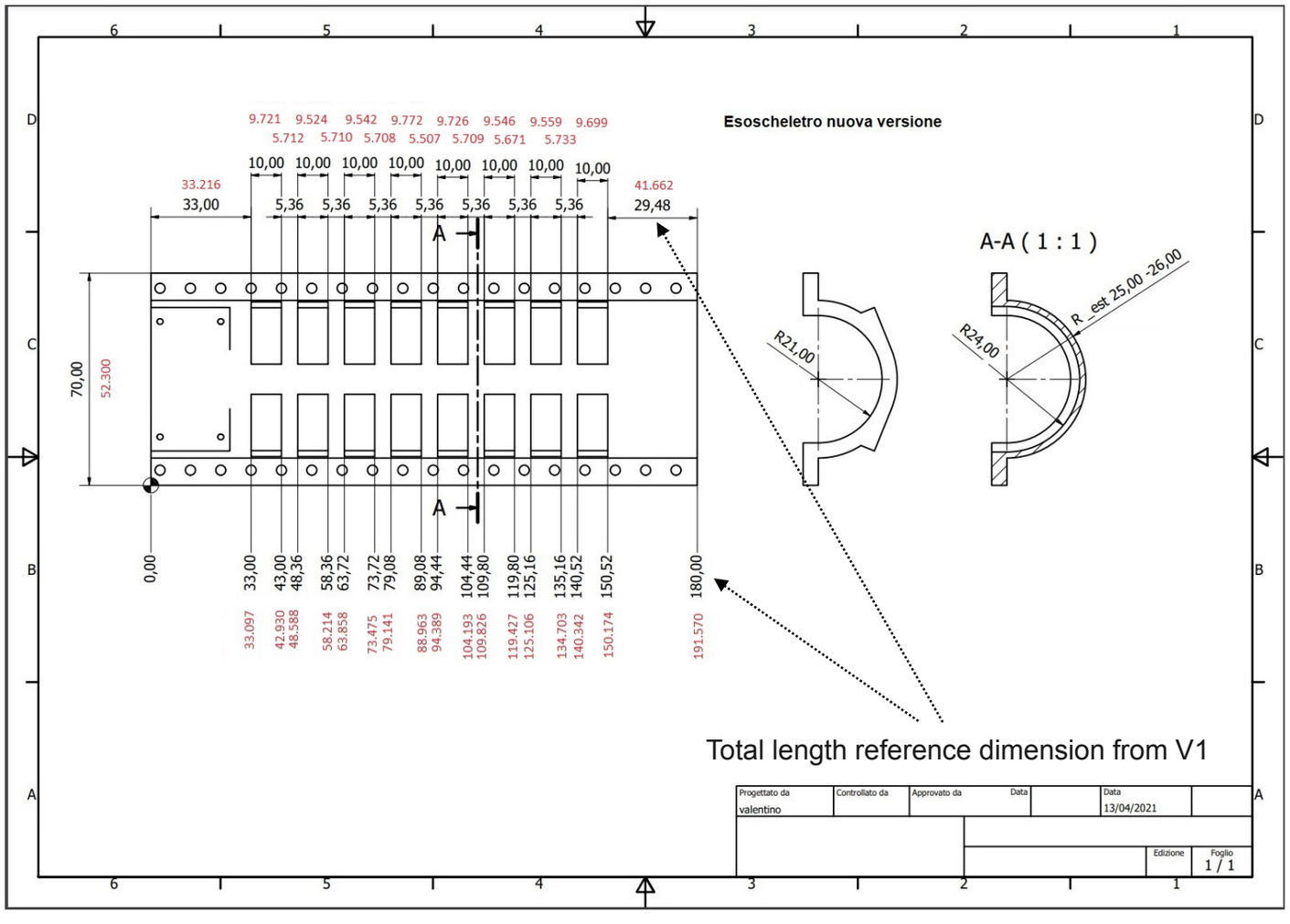
ITS3 activities in Bari

Super-ALPIDE mockup assembly

Dummy-super-ALPIDE	AVAILABLE	
Exoskeleton (V3)	UNDER RE-PRODUCTION	First printing out of tolerances
Mandrel (compatible with exo V3)	AVAILABLE	Old one modified
Wedges/Longerons/Half-rings	AVAILABLE	Produced in plastic
Tools for W/L/HR posit./gluing	TO BE PRODUCED	Waiting for drawing from CERN
Edge-FPC	AVAILABLE	What about connectors? (not a problem for this exercise)
Exo-FPC (V1)	AVAILABLE	Last available from first butch
Exo-FPC gluing procedure/tools	UNDER DEVELOPMENT	Tools similar to the ones used at CERN

Exoskeleton (V3) printing



From left to right with connectors on the left	VER3 (1mm) Ref. (mm)	Meas. (mm)	Diff. (um)	Rel/Err. (%)
RELATIVE DISTANCES	33	33,216	216	-0,65
	10	9,721	-279	2,79
	5,36	5,712	352	-6,57
	10	9,524	-476	4,76
	5,36	5,71	350	-6,53
	10	9,542	-458	4,58
	5,36	5,708	348	-6,49
	10	9,772	-228	2,28
	5,36	5,507	147	-2,74
	10	9,726	-274	2,74
	5,36	5,709	349	-6,51
	10	9,546	-454	4,54
	5,36	5,671	311	-5,80
	10	9,559	-441	4,41
	5,36	5,733	373	-6,96
	10	9,699	-301	3,01
	41,48	41,662	182	-0,44
ABSOLUTE DISTANCES	33	33,097	97	-0,29
	43	42,93	-70	0,16
	48,36	48,588	228	-0,47
	58,36	58,214	-146	0,25
	63,72	63,858	138	-0,22
	73,72	73,475	-245	0,33
	79,08	79,141	61	-0,08
	89,08	88,963	-117	0,13
	94,44	94,389	-51	0,05
	104,44	104,193	-247	0,24
	109,8	109,826	26	-0,02
	119,8	119,427	-373	0,31
	125,16	125,106	-54	0,04
	135,16	134,703	-457	0,34
	140,52	140,342	-178	0,13
	150,52	150,174	-346	0,23
	192	191,57	-430	0,22
DIAMETER	52	52,3	300	-0,58

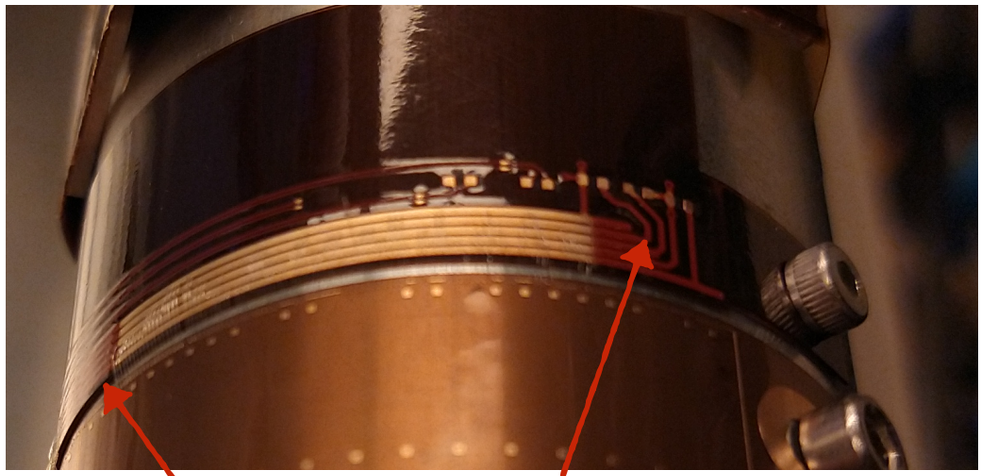
Several 100 μm displacement (especially) in the ribs position

Exo-FPC to dummy-Super-ALPDE wire-bonding

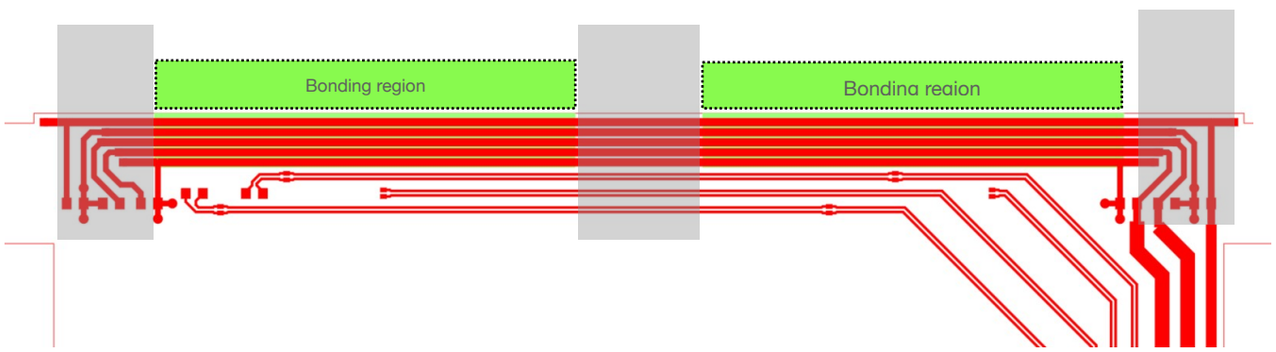
Comments from Pasquale:

