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Bringing Science Solutions to the World



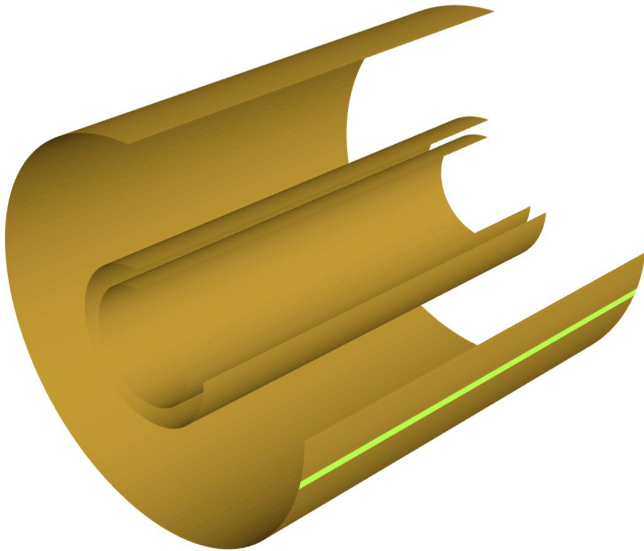
Office of Science

2025 SVT simulation and software plan

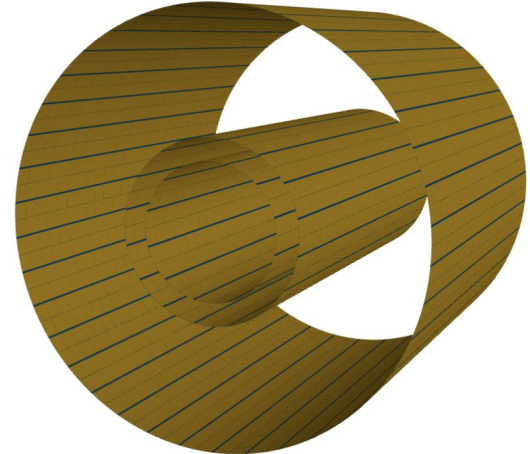
Shujie Li
RNC-EIC meeting
01.28.2025

Inner Barrel in ePIC simulation

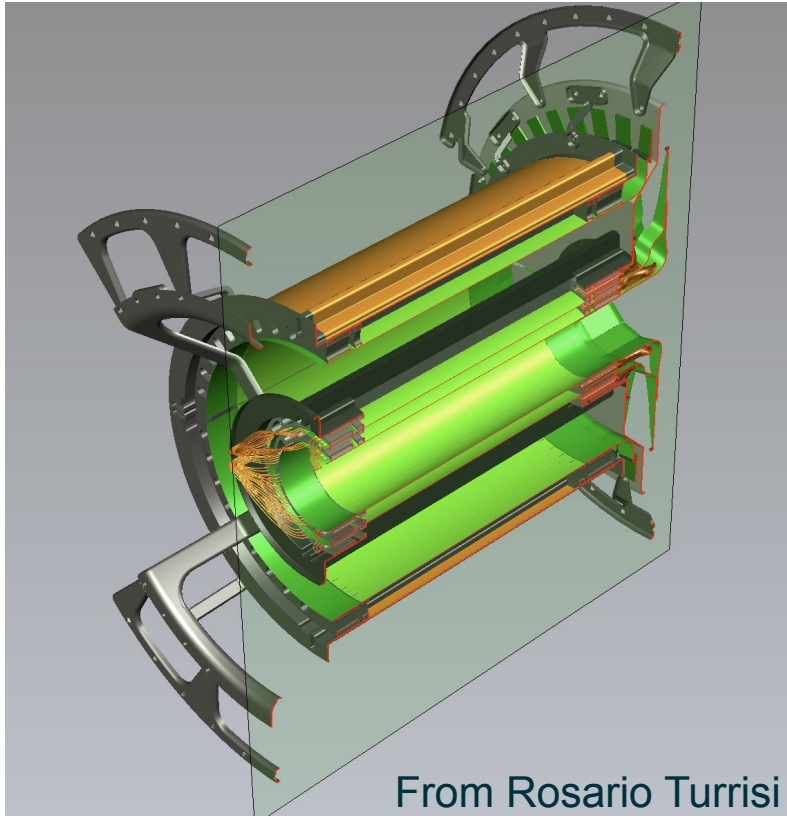
- **Official (25.01):**
 - 128 box shape per layer to approximate the cylinder
 - No RSU structure



