Opening of ILD detector

2021/10/14

@IDT-WG3-MDI-Phys meeting

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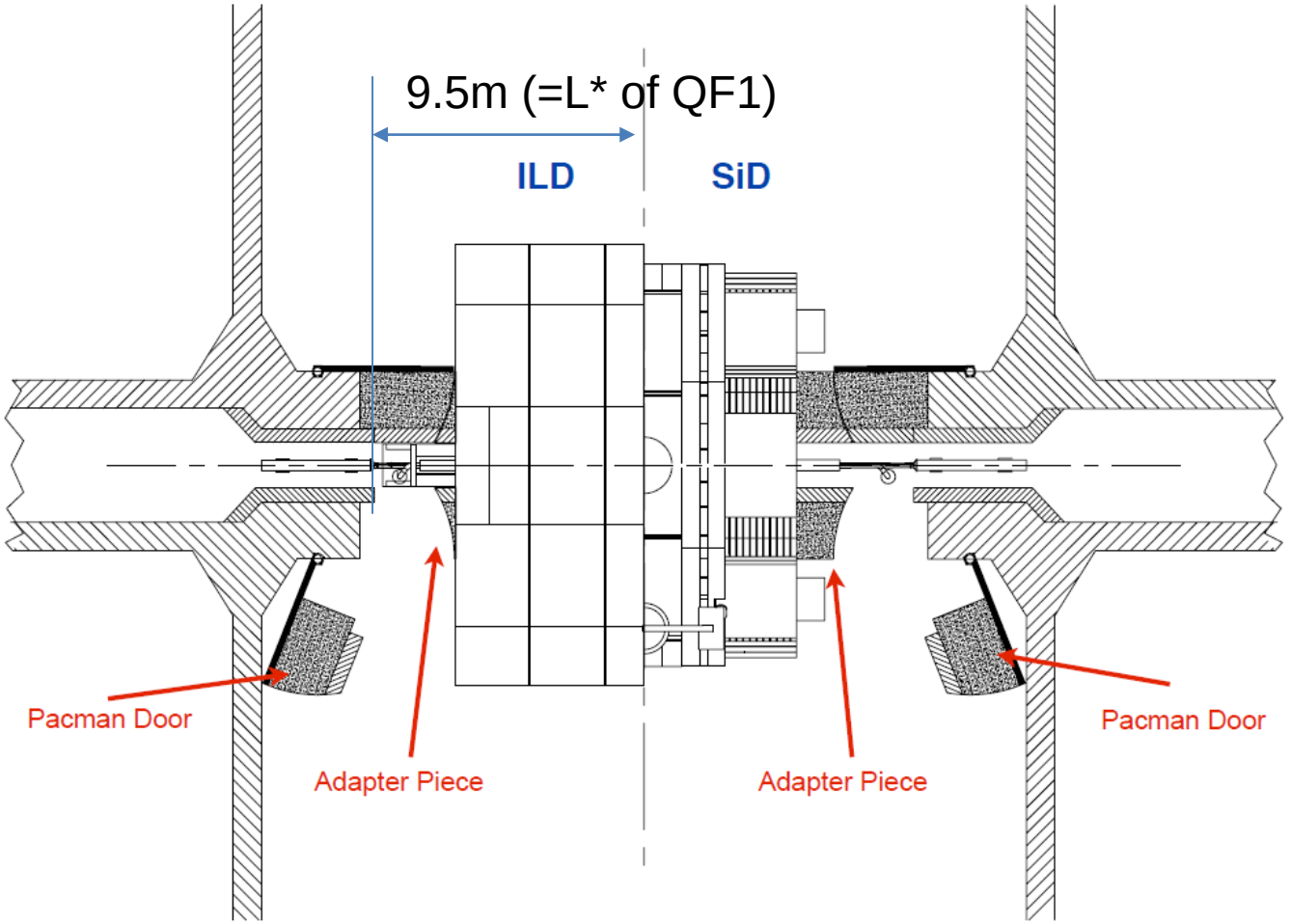
L*=4.2M