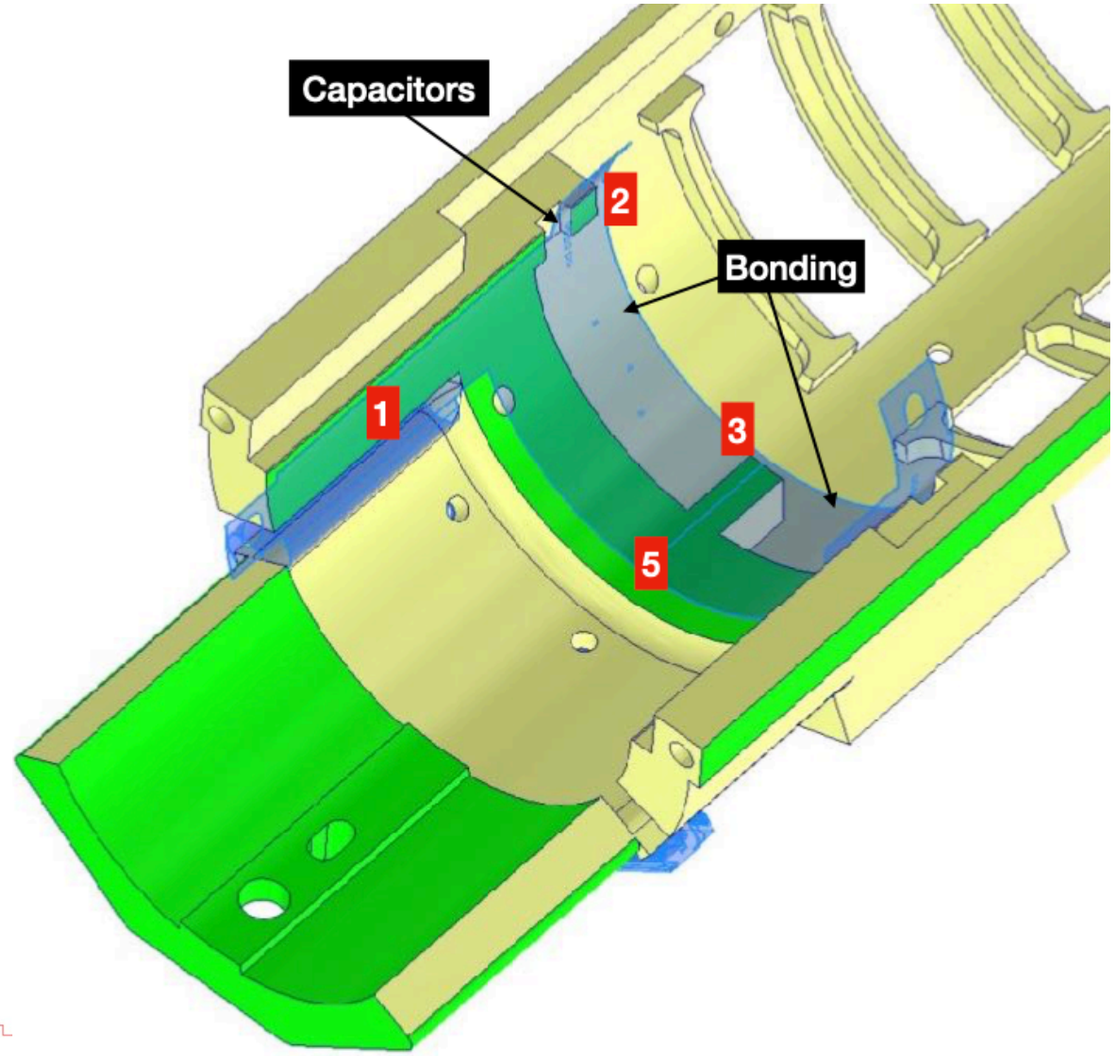
- Bend section well adherent to the mandrel
  → Good bonding surface
- Bonding on first (most external) FPC bonding line occasionally fails
  → Will try to clean with alcohol next time
- Random bonding scheme (all pad configurations covered)
  → Long process
  → Actual bonding scheme next time

Exo-FPC to dummy-Super-ALPDE wire-bonding



Regions for gluing to the exoskeleton.
No wire-bonding possible





Super-ALPIDE assembly

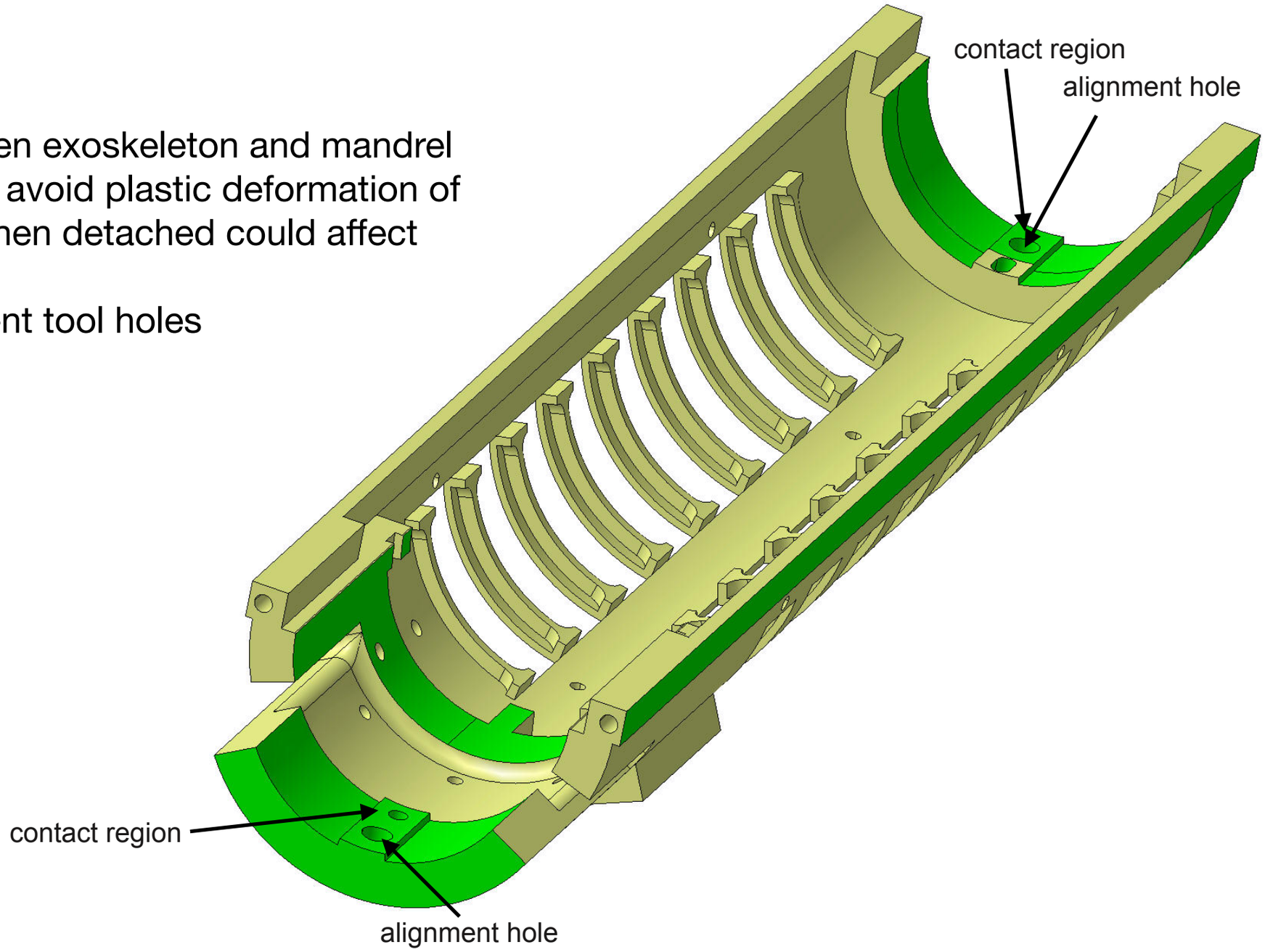
Super-ALPIDE		Will be shipped from CERN
Exoskeleton (V3)	UNDER VERIFICATION	More to be produced
Mandrel (compatible with exo V3)	TO BE PRODUCED	To be produced by external company (same as CERN)
Tools for chip bending	TO BE PRODUCED	Drawings available To be produce in local workshop
Large dimension silicon (for test)		Will be shipped from CERN
W/L/HR shaping	UNDER VERIFICATION	Verifying if possible to do at CERN
Carbon foam for W/L/HR	UNDER PROCUREMENT	By Elisa (WP5)
Tools for W/L/HR posit./gluing	TO BE PRODUCED	Waiting for drawing from CERN
Edge-FPC	UNDER VERIFICATION	What about connectors? (not a problem for this exercise)
Exo-FPC (V2)	UNDER PRODUCTION	What about connectors? (not a problem for this exercise)
Exo-FPC gluing procedure/tools	UNDER DEVELOPMENT	Tools similar to the ones used at CERN

BACKUP

ExoskeletonV3

Main modifications

1. Contact regions between exoskeleton and mandrel reduced to minimum → avoid plastic deformation of the exoskeleton that, when detached could affect wire-bonds
2. Carbon wedge alignment tool holes



ExoskeletonV3

Main modifications

1. Contact regions between exoskeleton and mandrel reduced to minimum → avoid plastic deformation of the exoskeleton that, when detached could affect wire-bonds
2. Carbon wedge alignment tool holes

