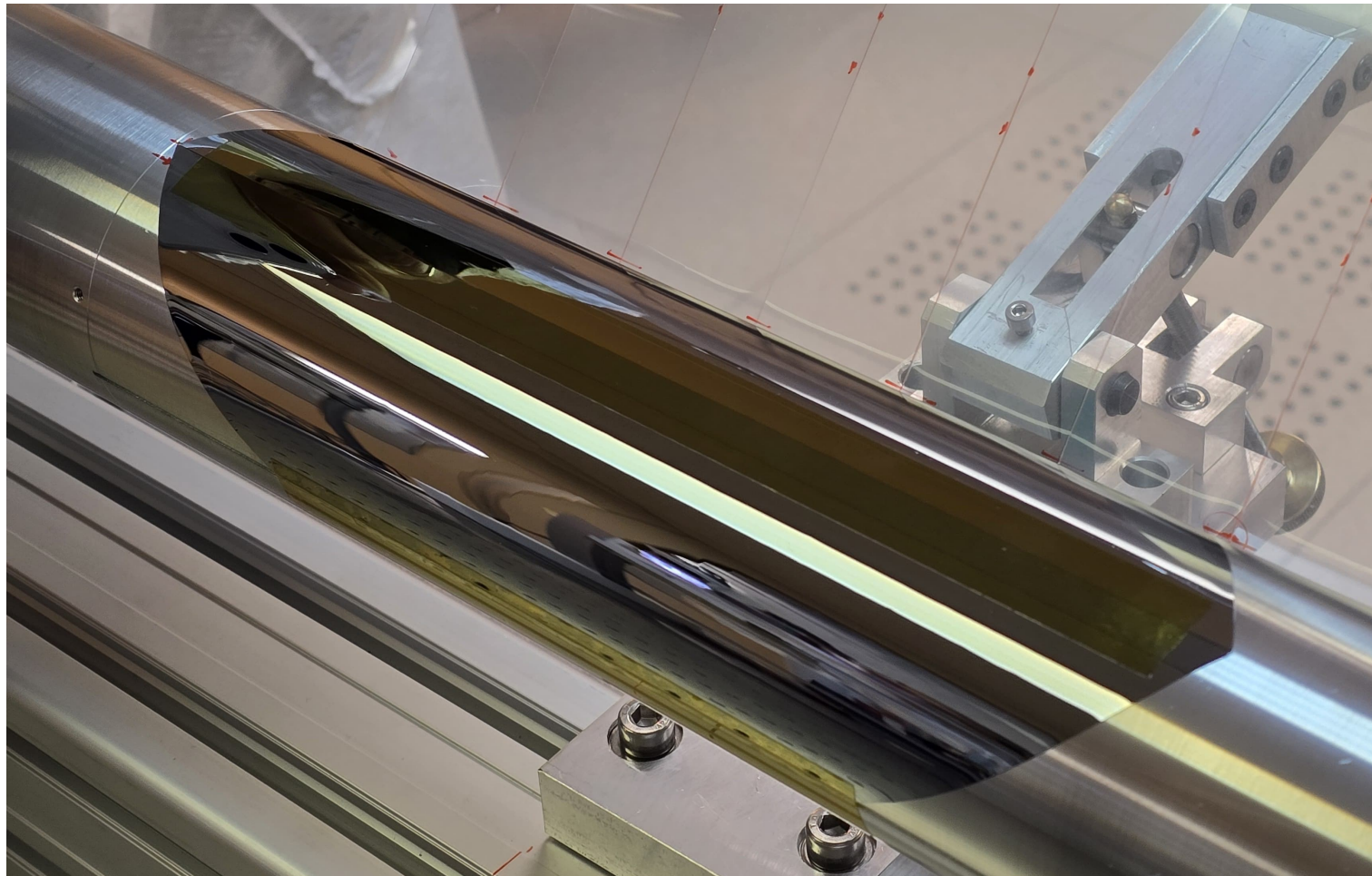
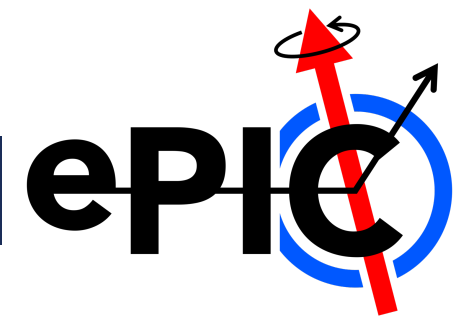


