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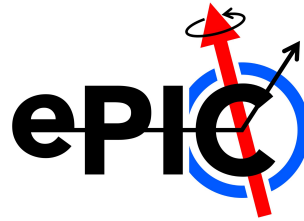
Office of Science

Status of SVT Disk Pavement in Simulation

Shujie Li

ePIC Tracking++ Meeting

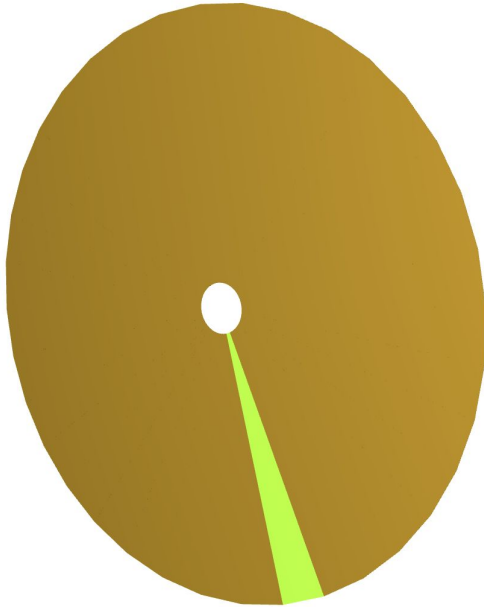
April 23, 2026



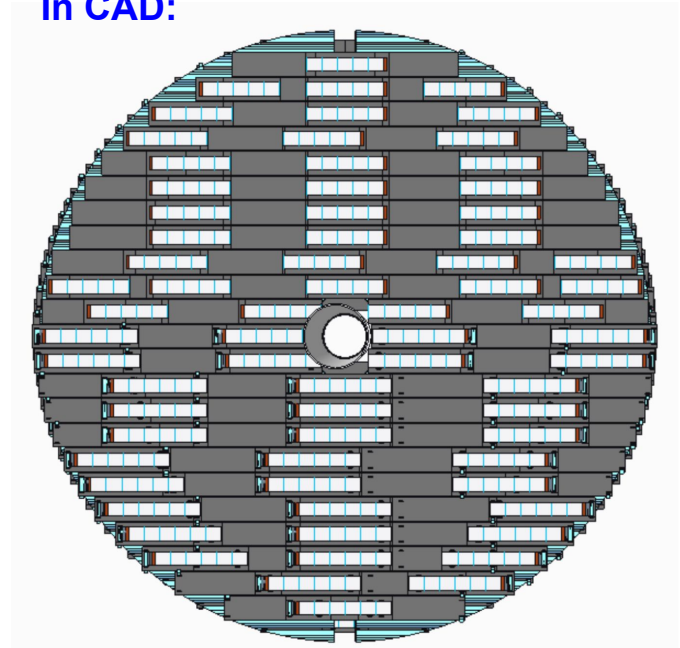
Goal: Construct Disk with EIC-LAS modules

- EIC-LAS modules on corrugated carbon frame
- Realistic disk opening around beampipe

In Simulation 26.04:



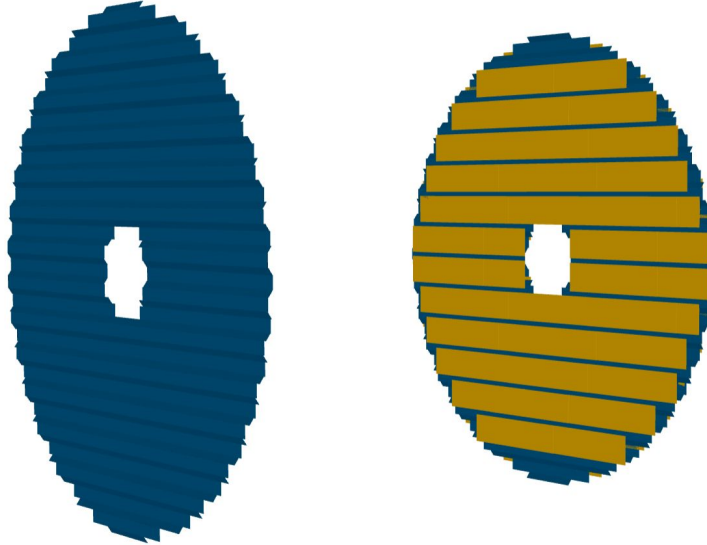
In CAD:



Work in Progress

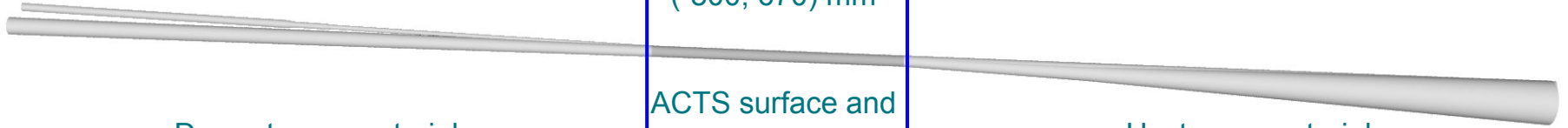
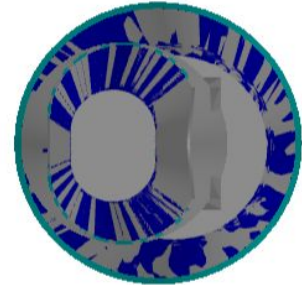
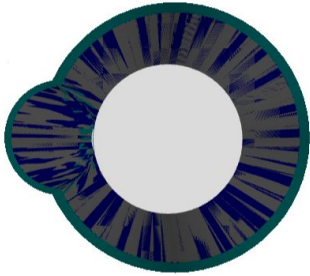
[PR1073](#):

- New plugin with parameterized carbon frame + read disk pavement from csv files
- **To do:** add module details, update the pavement according to the final design, check performance.



Issue: Beampipe fanout

Beampipe Intersections:



Downstream material

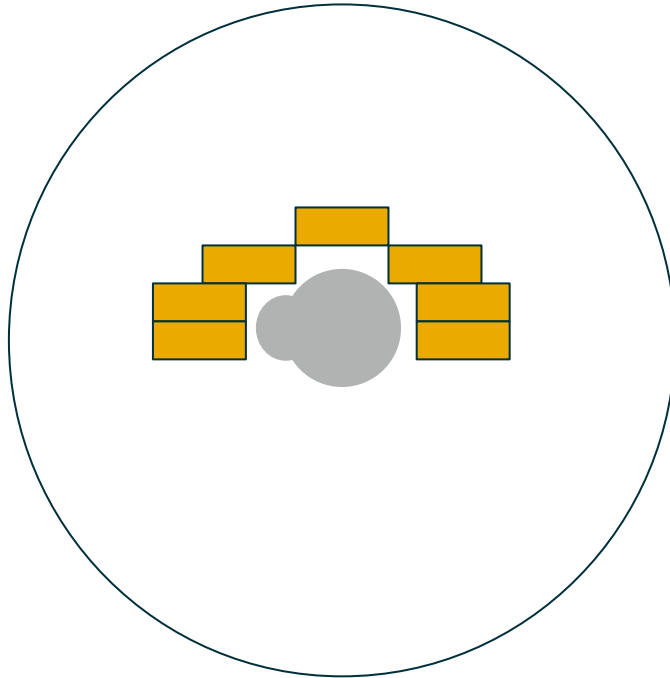
(-800, 670) mm

ACTS surface and
volume

Upstream material

Challenge of SVT disk geometry in simulation

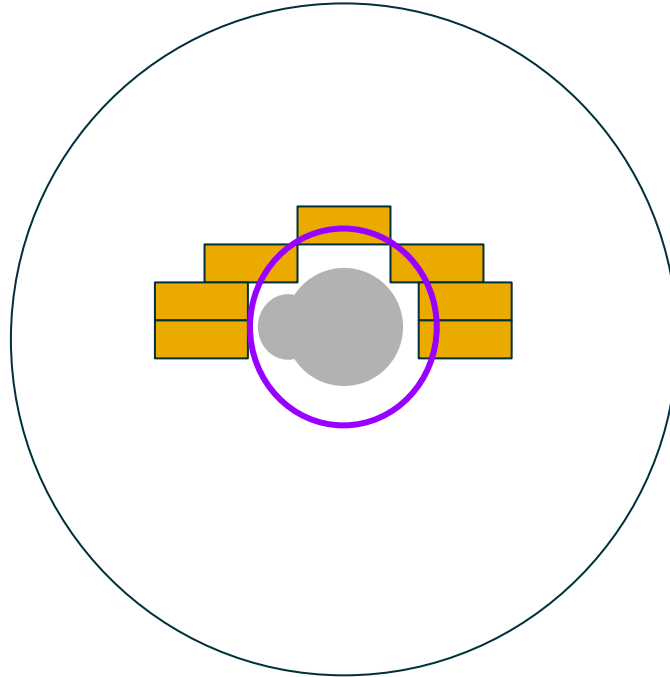
Goal: Place the EIC-LAS modules as close to the beampipe as allowed to max acceptance.



