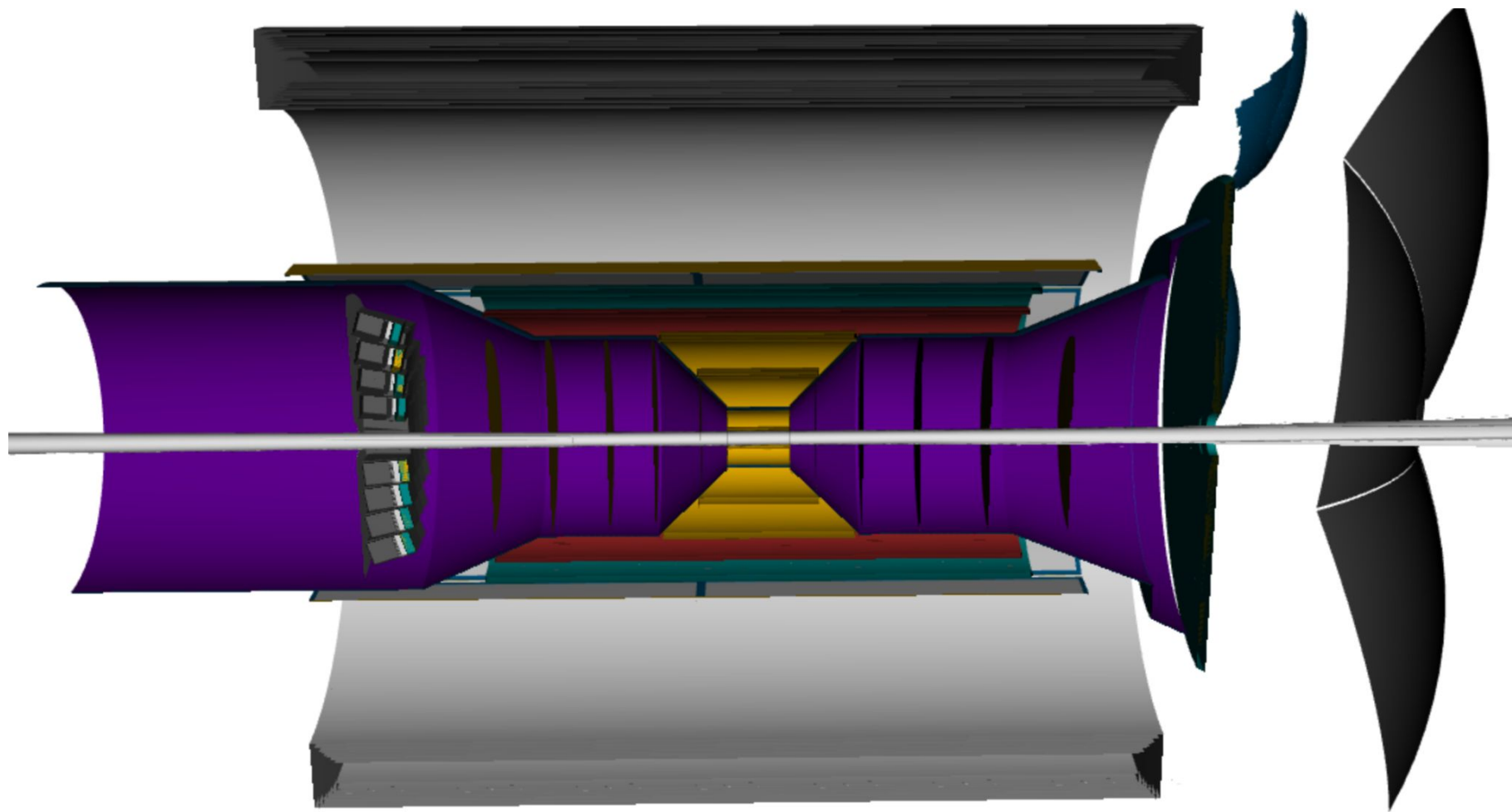


Silicon Tracker Geometry and Materials in DD4hep

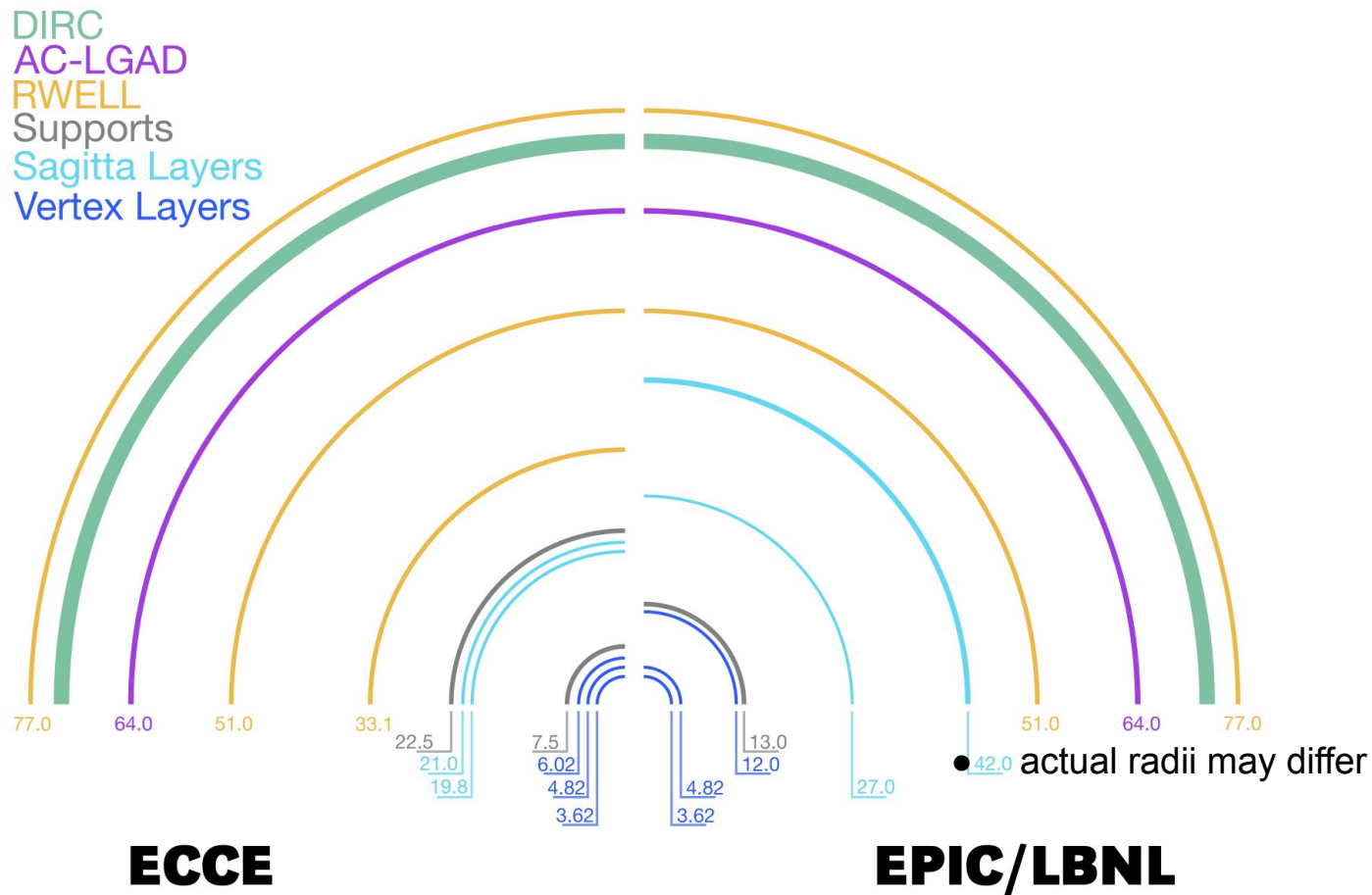
Shujie Li

with Sylvester Joosten, Ernst Sichtermann, Reynier Cruz-Torres