Bending and assembly of the L0 and L1 layers

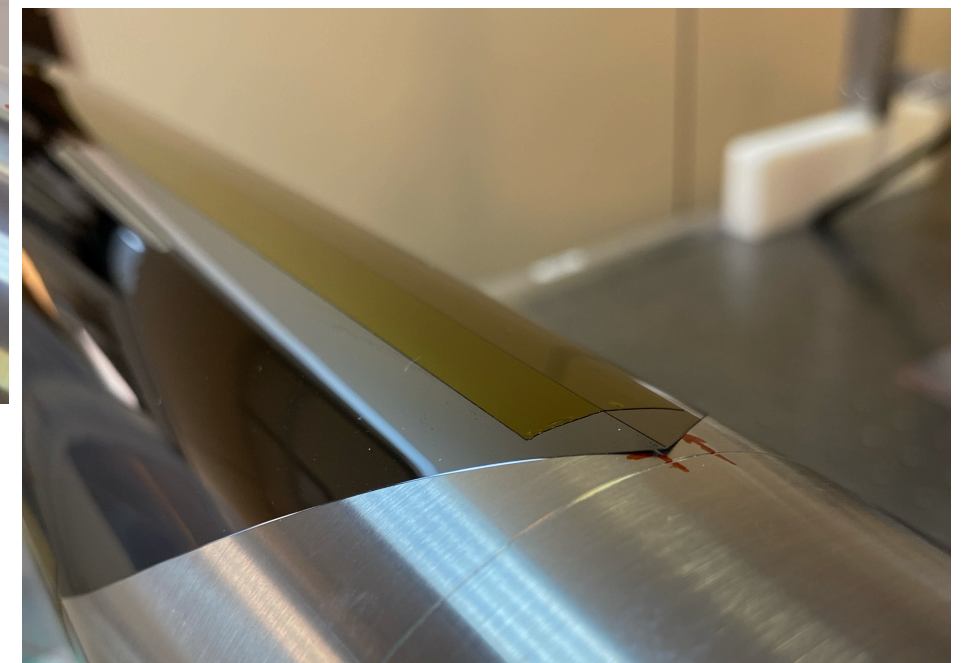
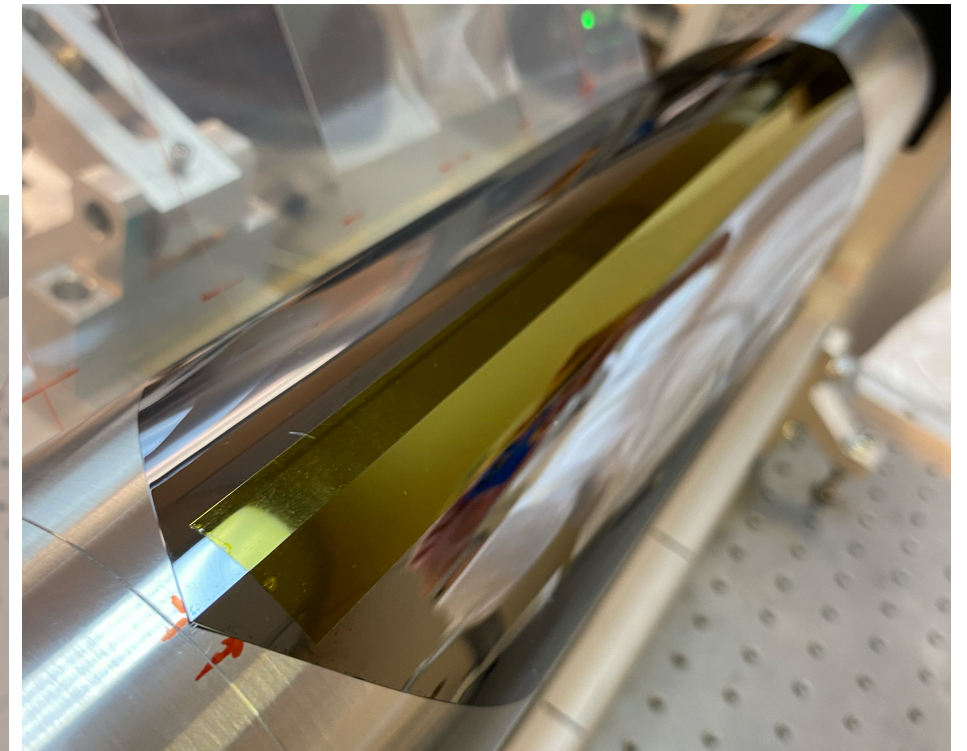
SVT Bari team

D. Elia, M.T. Camerlingo, S. Martiradonna,
C. Pastore, V. Valentino, D. Colella

Recent progresses

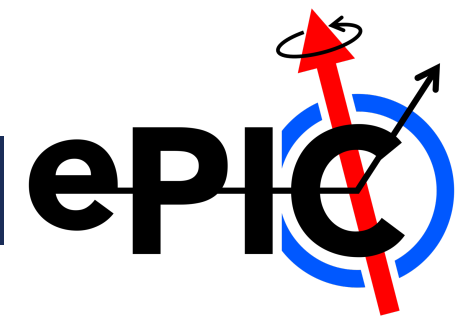


Already shown during the ePIC Collaboration meeting (*)

