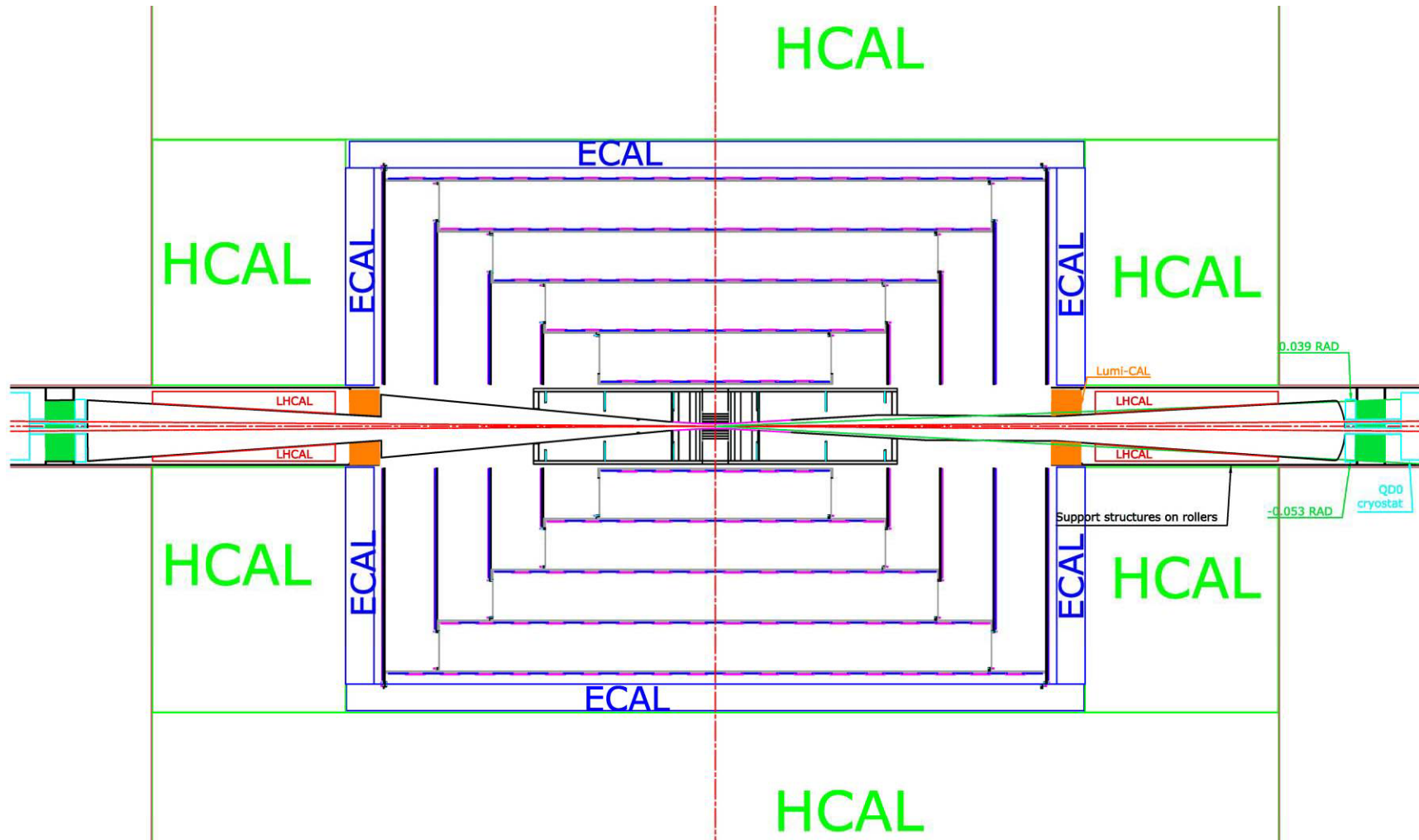


SiD Forward Calorimetry Geometry

Bill Cooper
Fermilab

Overall Geometry

- SiD with two alternative beam pipes (neither is the baseline):



