![Berkeley Lab logo] BERKELEY LAB
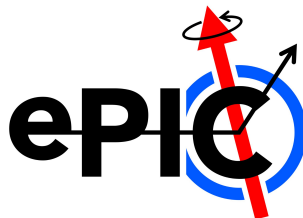Bringing Science Solutions to the World

IB Geometry Updates in DD4hep
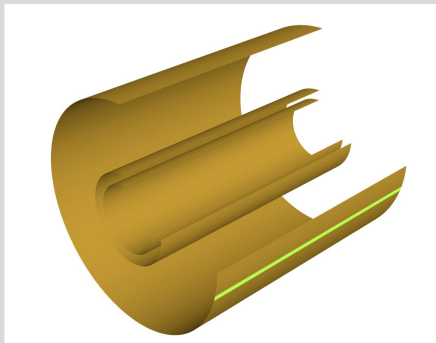
Shujie Li

Tracking++ meeting

Oct 2, 2025

SVT Inner Barrel in ePIC simulation

Until ePIC 25.08:
- 128 box shape per layer to approximate the cylinder
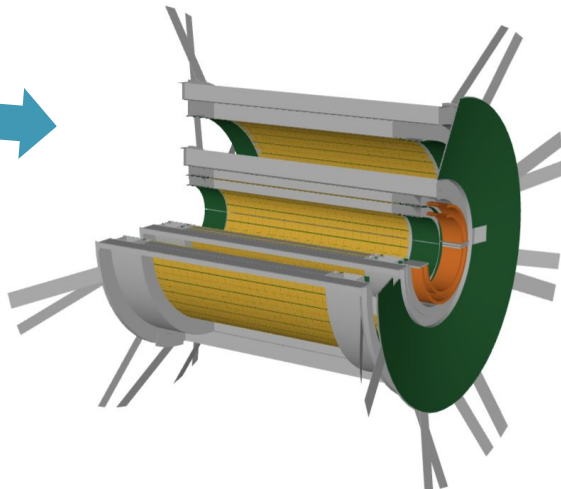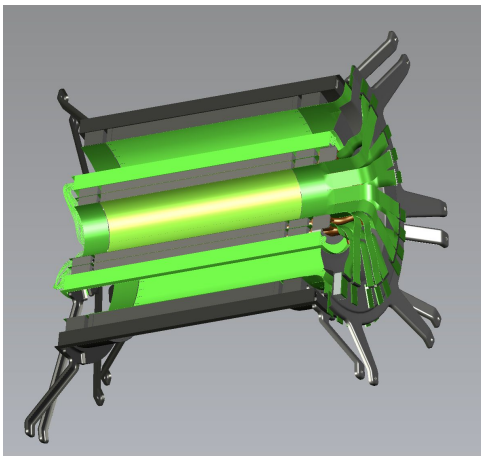- No RSU structure

Anticipated for 25.10:
- Curved RSU sensor with inactive areas
- IB support structure and cables

Stp file of the design → simplified 2D CAD drawings → dd4hep geo description
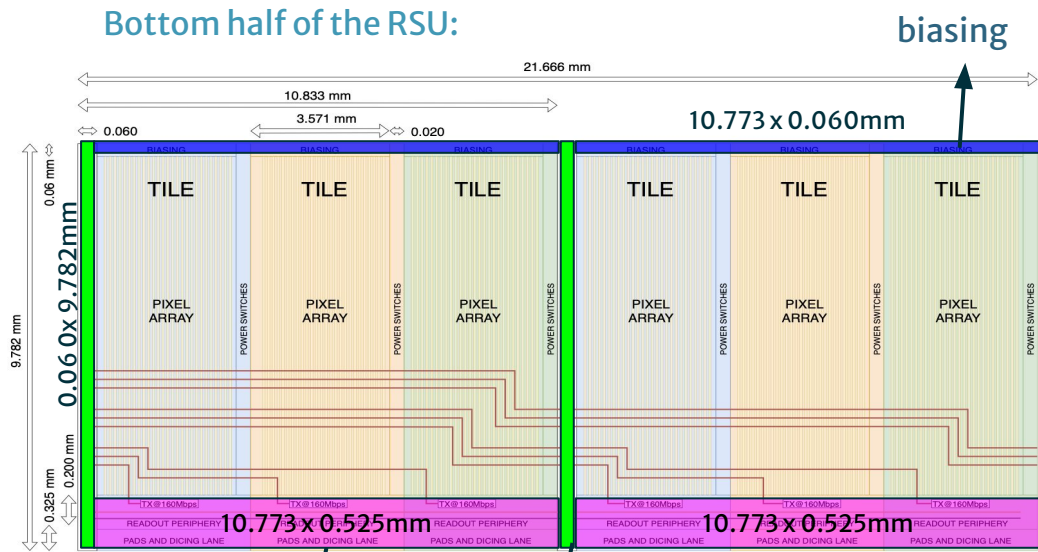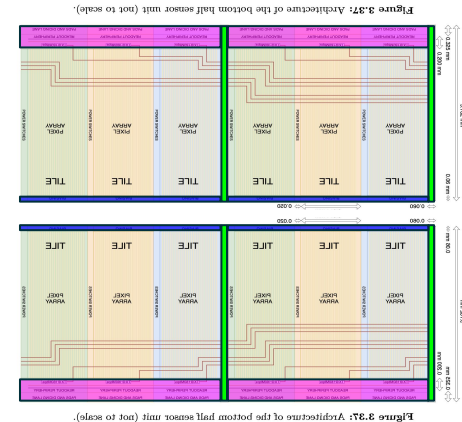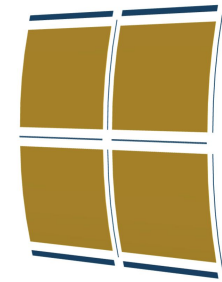Documents available at **PR803**

