SVT Mechanics Design

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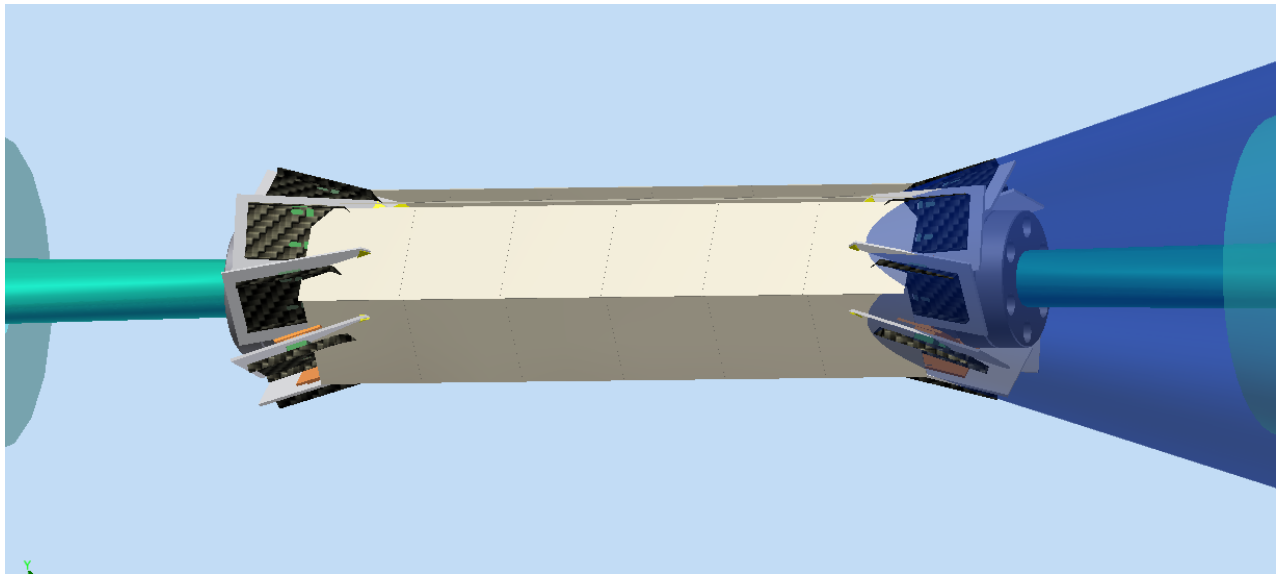
INFN Pisa-QMUL

Phone meeting 21.10.2011

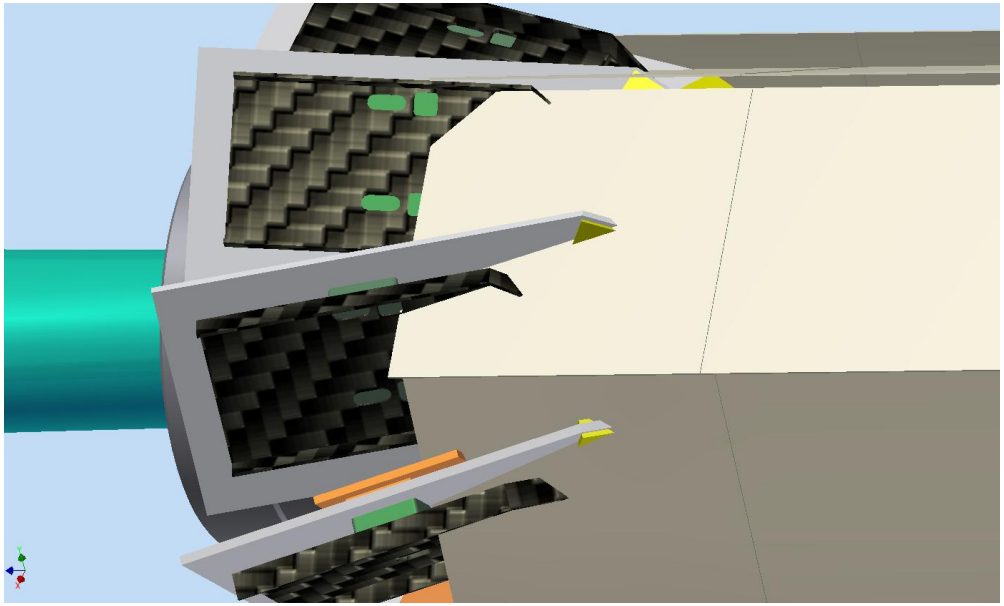
SVT L1-L5 Module design

- L0 striplets detector (PI)
- Be beampipe (Pi)
- Space Frame and supporting cones (QMUL)
- Supporting/cooling ring and gimbal ring (PI+QMUL)
- Criostat and Beam pipe Model (GE+PI+Stanford)