10.26.2022

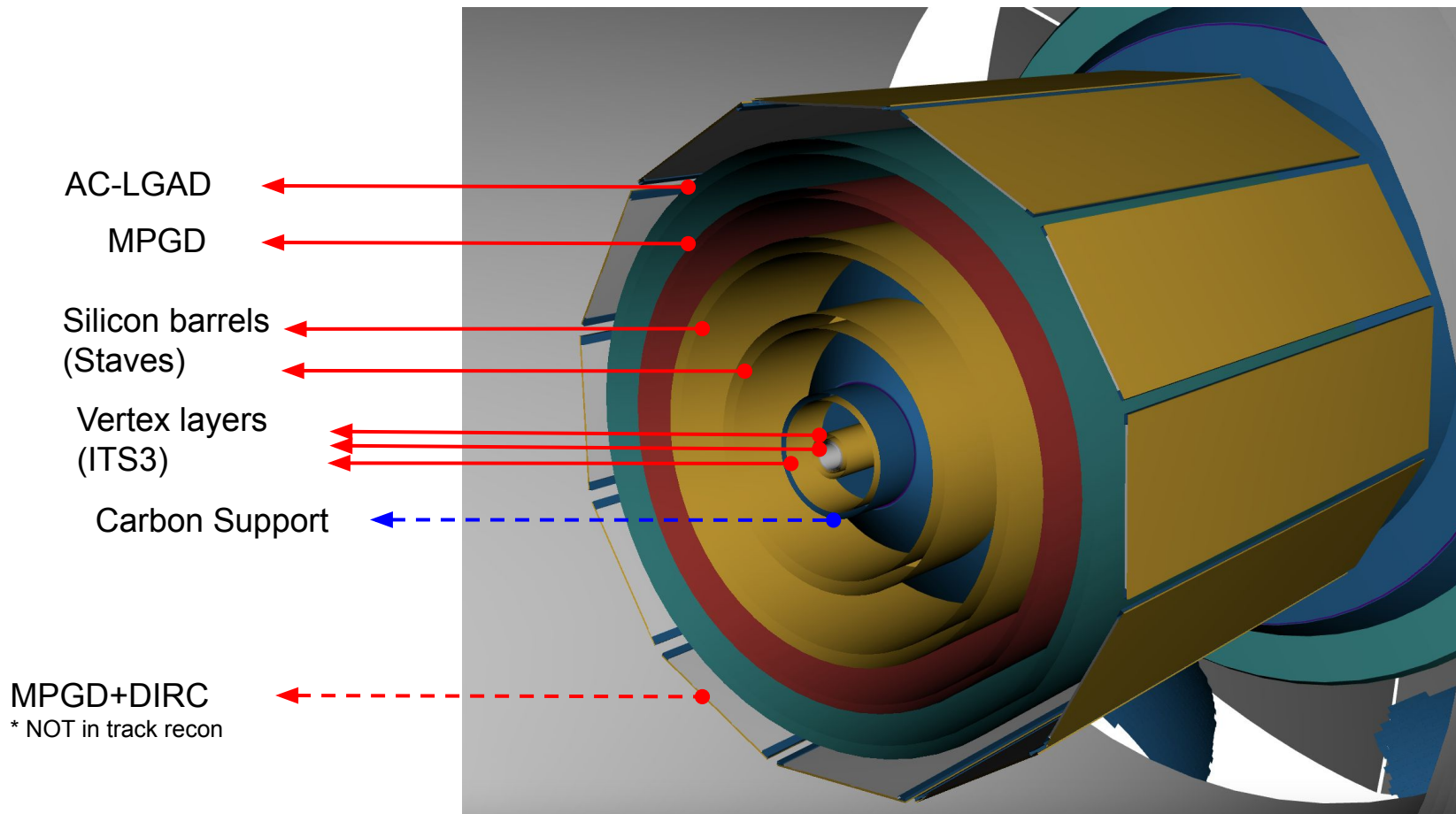


LBL Proposed Barrel Geometry



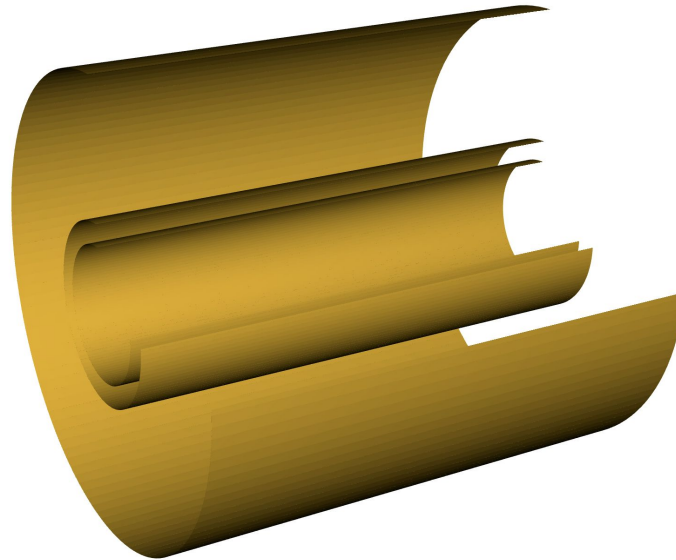
Barrel Geometry in DD4Hep