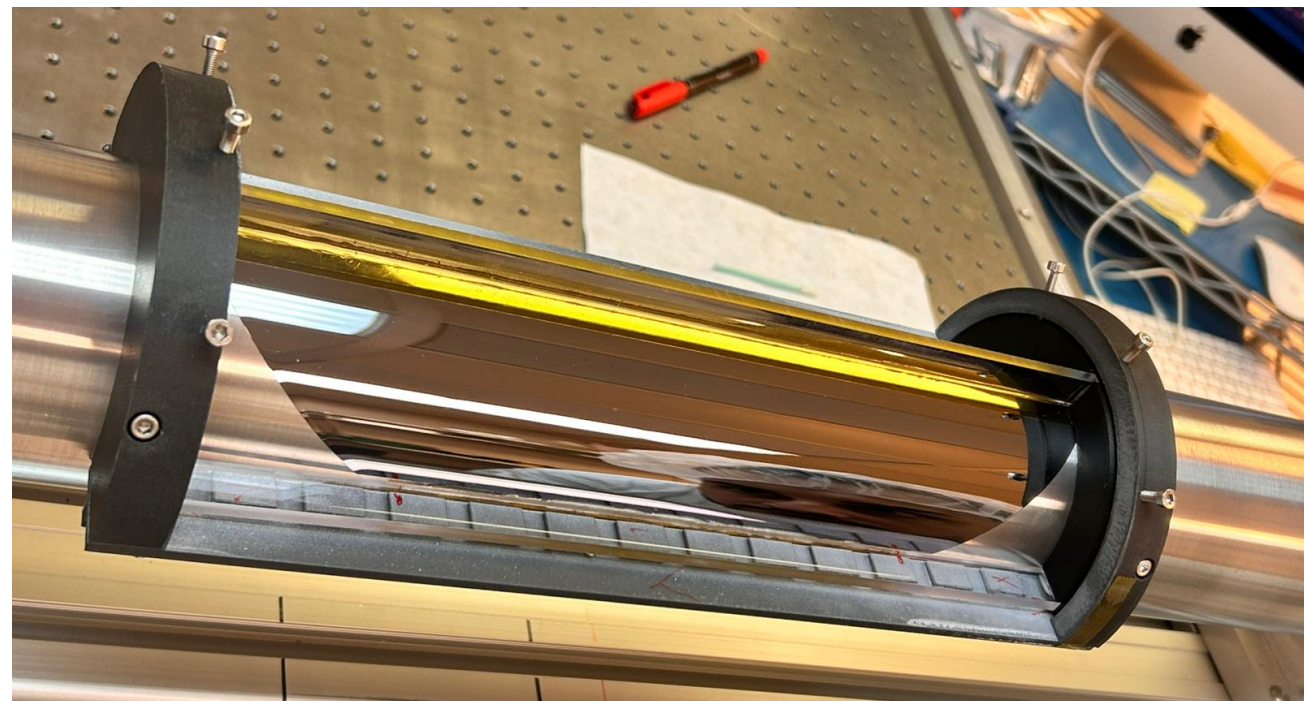
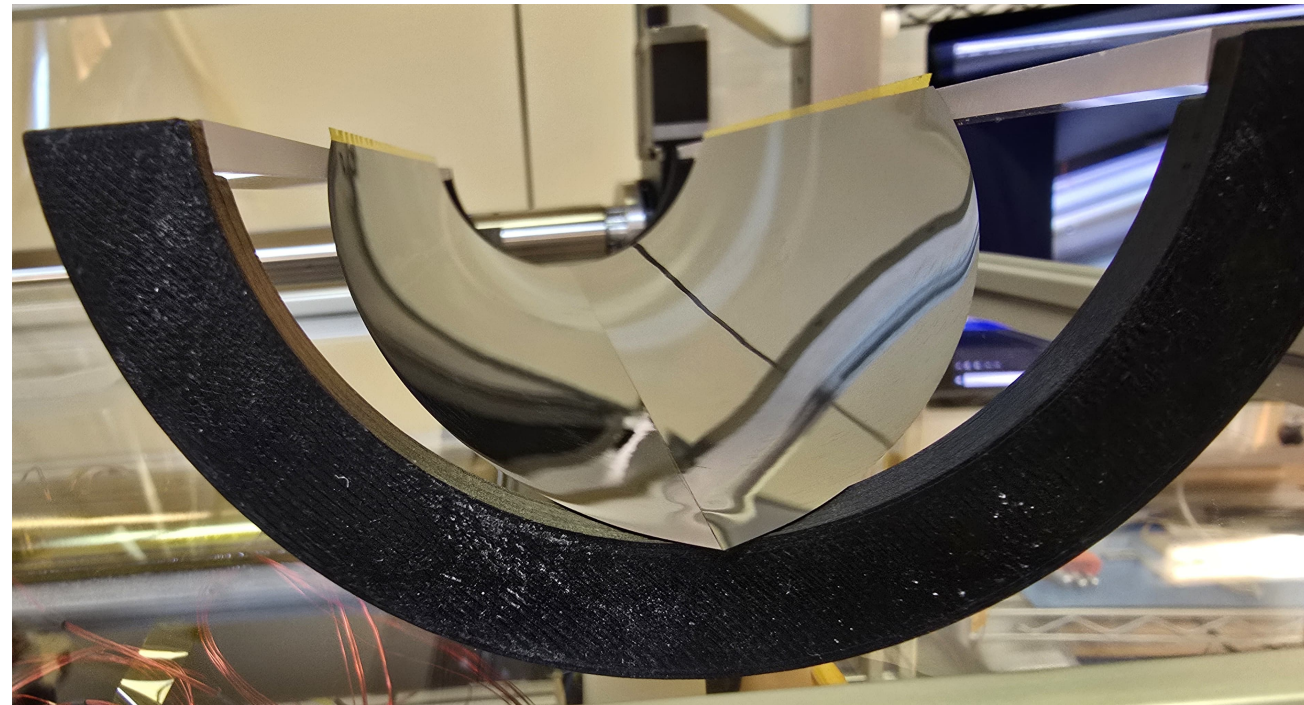