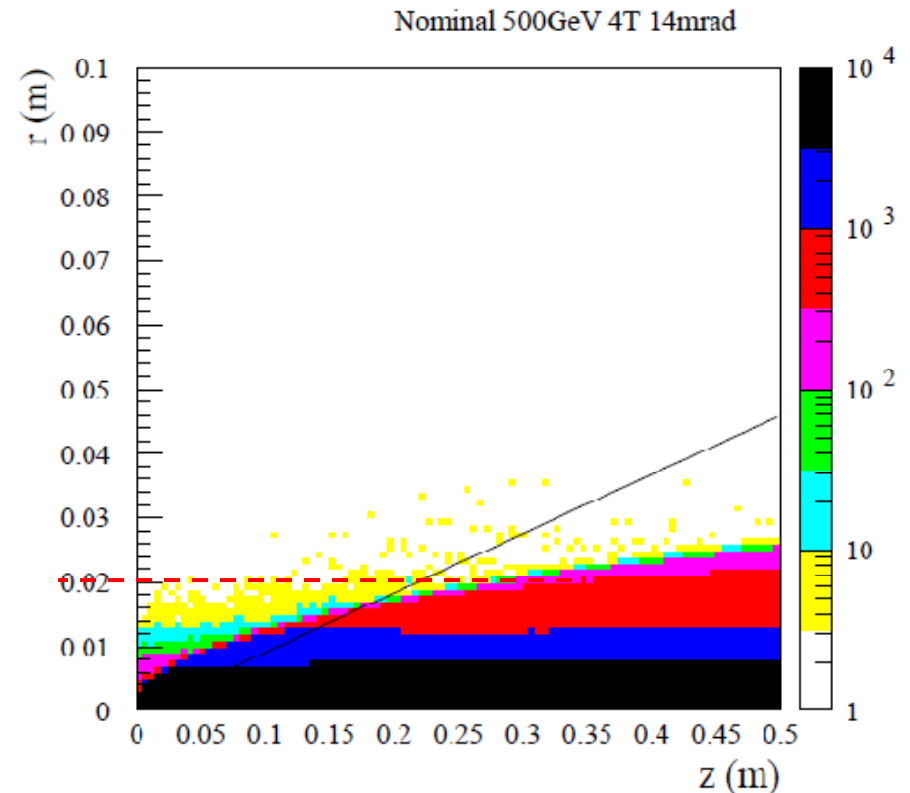
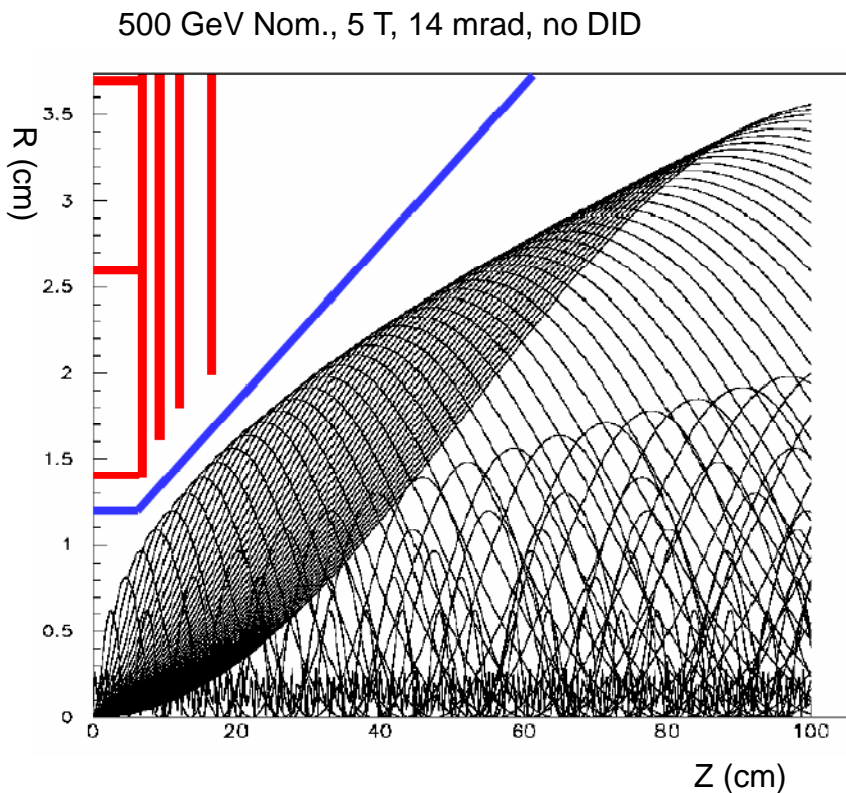
R30 Servicing Option

- The R 30 cm option (versus the current R 20 cm) decreases forward ECAL coverage from $\cos(\theta) = \sim 0.993$ to ~ 0.985 .
- For the current VTX geometry, un-instrumented radial gap to the outer tracker (90° tracks) increases from ~ 16 cm to ~ 26 cm.
- Average layer-to-layer gap (90° tracks) in the outer tracker decreases from ~ 25 cm to ~ 22.5 cm.