https://wiki.bnl.gov/EPIC/index.php?title=Tracking#2022_October_Simulation_production_configuration_and_updates



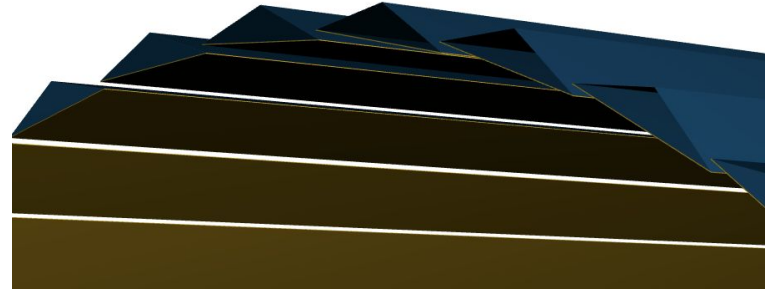
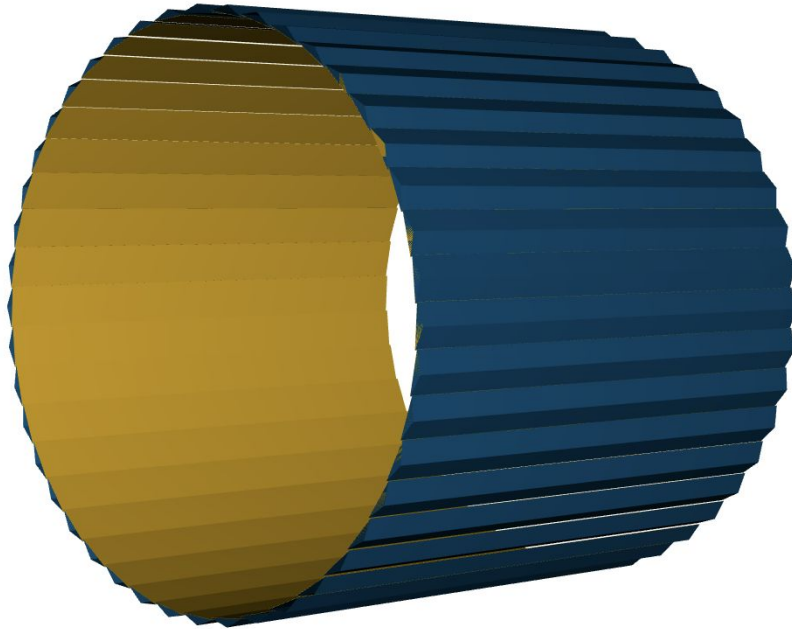
Vertex Layers

3 ITS3 silicon layers (0.04mm each) approximated with 128 staves



Sagitta Layer

44 slightly tilt triangle staves (silicon + Al + carbon fiber plates. No truss structure etc.)