(*) https://agenda.infn.it/event/43344/contributions/253351/attachments/130474/194153/2025_ePIC_CollaborationMeeting_L0L1activities_v4.pdf

Recent progresses

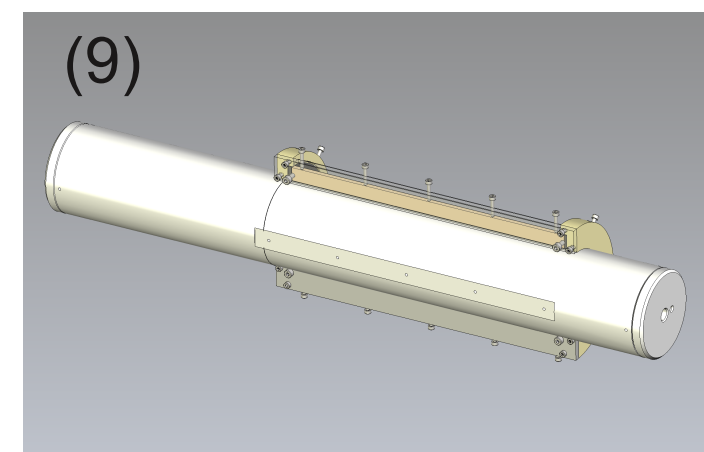
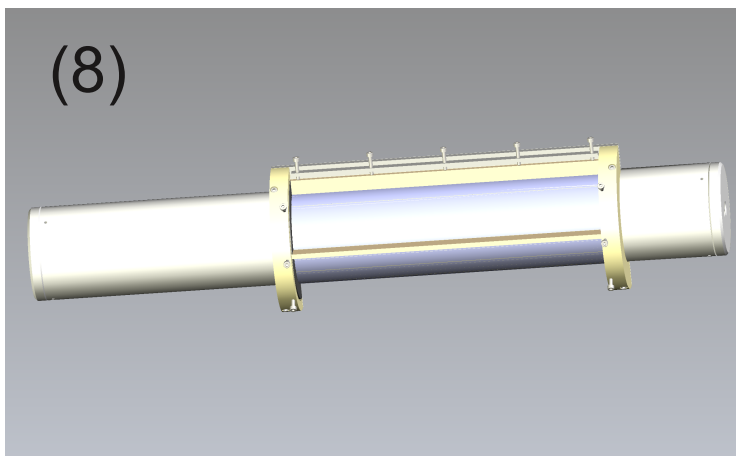
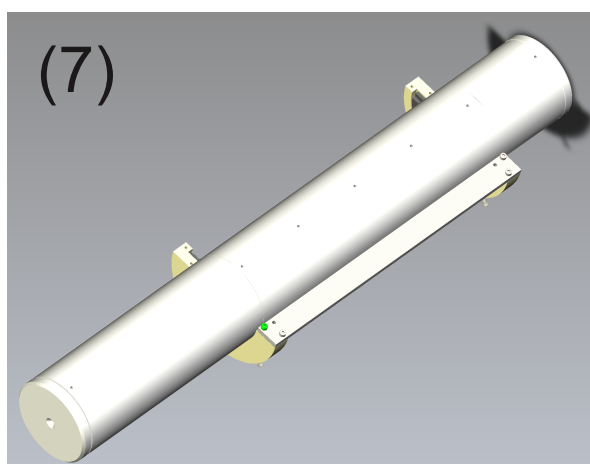
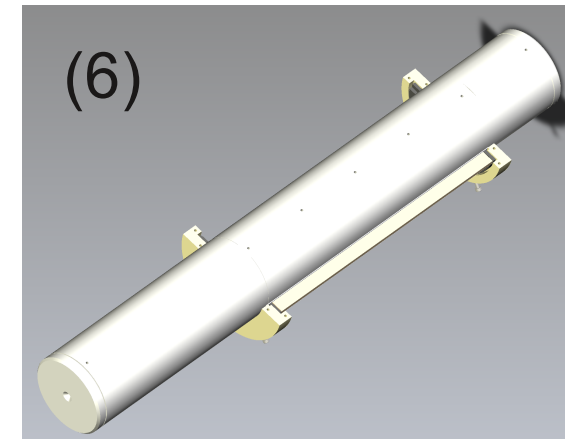