Problem in this design

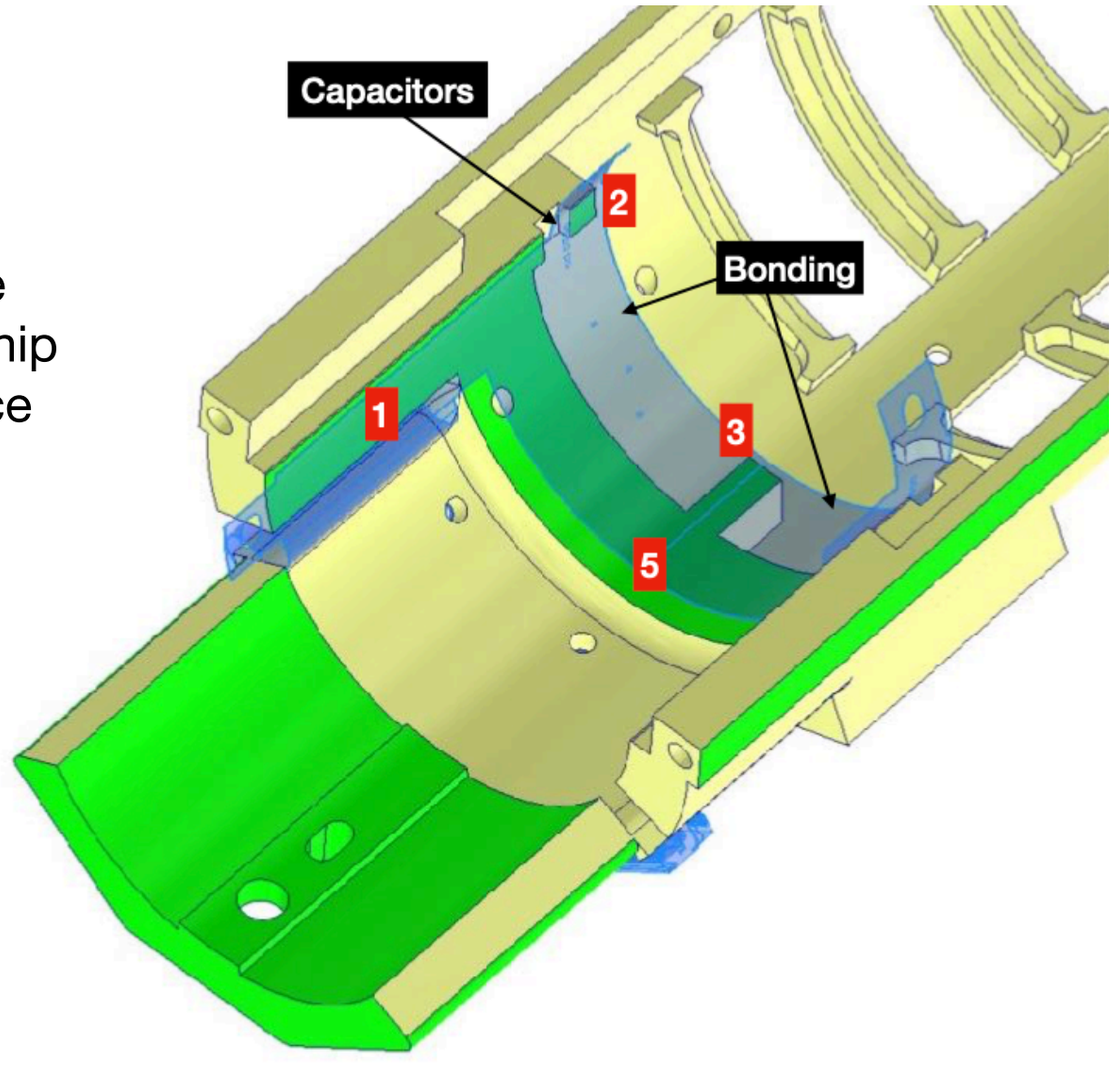
1. Edge-FPC gluing region: needs to be reset to the original thickness to grand edge-FPC and bent-chip to be at the same radius (and consequently reduce wire-bonds stress) → Notified to Gael

