

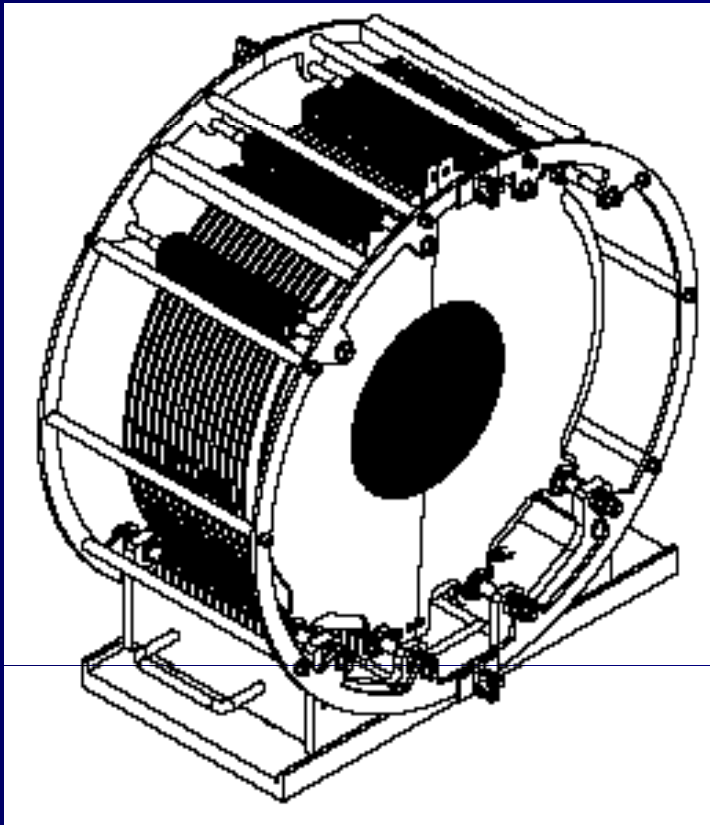
LumiCal mechanical design

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FCAL Workshop, LAL Orsay, 05-06.10.2007