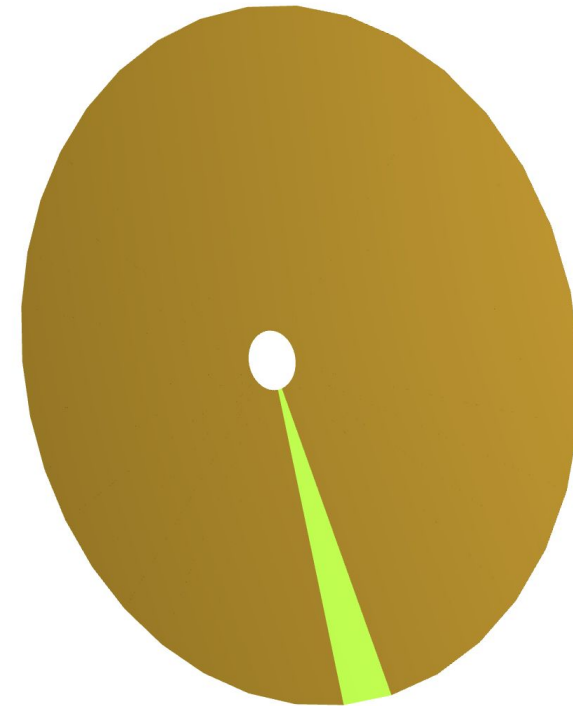


Disks

Symmetric wrt z axis. TBD: allow disk inner hole offset (S. Maple)

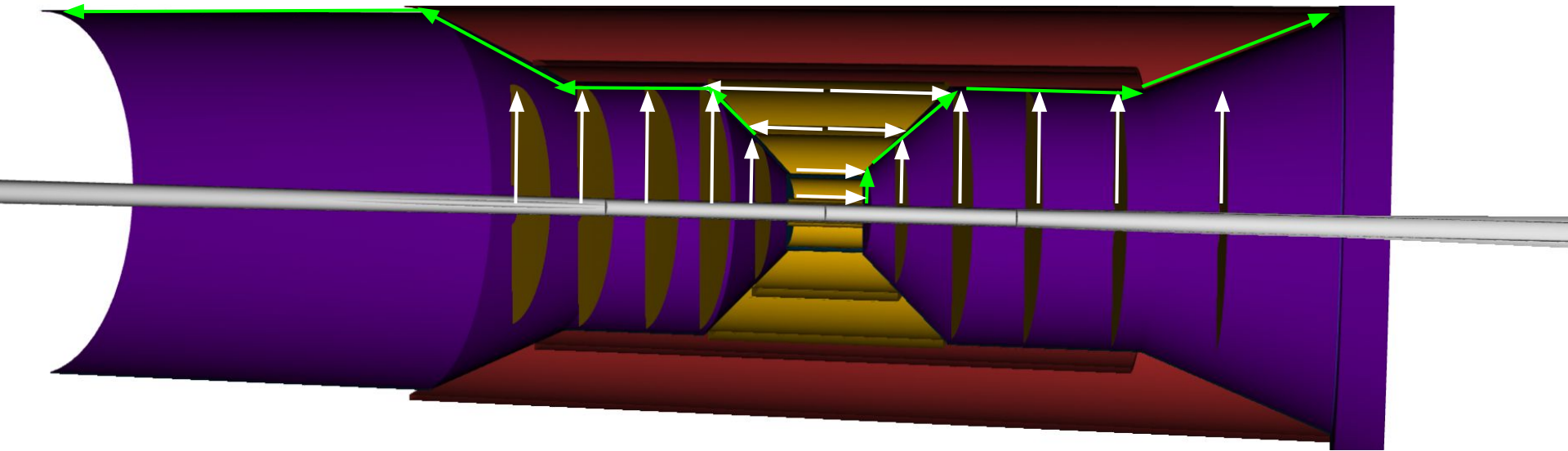