Small missing modifications

1. Exo-FPC alignment holes
2. Housing region for Exo-FPC connector stiffeners

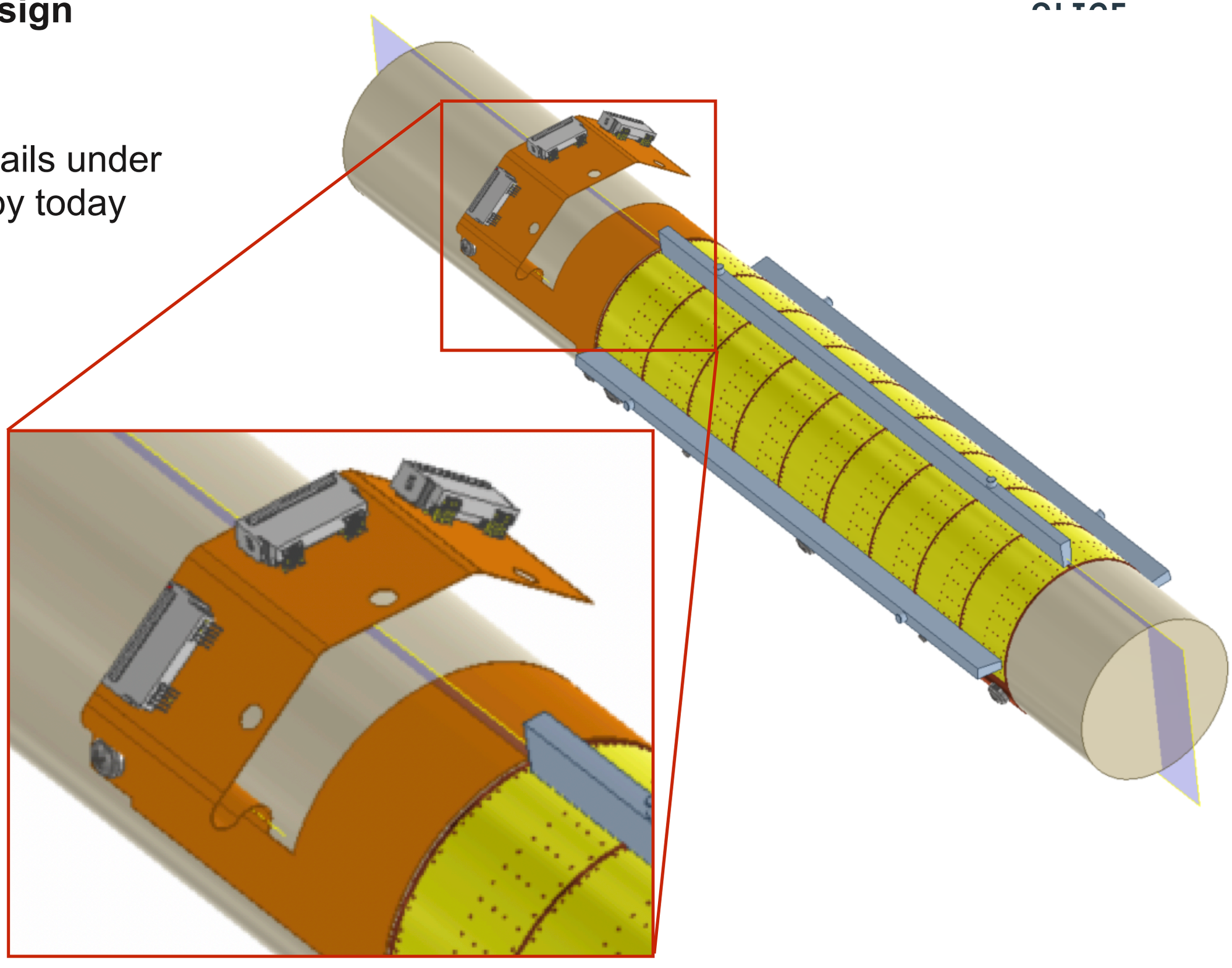
To be verified

1. Edge-FPC insertion neatness and simplicity

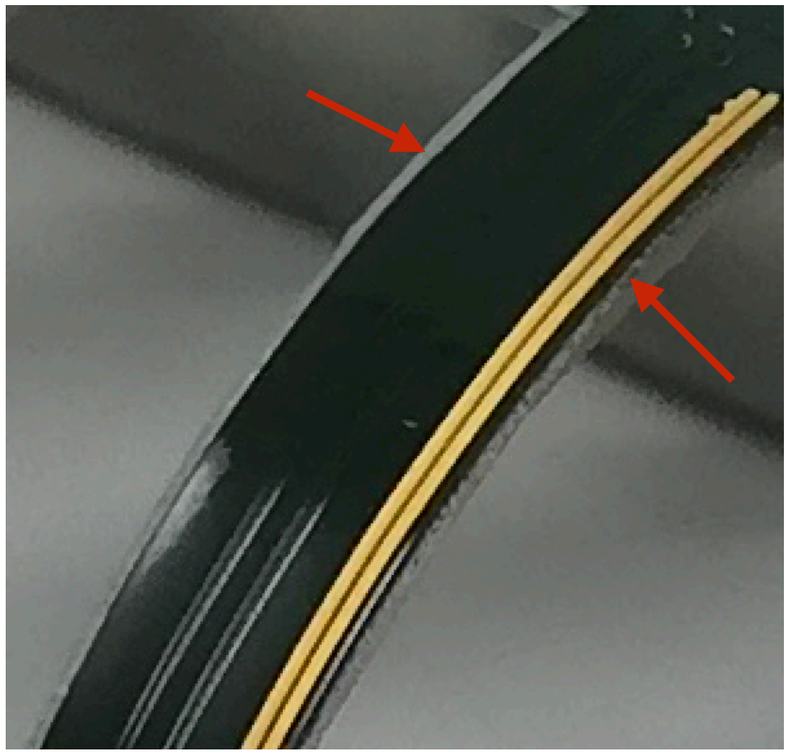


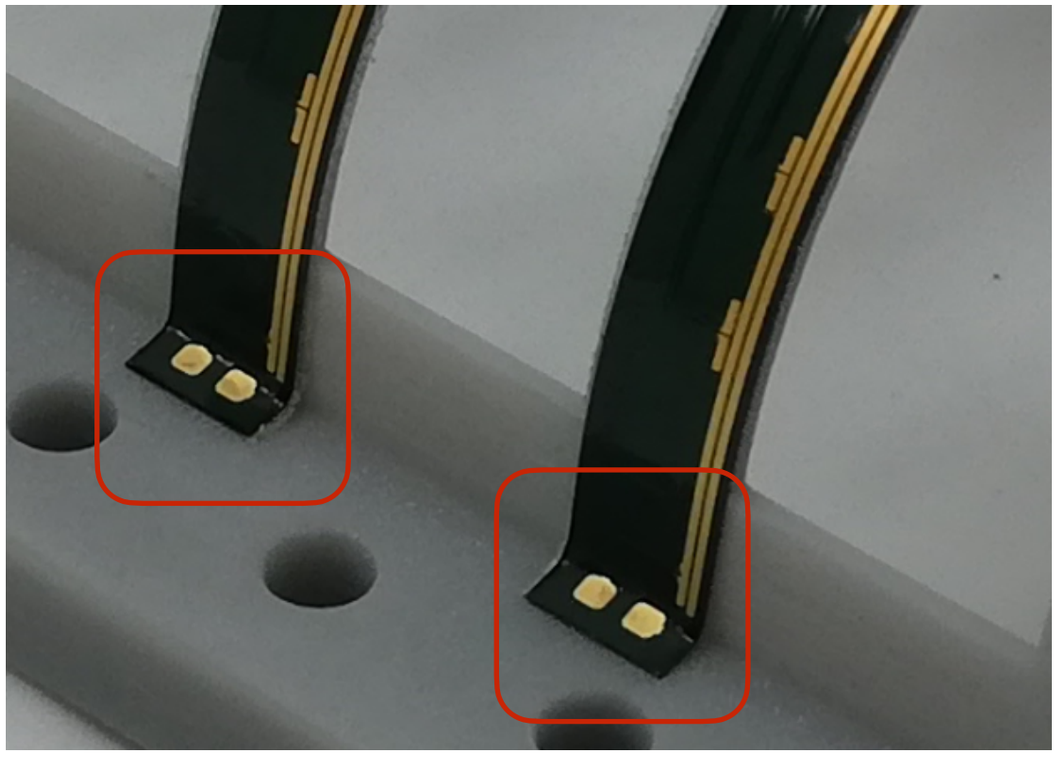
Edge-FPC design

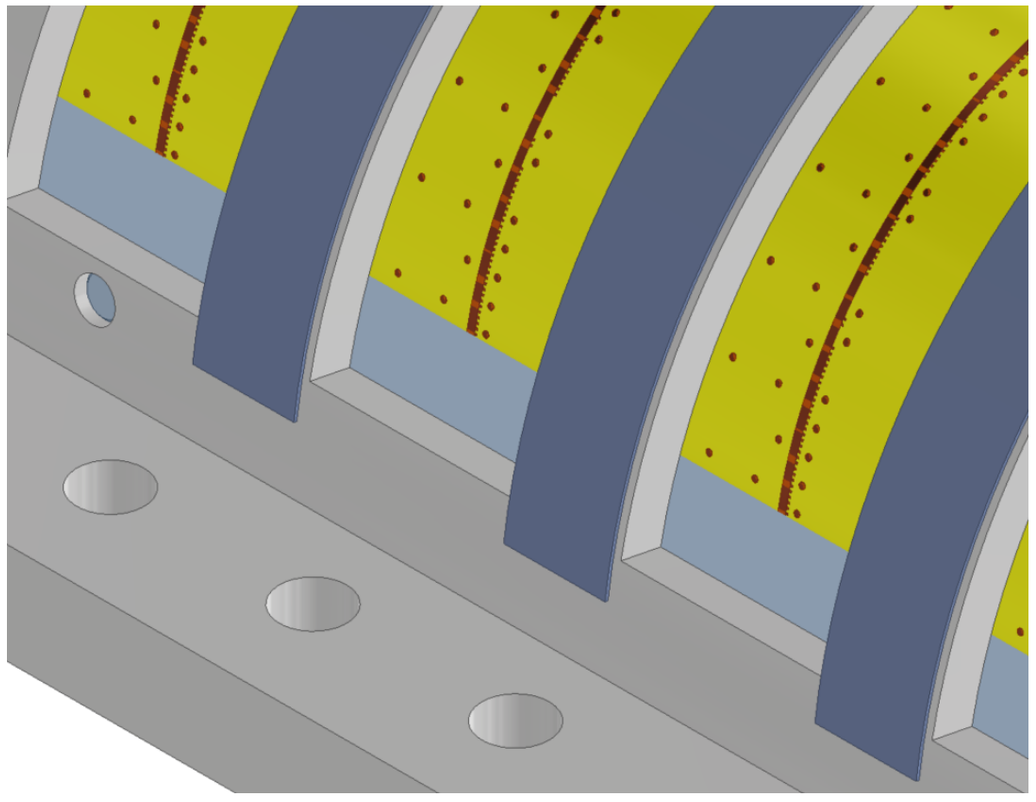
Very last details under completion by today