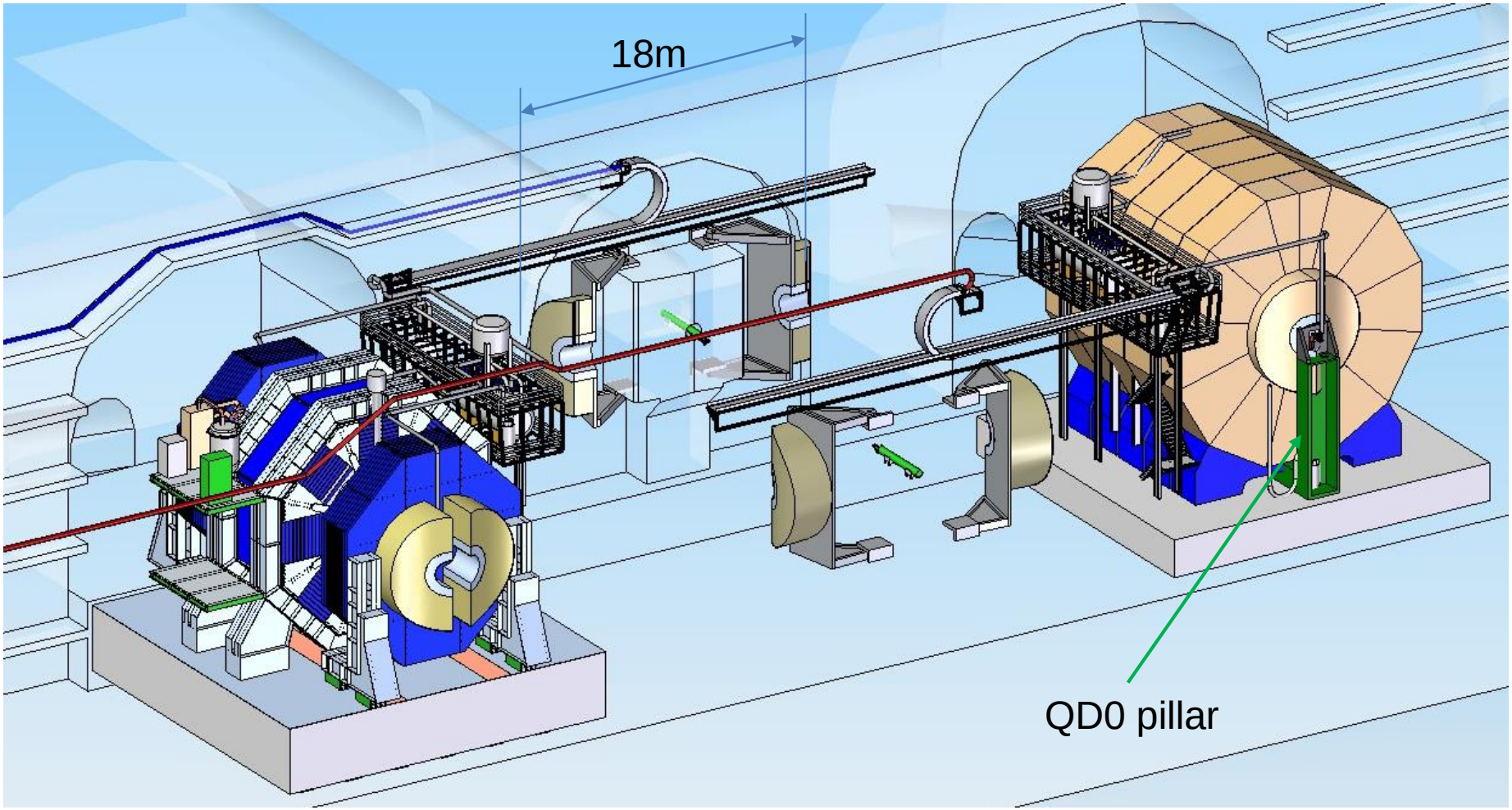
Original design

- TDR Vol.3, p146, Vol.4, p40

Figure 8.11
Design of the beamline shielding compatible with two detector of different size.