Mechanical design

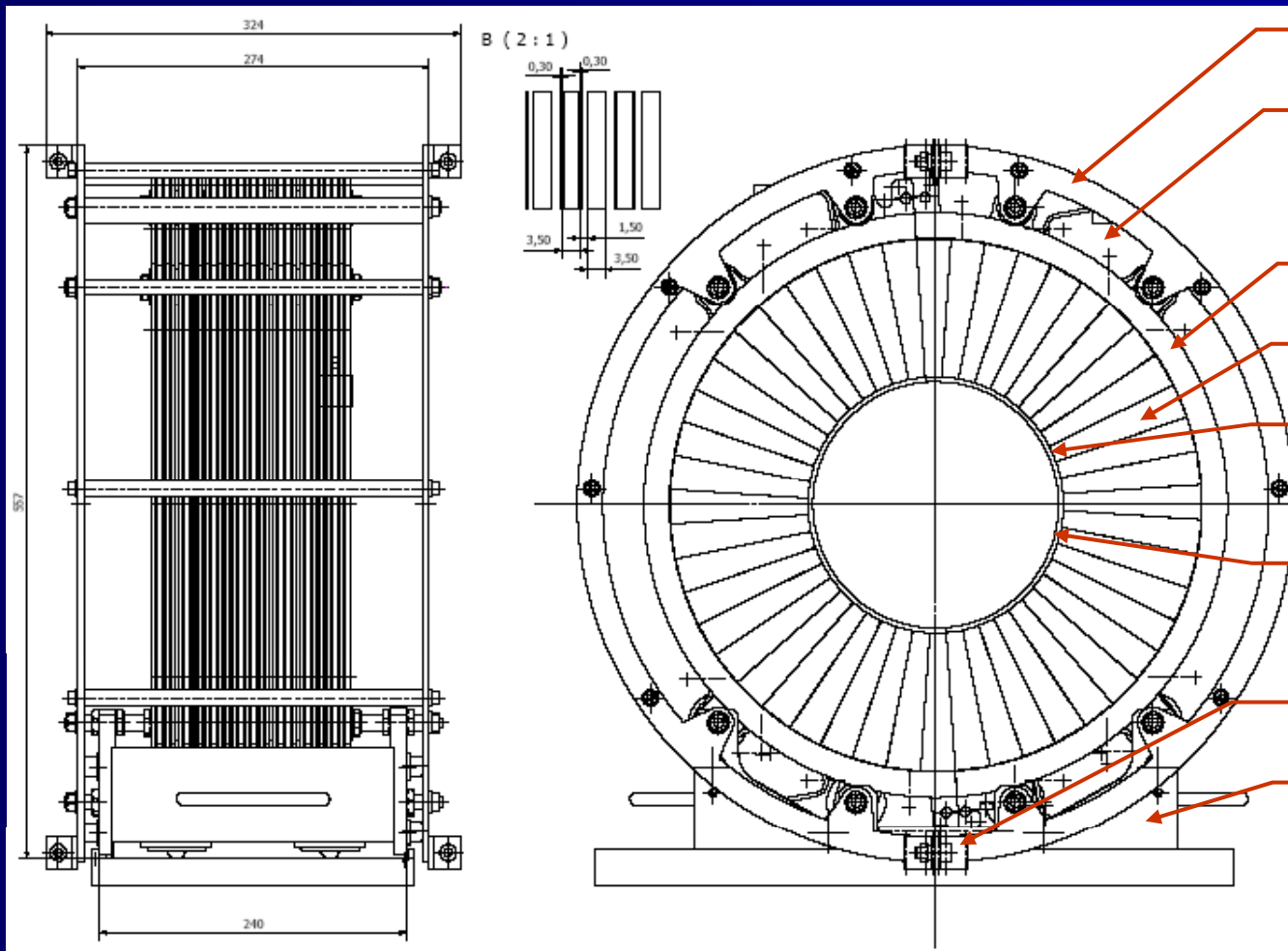


- Two half barrels to clamp LumiCal on the beam pipe
- 30 tungsten/silicon detector layers
- Odd/even planes rotated by 7.5 degree
- Total weight of ~250 kg (one LumiCal)
- Self supporting design of the tungsten structure
- „C” frames for supporting cables, cooling, alignment
- Movable support to open LumiCal – temporary support necessary