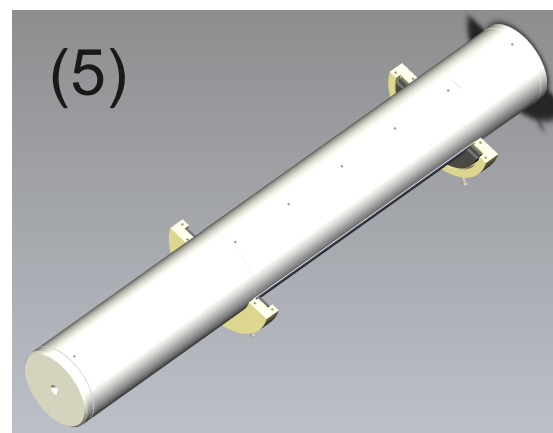
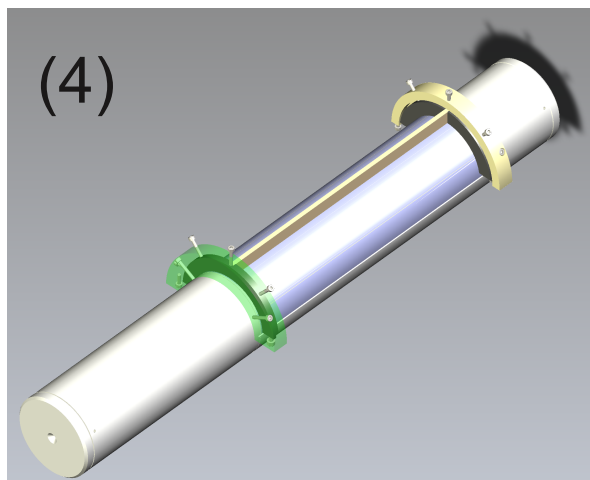
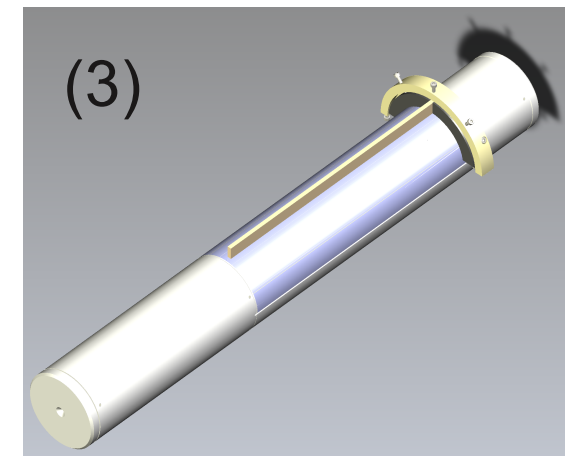
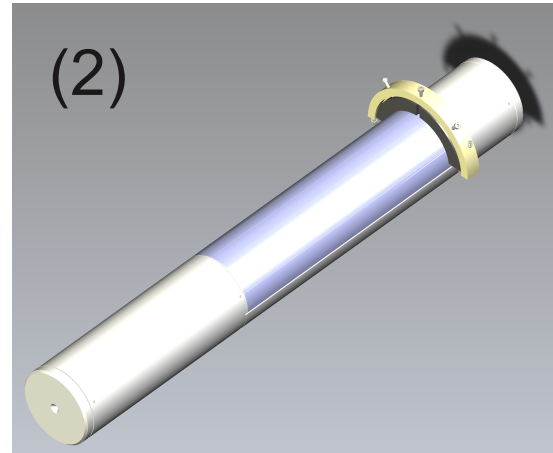
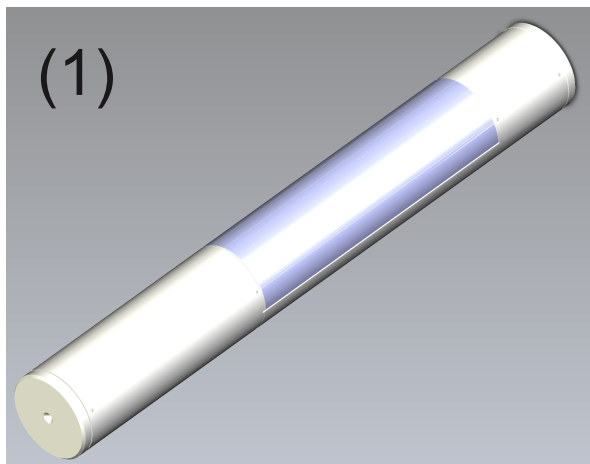


First L0 layer successfully glued to support structures and removed from mandrel!