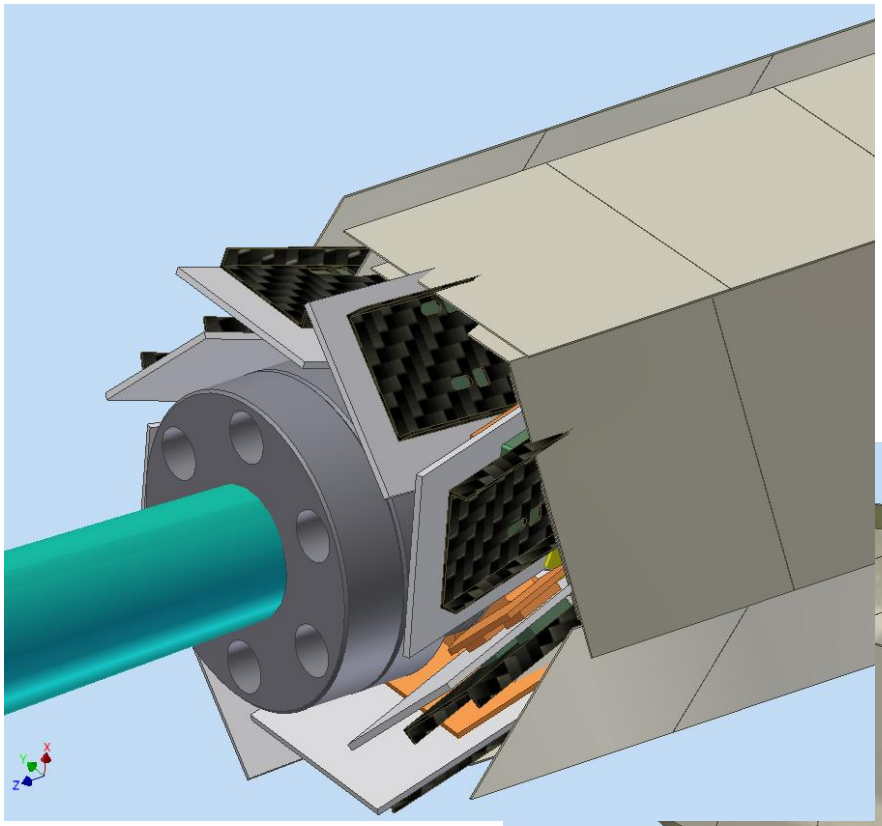
L0 design at London Workshop



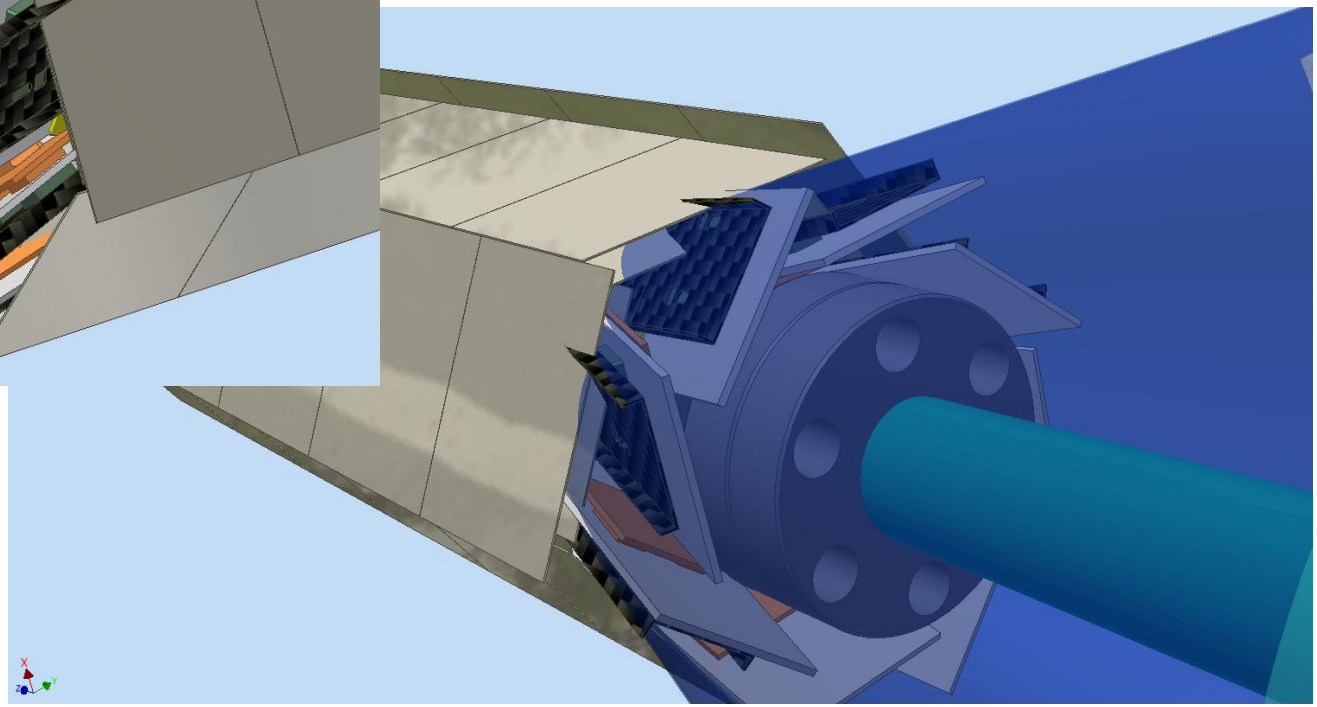
Layer 1



L0 design at London Workshop



Layer 2



New L0 striplets design

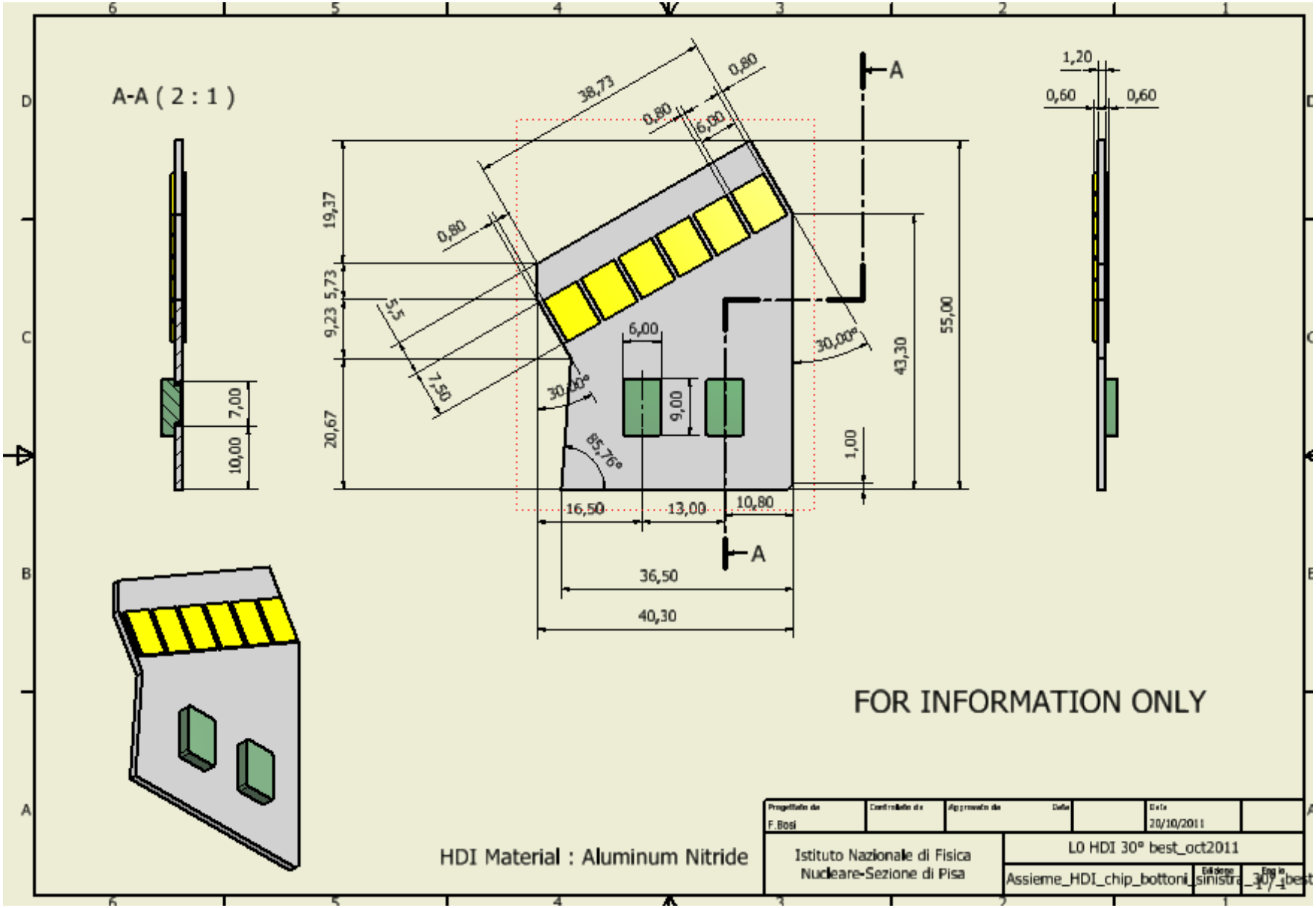
- **Solution passed through :**
  1. **Longer Be beam pipe (meeting with M.Sullivan)**
  2. **Modification of design of L0 module components**

- **HDI design:**
  1. **More space between F.E. chips and new HDI geometry to allow to be contained between the 300 mrad angle and beam pipe flanges**

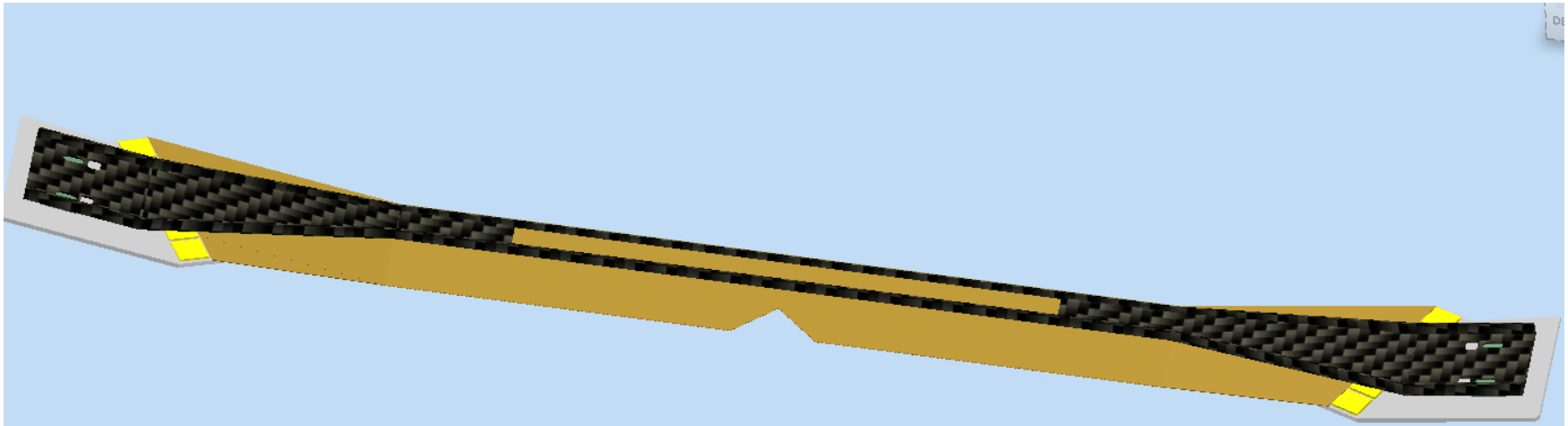
- **Kapton circuit :**
  1. **Different shape and length (more noise…….) L=150 mm**

- **C.F. Supporting structure :**
  1. **New design**

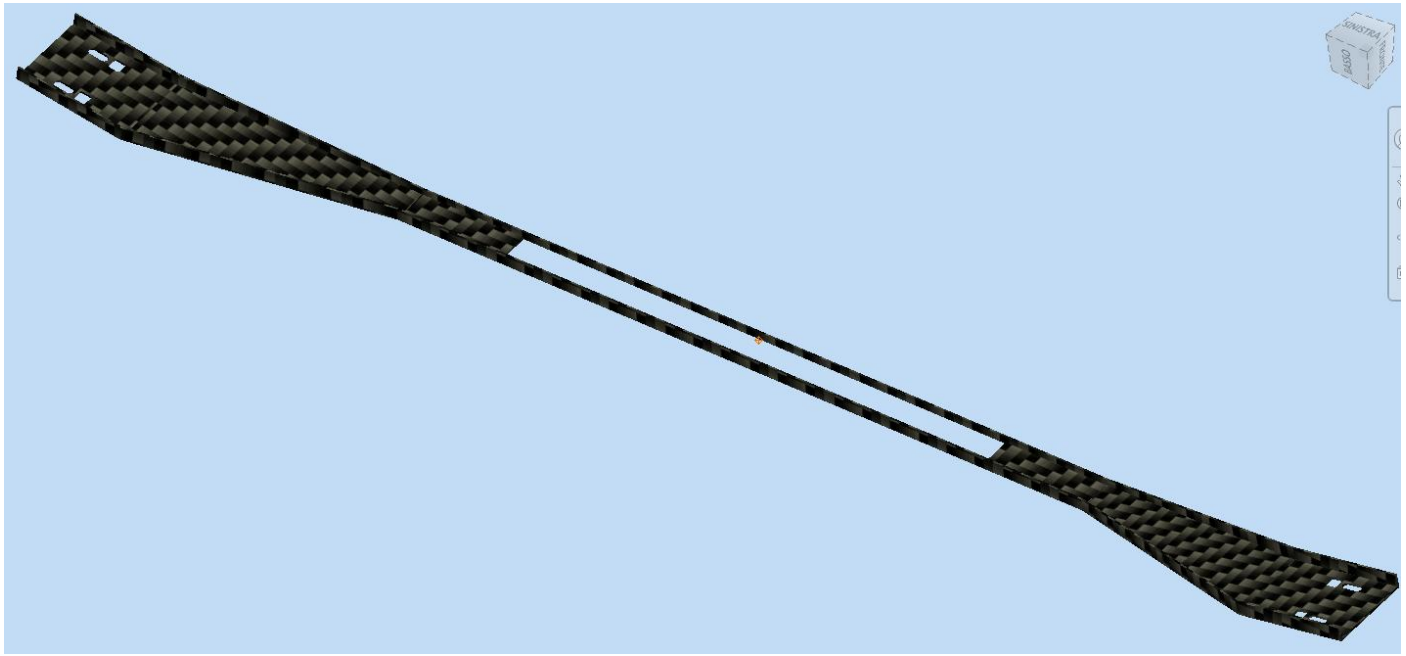
New L0 striplets design



New L0 striplets design

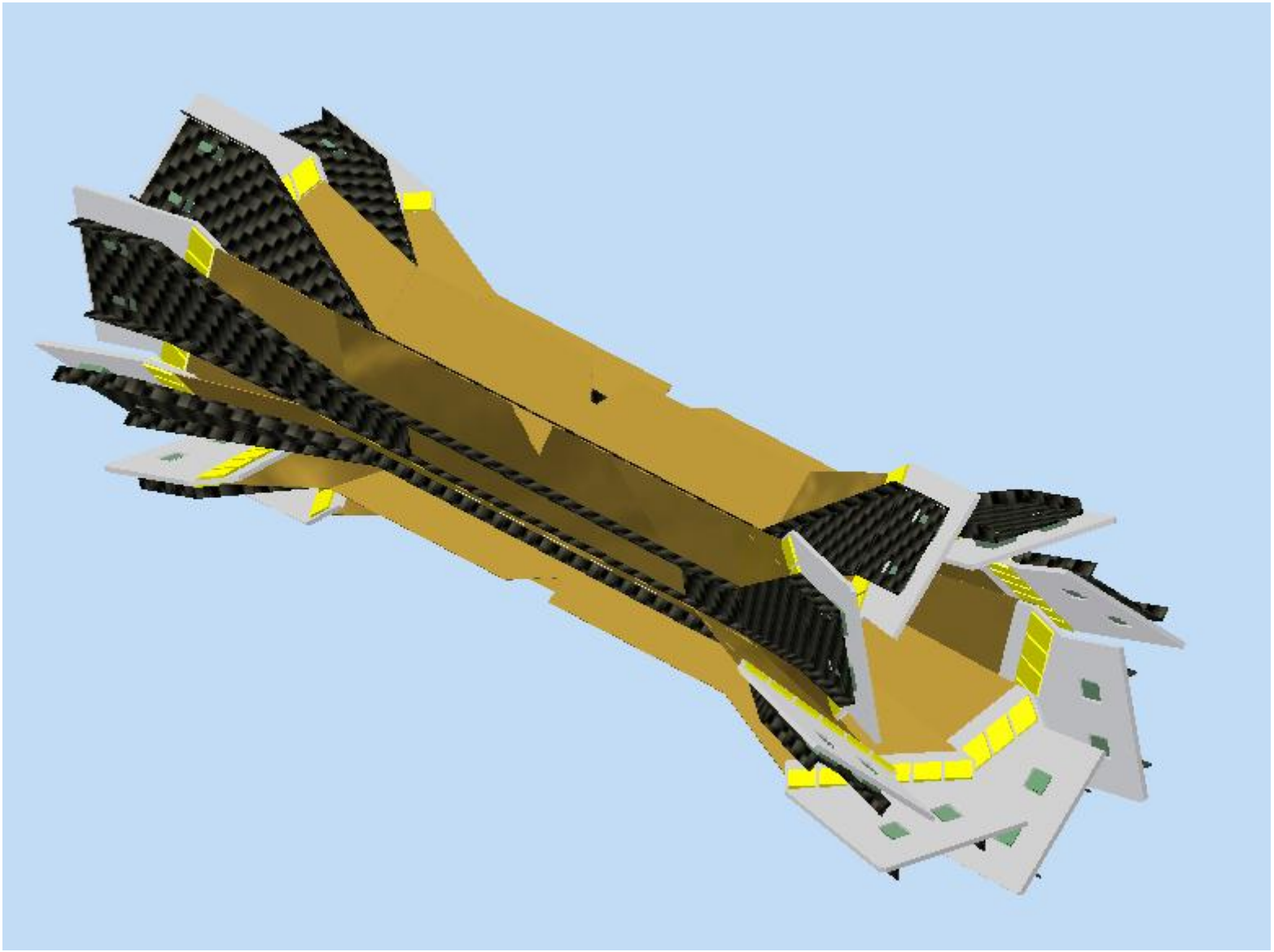


HDI/kapton inclinated 10° (17.8° precedent design)