Very challenging project

Accuracy in Si sensors placement in order of a few micrometers

Mechanical design



„C” frame

Cables,
cooling

FE electronics

Si detector

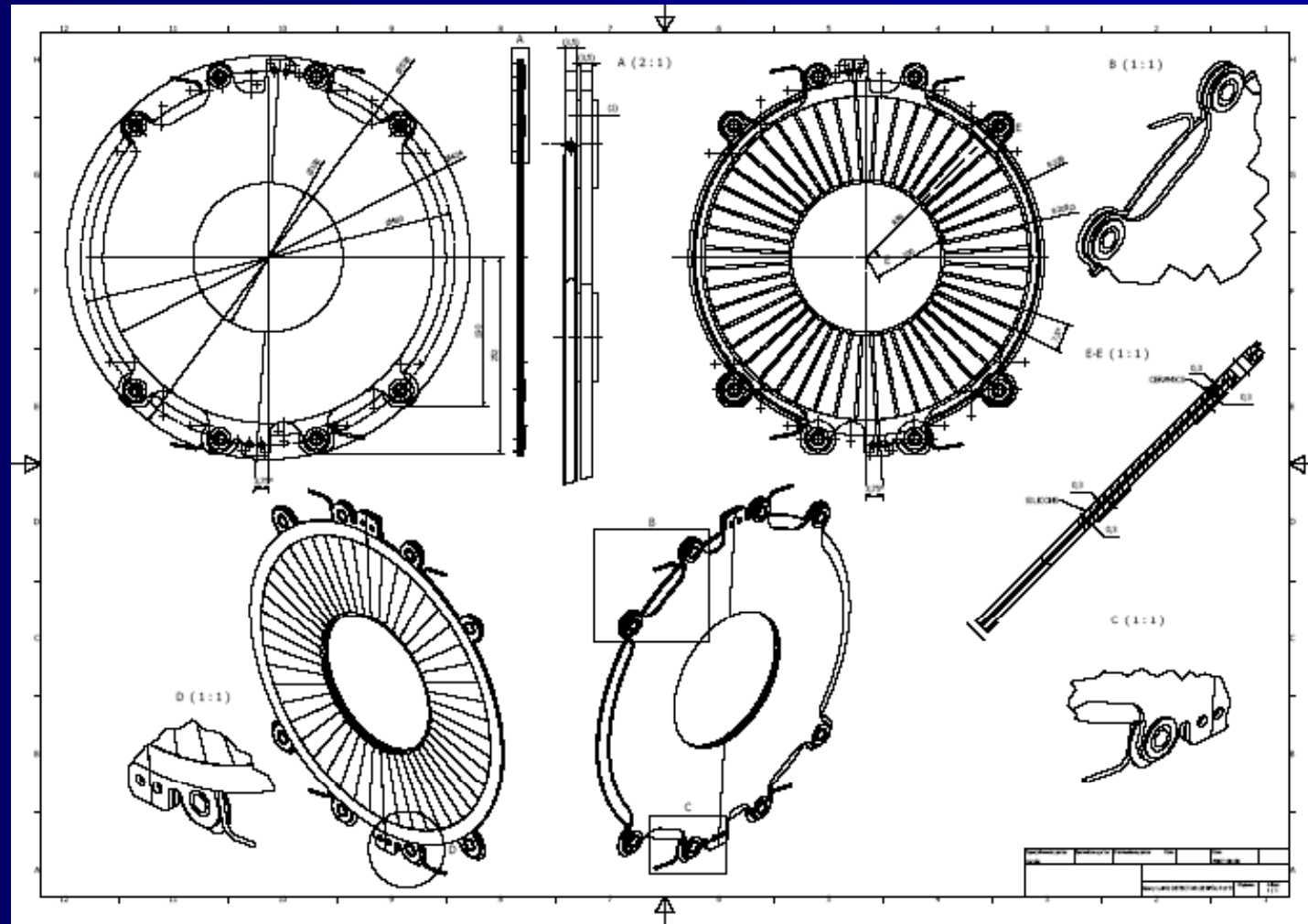
Inner det.