Super-ALPIDE FPCs support mechanics integration



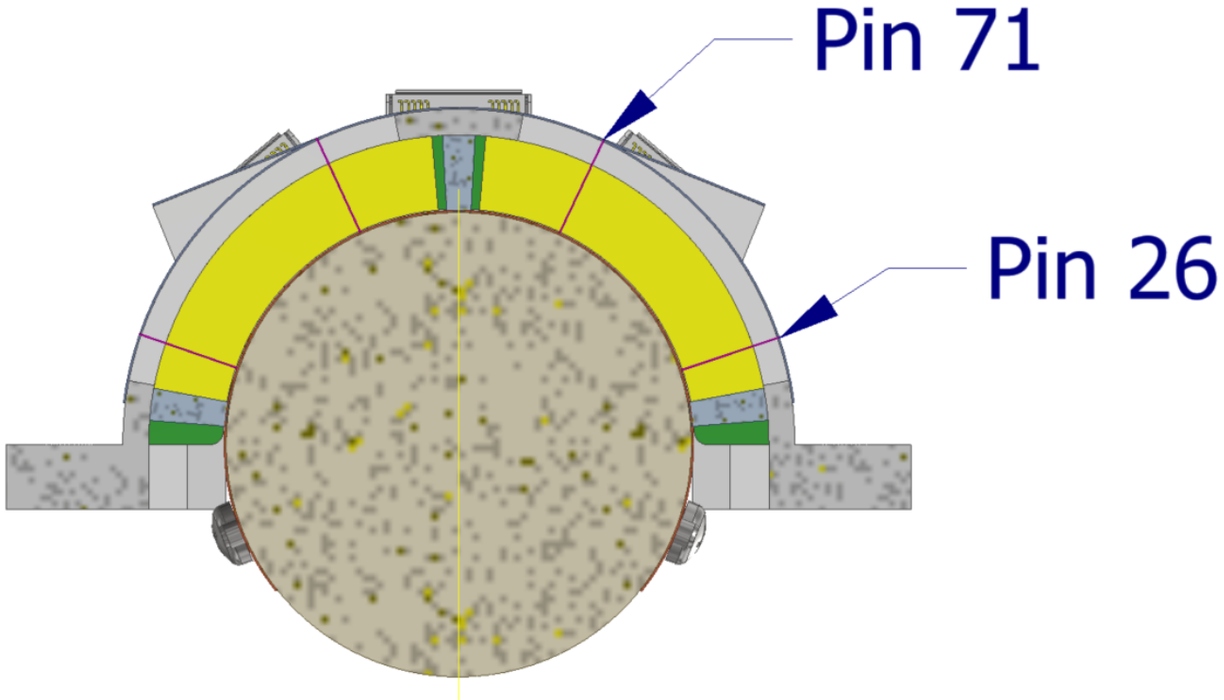


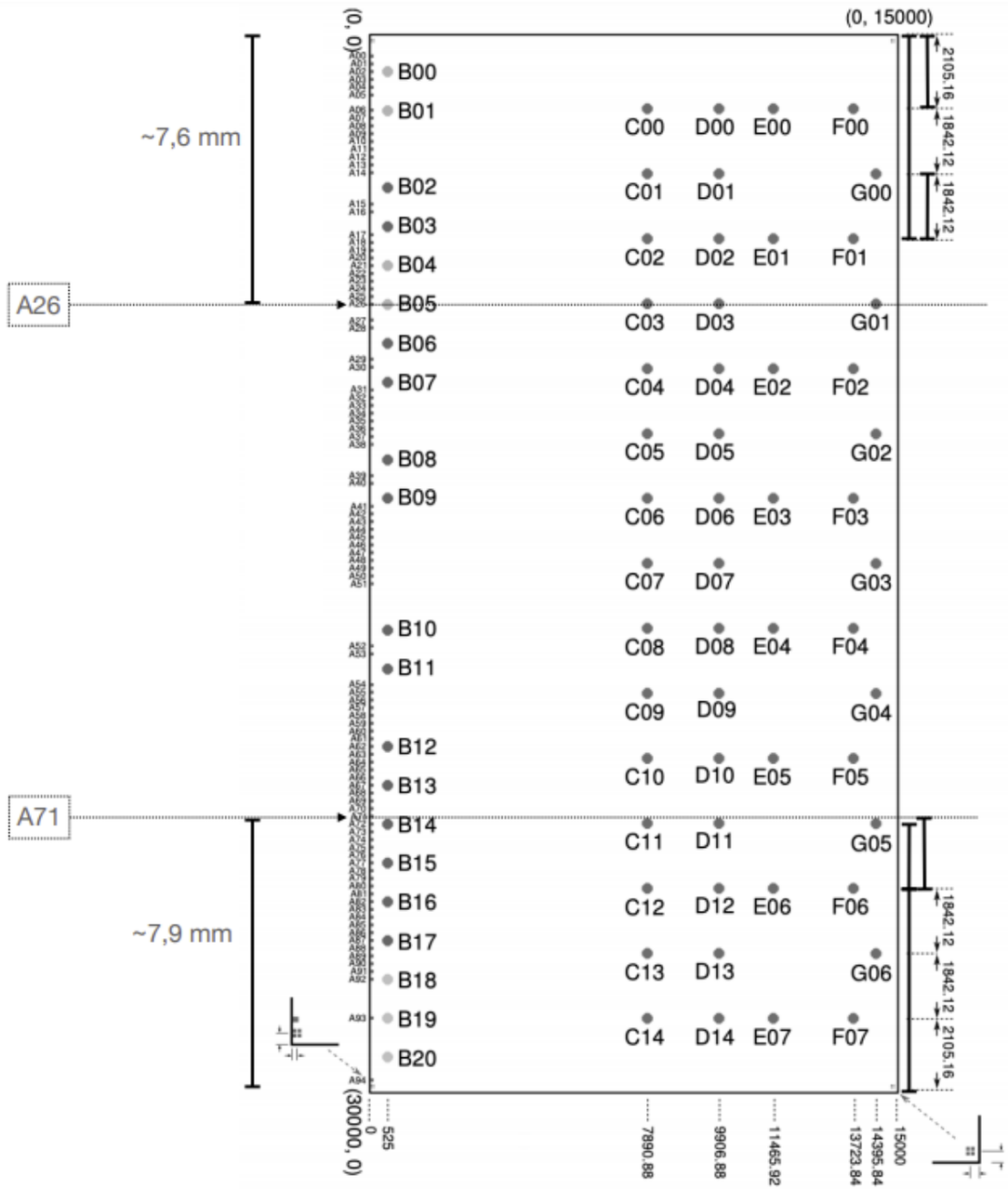


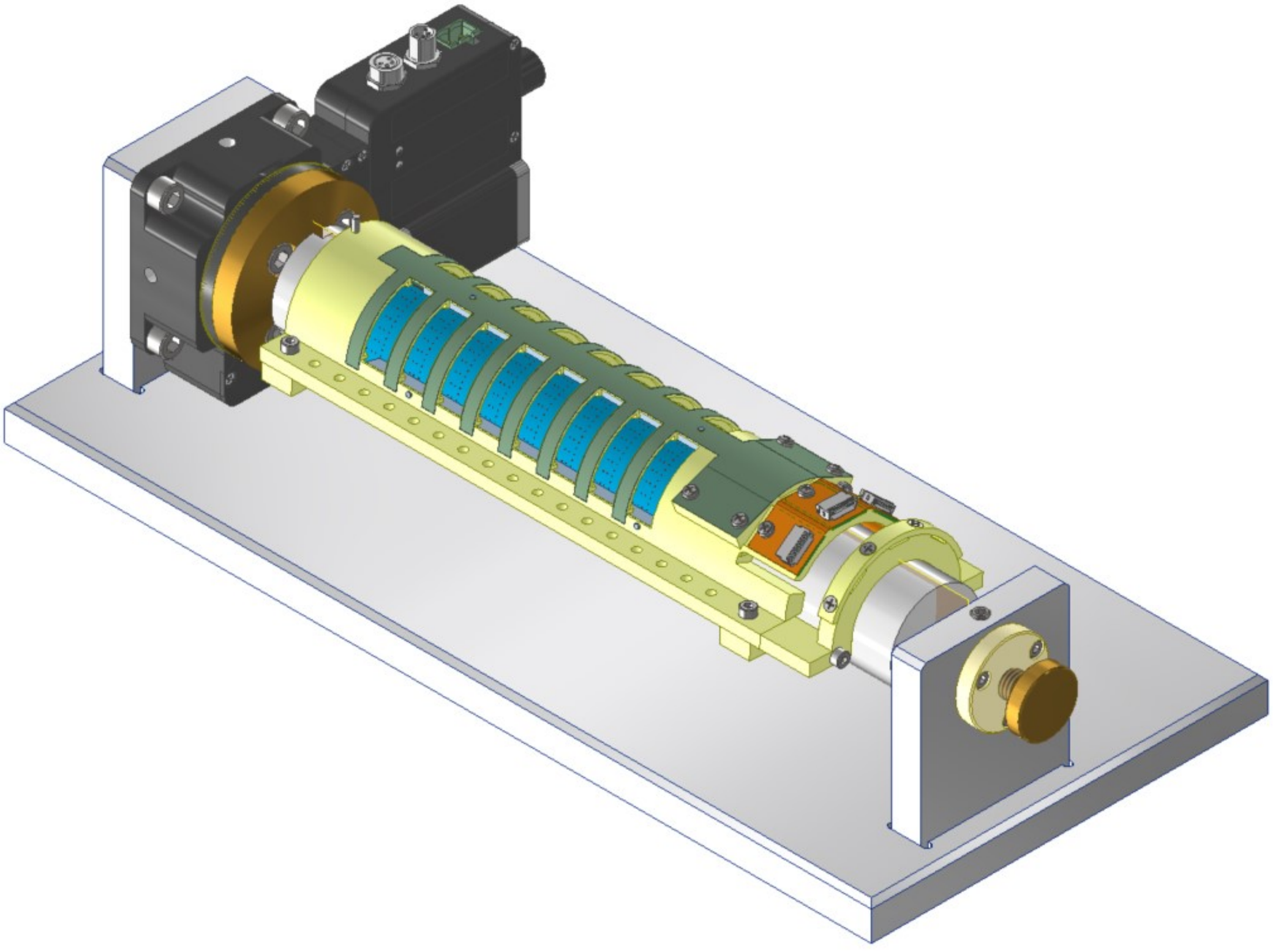
To be understood

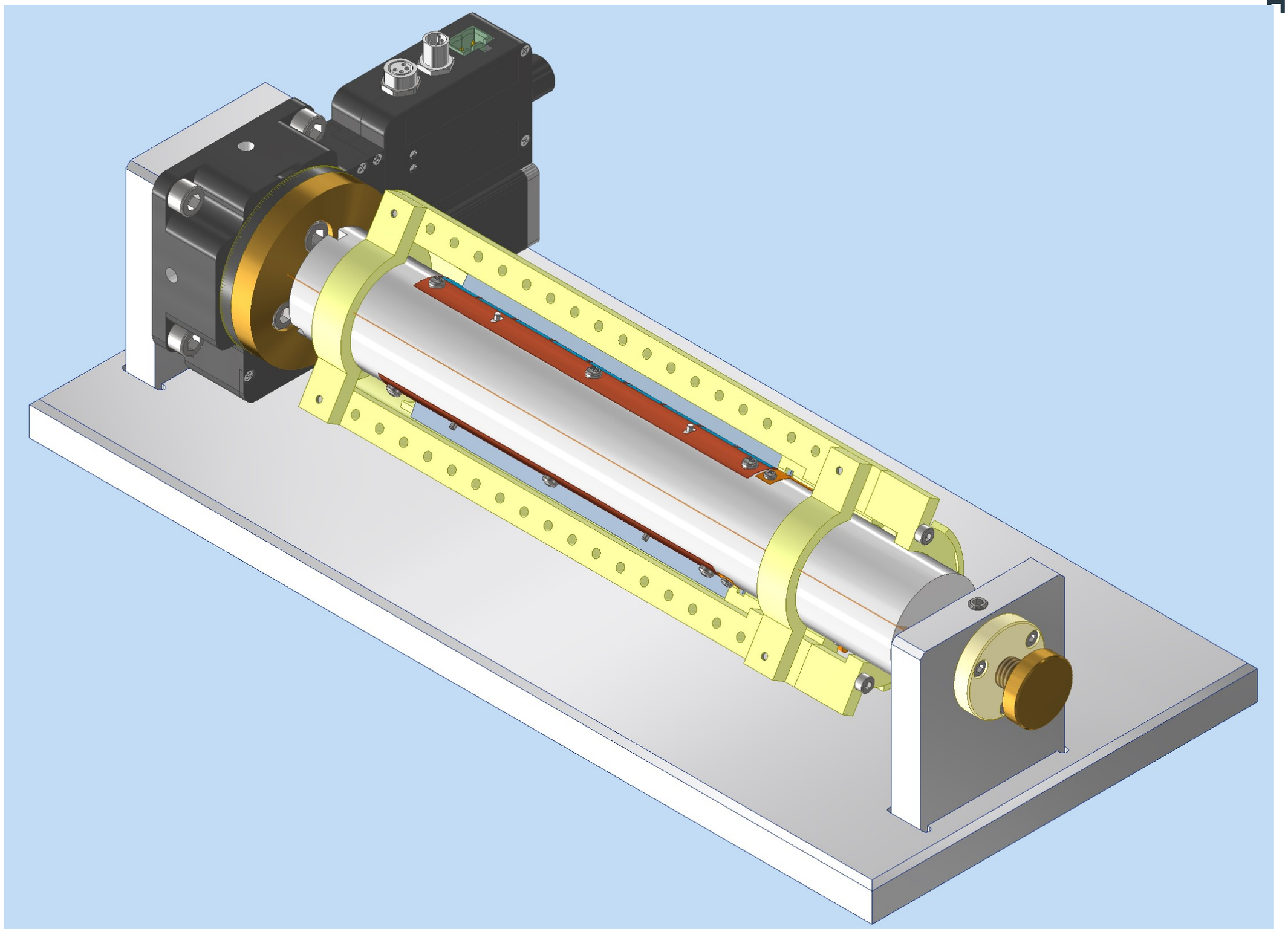