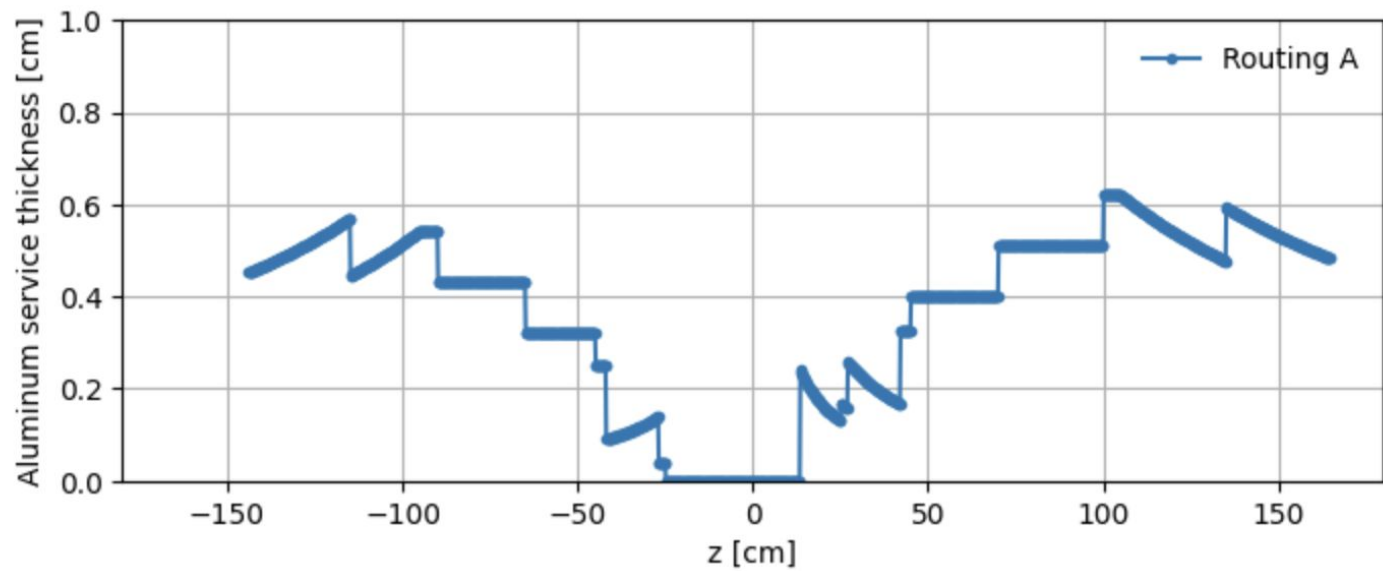
- $X/X_0=0.24\%$
- silicon + carbon fiber + aluminum plates
- 36 sections of