Backgrounds

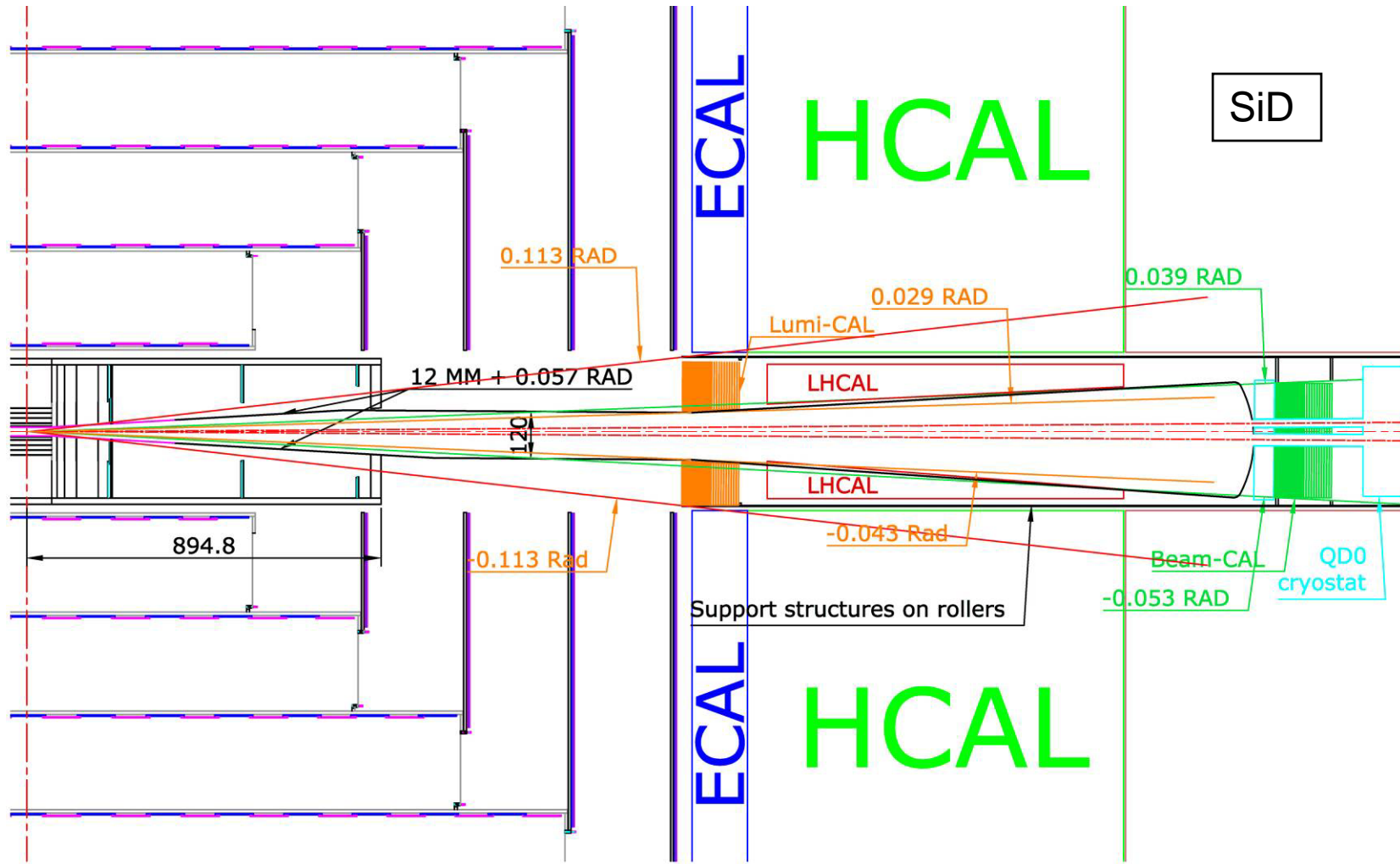
- T. Maruyama (SLAC)
 - Note that trajectories seem to return to the Z-axis.
 - We need to understand effects of the crossing angle.

- Y. Sugimoto (Sendai meeting)
 - Note the additional background below $z = 0.25$ m.
 - Yasuhiro suggests a single cone design is not preferable for VTX.