- One source: having used the 1mm thick exoskeleton (reduced radius) for an FPC designed for a 2 mm thick one

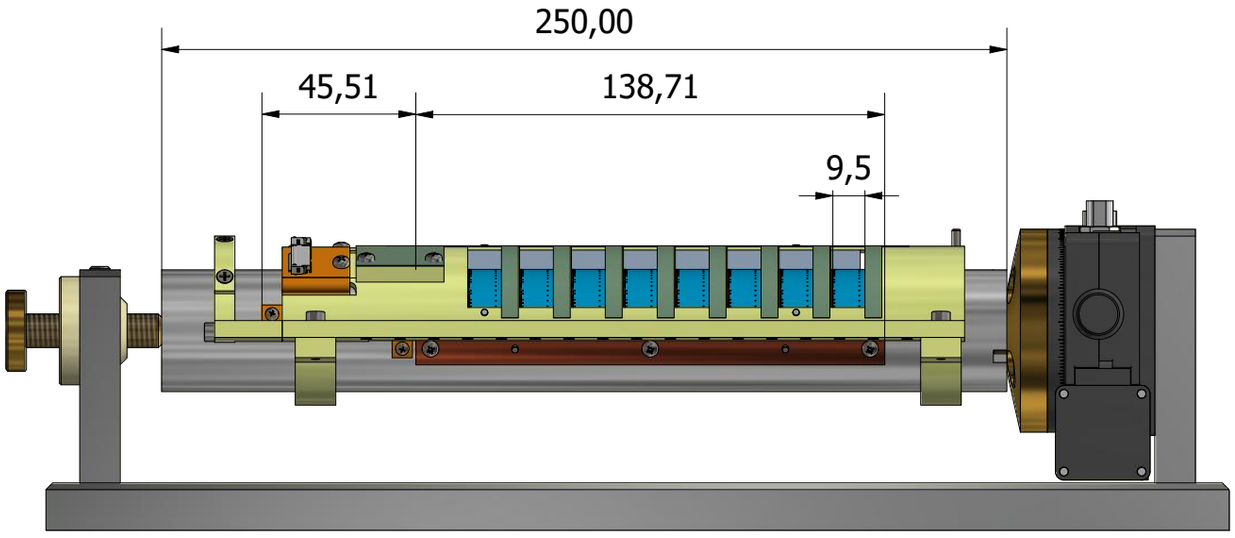
Super-ALPIDE FPCs support mechanics integration