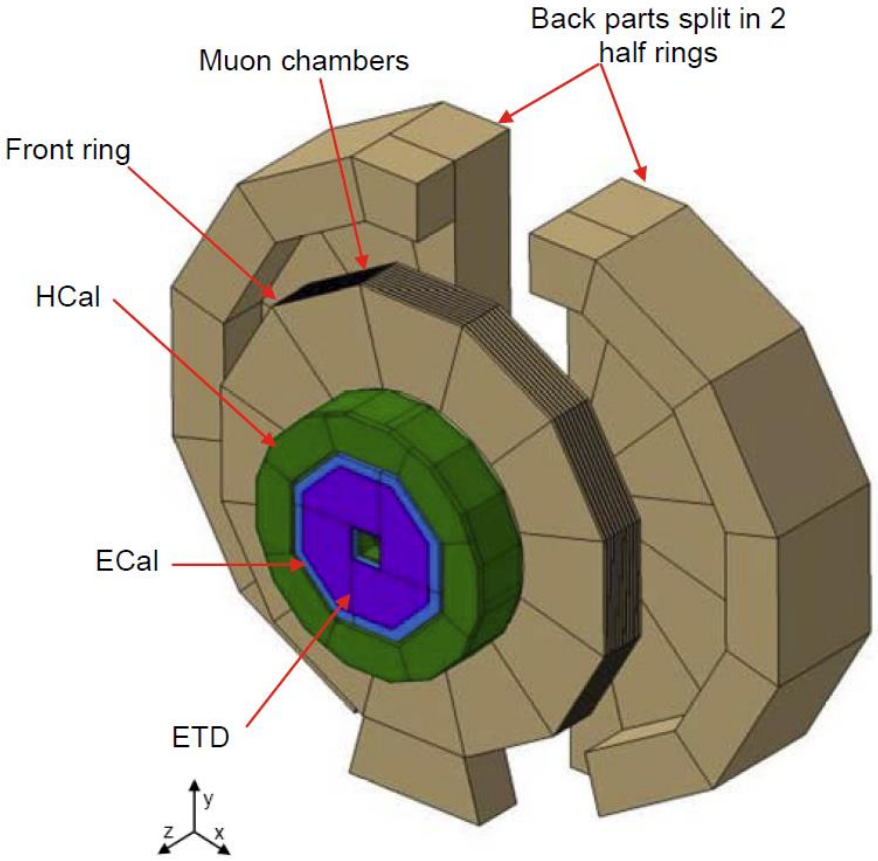


Original design



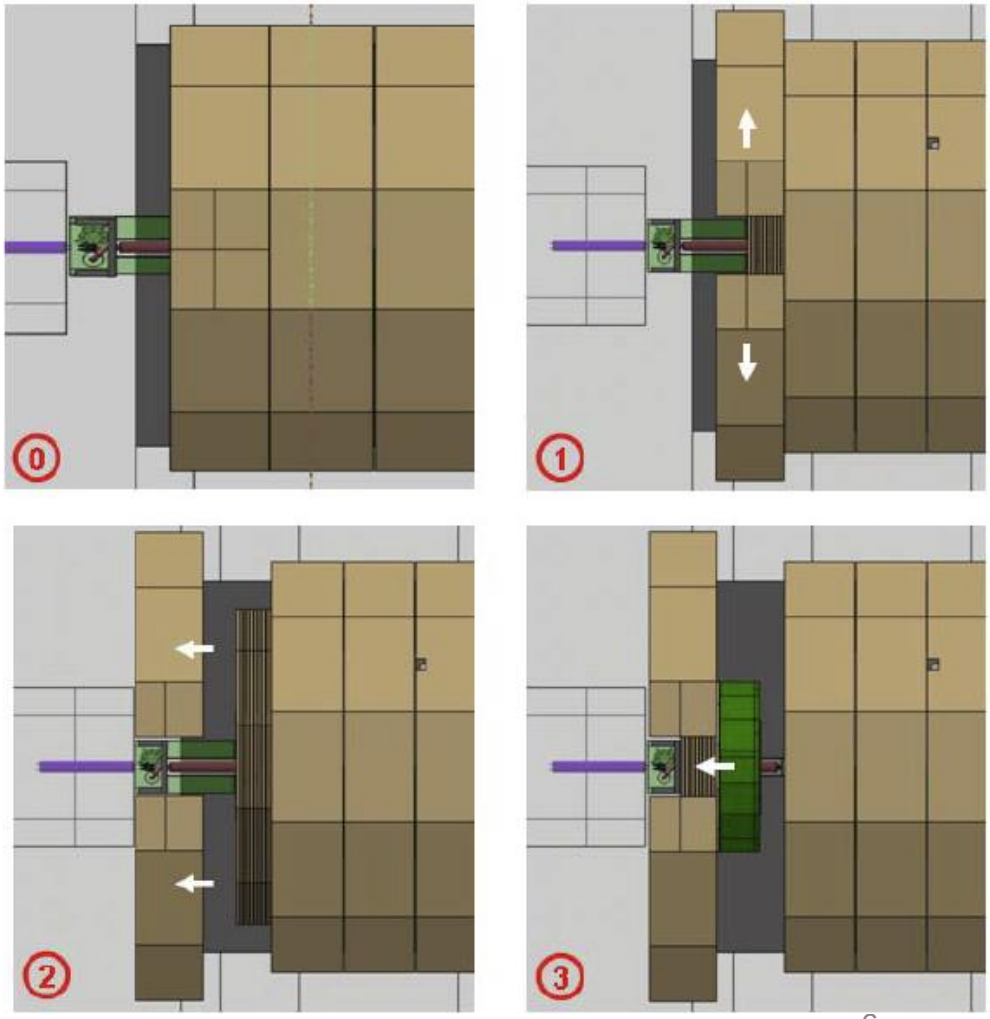
Endcap opening at beam position (1)