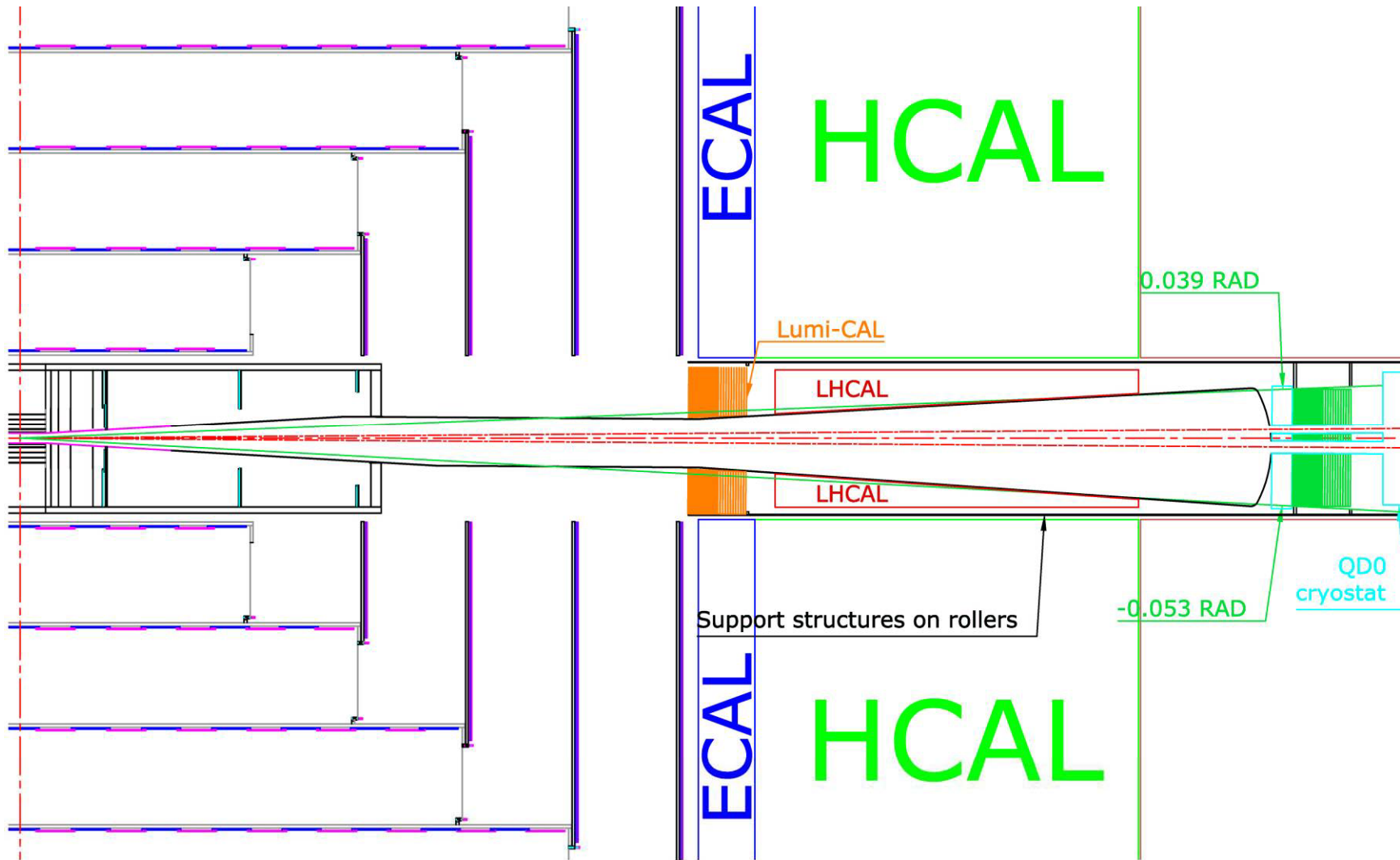
Geometry in the Forward Region

- Which beam pipe portions should be rotated to the outgoing beam line?