radius

Inner mech.
radius

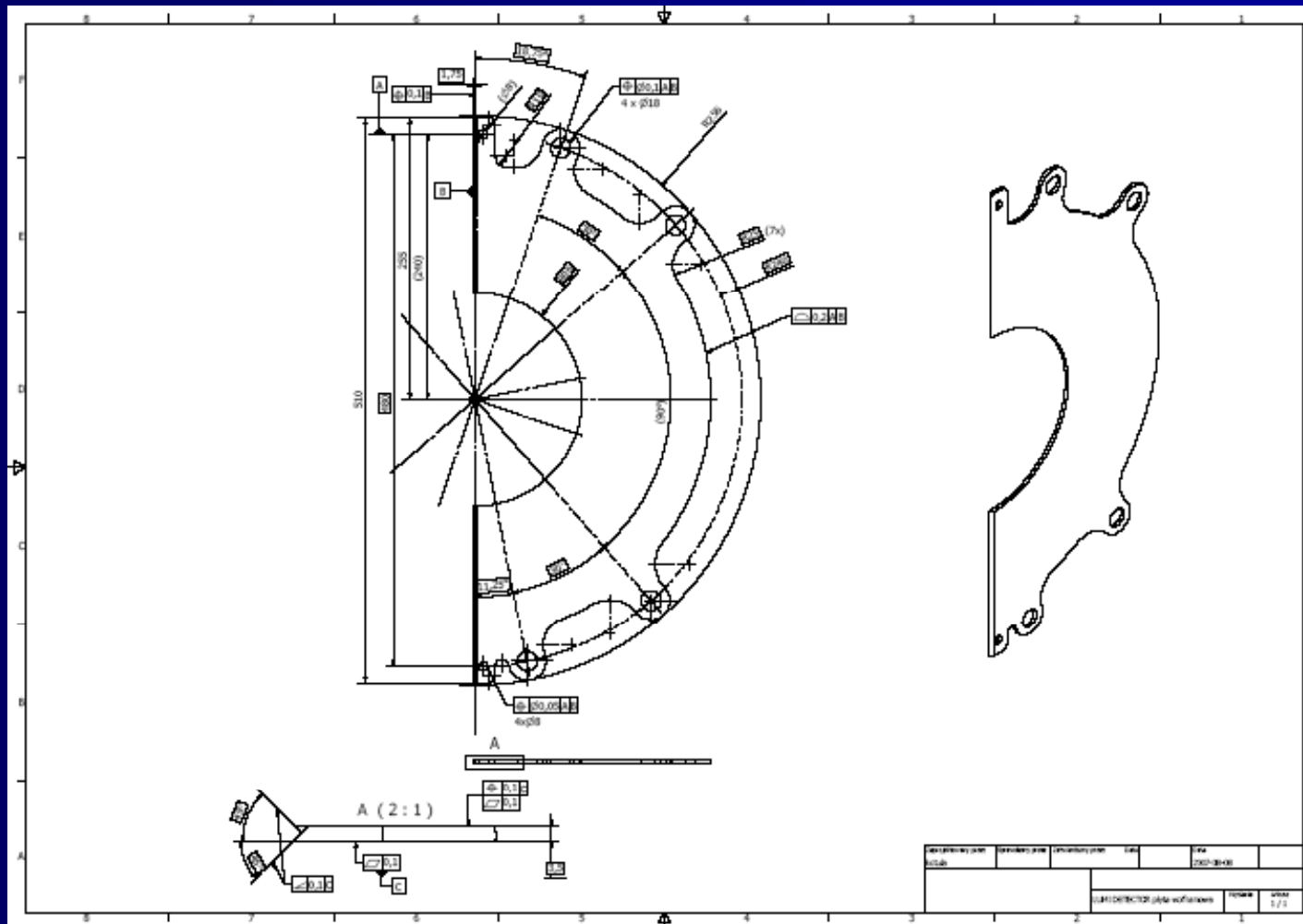
Barrel closing

Movable
support

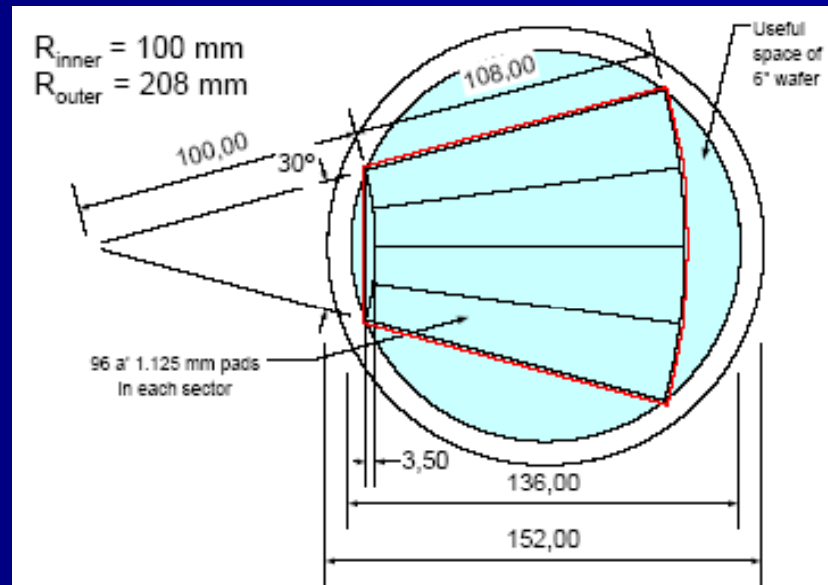
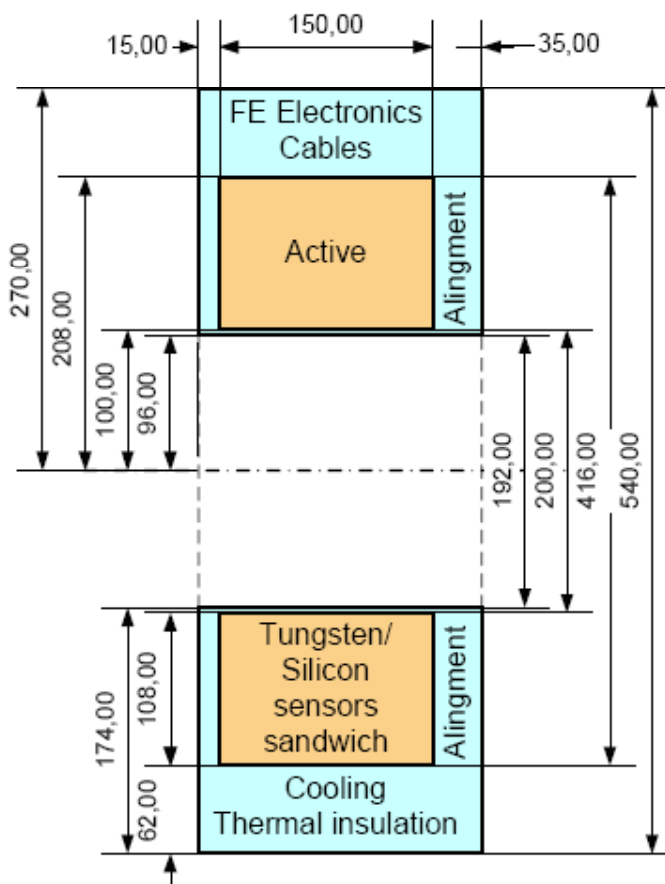
One plane with Si detector