disk	Name in dd4hep	z pos (mm)	R_bpipe	x_offset	R_outer	R_inner_sym
5n	TrackerEndcapNDisk4	-1150	38.0431	-3.3098	430	46.3529
4n	TrackerEndcapNDisk3	-900	34.2444	-0.817	430	40.0614
3n	TrackerEndcapNDisk2	-650	31.76	0	430	36.76
2n	TrackerEndcapNDisk1	-450	31.76	0	430	36.76
1n	InnerTrackerEndcapN	-250	31.76	0	230	36.76
1p	InnerTrackerEndcapP	250	31.76	0	230	36.76
2p	TrackerEndcapPDisk1	450	31.76	0	430	36.76
3p	TrackerEndcapPDisk2	700	32.86	0.56	430	38.42
4p	TrackerEndcapPDisk3	1000	40.58	7.85	430	53.43
5p	TrackerEndcapPDisk4	1350	49.12	16.02	430	70.14

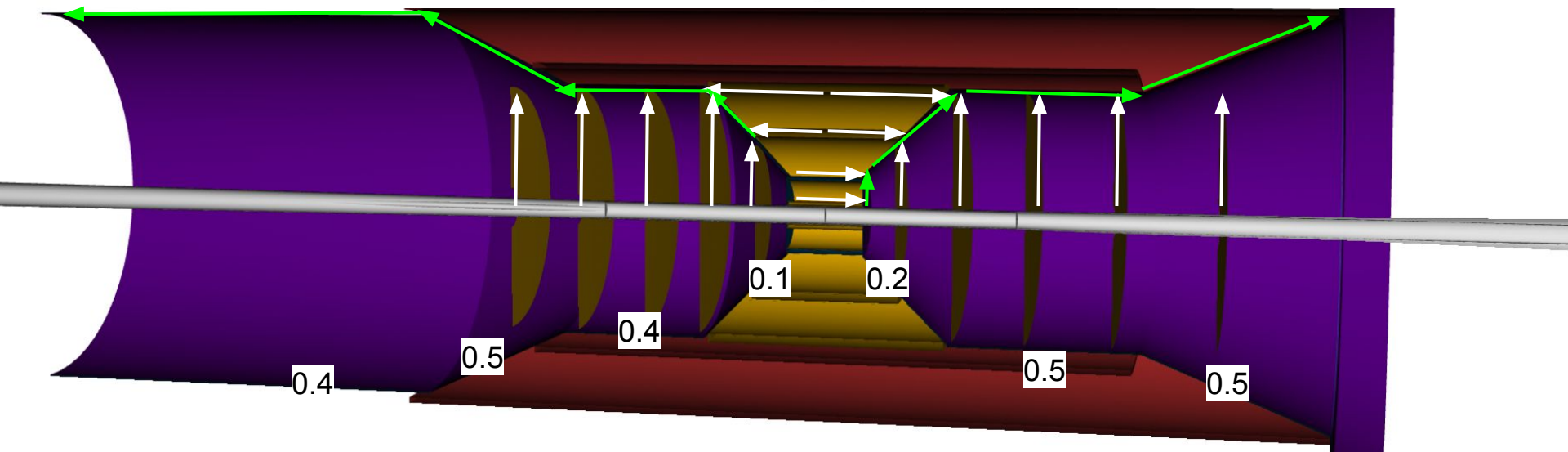
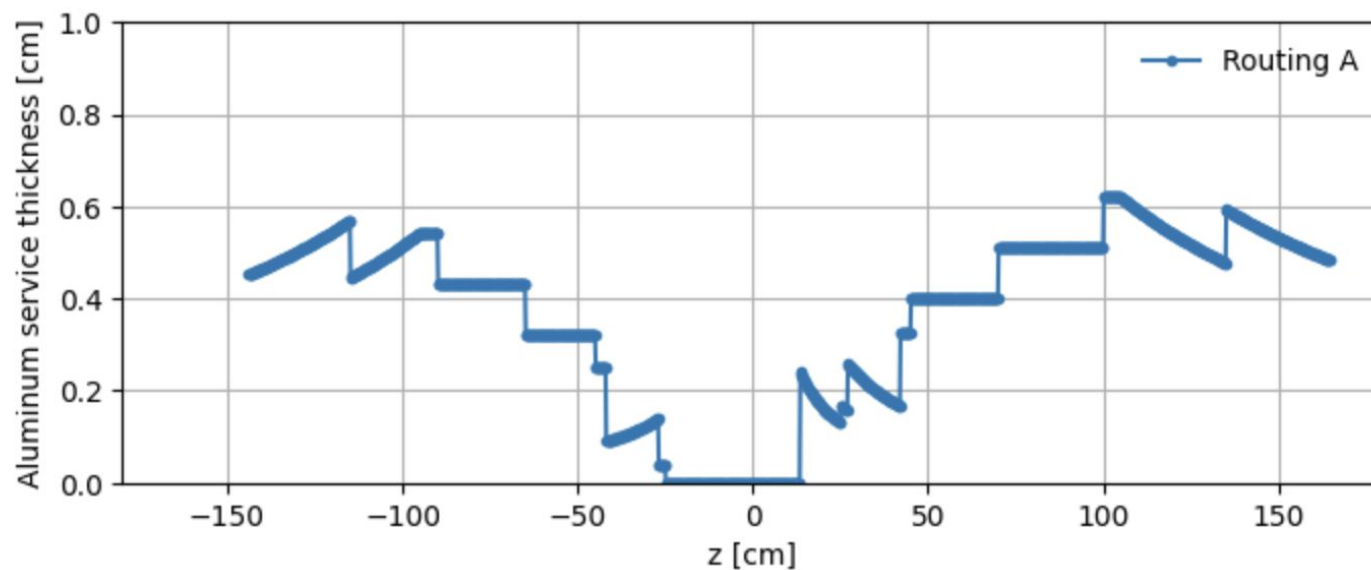


Disk z position re-optimized. See [Ernst's talk](#)