- ILD End-cap consists of front part and rear part
- Rear part is split into two parts to clear the QD0 pillar
  - Klaus's talk at Mini-Workshop on 2019/2/28

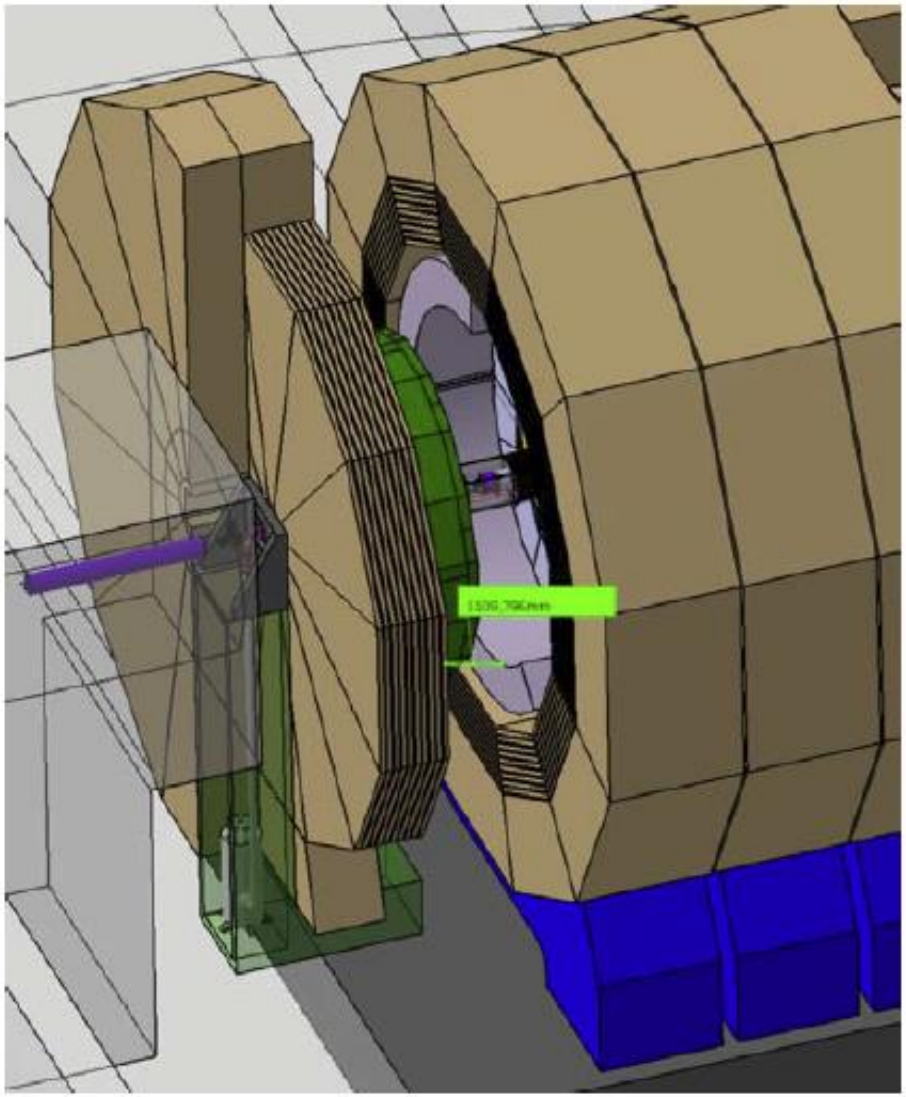


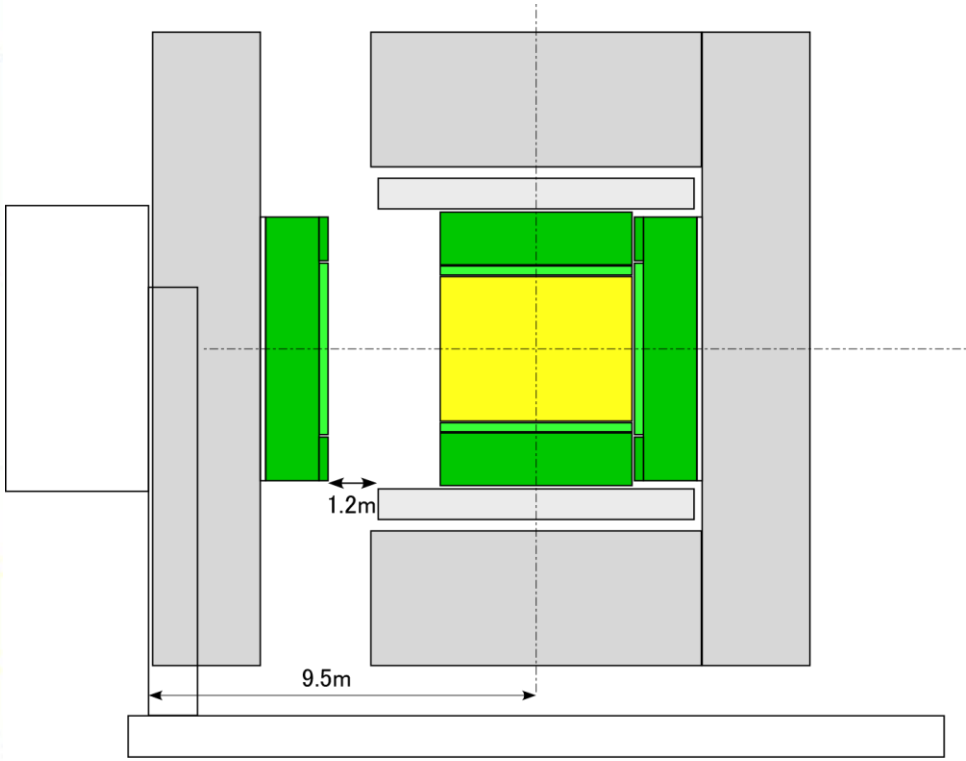