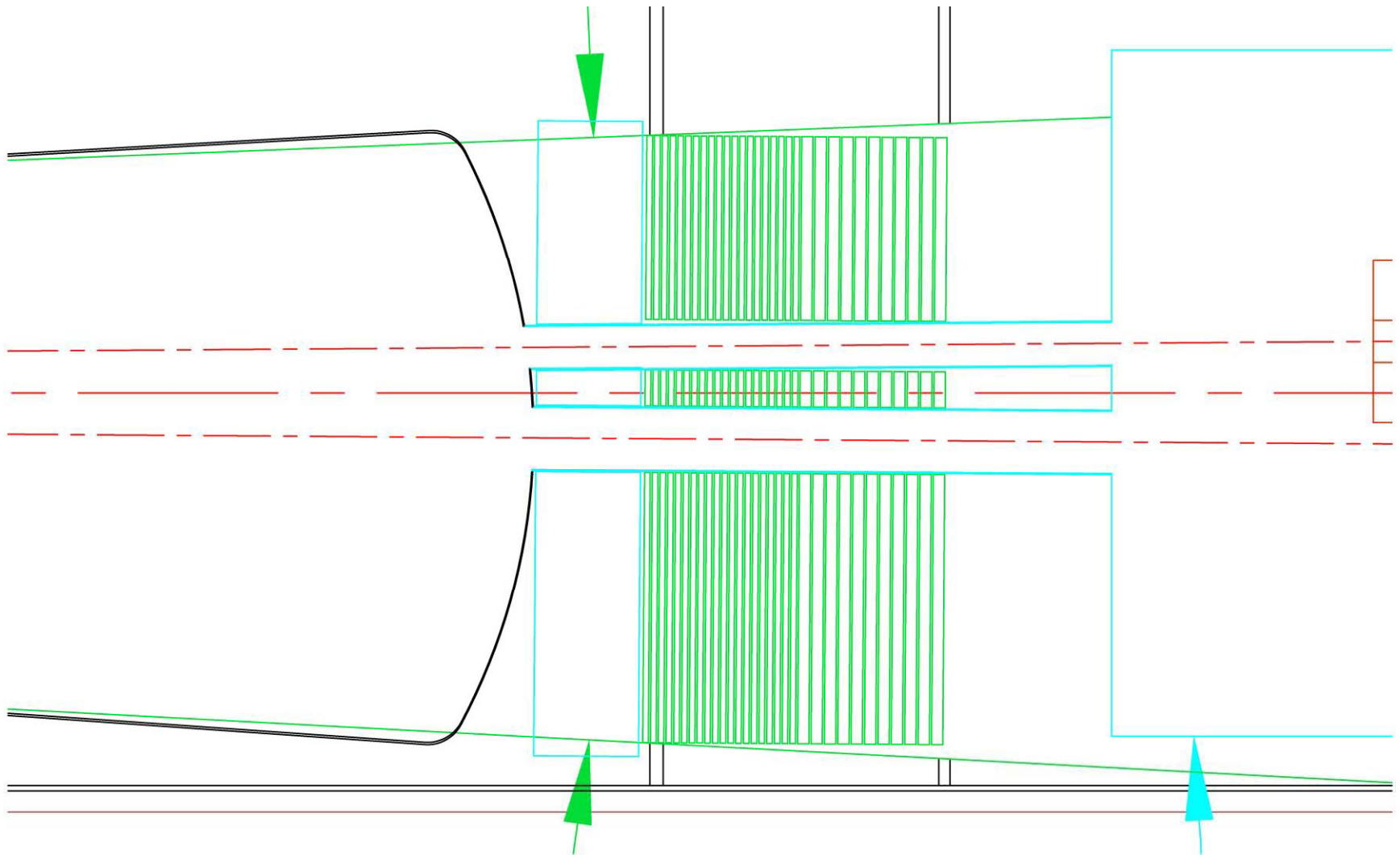
Geometry in the Forward Region

- Which beam pipe portions should be rotated to the outgoing beam line?