Recent progresses

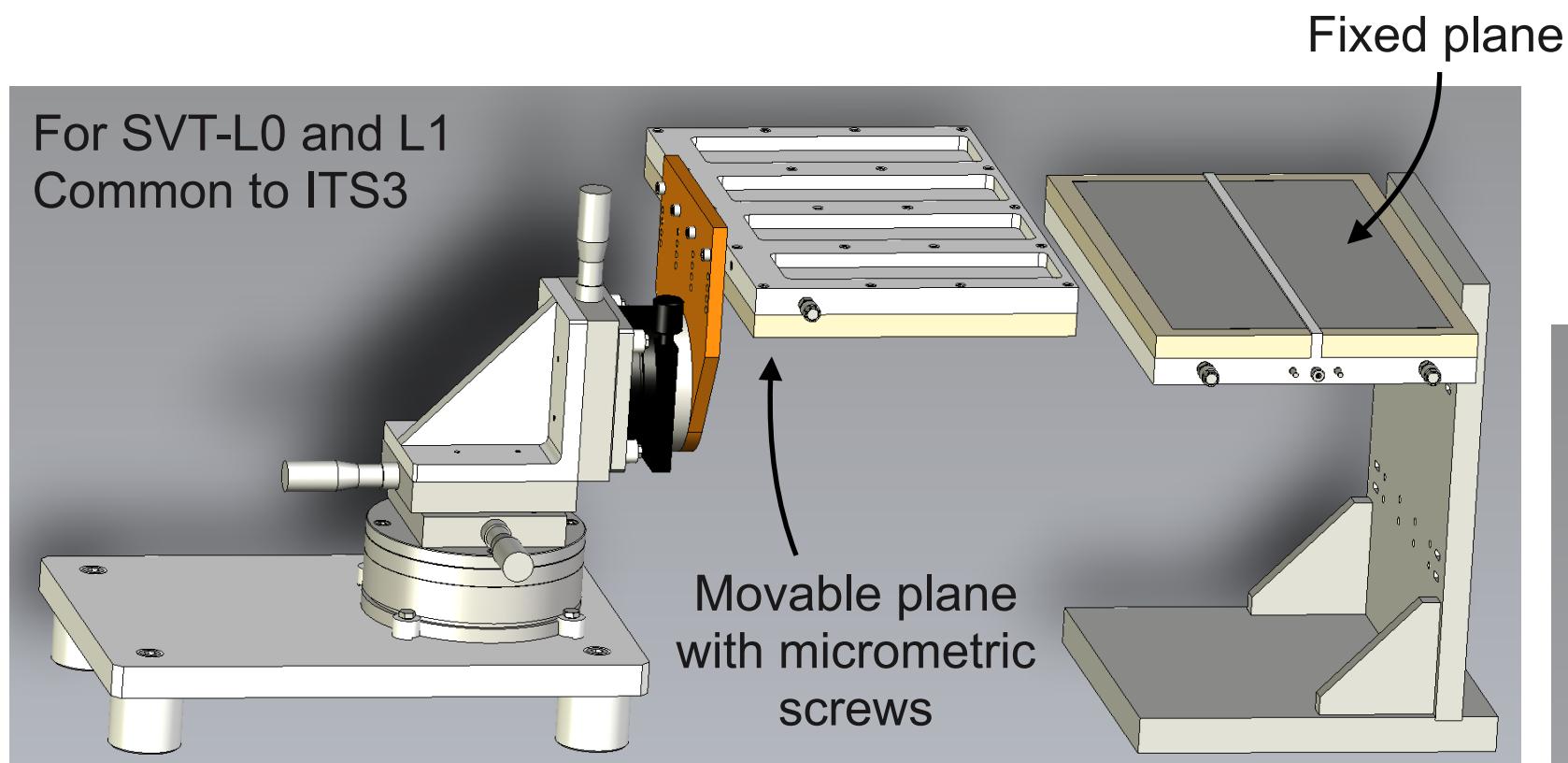
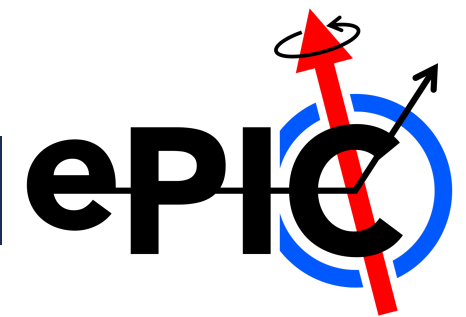
Support structures gluing tool



Tools under refinement after successful gluing.
Mainly improving pressing components for longerons to the sensors.