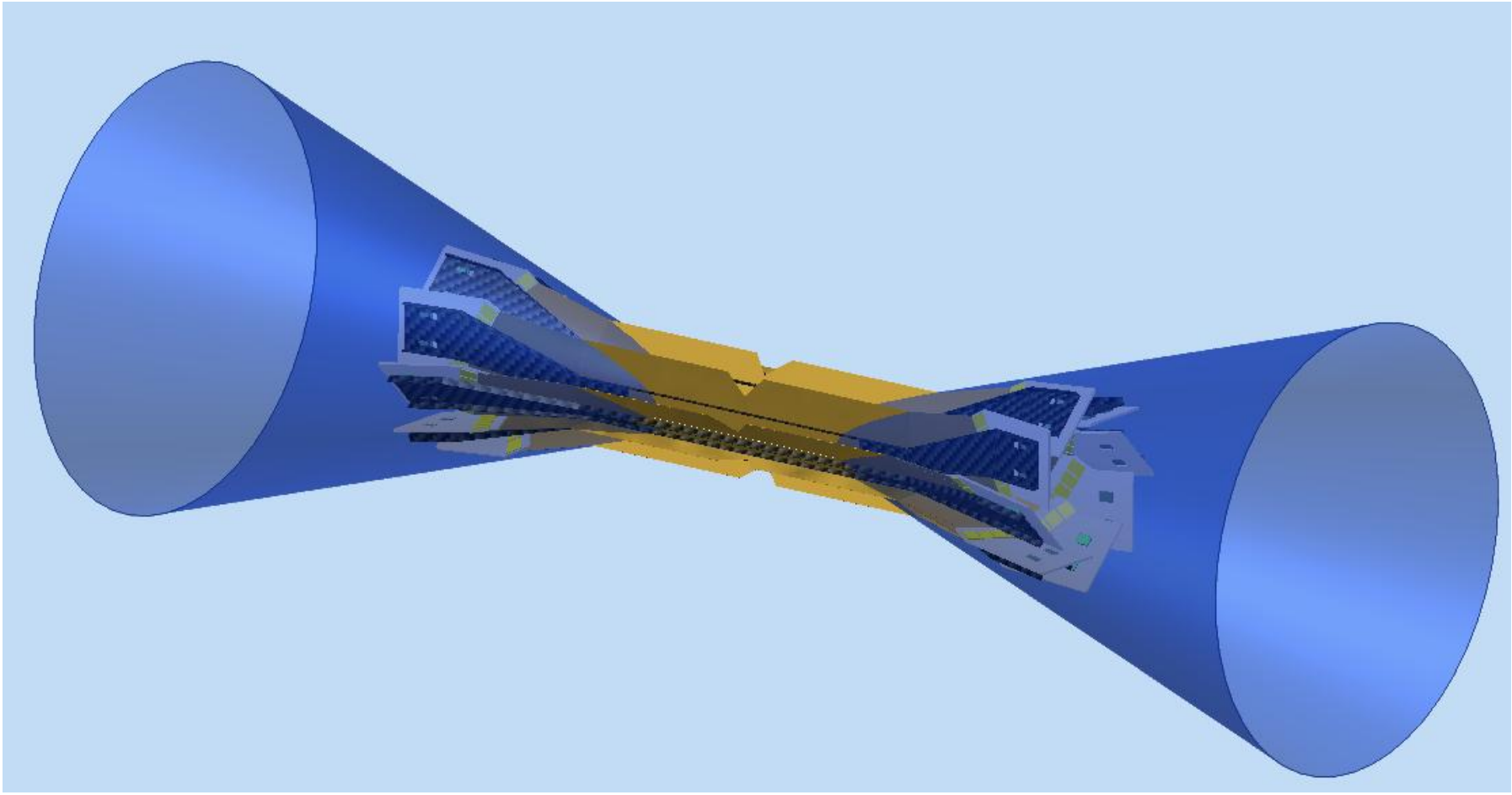


Si sensor :
W=13.9 mm
L=104 mm
R=15 mm

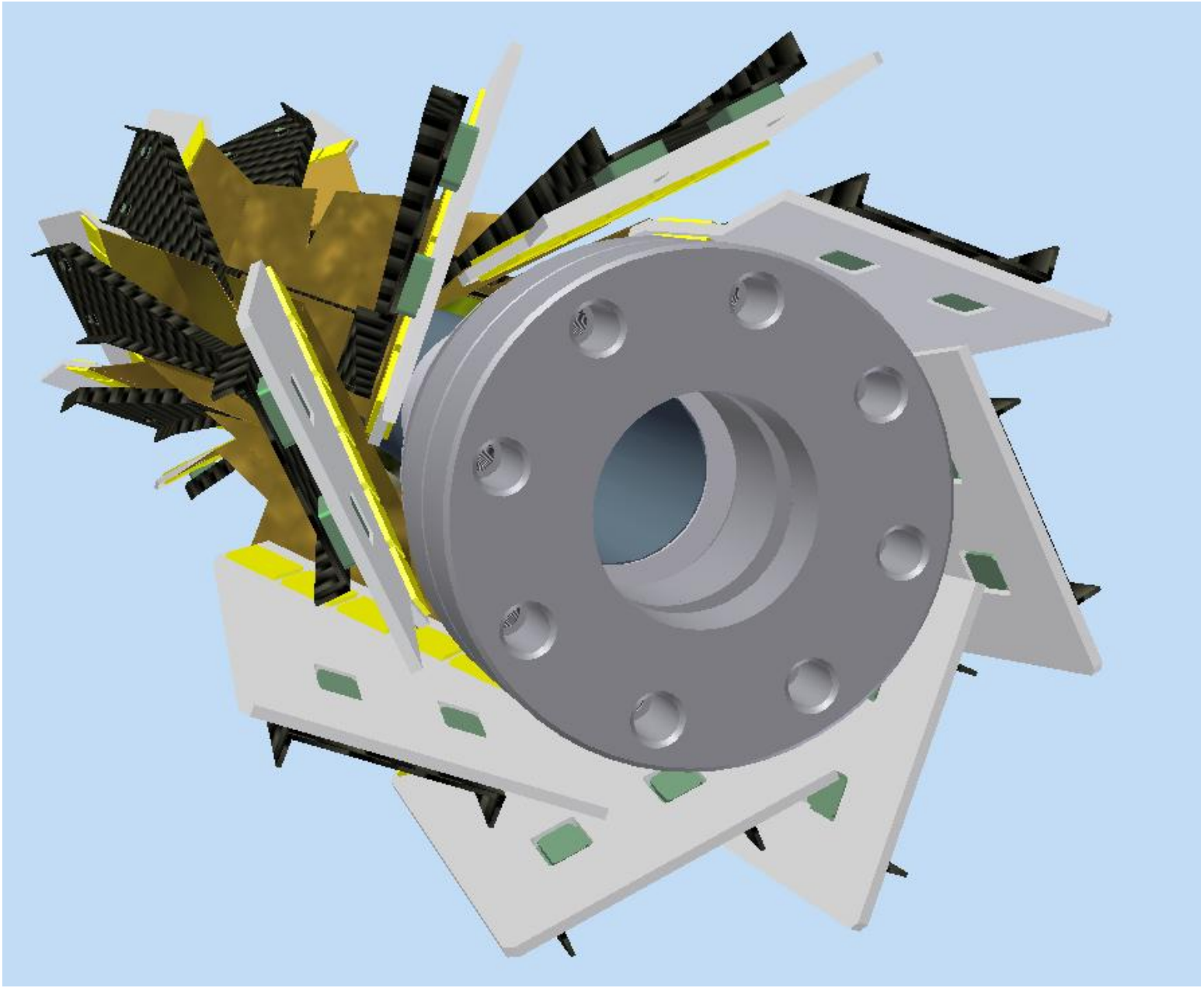
New L0 striplets design



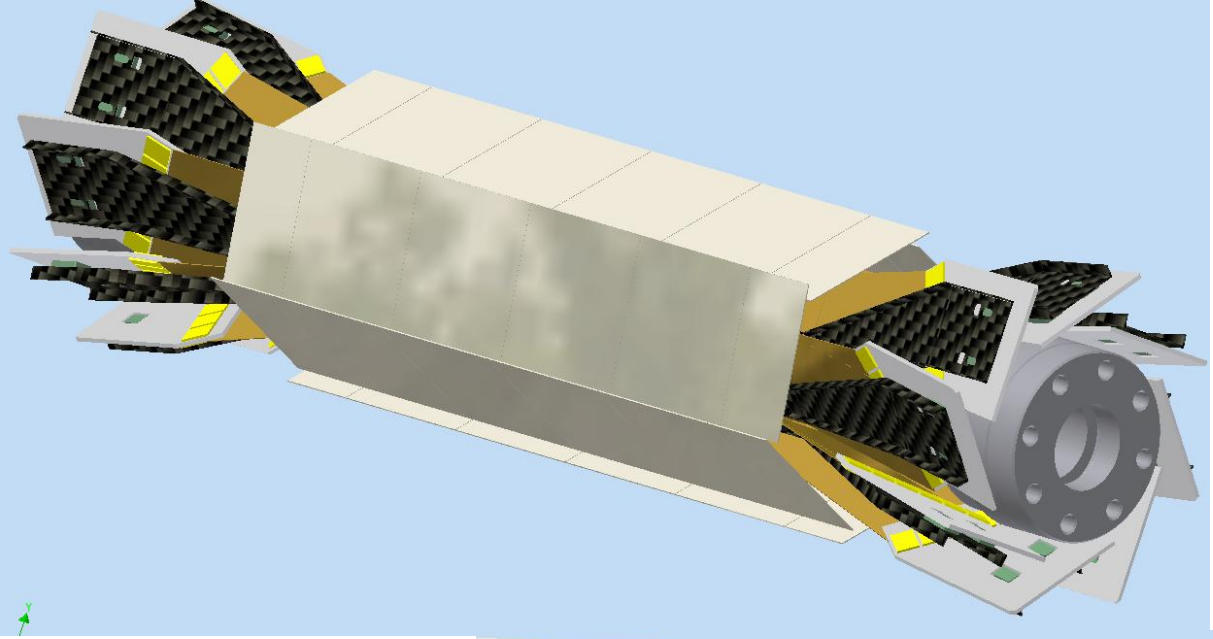
New L0 striplets design



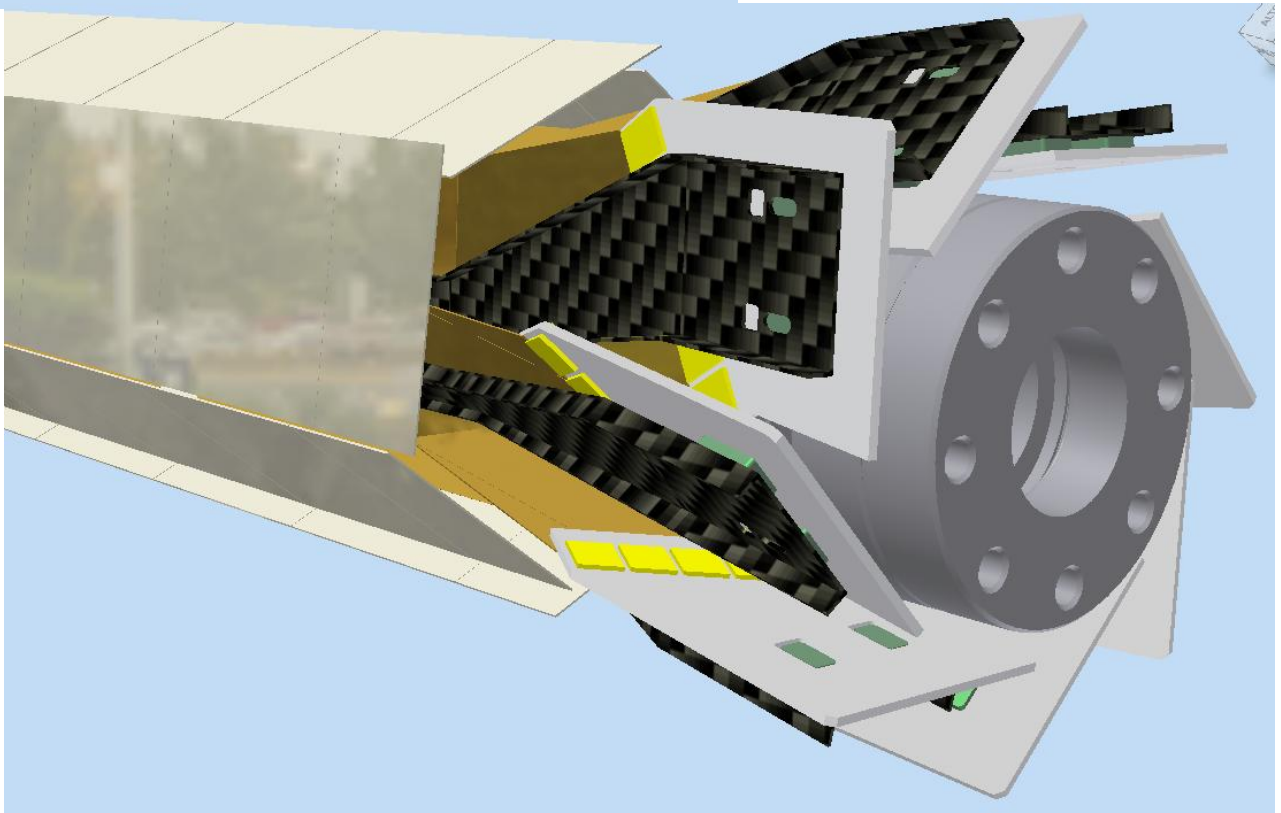
New L0 striplets design



New L0 striplets design

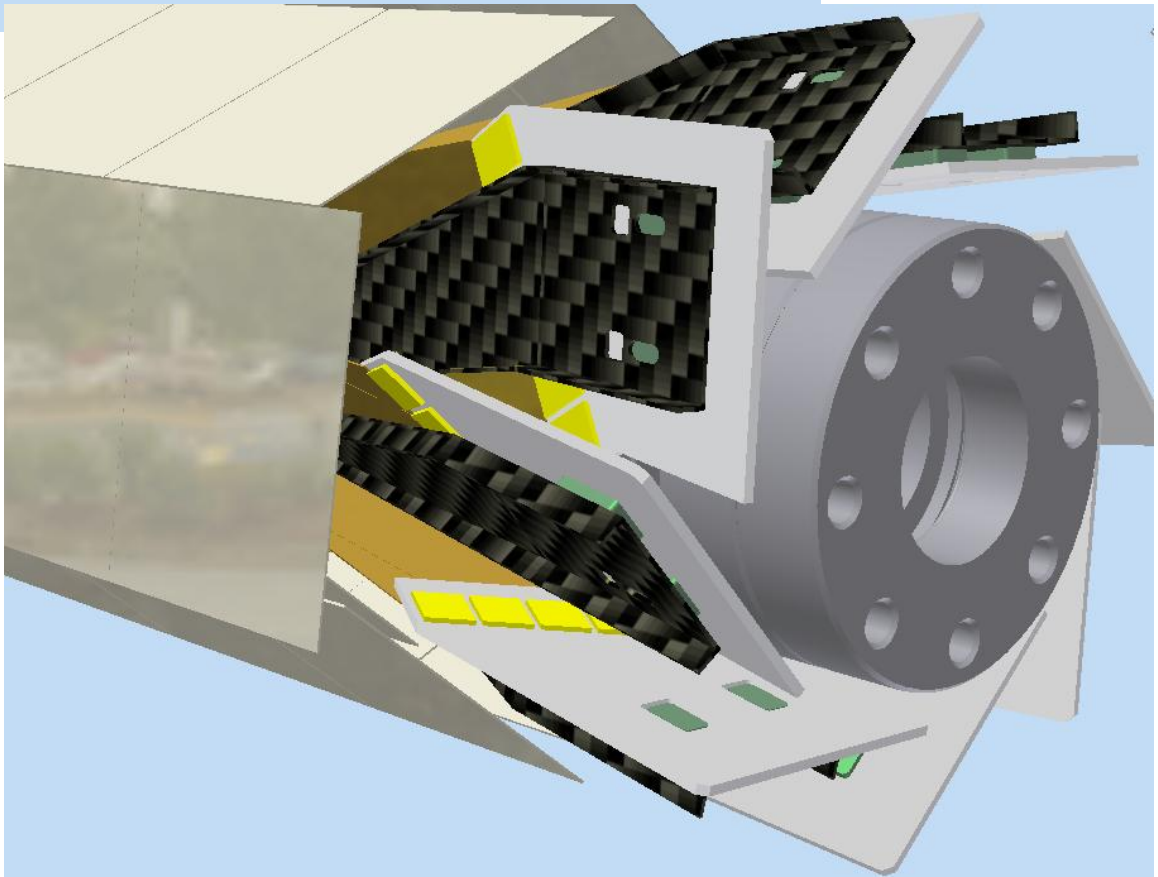


Layer0/Layer1



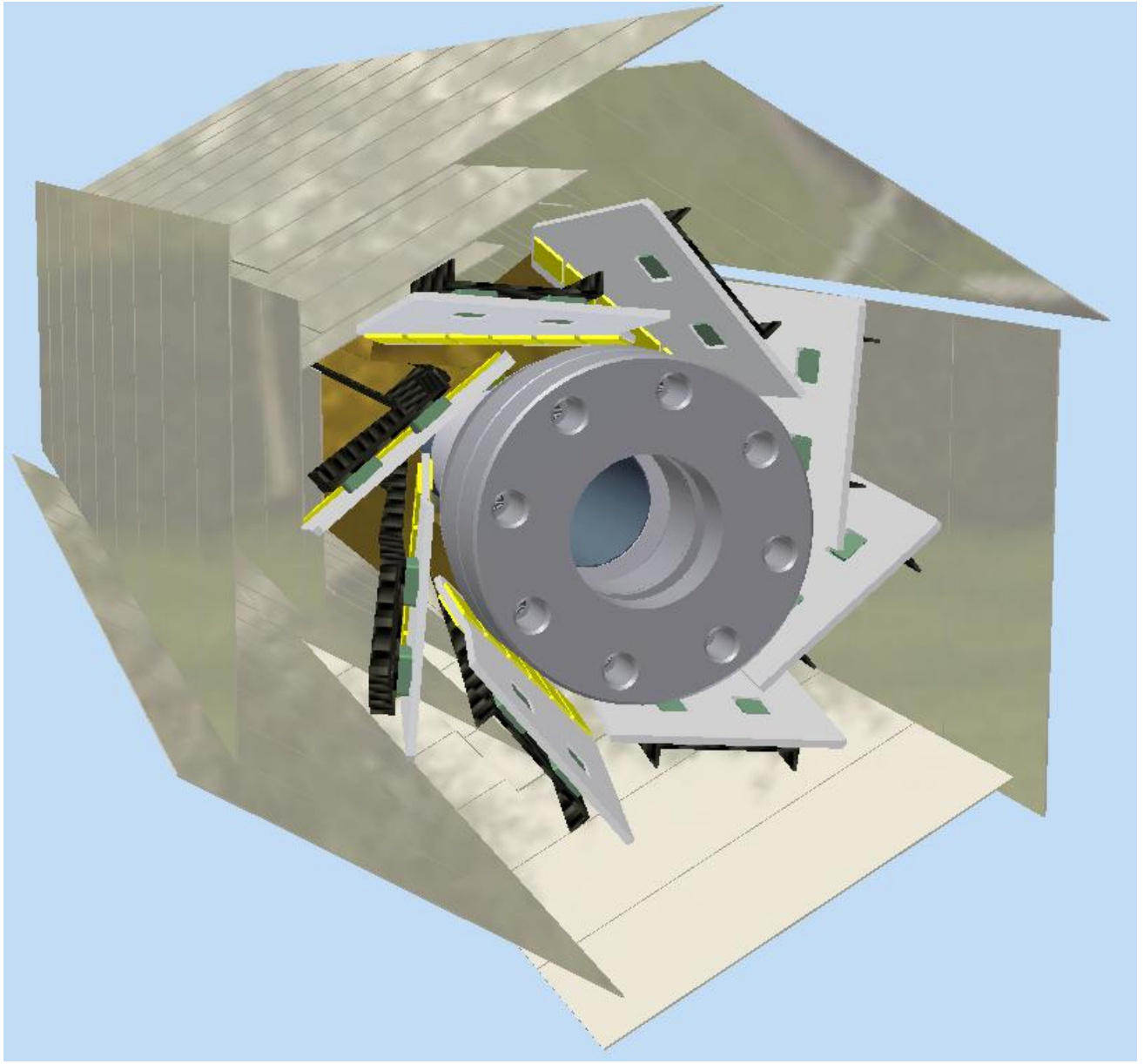
New L0 striplets design

Layer0/Layer2

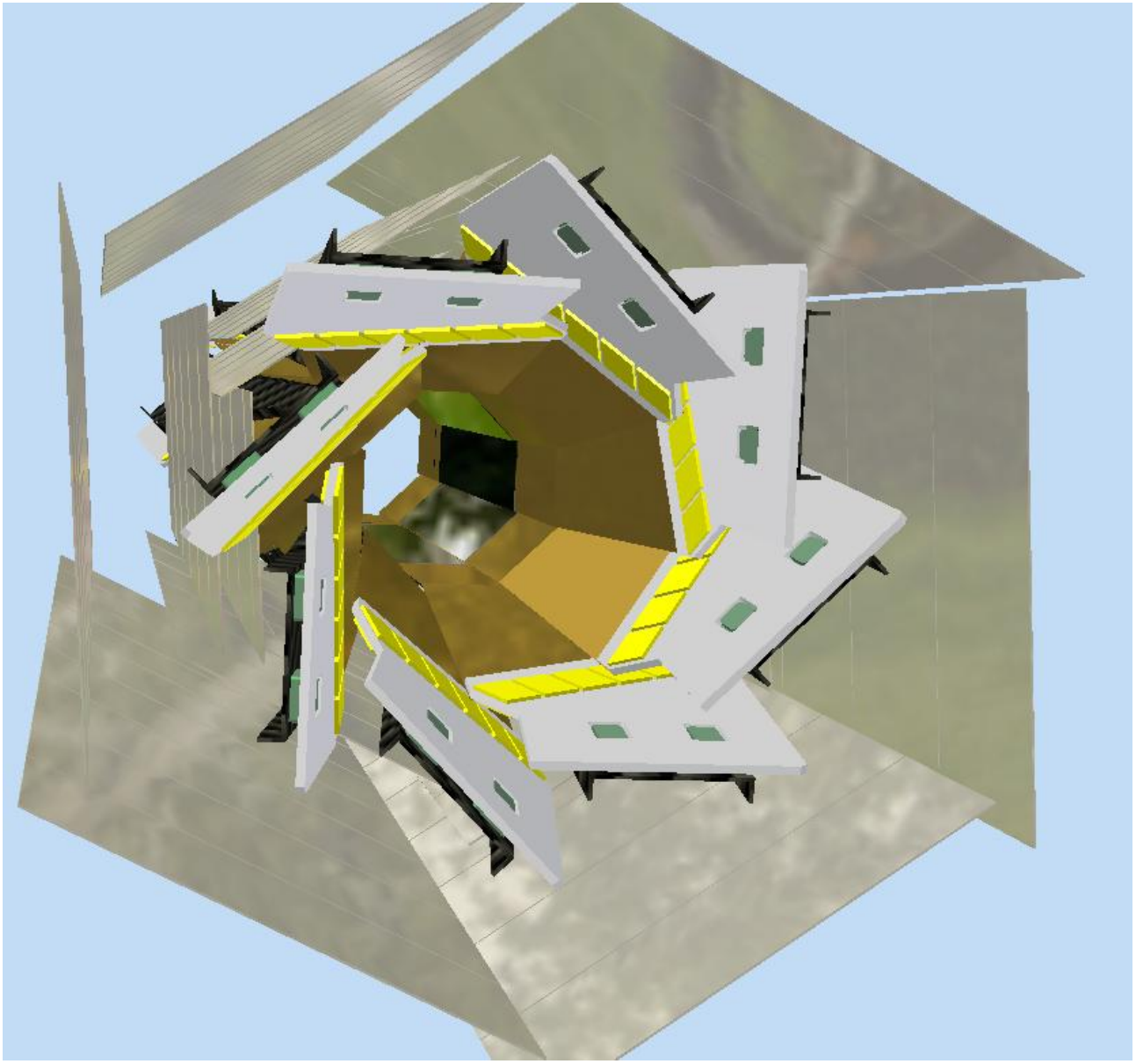


New L0 striplets design

Layer0/Layer3



New L0 striplets design



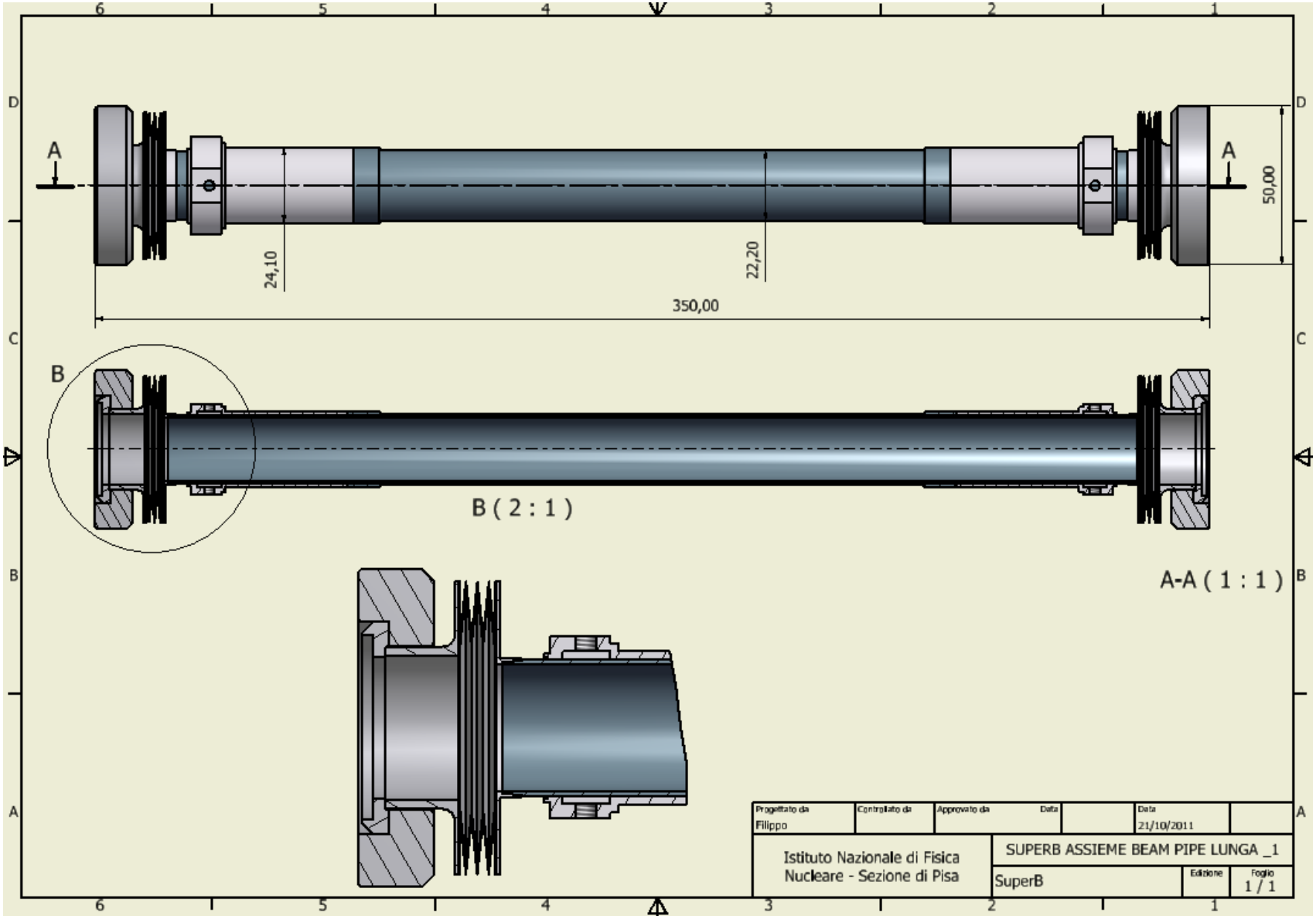
Be Beam pipe

- New lenght to match L0 striplets design L=304 → 350 mm :
