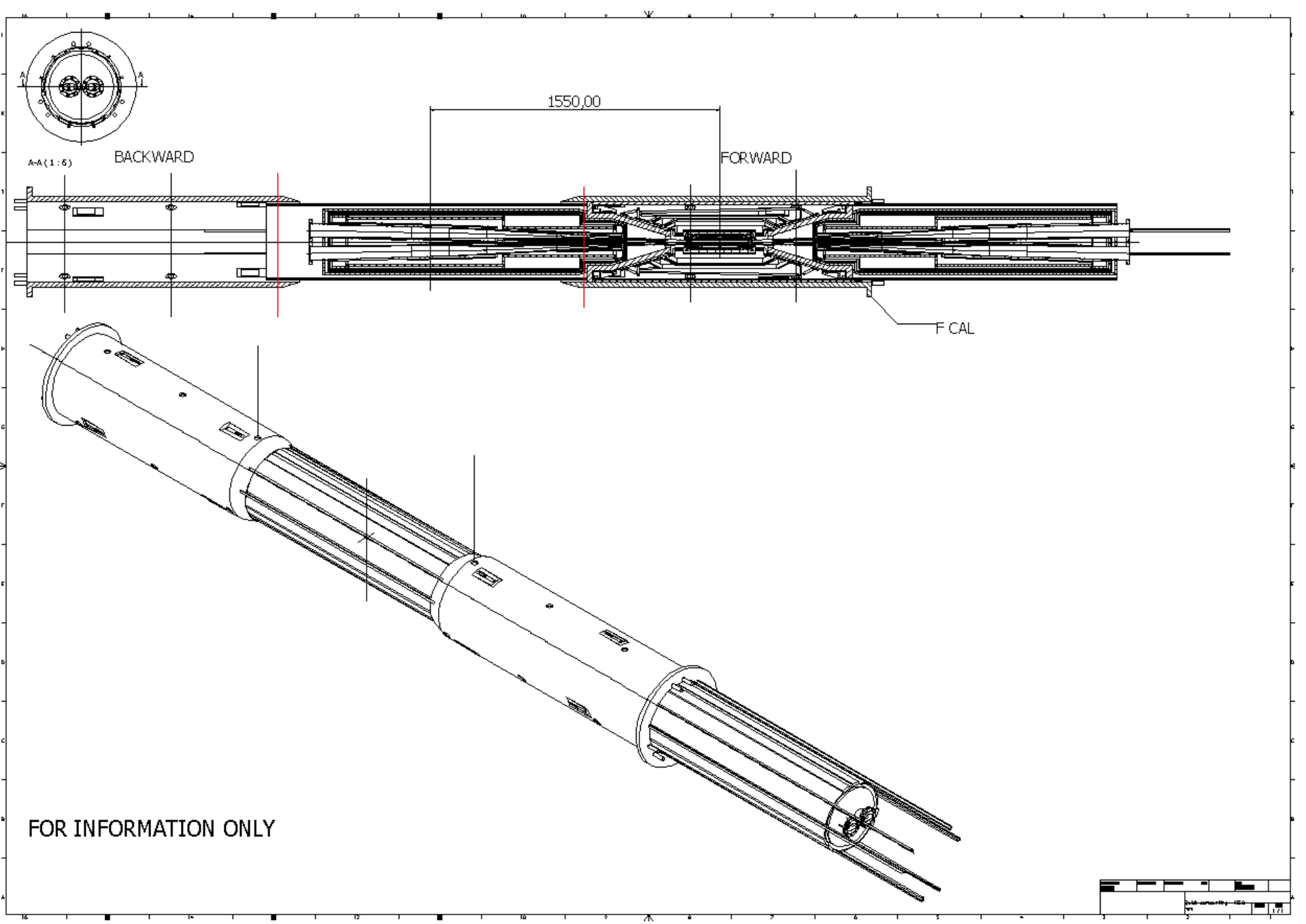


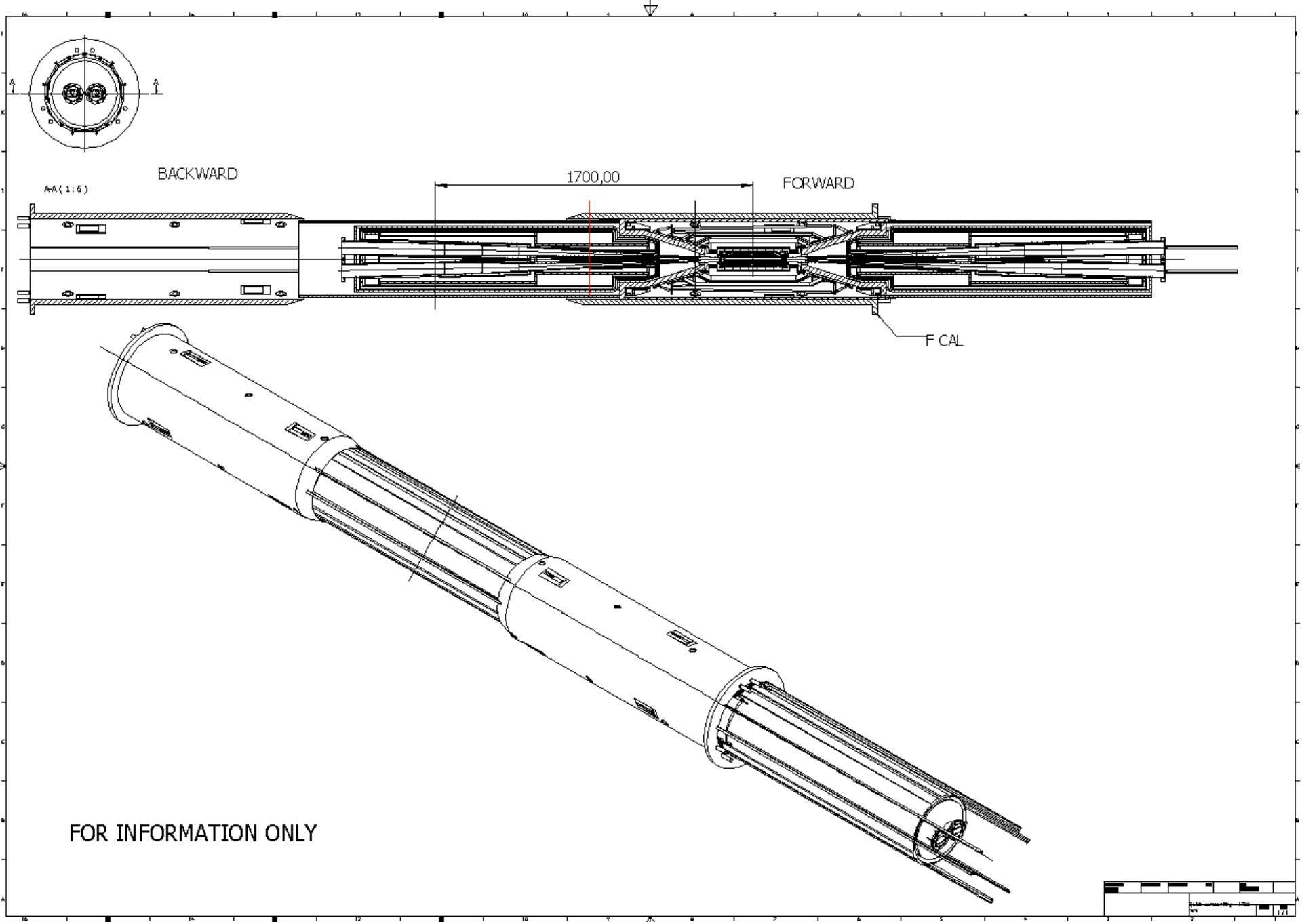


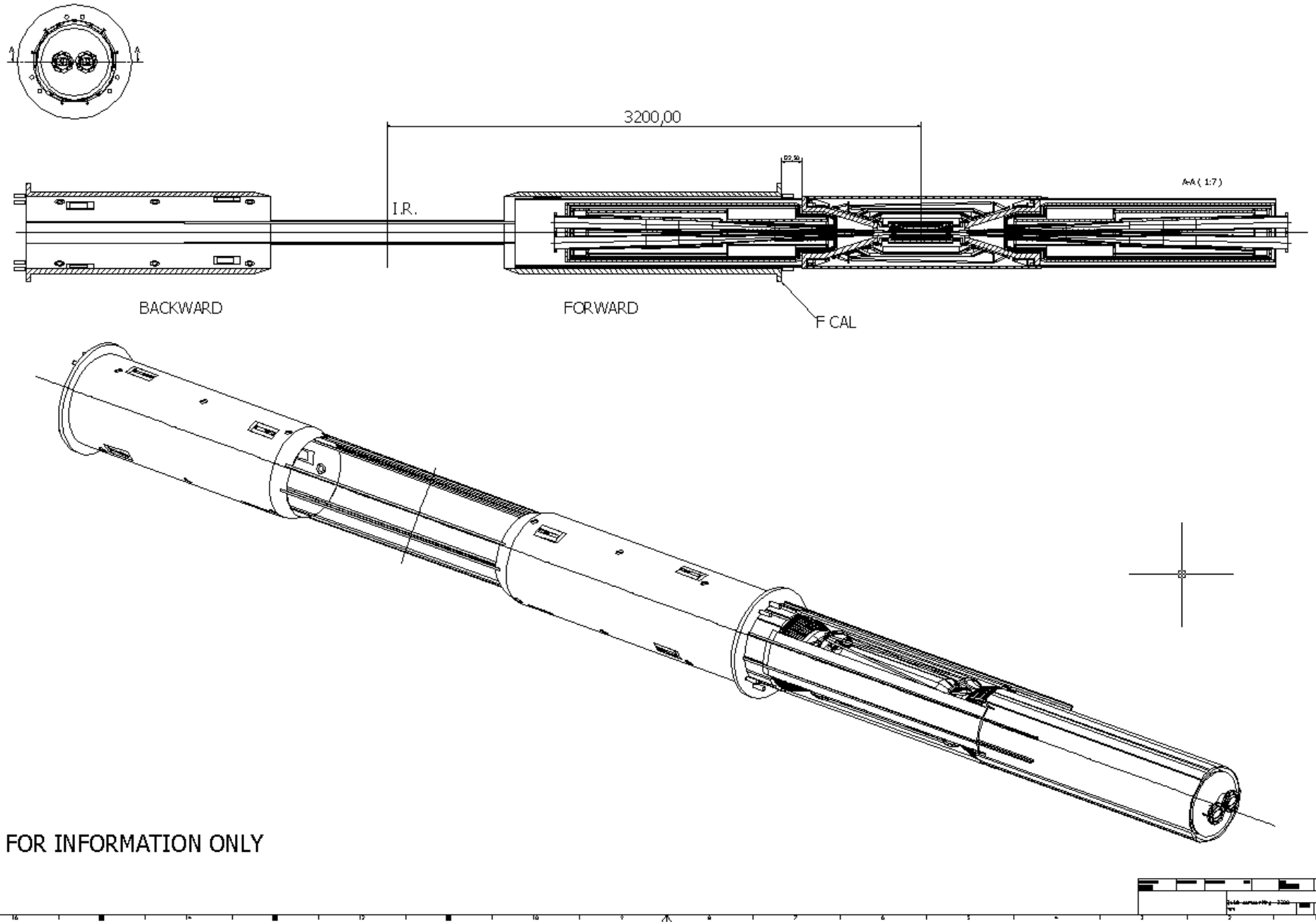

MAGNET
HORSE COLLAR ASSEMBLY
DIRC PMT SHIELD
CABLES
CABLES
FLUX RETURN
DIRC ELECT.
STAND-OFF BOX