Service Cable Routing

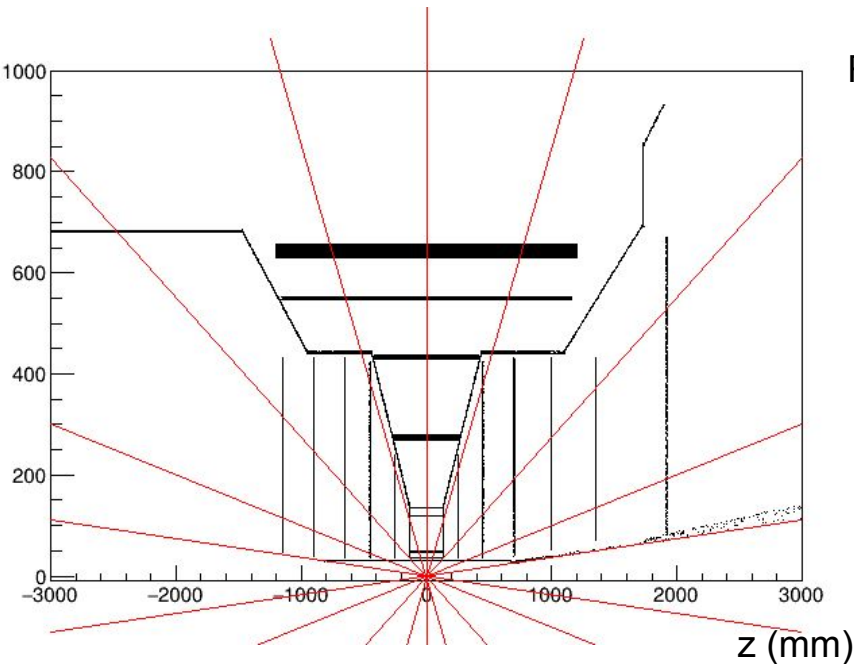


Service Cable Routing

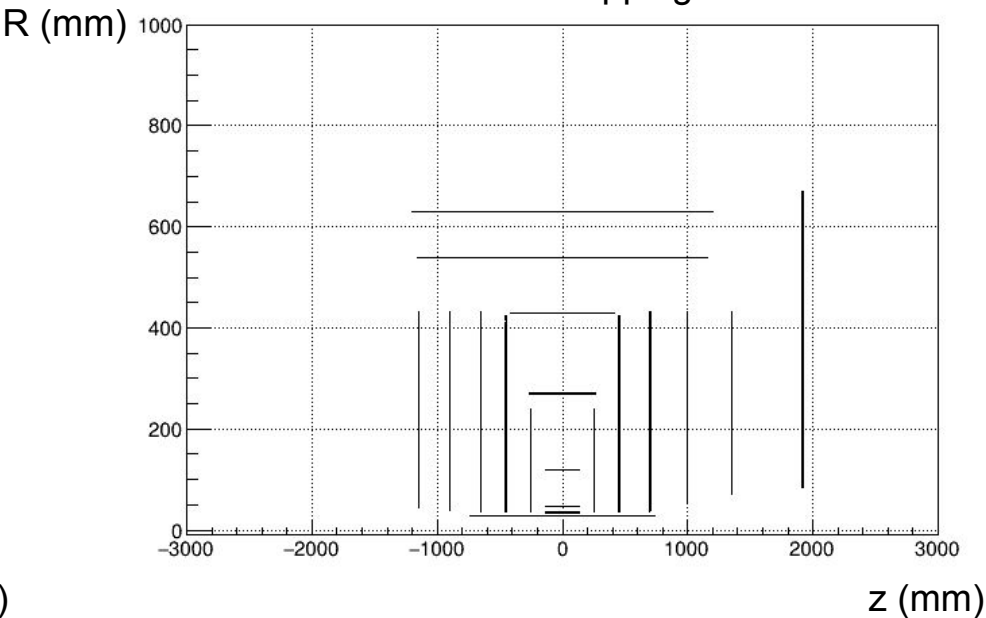


Material Mapping for ACTS

Geantino Scan



ACTS Surfaces with
Material Mapping



Material Mapping for ACTS