Challenge of SVT disk geometry in simulation

Attempt 0: the disk **volume** has a symmetric and larger inner hole

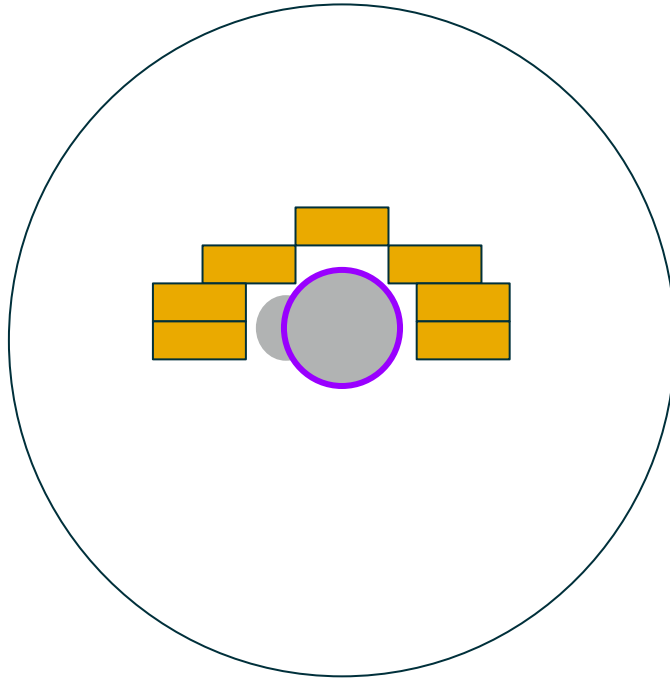
Issue: can't place modules close to beampipe as needed otherwise it go across the disk volume boundary



Challenge of SVT disk geometry in simulation

Attempt 1: define a smaller disk inner envelope **boundary**, it will overlap with beampipe, but as long as no actual module is placed on the beampipe, there's technically no material overlap.

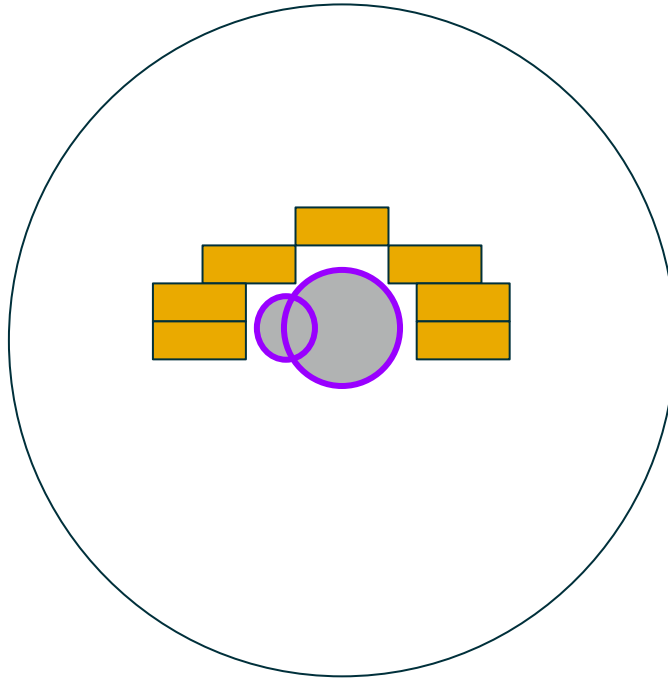
Issue: Geant4 reports overlap which is “dangerous” according to ACTS experts



Challenge of SVT disk geometry in simulation

Attempt 2: endcap is a SubtractionSolid = disk - two beampipe circles.

Issue: ACTS Gen 1 Geometry does NOT support composite geometry as sensitive surfaces