  (+23 mm/side, M.Sullivan suggested around 15 mm....)

- CF flanges not standard :
  - reduced in diameter (4 mm)
  - reduced in thickness (1.5 mm)
  - more screw with reduced diameter

- Need calculation to confirm custom flanges design !
- Need check about permanent magnet position and elliptical pipe hole contained in the sealing flange space

Be Beam pipe

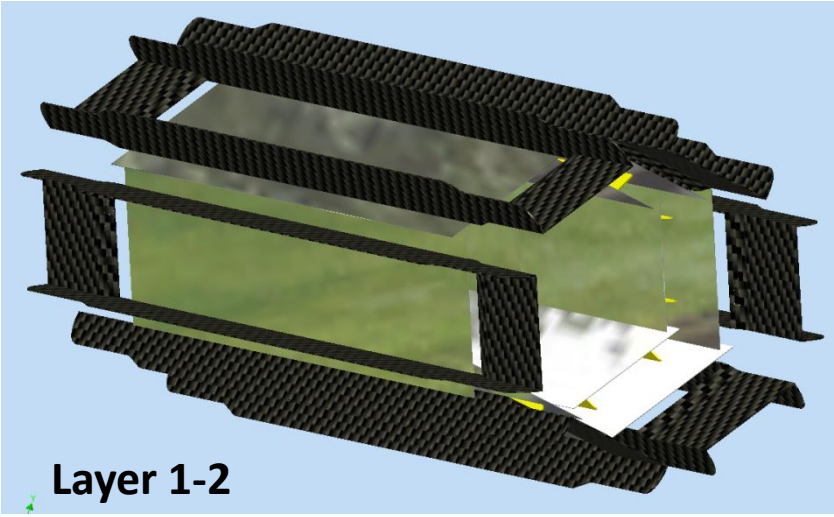

A
A
24,10
22,20
50,00
350,00
B
B (2 : 1)
A-A (1 : 1)
Progettato da
Filippo
Controllato da
Approvato da
Data
Data
21/10/2011
Istituto Nazionale di Fisica Nucleare - Sezione di Pisa
SUPERB ASSIEME BEAM PIPE LUNGA _1
SuperB
Edizione
Foglio
1 / 1

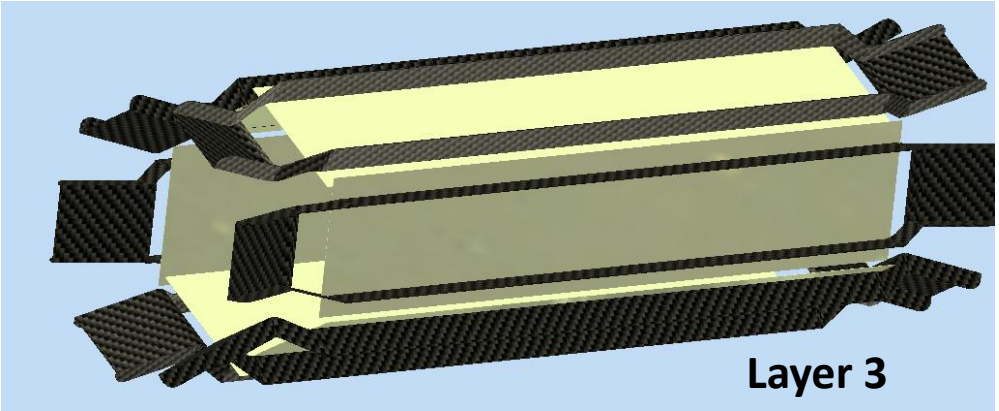
Space Frame/Supporting Cones (QMUL)