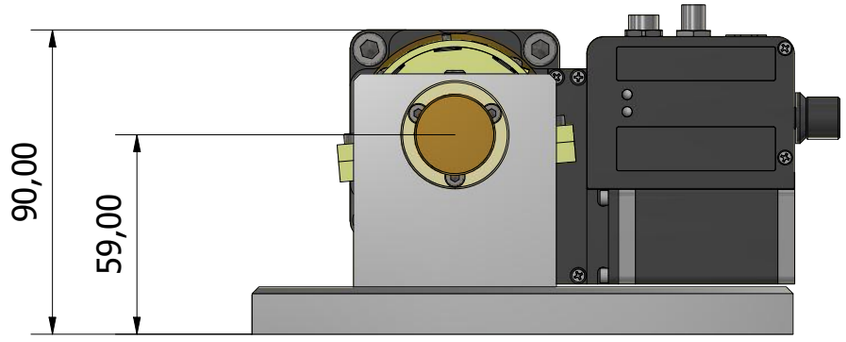









250,00
45,51
138,71
9,5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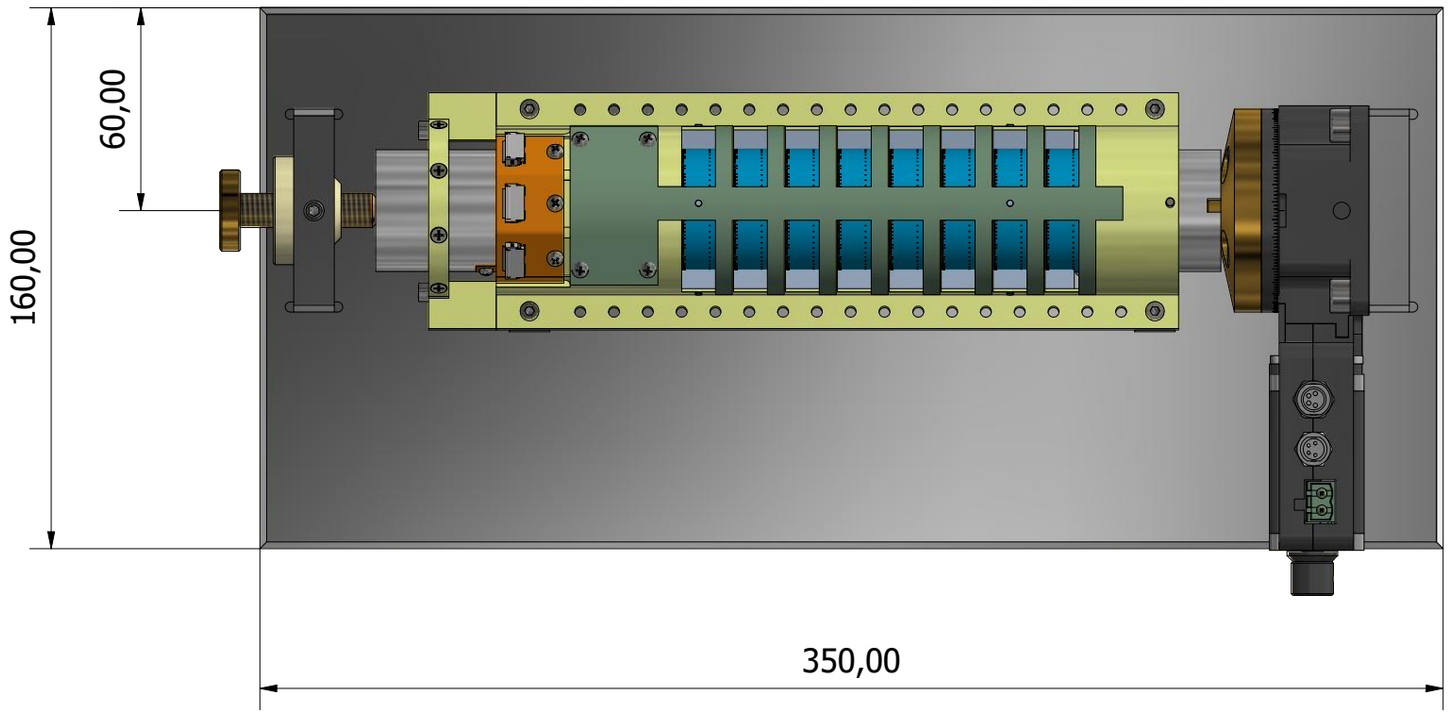
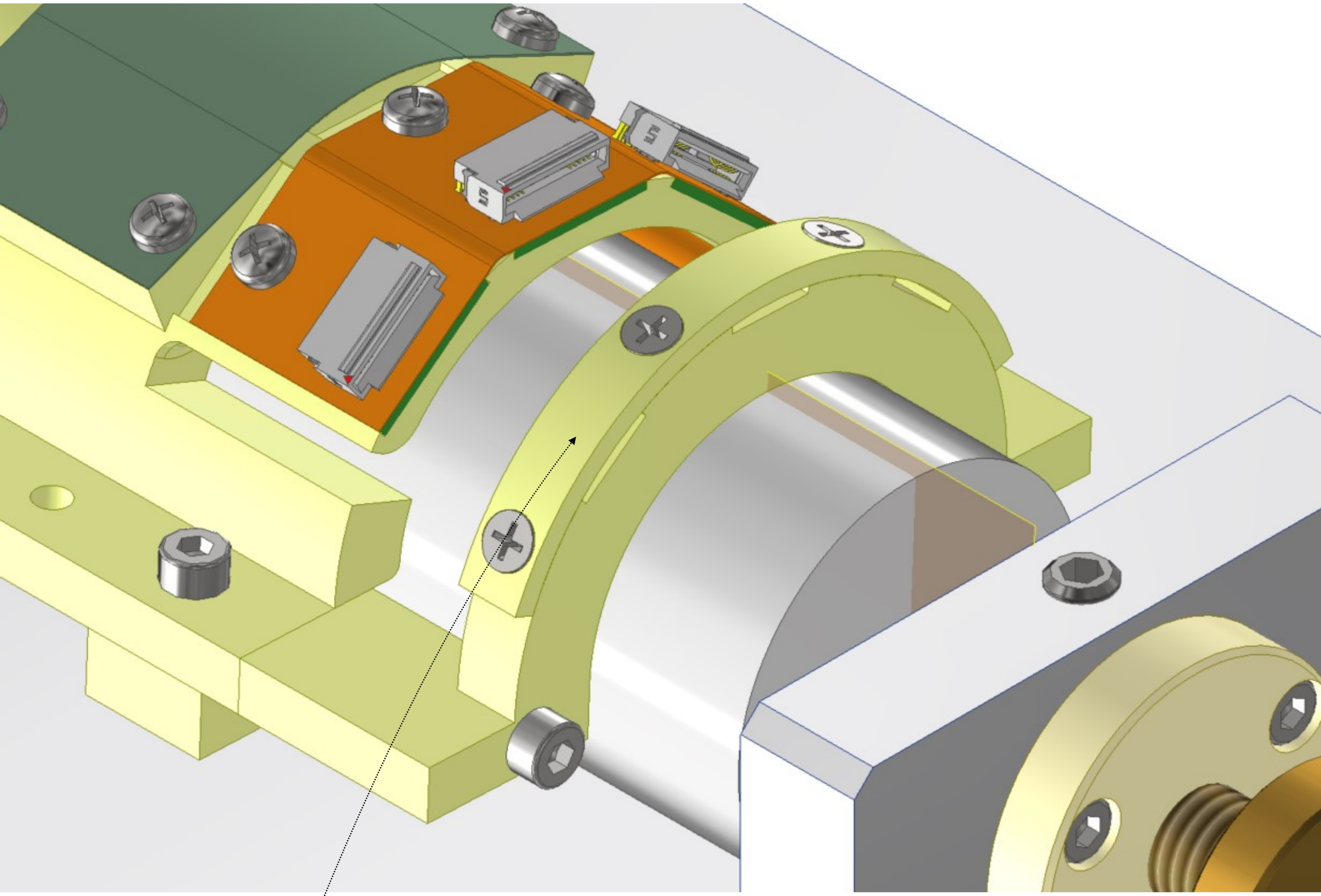
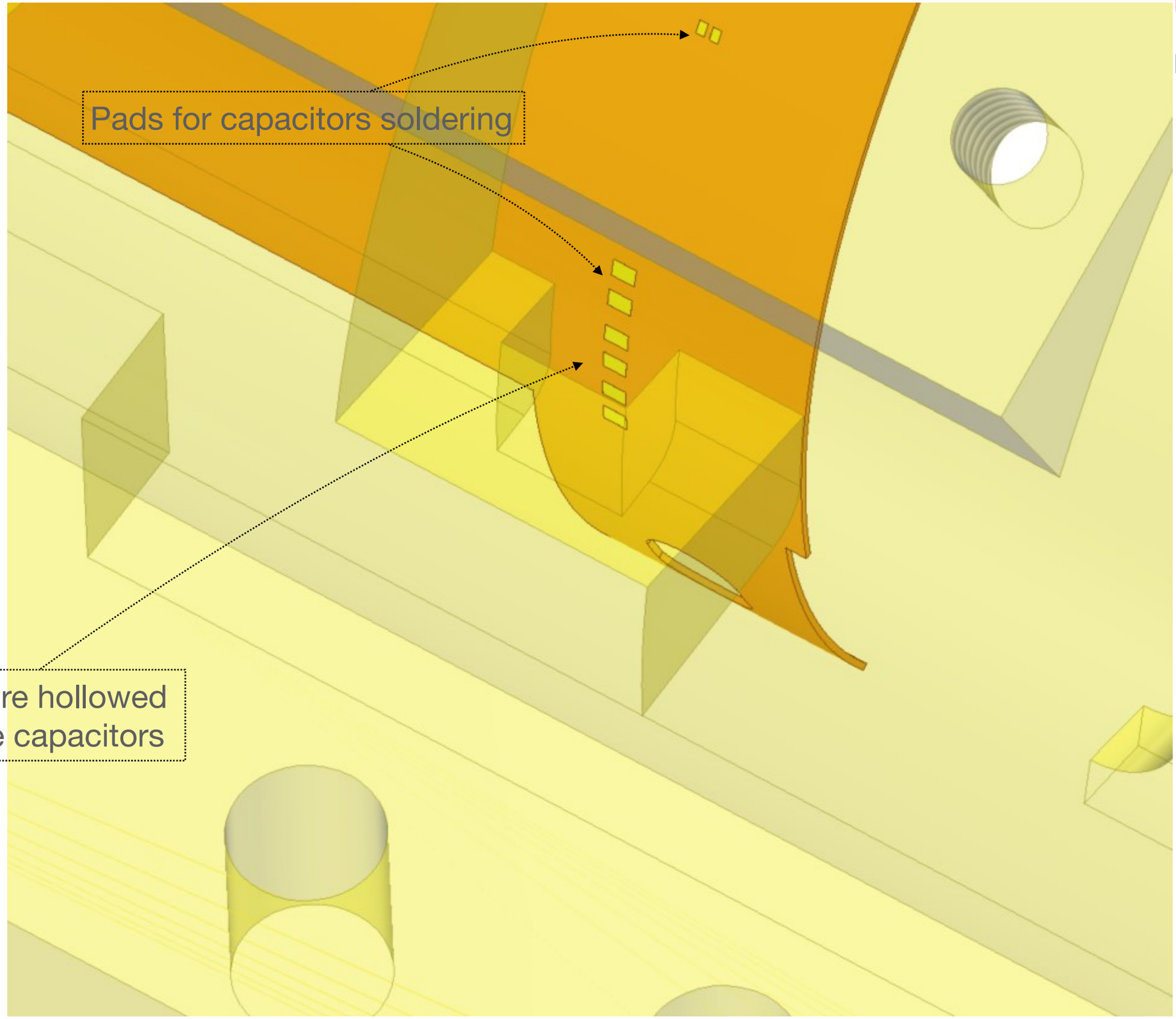
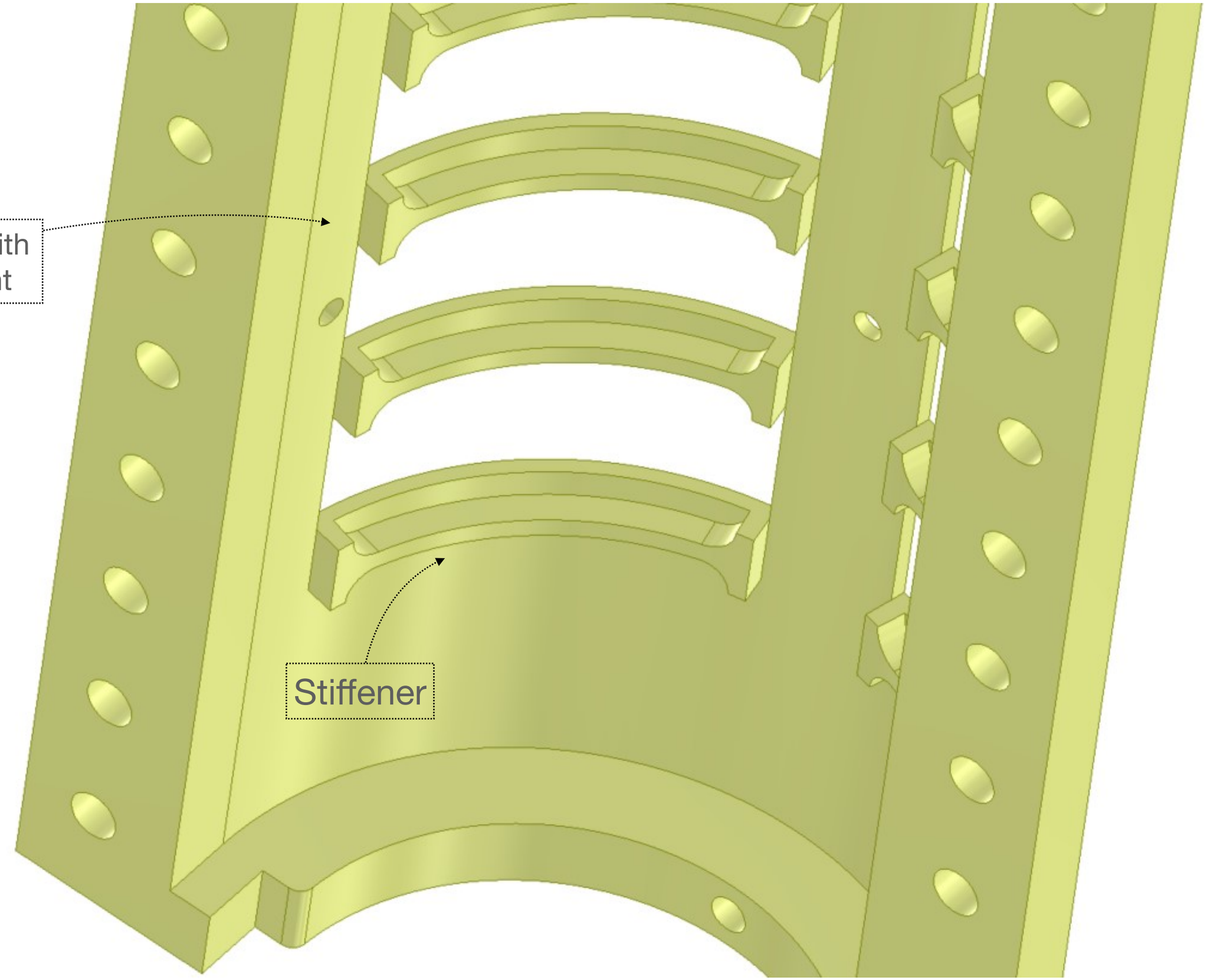
59,00