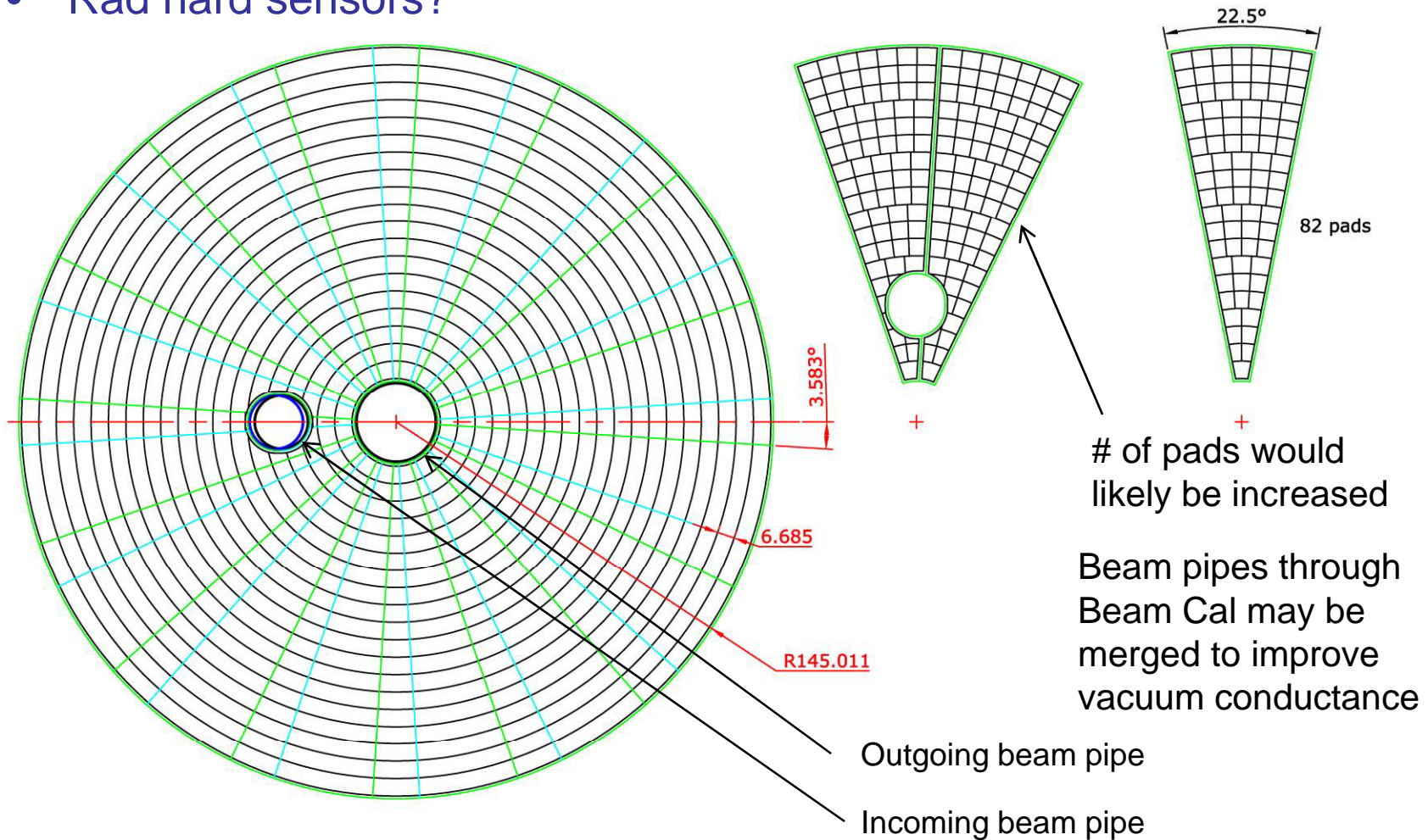
Geometry in the Forward Region

- BeamCal coverage



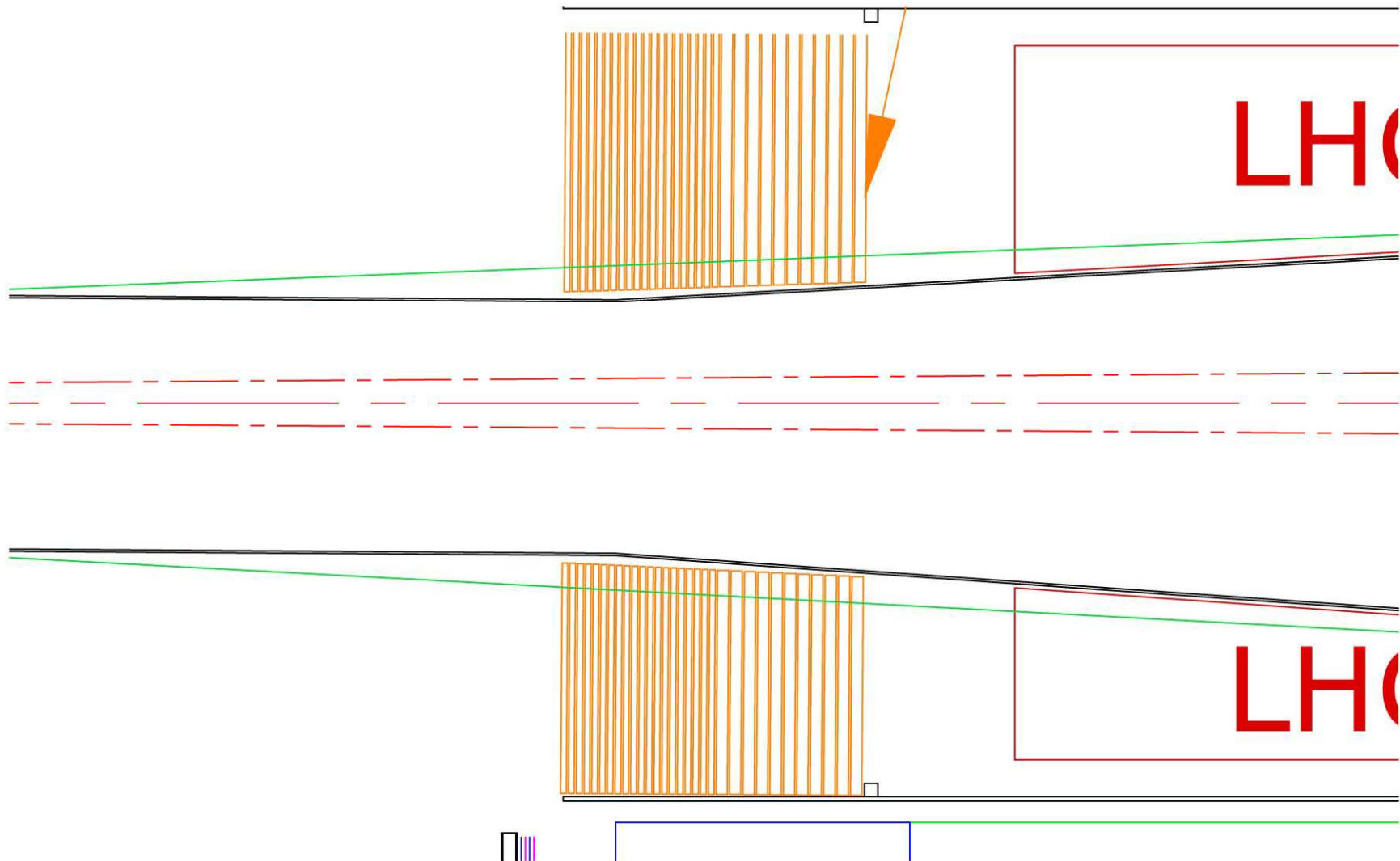
Preliminary BeamCal Sensor Layout (SiD)

- Assumes 6" silicon sensor technology.
- Wedges rotated in alternate planes for overlap.
- Rad hard sensors?