- Starting from modules dimension presented at london:
  1. Solid model of Si Modules Layer 1-2-3-4-5
  2. Solid model of support Cones
  3. Solid model of Space frame (N.2 version)

- although this is a preliminary design it is very important
  - QMUL takes confident with SVT components in order to procede independently in the design of spaceFrame /supporting Cones
  - 2° version of Spaceframe is reduced in ext. diameter 400->368 mm (it can be very usefull for quick demounting operation)
  - Issued order for SpaceFrame base C.F. tube in order to start with mechanical test and characterization

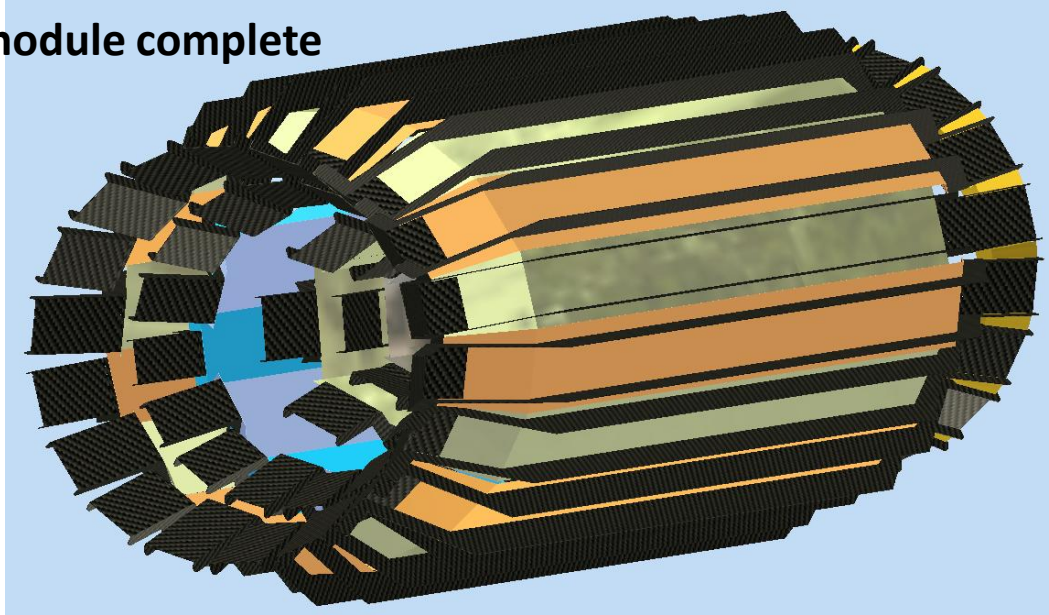
Space Frame/Supporting Cones (QMUL)