Endcap opening at beam position (2)

- About 1m gap between end-cap CAL and the barrel
- People get into the detector through the small gap



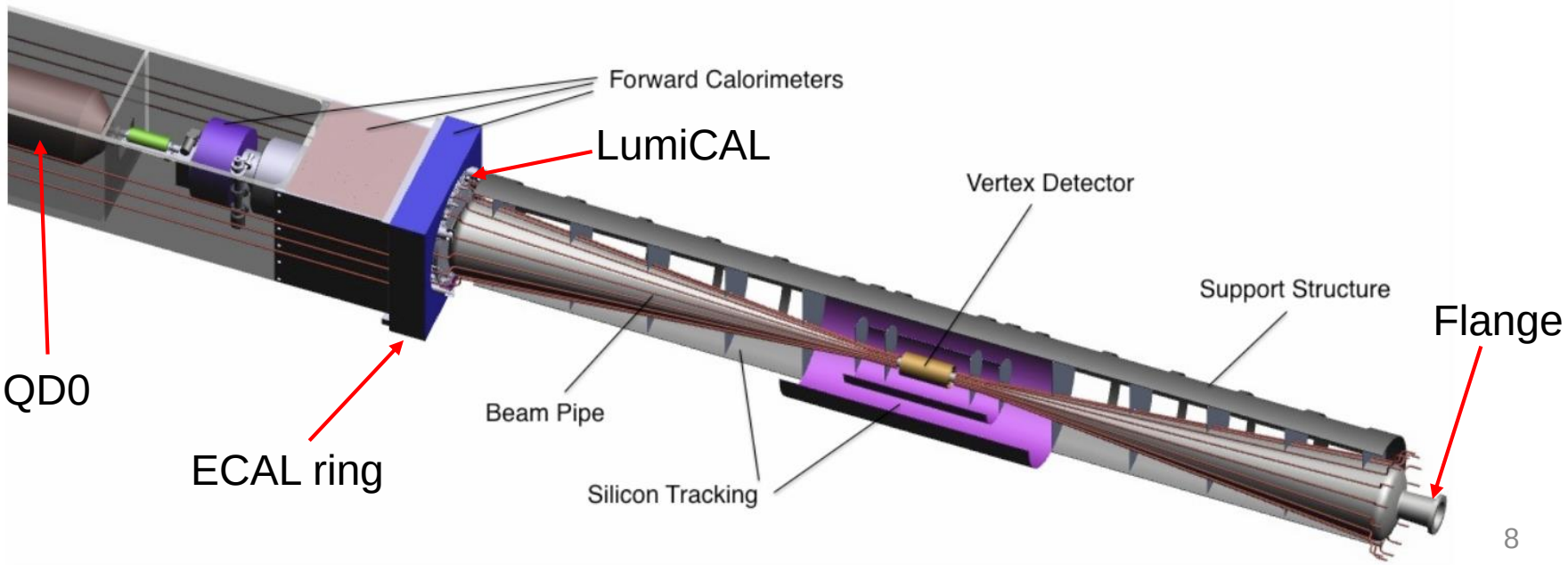
Endcap opening at beam position (3)