RSU in Simulation

Bottom half of the RSU:

biasing

10.773 x 0.060mm

Figure 3.37: Architecture of the bottom half sensor unit (not to scale).

readout&dicing
(may shrink in the
actual design)

backbone

10.773 x 0.525mm

2x2 sections, 3 tiles/section:
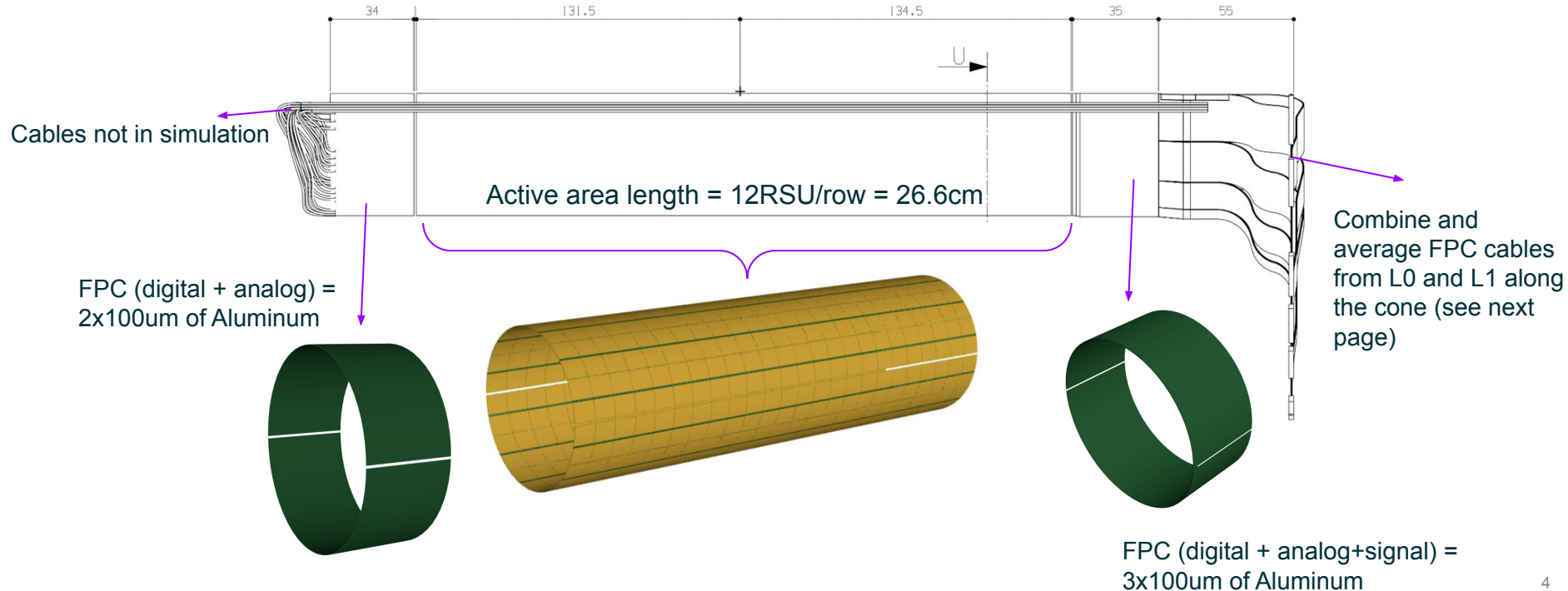

Curved RSU in simulation:

3

Assemble the IB layer:

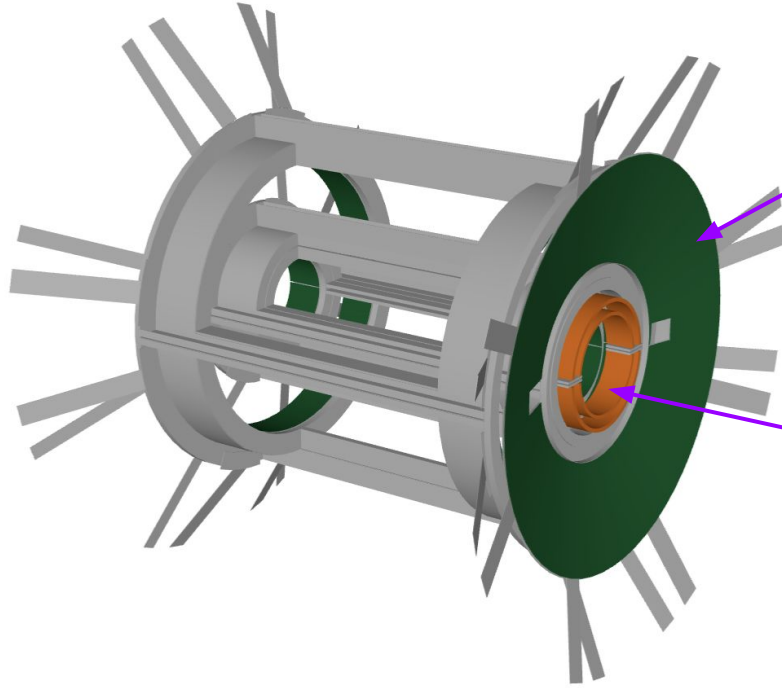Drawing: Draft_Half_Asm_L0L1.pdf from R.Turrisi. See PR803 for details

IB	# of sensors	Rows per sensor	Total # of rows
L0	4	3	12
L1	4	4	16
L2	8	5	40

r=38mm, 50.3mm, 125.2mm

L0:

34   131.5   134.5   35   55

U

Cables not in simulation

Active area length = 12RSU/row = 26.6cm

FPC (digital + analog) = 2x100um of Aluminum

Combine and average FPC cables from L0 and L1 along the cone (see next page)

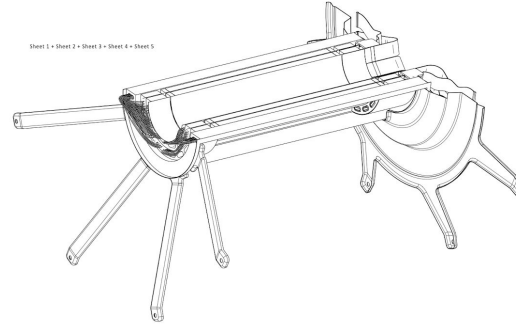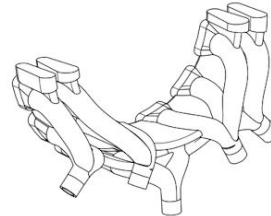FPC (digital + analog+signal) = 3x100um of Aluminum

4

Build Mechanical structures with Simple TGeo Shapes

Distribute cables along the cone.

Approx. air tube connector as a ring

Material Scan

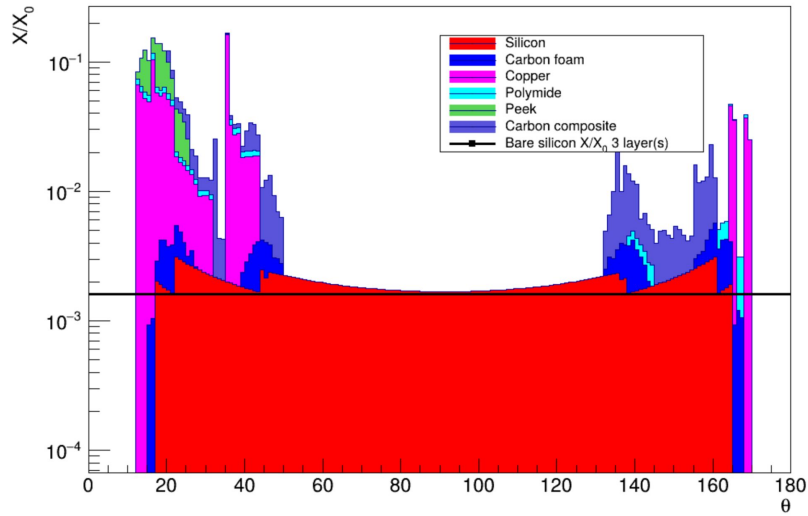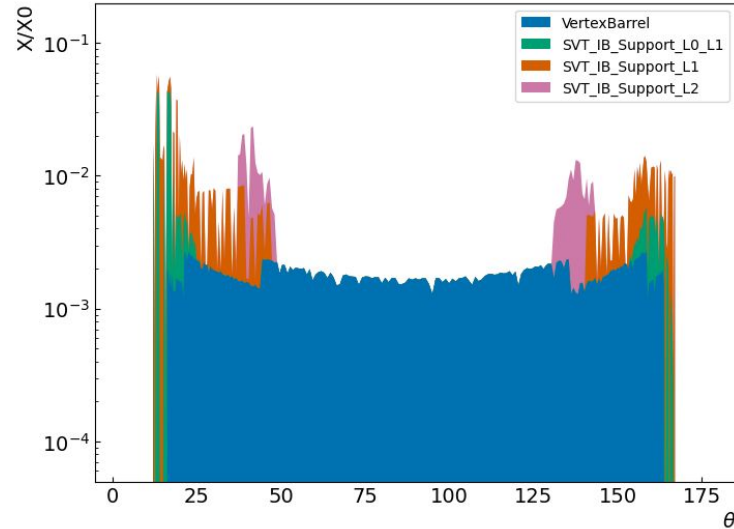- **From stp file → GDML**
  Courtesy of R.Turrisi