Details of absorber halfplane

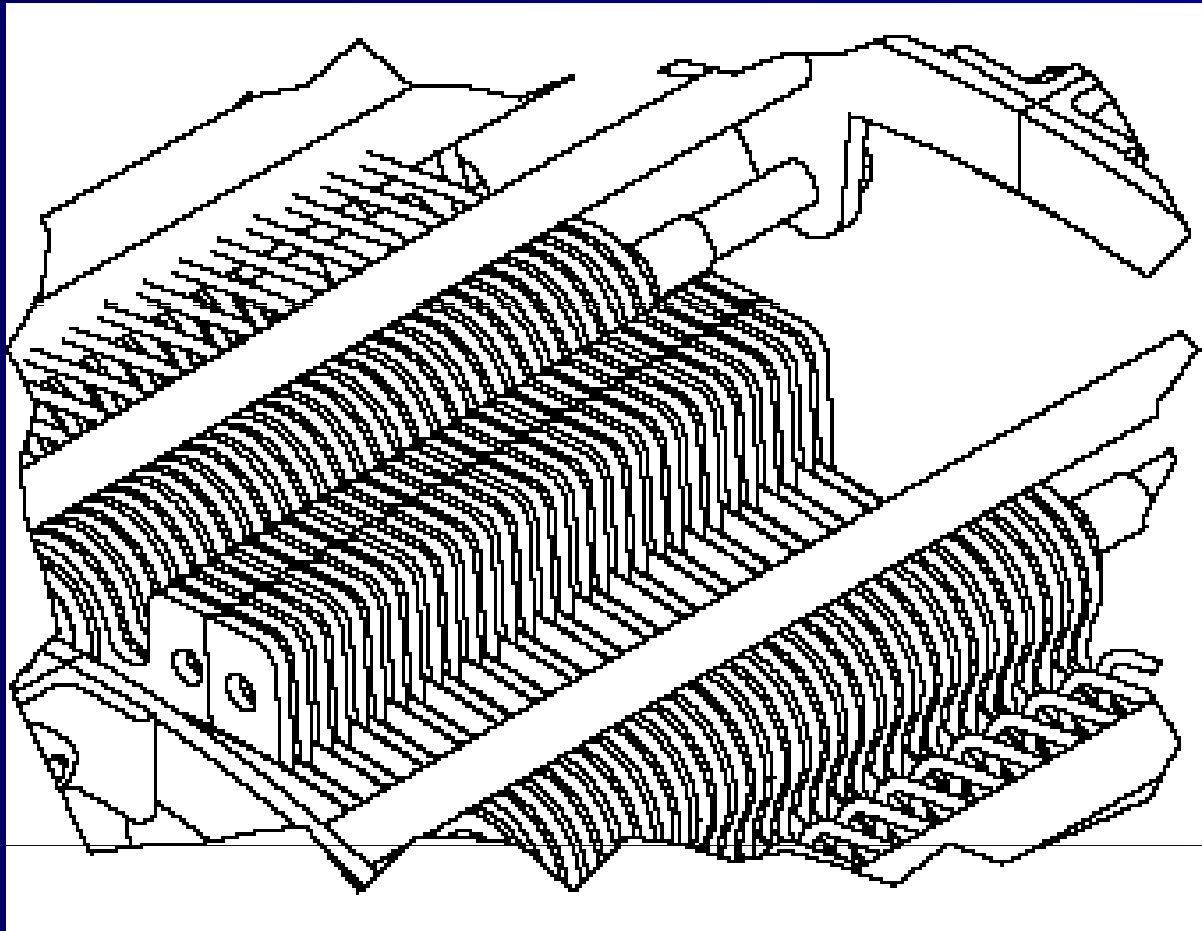


LumiCal mech. dimensions



Inner mech. radius (96 mm) has to be smaller by ~4 mm than inner det. (100 mm) radius because of straight line cutting of Si wafer. Outer det. radius is limited by the 6" Si wafer size.