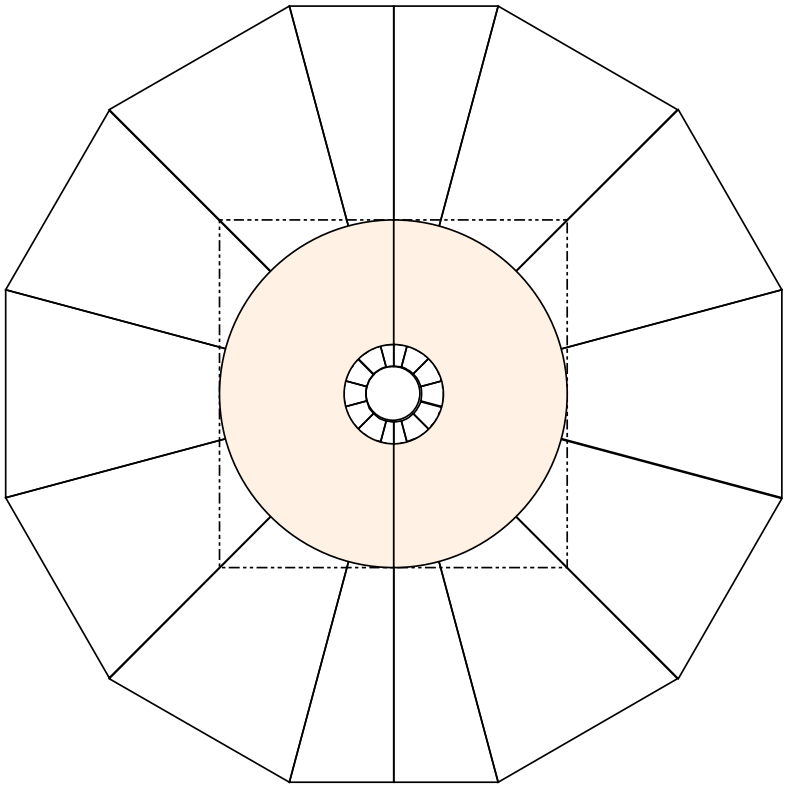
Endcap opening at garage position

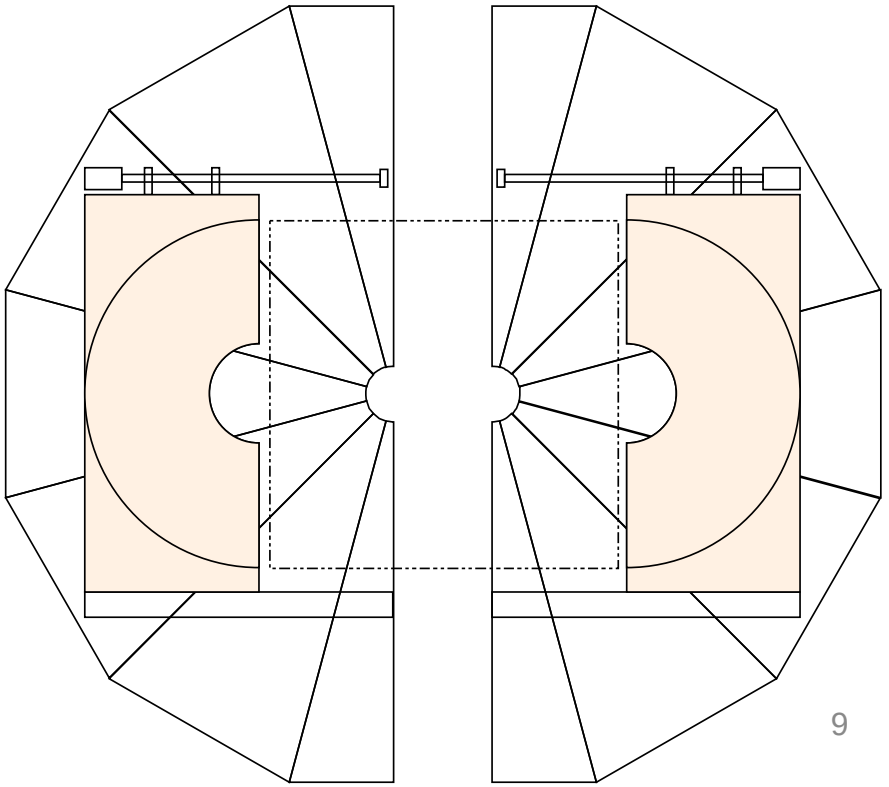
- Same procedure as the opening at beam position (1) ~ (3)
- Remove ECAL ring and LumiCAL
- Cut the beam pipe between QD0 support tube and Inner support tube
- Draw out the QD0 and FCALs together with the QD0 support