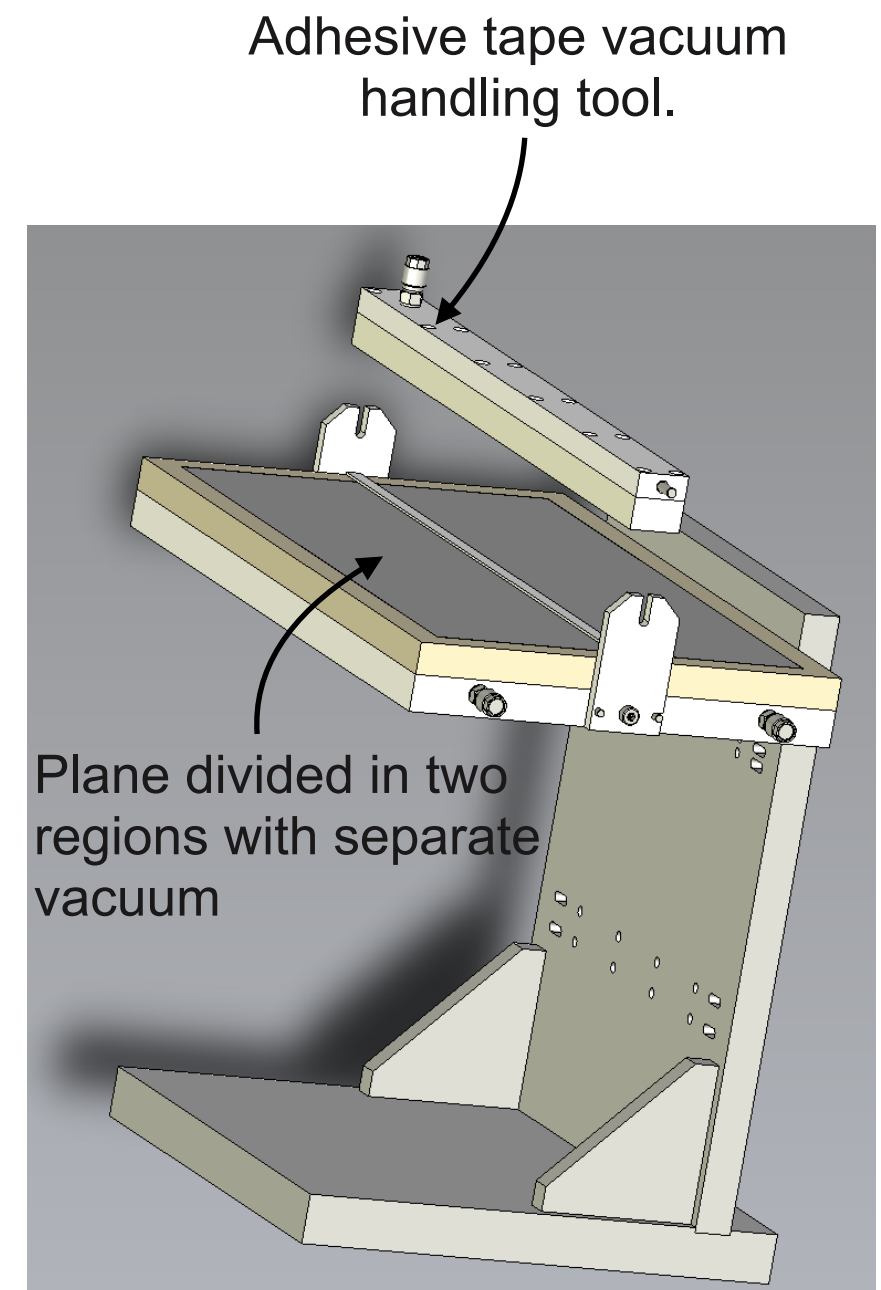
Recent progresses

Sensors alignment and handling tools

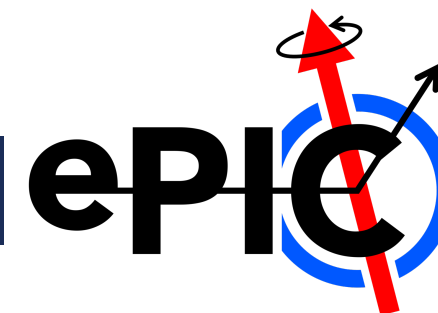


Required to:

- Precisely align and join the two sensors
- Handle the joint sensors during the bending procedure to approach the mandrel