Water cooling

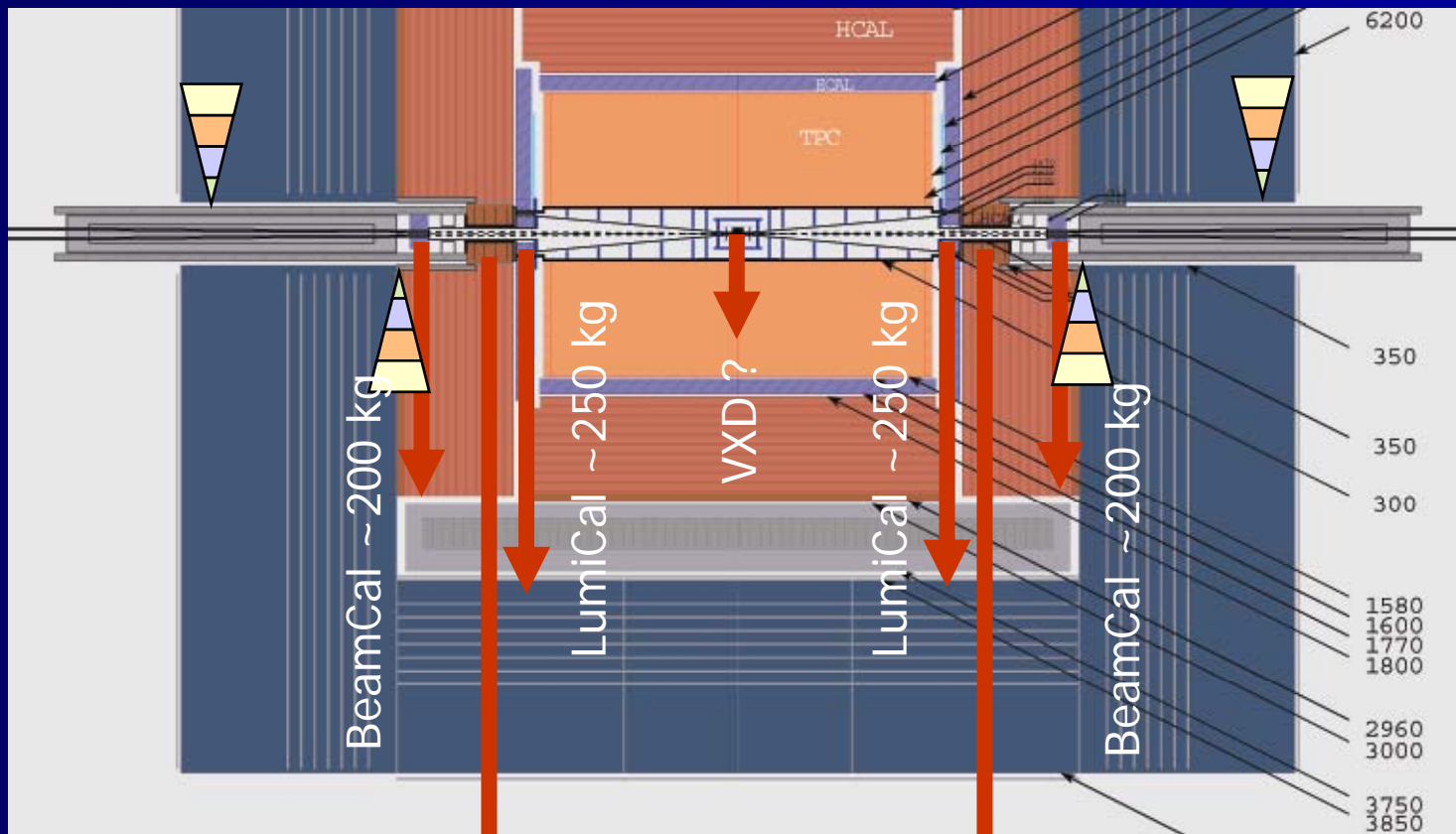


Power dissipation
~20 W
with cycled
electronics

Water used for
cooling and
temperature
stabilization

Underpressure
cooling system to
avoid leakages

Gravity!



LHCAL ~ 1000 kg ?

LHCAL ~ 1000 kg ?

Summary

- Very challenging project for mechanical design.
- Opening and closing the halfbarrels with accuracy better than $\sim 10 \mu\text{m}$.
- Work in progress on precise adjustment of x, y, z and tilt position of LumiCal.
- Need more information about 'construction' tube fixing (both ends, inside LDC support)