- Fully open the End-cap



Problem (1)

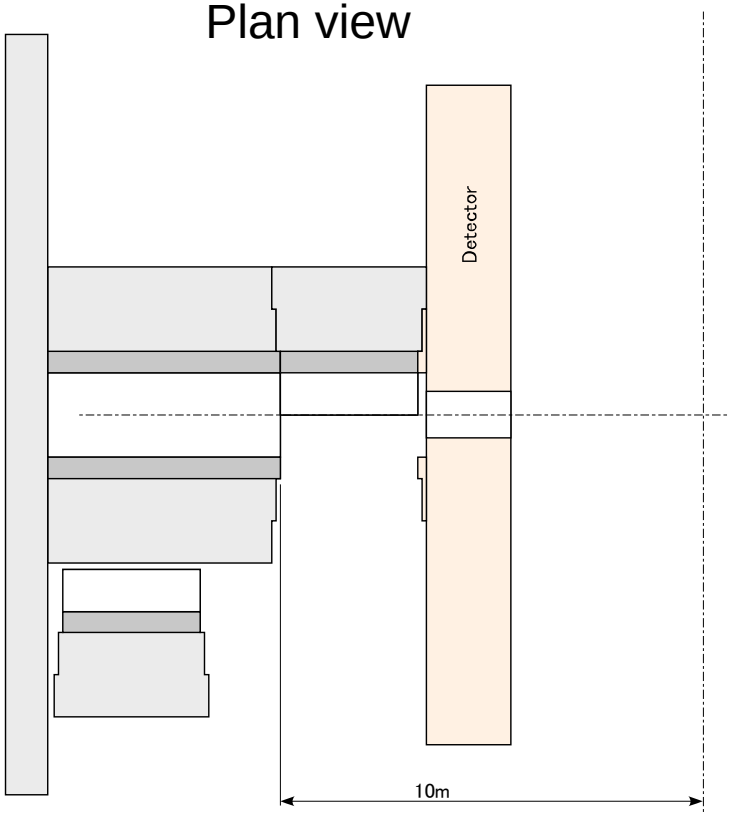
- This procedure ignores the pac-man adapter (t~1.2m) on the detector, which hit the wall when we want to open the endcap **at beam position**
  - Solution 1: Movable adapter
  - Solution 2: Sliding pac-man instead of rotating pac-man