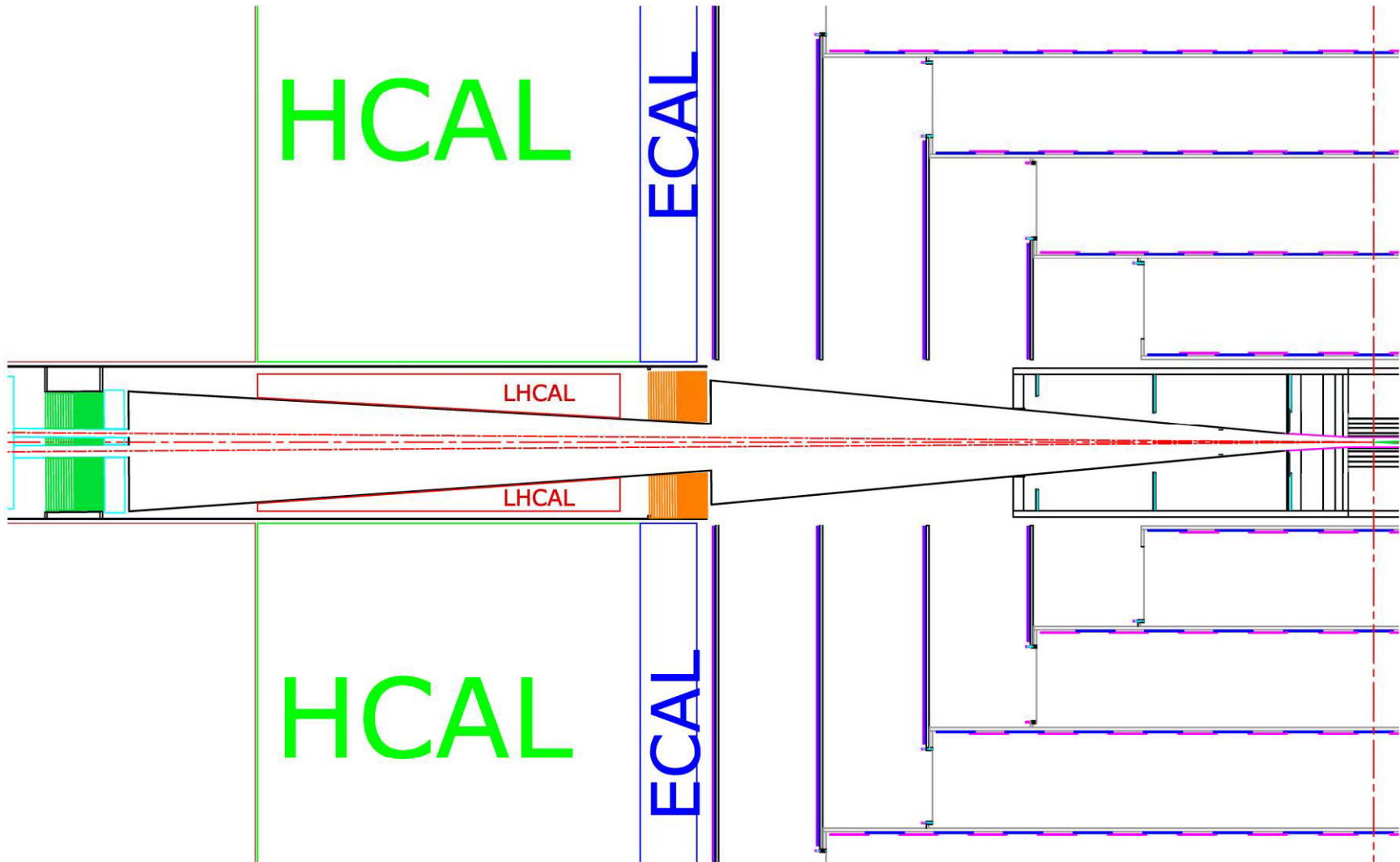
Geometry in the Forward Region

- LumiCal coverage



Geometry in the Forward Region

- Which beam pipe portions should be rotated to the outgoing beam line?



ILD LumiCal Layout (C. Grah, Sendai Meeting)



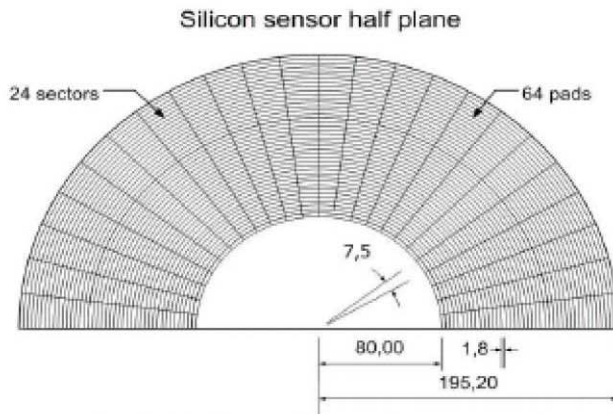
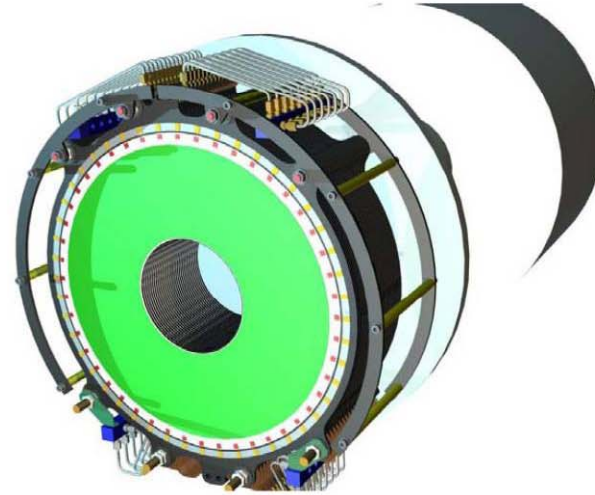
LumiCal: Design Parameters

➤ 1. Placement:

- ❖ 2270 mm from the IP.
- ❖ Inner Radius - 80 mm
- ❖ Outer Radius - 190 mm

➤ 2. Segmentation:

- ❖ 48 sectors & 64 cylinders:
- ❖ Azimuthal Cell Size - 131 mrad
- ❖ Radial Cell Size - 0.8 mrad



➤ 3. Layers:

- Number of layers - 30
- Tungsten Thickness - 3.5 mm
- Silicon Thickness - 0.3 mm
- Elec. Space - 0.1 mm
- Support Thickness - 0.6 mm

March/2008

C.Grah: Forward Region

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