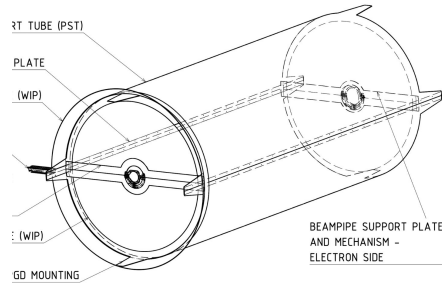- **This simplified geometry for 28.10:**
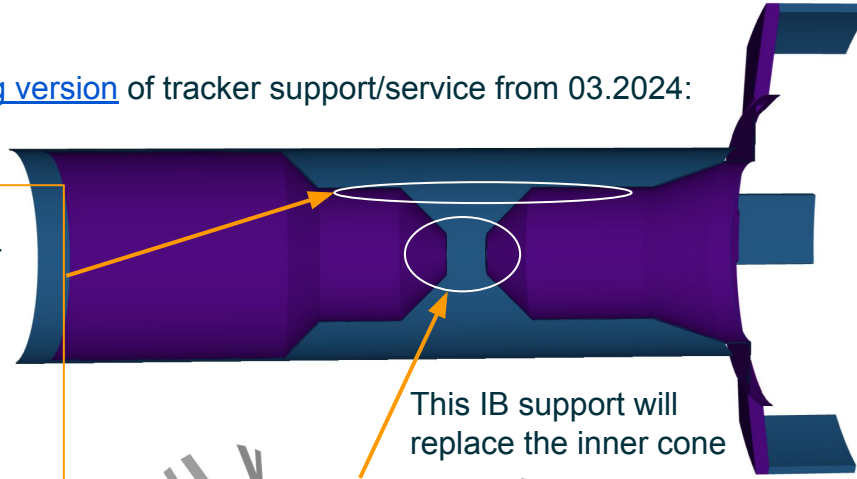
More details on the Support/Service

- [Existing version](#) of tracker support/service from 03.2024:

Next step:
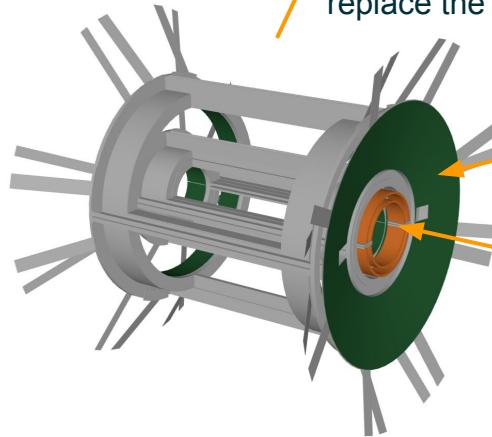1. replace the cylinder with PST (design by Ben Denos) , outer radii 537mm

RT TUBE (PST)

PLATE

(WIP)

(WIP)

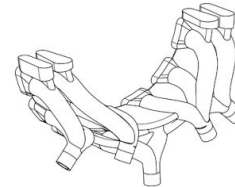BEAMPIPE SUPPORT PLATE
AND MECHANISM –
ELECTRON SIDE

GD MOUNTING

2. Update the service thickness
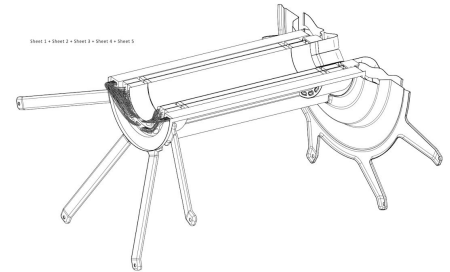3. More updates on the disks (z position, EIC-LAS module+corrugated support…)

This IB support will replace the inner cone

Distribute cables along the cone.

Sheet 1 + Sheet 2 + Sheet 3 + Sheet 4 + Sheet 5.

Approx. air tube connector as a ring

Thanks!