Prototyping campaign vs Material procurement



	Prototype	Components	Goal	
MAR 2025	IBL01_P1 (half-layer)	<ul style="list-style-type: none"> 2 naked silicon L1 sensors L1 local support structure (3-D printed) outer support shell (machined in PEEK) 	<ul style="list-style-type: none"> finalize half-layer assembly procedure 	They require dummy silicon sensors from DISCO; to validate 2-sensor connection and bending , to design local support structure, external shell etc
	IBL01_P2 (half-barrel)	<ul style="list-style-type: none"> IBL01_P1 + 2 naked silicon L0 sensors L0 local support structure (3-D printed) 	<ul style="list-style-type: none"> finalize half-barrel assembly procedure 	
JUL 2025	IBL01_P3 (half-layer)	<ul style="list-style-type: none"> 2 naked silicon L1 sensors L1 local support structure (carbon foam) outer support shell (carbon fiber, to be defined) 	<ul style="list-style-type: none"> thermal chamber test 	In addition to DISCO dummies, they require: <ul style="list-style-type: none"> carbon foam local support (procurement and machining TBD) carbon fiber outer support shell TBD (if yes, needs for design&simulation, procurement and machining)
	IBL01_P4 (half-barrel)	<ul style="list-style-type: none"> IBL01_P3 + 2 naked silicon L0 sensors L0 local support structure (carbon foam) 	<ul style="list-style-type: none"> thermal chamber test 	
OCT 2025	IBL01_P5 (half-barrel)	<ul style="list-style-type: none"> 2+2 silicon L0+L1 sensors with heaters from CERN L0+L1 local support structures (carbon foam) outer support shell (carbon fiber, to be defined) air distribution inlet et outlet (to be designed) PT1000 sensors (to be glued on heater surface) 	<ul style="list-style-type: none"> wind tunnel test 	IBL01_P5 requires: <ul style="list-style-type: none"> dummy silicon sensors with heaters air-cooling mechanism verification Possible preliminary FPC (mechanical) prototype to check volumes, transport etc) transport issues to wind tunnel facility

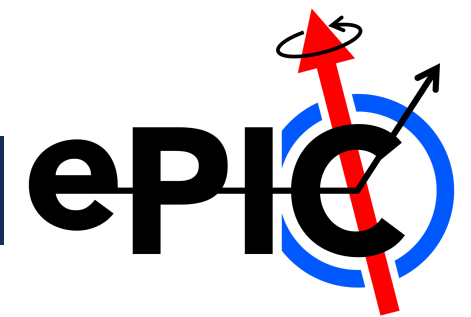
L0/L1 Silicon pieces
SS 3D printed

L0/L1 Silicon pieces
SS carbon fibre/foam

L0/L1 heaters
SS carbon fibre/foam

Prototype	Components	Goal	Date	
IBL012_P6/7	<ul style="list-style-type: none"> 2+2+4 ER2 pad wafer L0+L1+L2 sensors (x 2 HB?) L0+L1+L2 local support structures global support mechanics (advanced design) FPCs (advanced design) air distribution inlet & outlet (advanced design) 	<ul style="list-style-type: none"> first complete IB HB prototype w/o sensors including test of wirebonding to FPCs final test on HB support mechanics possibly built 2 complete HBs (to allow HB mechanical support matching test) 	2026/07	L0/L1 pad sensors SS carbon fibre/foam
IBL012_P8	<ul style="list-style-type: none"> 2+2+4 ER2 wafer L0+L1+L2 sensors L0+L1+L2 local support structures mechanics, FPCs, cooling (~final/advanced design) 	<ul style="list-style-type: none"> complete IB HB prototype w/ sensors qualification model w/ bent sensors for cooling + powering/DAQ/DCS finalisation 	2026/10	L0/L1 ER2 sensors SS carbon fibre/foam

Prototyping campaign vs Material procurement



Silicon sensors:

Silicon pieces	4 L0 - 4 L1	AVAILABLE No spares
Heaters	2 L0 - 2 L1	Under production at CERN (Rui team) Foreseen: 4 L0 - 4 L1
Pad sensors	[2 L0 - 2 L1 - (4 L2)] x 2	If two half-barrels (16 pad sensors = 16 wafers) → no spares
ER2 sensors	2 L0 - 2 L1 - (4 L2)	Only one half-barrel No spares

Support structures:

3D printed	Many...	Actually mixing printed and manufactured in very first exercises
Carbon fibre/foam	Many...	<p>Design and material to be established (foam for half-rings and fibre for logerons)</p> <p>Foam procurement and shaping:</p> <ul style="list-style-type: none"> - Genova INFN → To be explored - Berkley (Nikki) → Expressed availability - U.K. (George) → Expressed availability <p>Carbon fibre production:</p> <ul style="list-style-type: none"> - producer to be identified...

BACKUP