- **Recent developments**
(<https://github.com/eic/epic/pull/803>):
 - With RSU structure:
 - 4 sections / RSU + inactive areas
 - Smooth cylindrical surface



IB To do: geometry



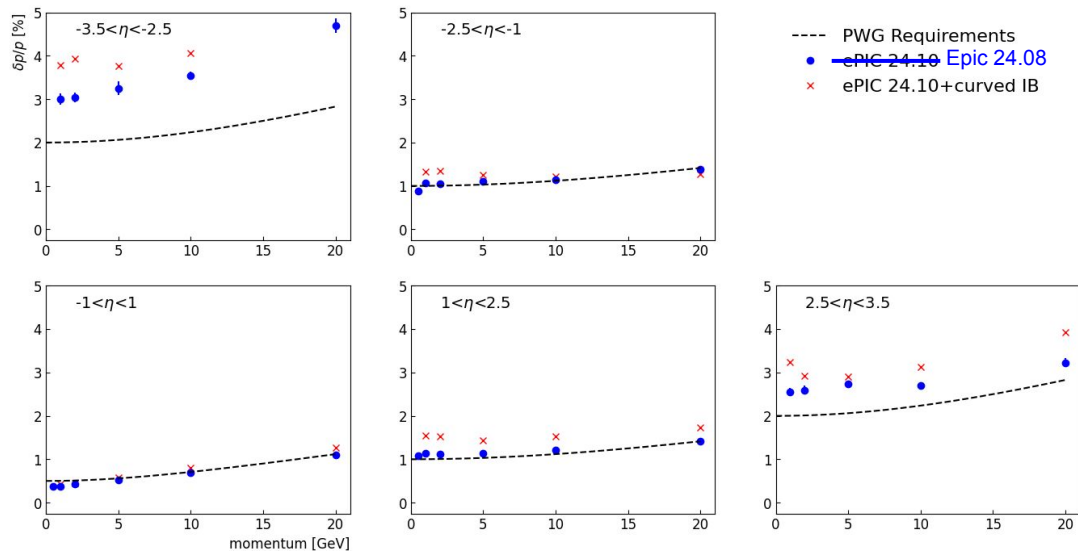
Describe RSU endcaps, mechanical structure and cables in DD4hep

Engineer drawings available, options to convert:

1. Resolve all small overlaps, check the mesh grids with the cylinder shape, then convert the drawing to DD4hep (> 2 months)
2. Sort out shape and material of major pieces, and manually implement them in DD4hep (1-2 weeks)

*will go with option 2. Need discussion with the INFN group

IB To do: validation

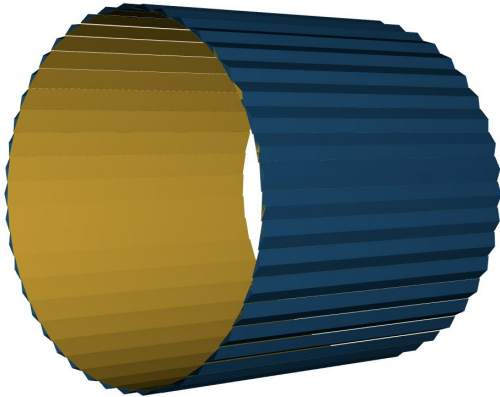


To do:

- Understand changes in 24.10 official version
- Update material map for curved IB
- Performance study