SUPERCONDUCTING SOLENOID
BARREL CALORIMETER
DIRC
REMOVABLE HORSESHOE
D.C. ELECT.
DRIFT CHAMBER
SVT
FCAL
FORWARD END PLUG
Q4
Q2
Q1
B1
B1
Q1
Q2
Q4
STATIONARY WEDGE
D.C. ELECT.
DRIFT CHAMBER CABLES
CYLINDRICAL RESISTIVE PLATE CHAMBER
DIRC ELECT.


A
A
A-A (1 : 6)
B
B (1 : 4)
C (1 : 4)


A-A(1:6)
BACKWARD
1400,00
FORWARD
I.R.
F CAL
FOR INFORMATION ONLY


A-A(1:6)
BACKWARD
1550,00
FORWARD
F CAL
FOR INFORMATION ONLY


BACKWARD
A-A (1 : 6)
1700,00
FORWARD
F CAL
FOR INFORMATION ONLY


3200,00
I.R.
A-A (1:7)
BACKWARD
FORWARD
F CAL
FOR INFORMATION ONLY

BACKUP

SVT module master tablet

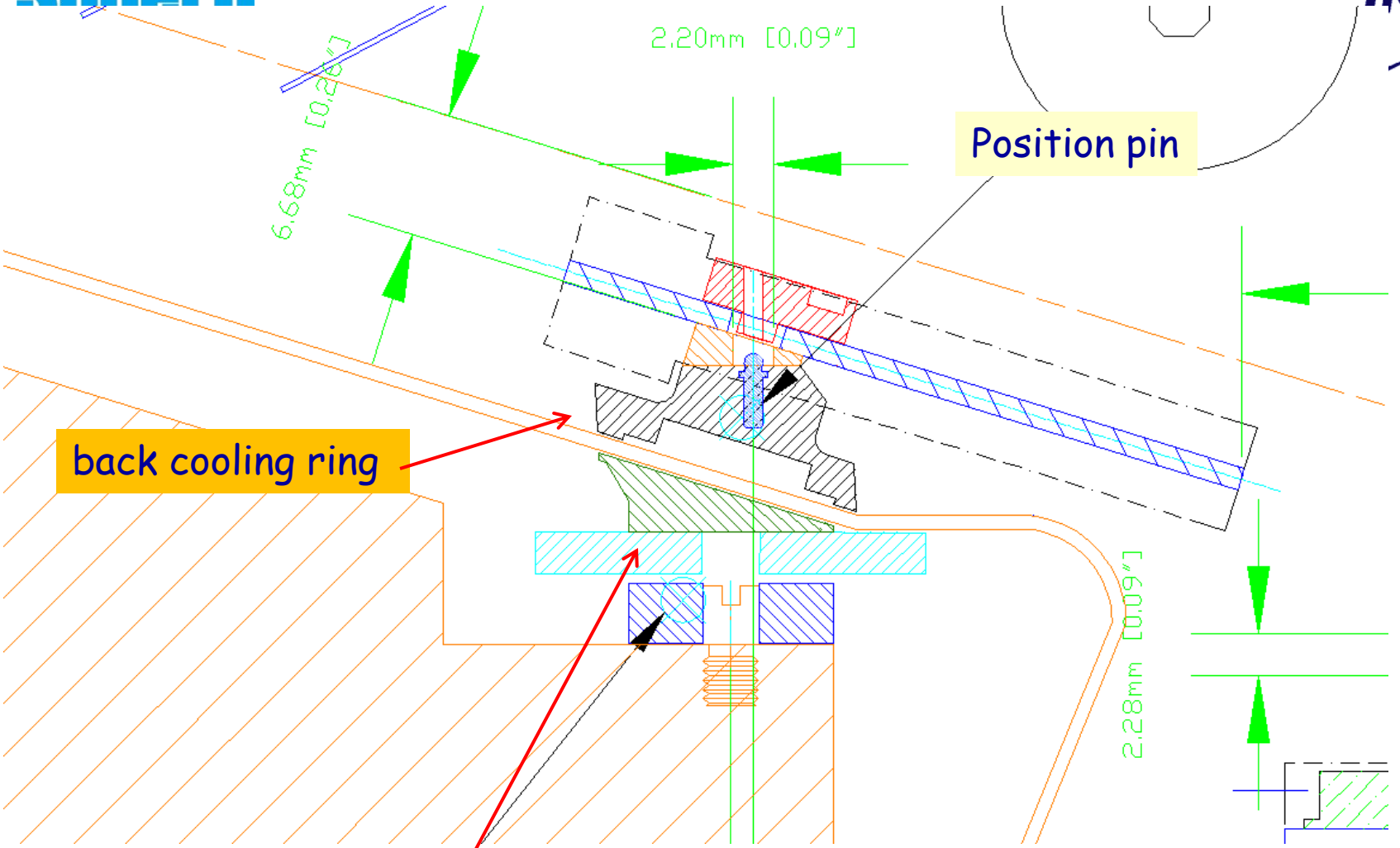
SVT - Dimensioni e copertura angolare sensori