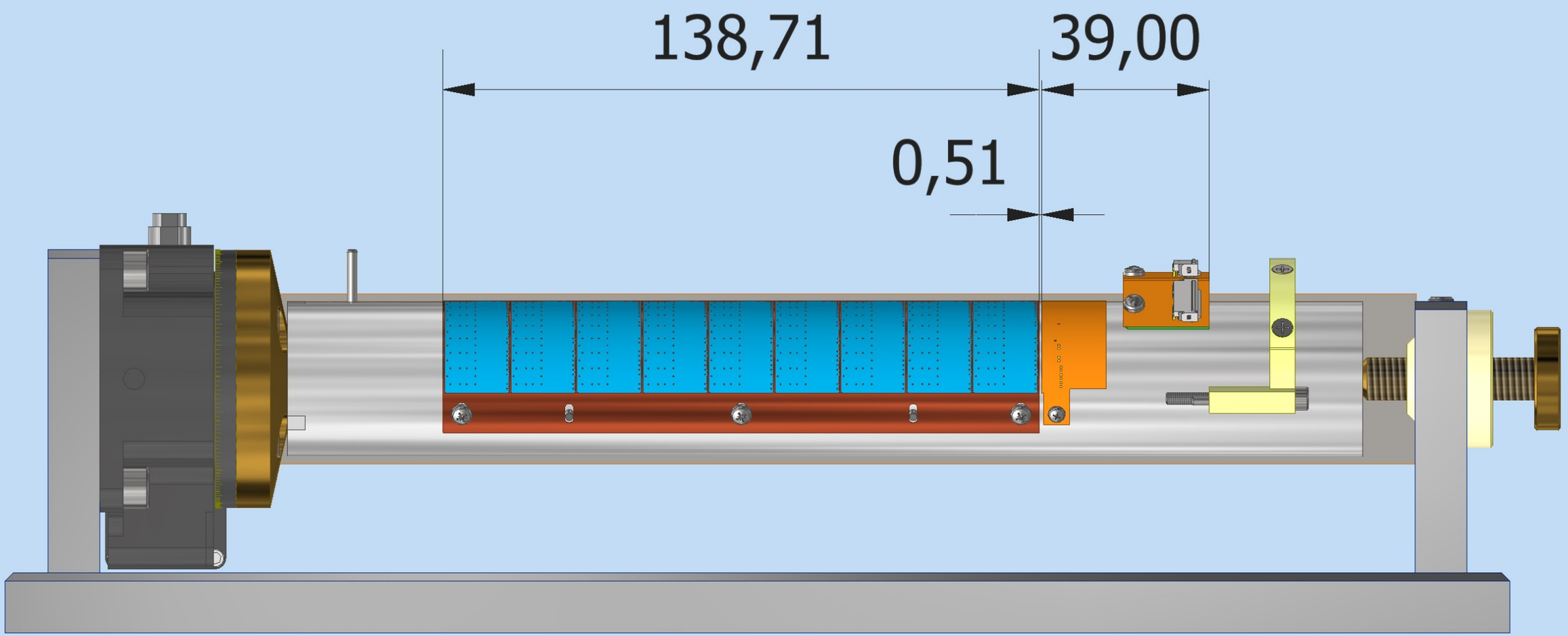

160,00
60,00
350,00

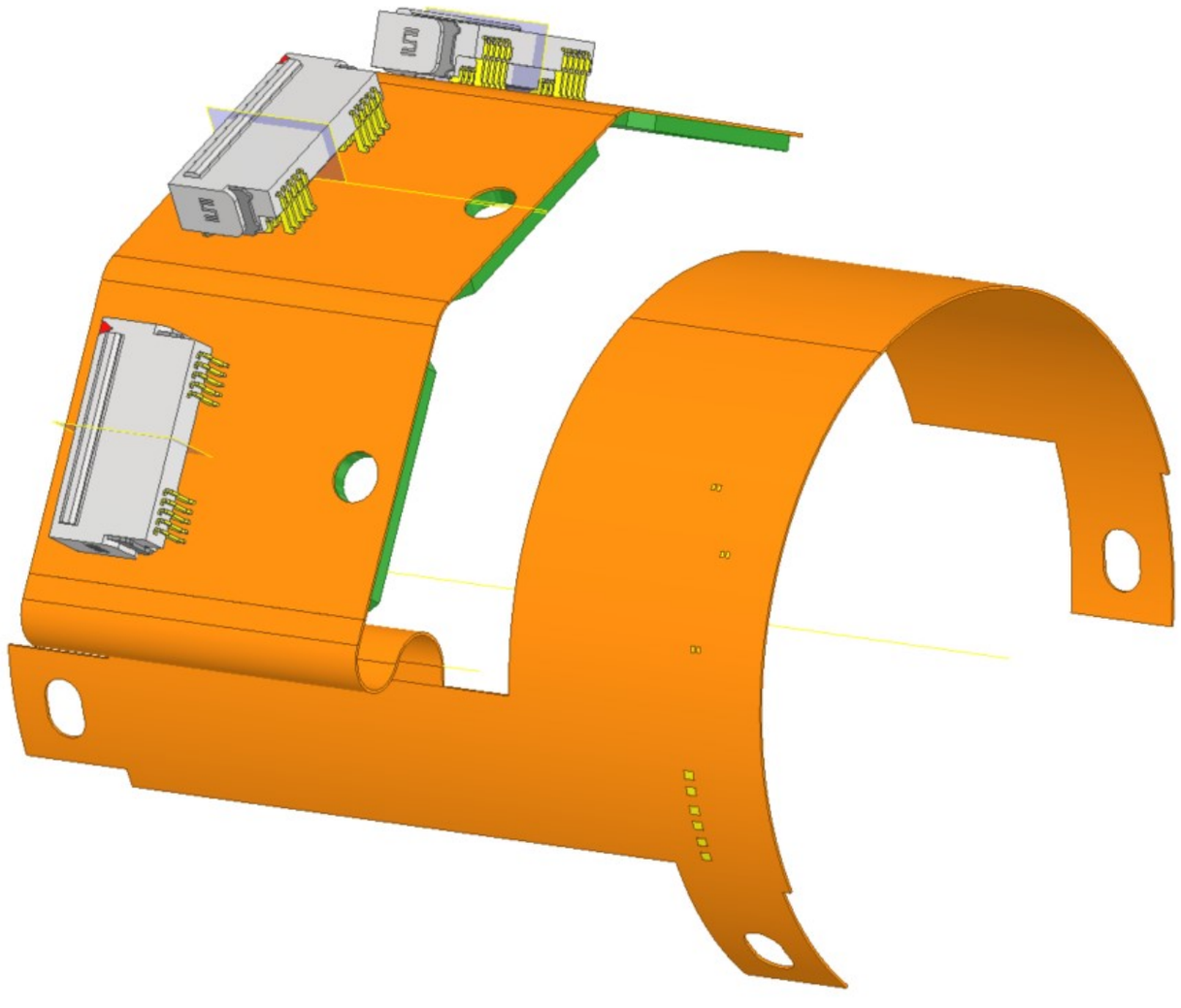


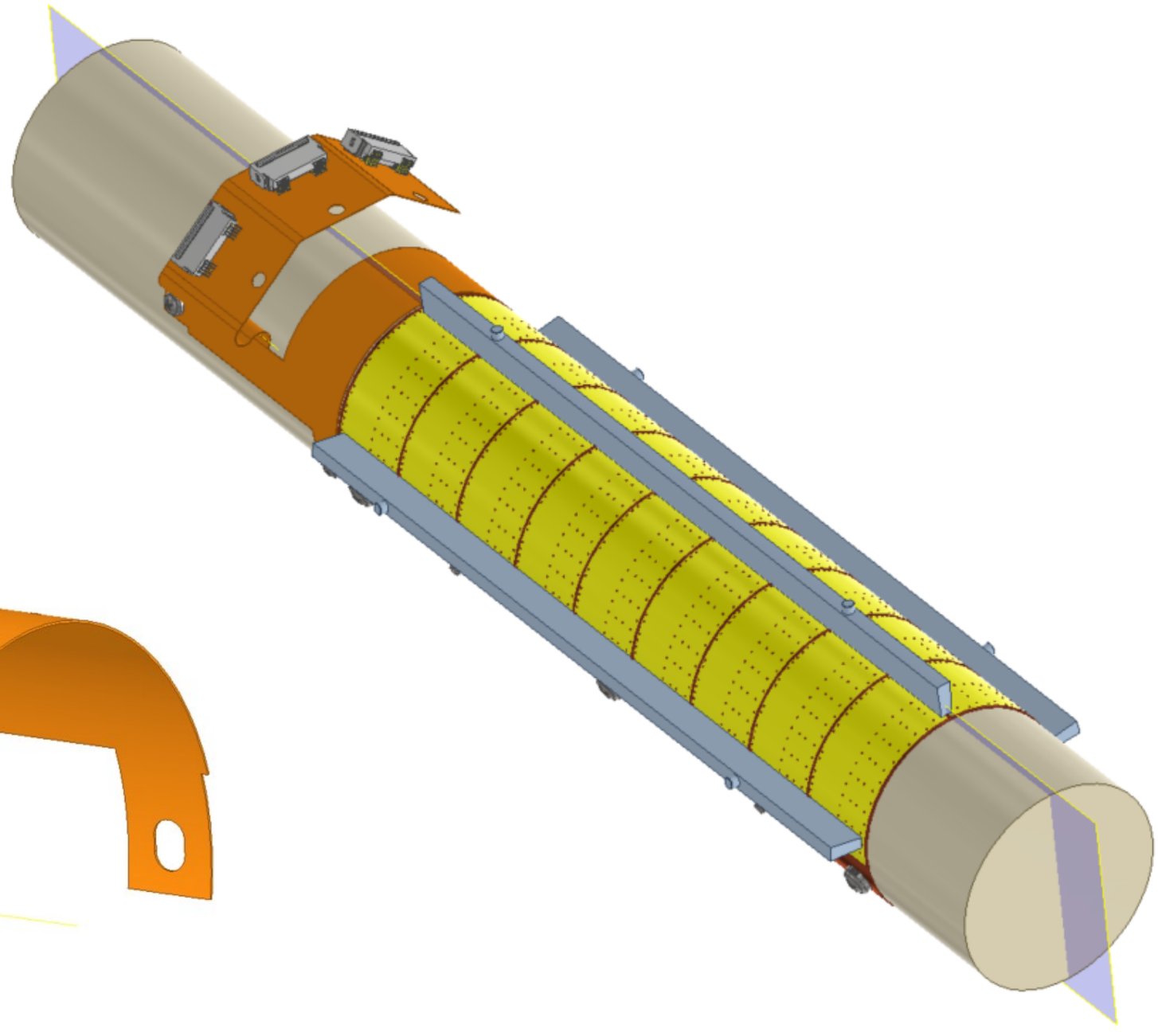
SAMTEC cables support and holder

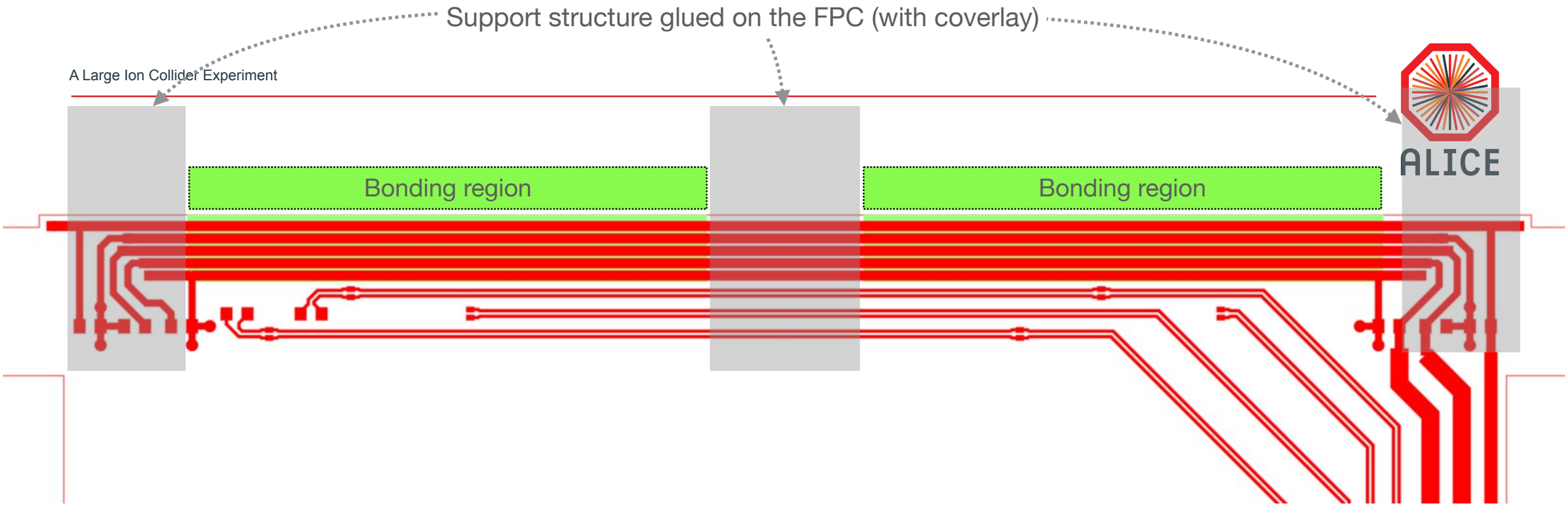

Pads for capacitors soldering
Support structure hollowed
to not touch the capacitors


Do not interfere with wedges placement
Stiffener


138,71
39,00
0,51






Support structure glued on the FPC (with coverlay)
A Large Ion Collider Experiment
ALICE
Bonding region
Bonding region