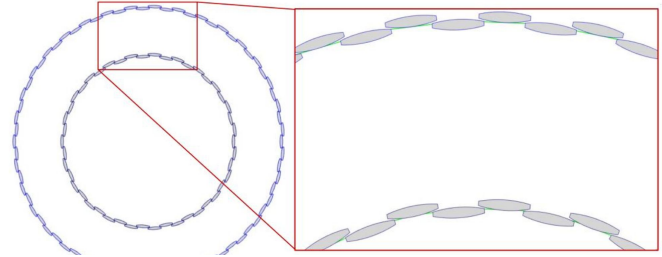
OB in simulation

- **Official (25.01):**
 - Stave with truss-like support structure



- **Recent developments:**

- <https://indico.bnl.gov/event/25167/contributions/97894/attachments/57990/99584/Tracking%20simulation%20OB.pdf>

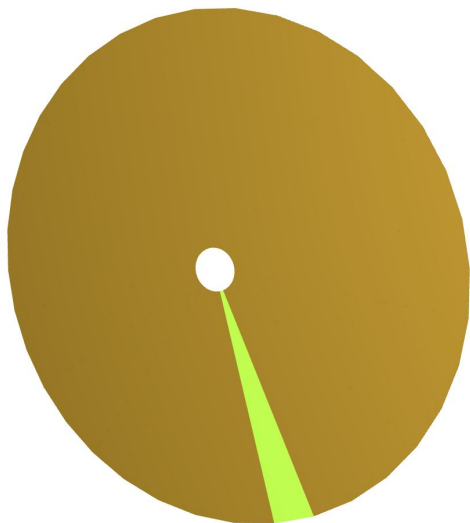


Status: the UK group tried to import engineer drawings but struggling with overlaps.

*will suggest them to implement the shapes (similar to IB option 2)

Disks in simulation

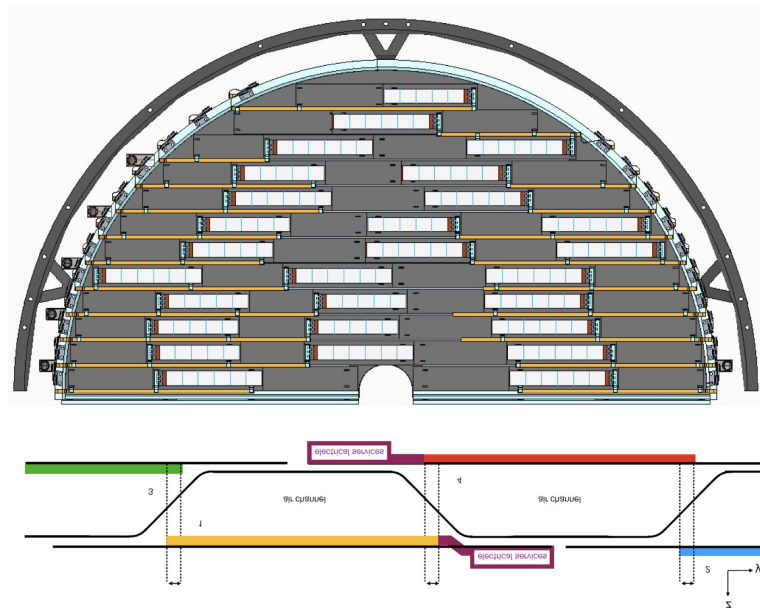
- Official (25.01):



- Recent development:

See Nikki's talk

https://agenda.infn.it/event/43344/contributions/253353/attachments/130605/194405/ePIC_SVTDiscs_1_23_25.pdf



Status:

- waiting for layout from engineer drawings,
- or adapt ALICE algorithm for disk layout – Rita

Ongoing Tracking Study

- Adding random noise in digitization *new undergrad can take over from Mito
- New background merger, SR+electron and hadron beam gas:
<https://indico.bnl.gov/event/26268/>
- KFParticle for secondary vertexing - Xin
- Track projection to PID detector - MPGD group is actively working on it. We may want to reexamine the CKF error propagation on our end.