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Layer	Radius piano y-z sensore barrel SuperB	Radius piano y-z punto estremo sensore wedge SuperB	Radius punto estremo laterale sensore SuperB	Lunghezza orizzontale sensore tangente cono 300 mrad SuperB	Lunghezza sensore barrel SuperB (tabella Londra)	Lunghezza totale sensore barrel SuperB	Lunghezza totale sensore totale SuperB	Lunghezza estensione sensore oltre 300 mrad SuperB column (G-E)/2	Lunghezza estensione sensore oltre 350 mrad BaBar	Angolo intercettato nel punto ingombro estremo sensore con piano y-z (rad)	Angolo intercettato nel punto ingombro estremo laterale sensore (rad)	Shift Layer asse Z (mm)	Angolo intercettato nel punto ingombro estremo sensore con piano y-z+shift (rad)	Angolo intercettato ingombro fisico sensore estremo laterale +shift (rad)
0	15,10	-	17,30	97,63	-	104,00	104,00	3,19	-	0,283	0,321	0	-	-
1	32,85	-	36,97	212.39	214,78	223,36	223,36	5,48	21.69	0,286	0,320	+2	0,284	0,325
2	39,85	-	44,26	257.65	262.78	265,78	265,78	4.06	2.51	0,291	0,322	-2	0,293	0,326
3	58,85	-	65,28	380.49	385,70	385,70	385,70	2,60	1.41	0,296	0,326	0	-	-
4A	119,85	87,91	90,54	574,60	457.95	457.95	578,23	2,05	1.96	0,295	0,303	+2	0,293	0,293
4B	123,85	91,91	94,42	597,69	479.42	479.42	599,70	1.14	1.07	0,297	0,305	+2	0,296	0,296
5A	139,85	112,18	114,25	732,47	613.04	613.04	737,46	2.72	2.58	0,295	0,300	-2	0,297	0,297
5B	143,85	116,18	118,18	756,53	635.84	635.84	760,26	2.05	1.93	0,297	0,301	-2	0,298	0,298

Tablet usefull for trieste group to fix sensor and fanout dimensions

Modules have sensor in symmetric position respect I.P. but are shifted along z direction to avoid middle dead space