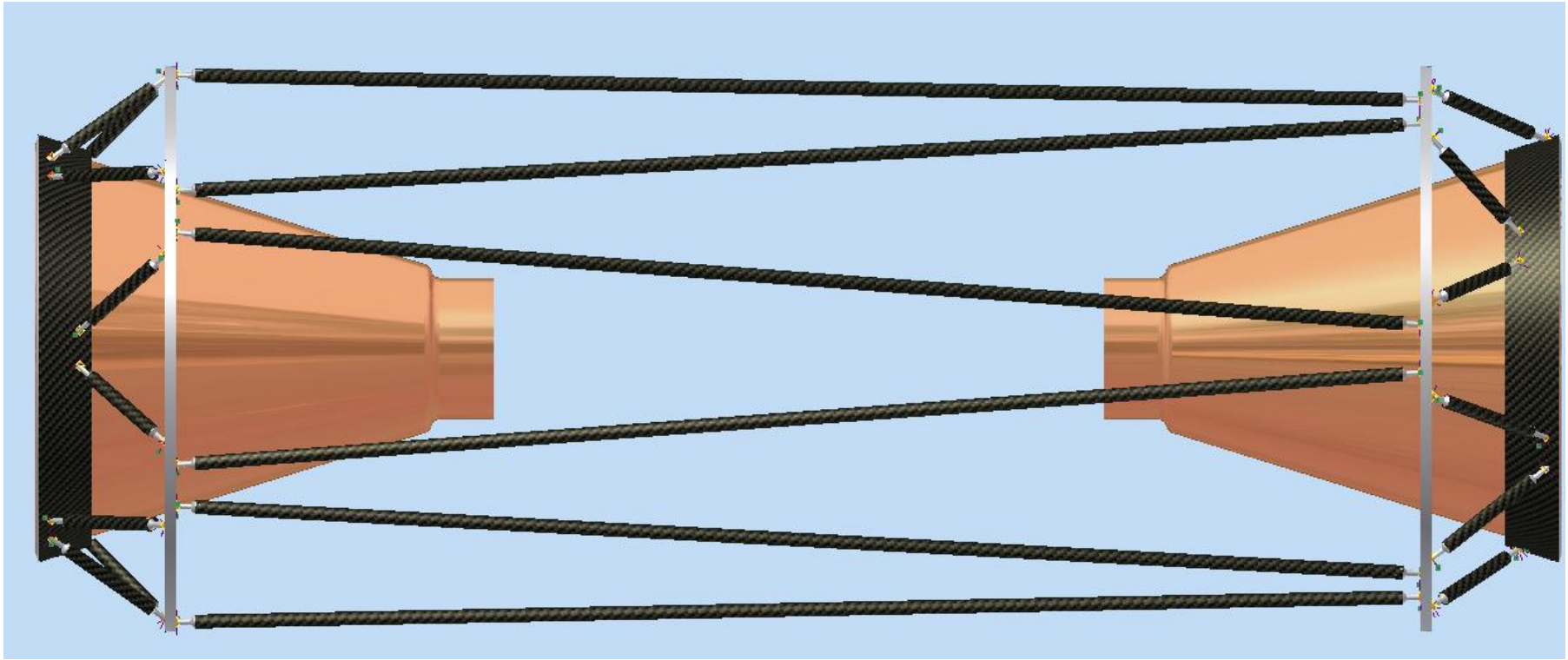


Layer4-5

SVT module complete

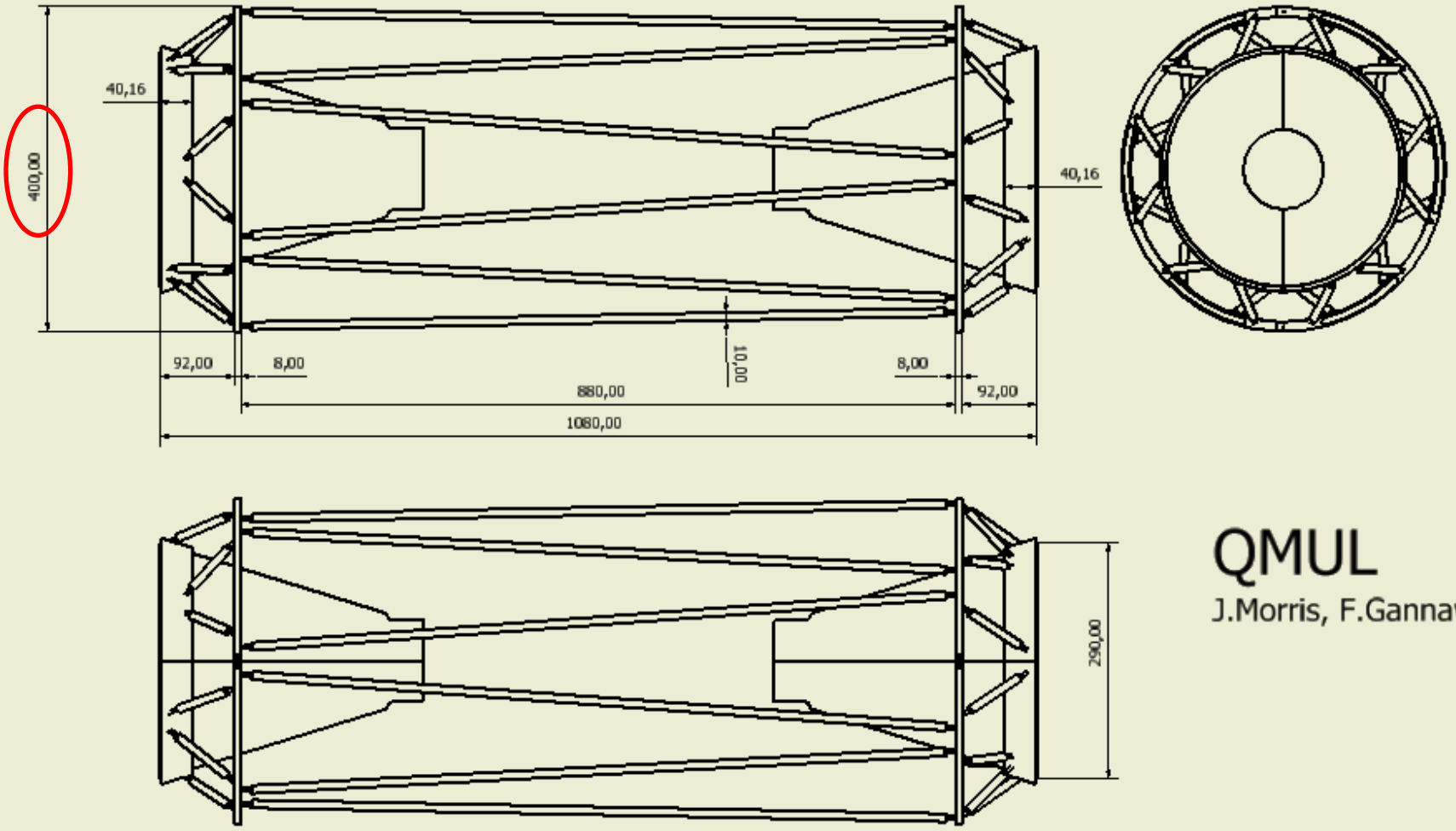


Space Frame/Supporting Cones (QMUL)