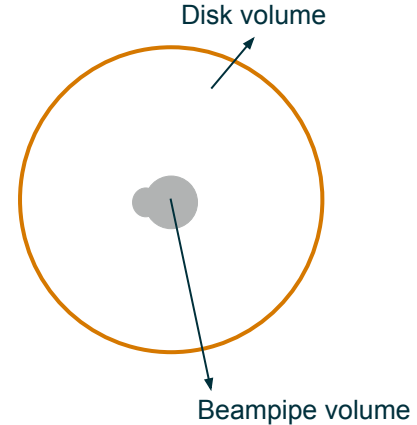
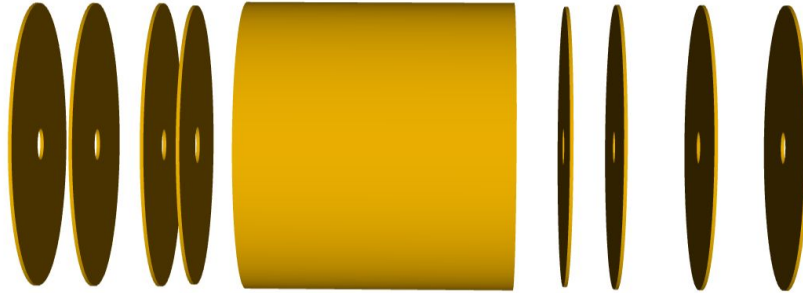
Two Potential Solutions:

1. Slice the beampipe, and put the beampipe segment + SVT disk in one envelope:

Now:

- each endcap as a disk volume with inner hole
- Beampipe (upstream, center, downstream) each as one volume

ED4 volume, ED3 volume, ..., OB volume, ..., HD4 volume



Downstream,

center,

upstream beampipe volume

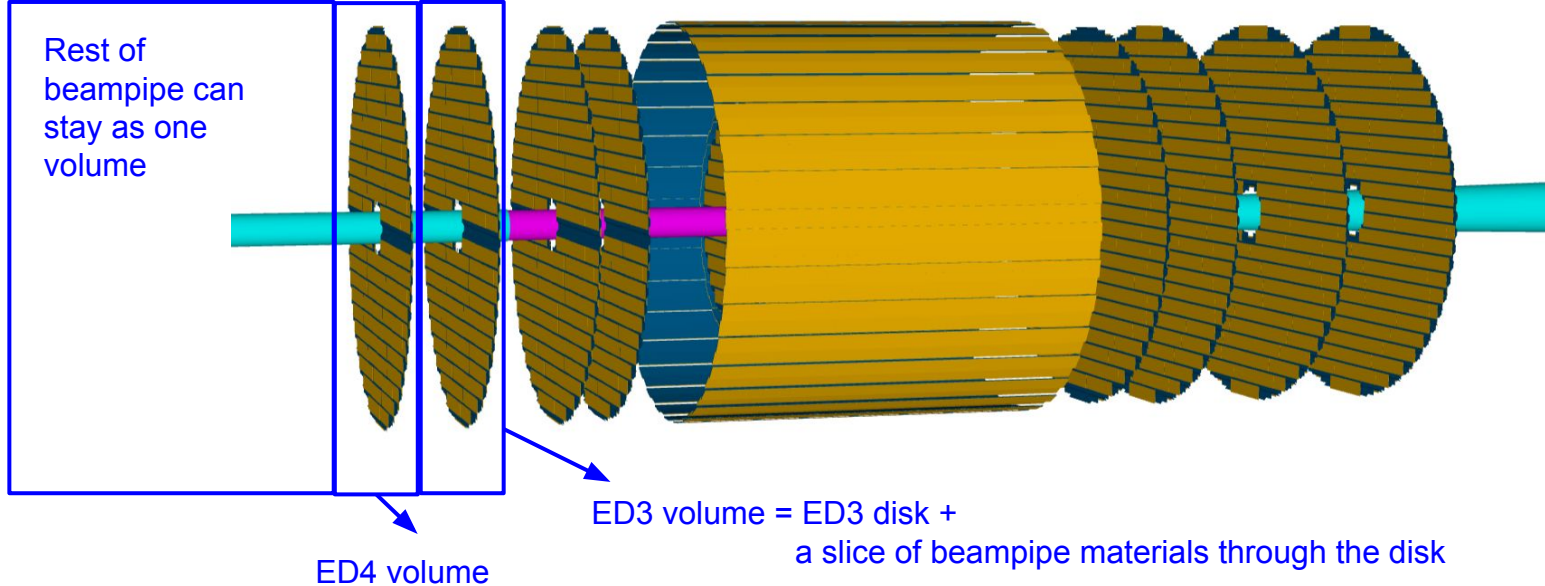


Two Potential Solutions:

1. Slice the beampipe, and put the beampipe segment + SVT disk in one envelope:

Change to:

- Each endcap is a disk volume with no hole.
- Place the slice of beampipe in the volume



Two Potential Solutions:

1. Slice the beampipe, and put the beampipe segment + SVT disk in one envelope:
Change to:
 - Each endcap is a disk volume with no hole.
 - Place the slice of beampipe in the volume
2. Update to ACTS Gen3 geometry which supports more flexible shapes.
 - Timeline?