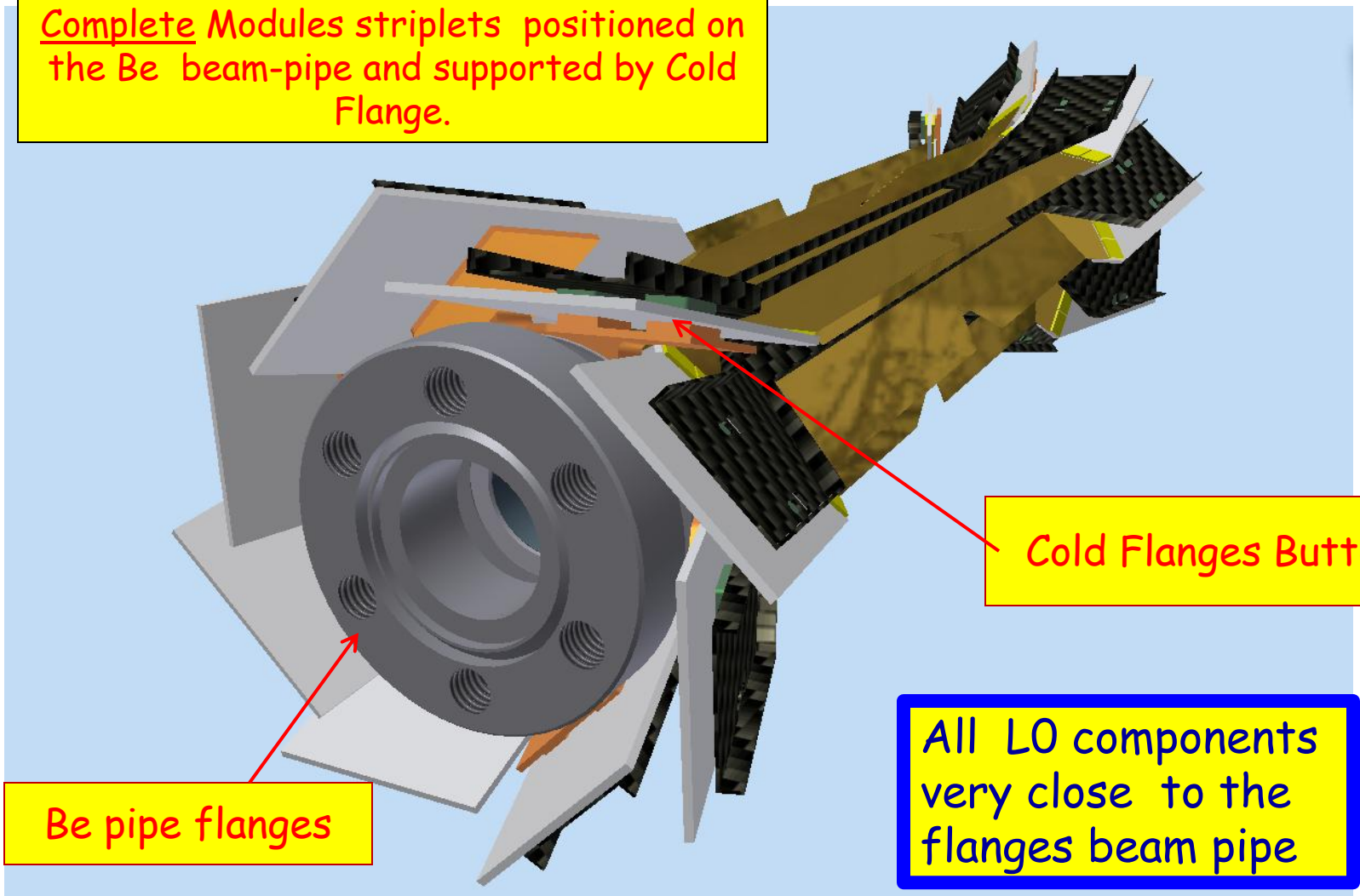
General Layout SVT



44

Module Striplets

Complete Modules striplets positioned on the Be beam-pipe and supported by Cold Flange.



Cold Flanges Buttons

Be pipe flanges

All LO components very close to the flanges beam pipe