Space Frame, version1

Space Frame/Supporting Cones

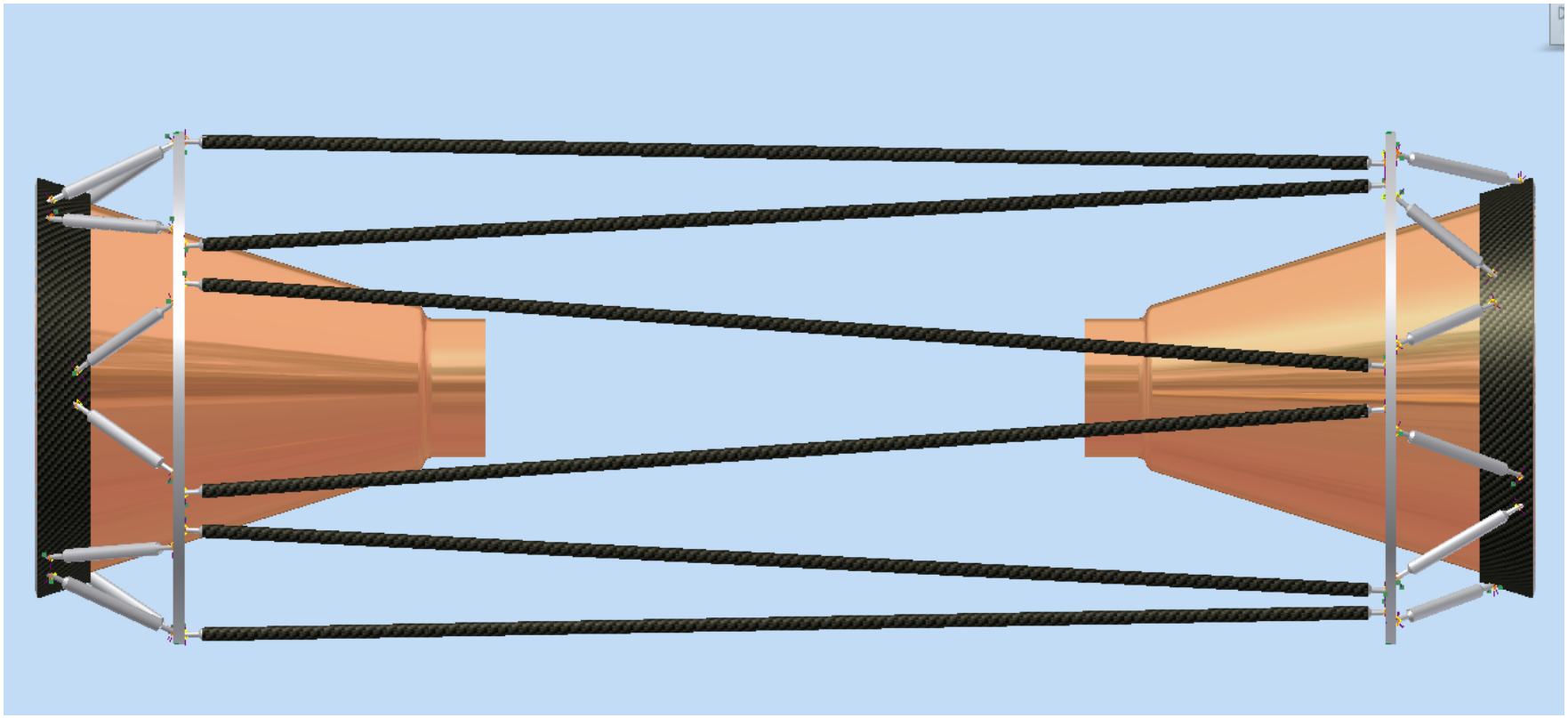


QMUL

J.Morris, F.Gannaway

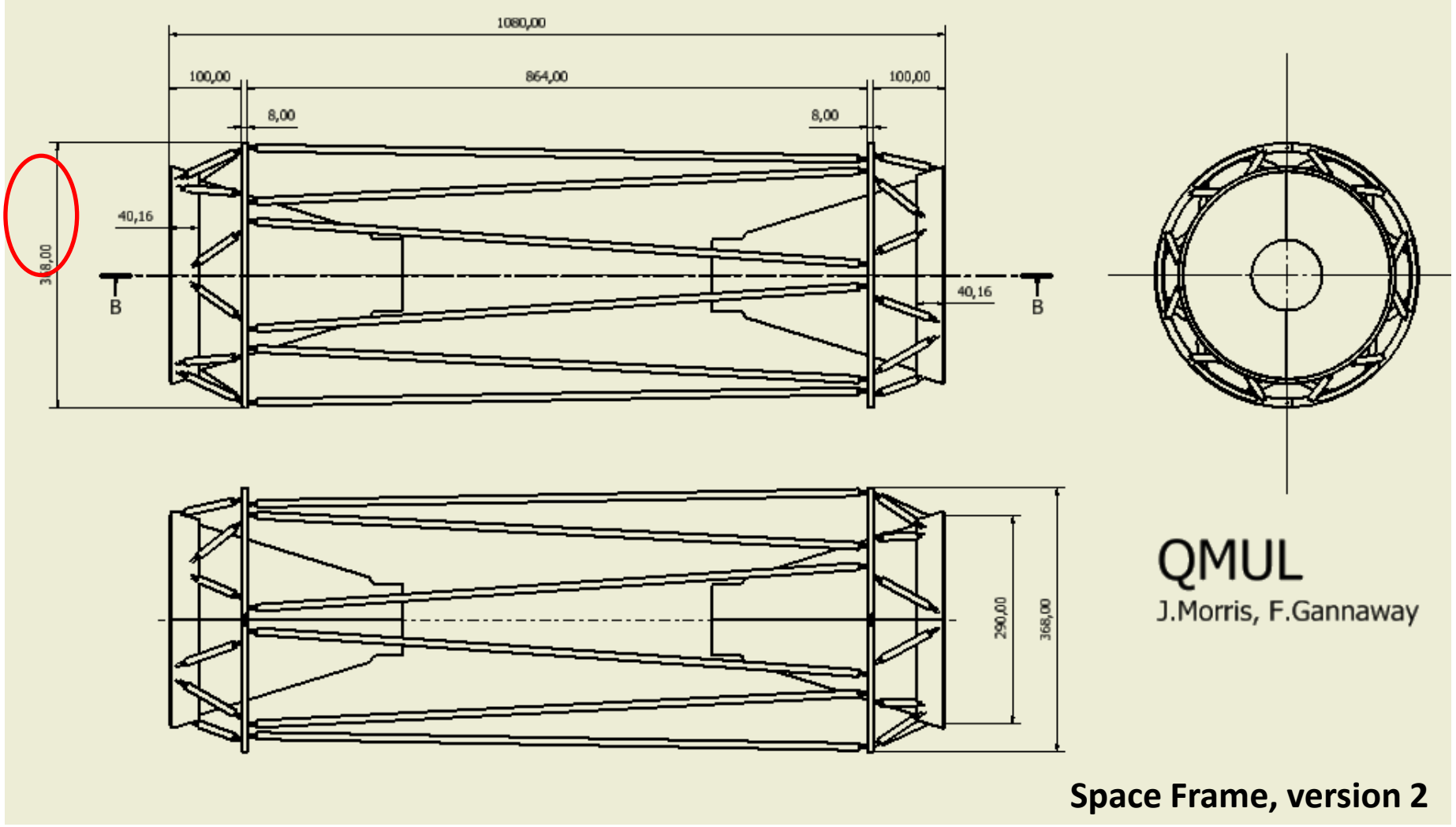
Space Frame, version1

Space Frame/Supporting Cones



Space Frame, version 2

Space Frame/Supporting Cones



Space Frame, version 2

Space Frame/Supporting Cones (QMUL)

• Now john and Fred are waiting from Pisa the geometrical position of Gimbal ring and Supporting/cooling Ring for layer all SVT layer for realistic design.
•We are working on this item and I think to be ready to transmit this informations in about a week.

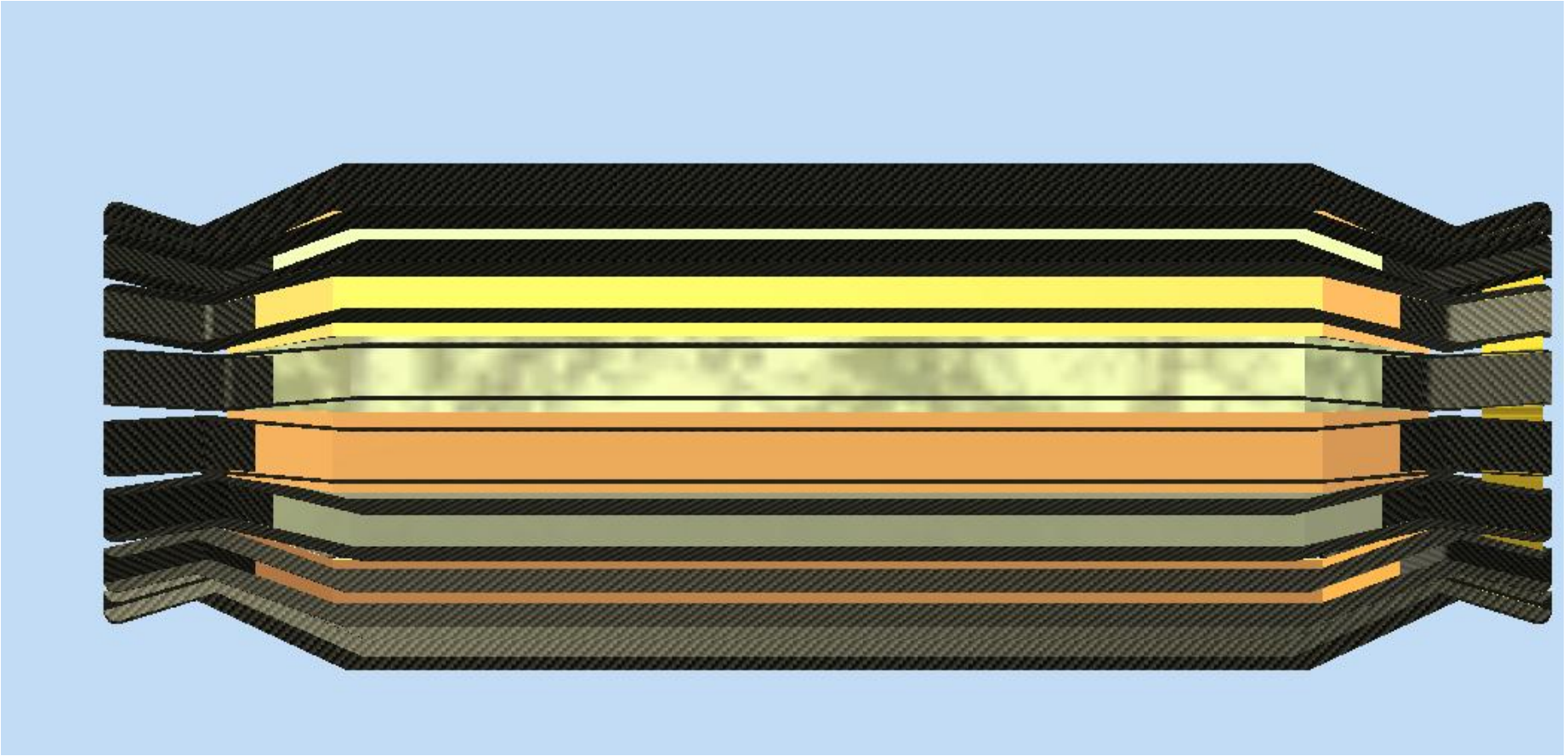
•Discussion also on the shape of backward part Si module layer 3-4-5 in order to allow an isostatic mounting (like in Babar)

Because the simmetry of forw and backw 300 mrad angle the two shape HDI+C.F. Endpiece coul be 300 mrad inclinated but this coul be procure an over constarin on the module for thermal eleongation (even 300 mrad is a low angle…..)

So, possible flat geometry on backward HDI+C.F. Endpiece need variation on shielding design.

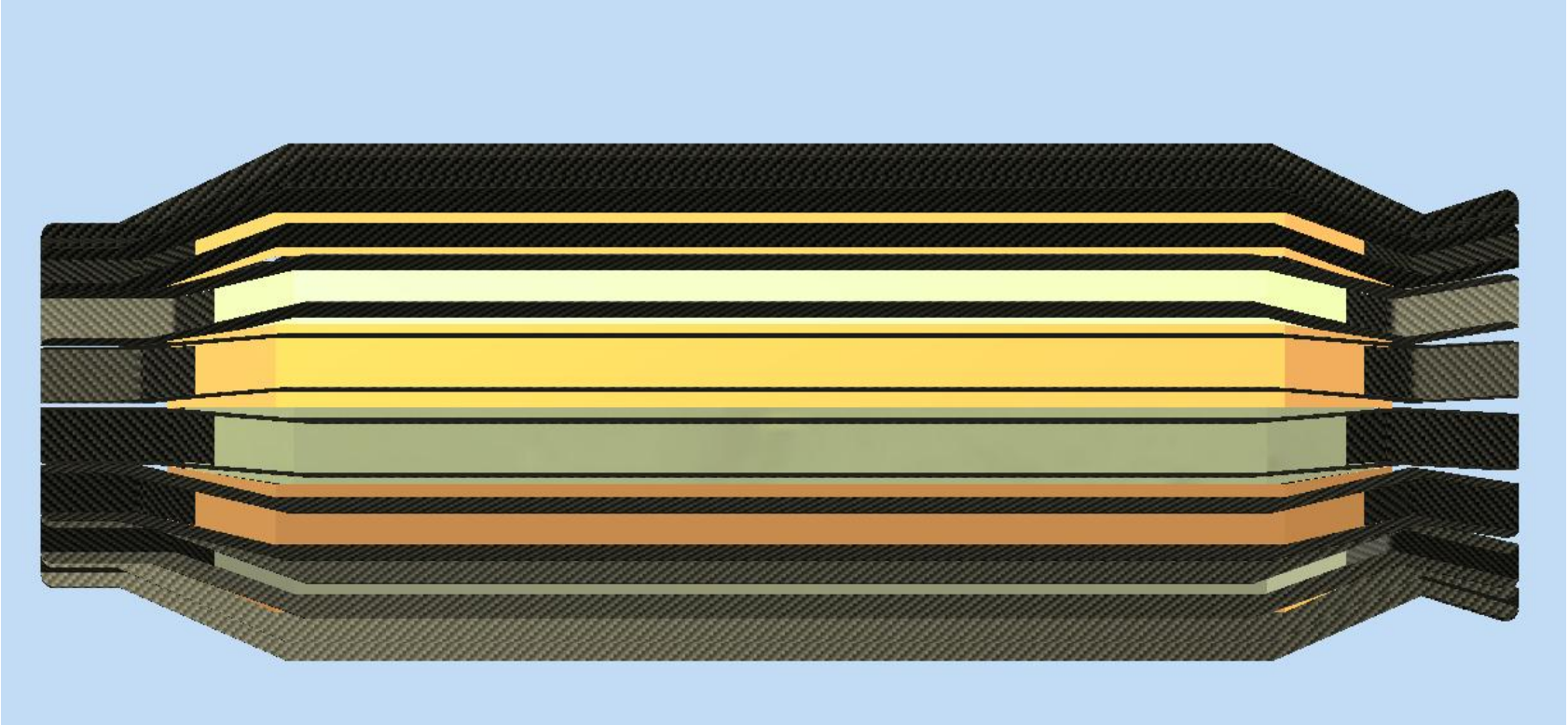
We are studing this problem .

Space Frame/Supporting Cones (QMUL)



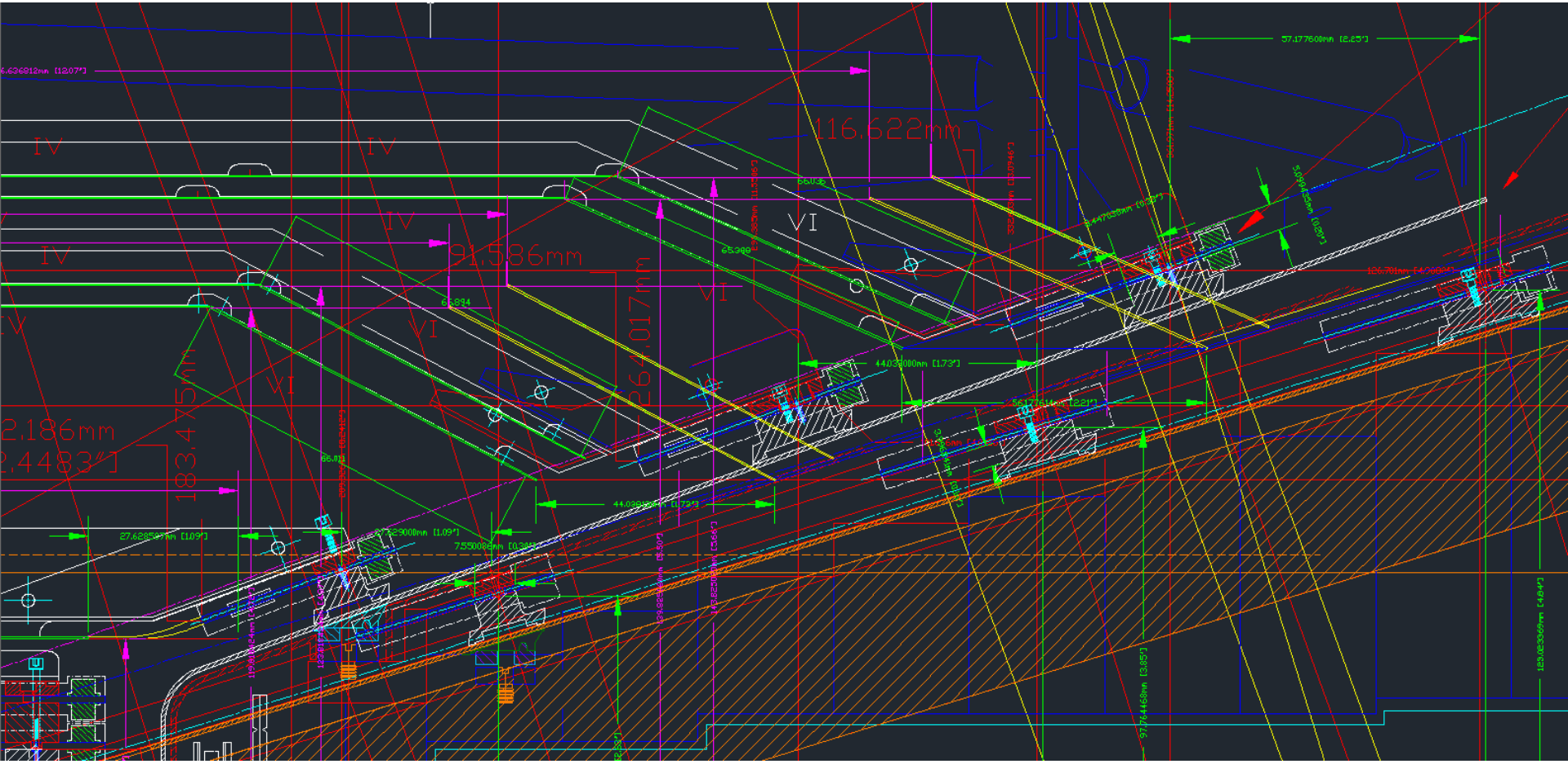
HDI+Endpiece inclinated backw and forw

Space Frame/Supporting Cones (QMUL)

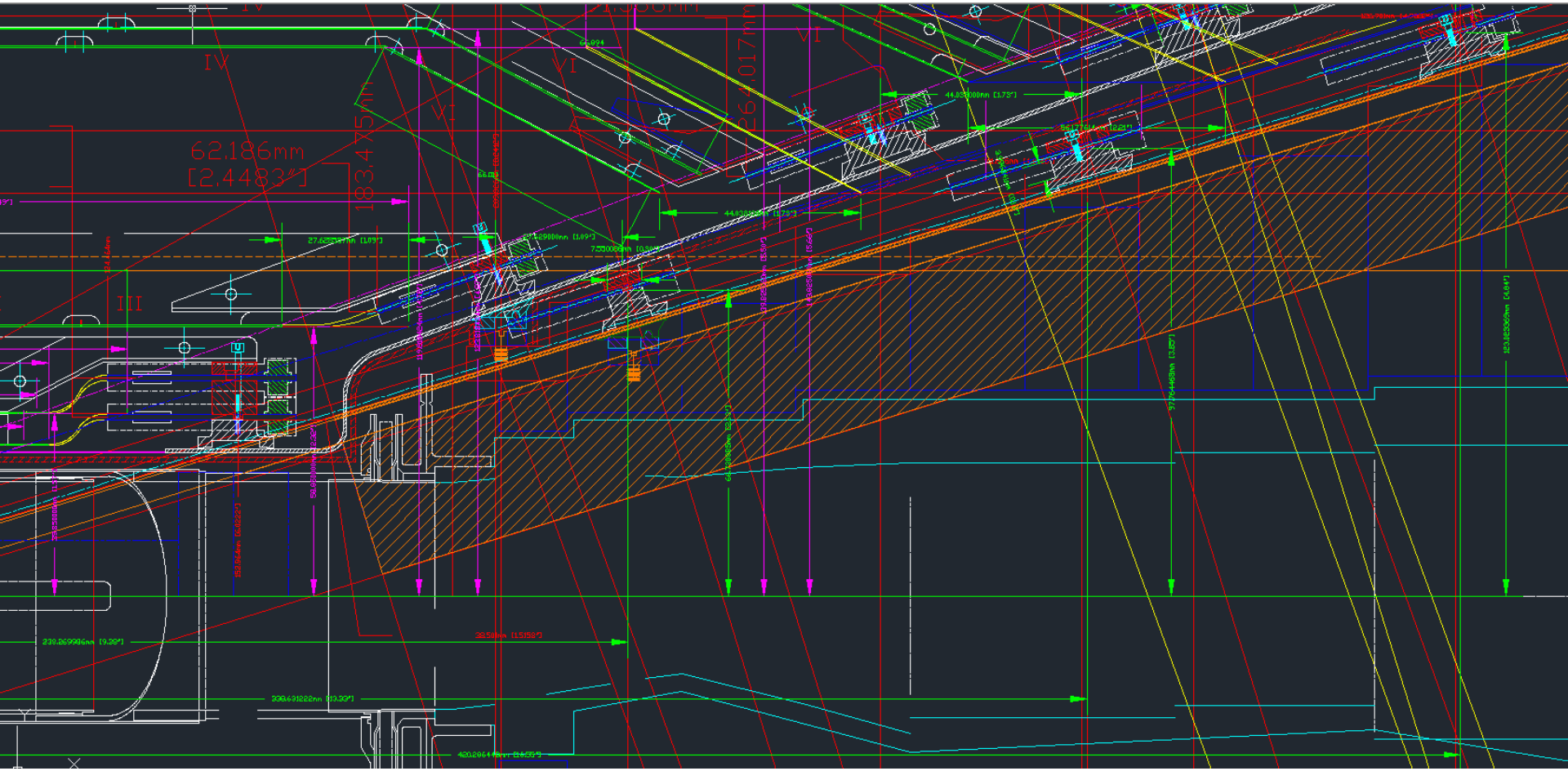


HDI+Endpiece inclinated forw and flat backw

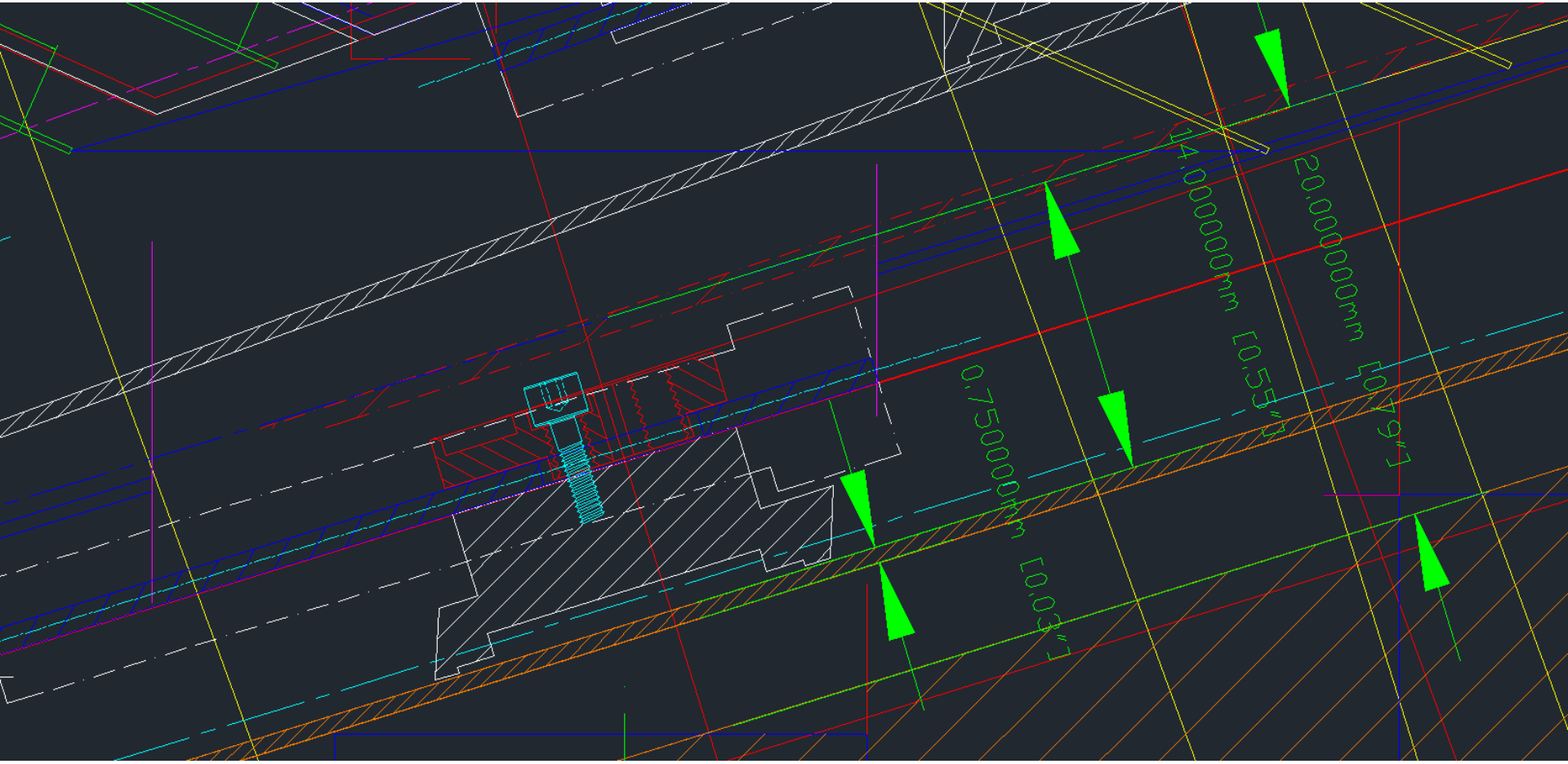
Cooling Ring/Gimbal Ring



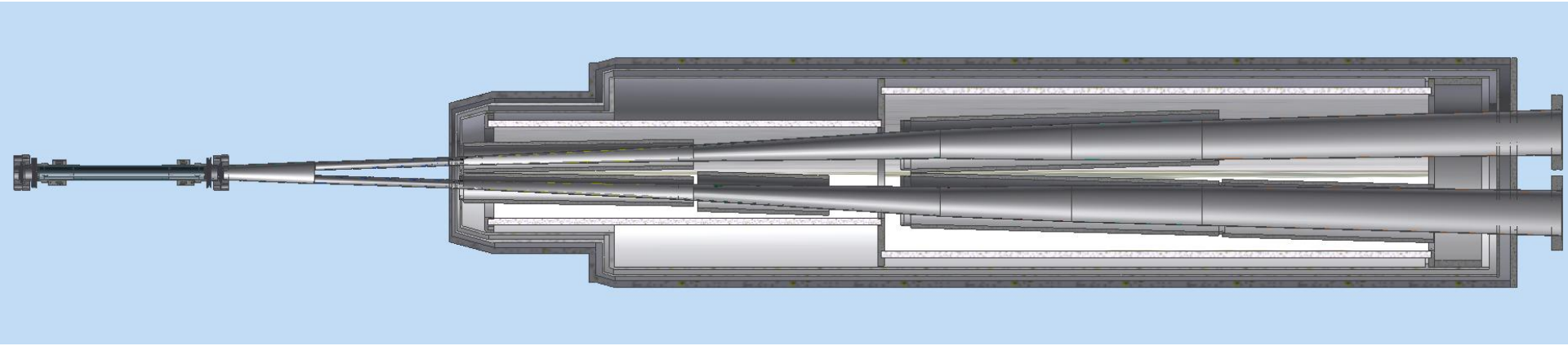
Cooling Ring/Gimbal Ring



Cooling Ring/Gimbal Ring



Criostat/ Beam pipe



Beam pipe