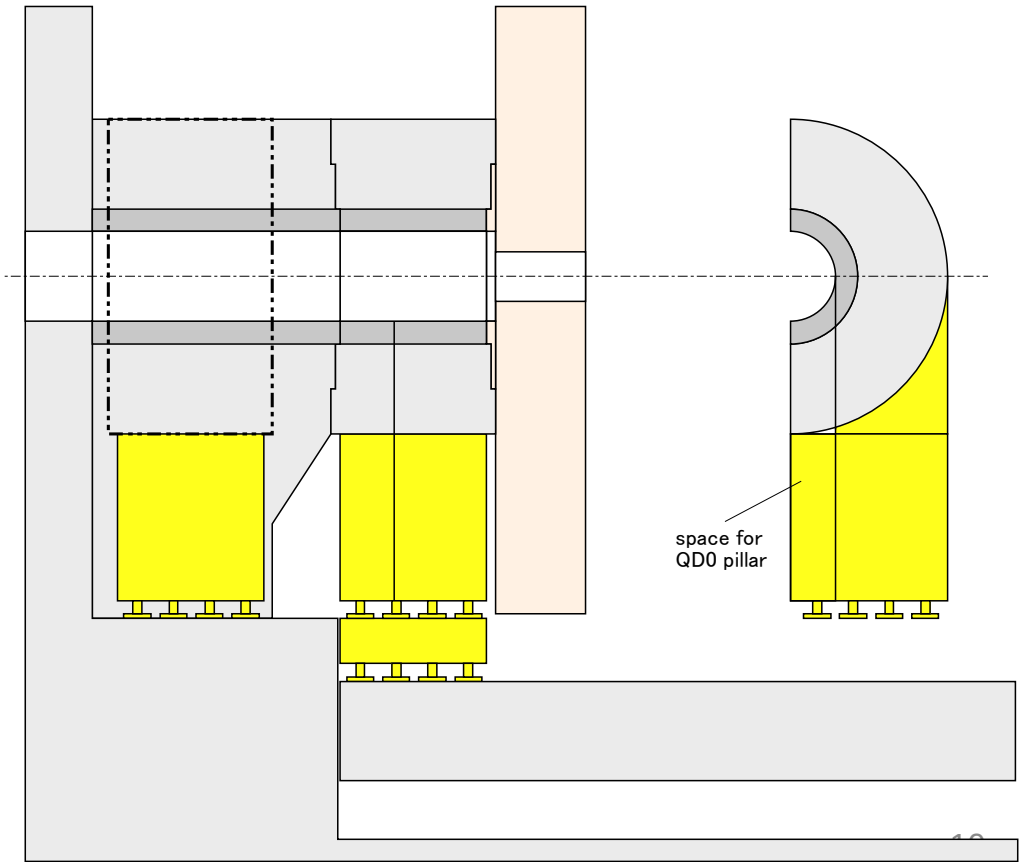


Sliding Pac-man

Plan view

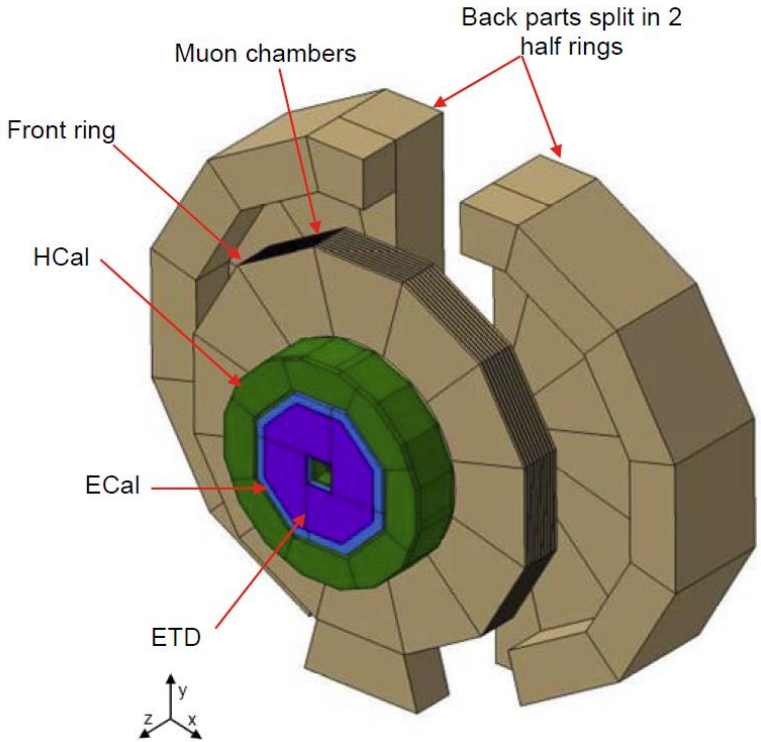


Side view



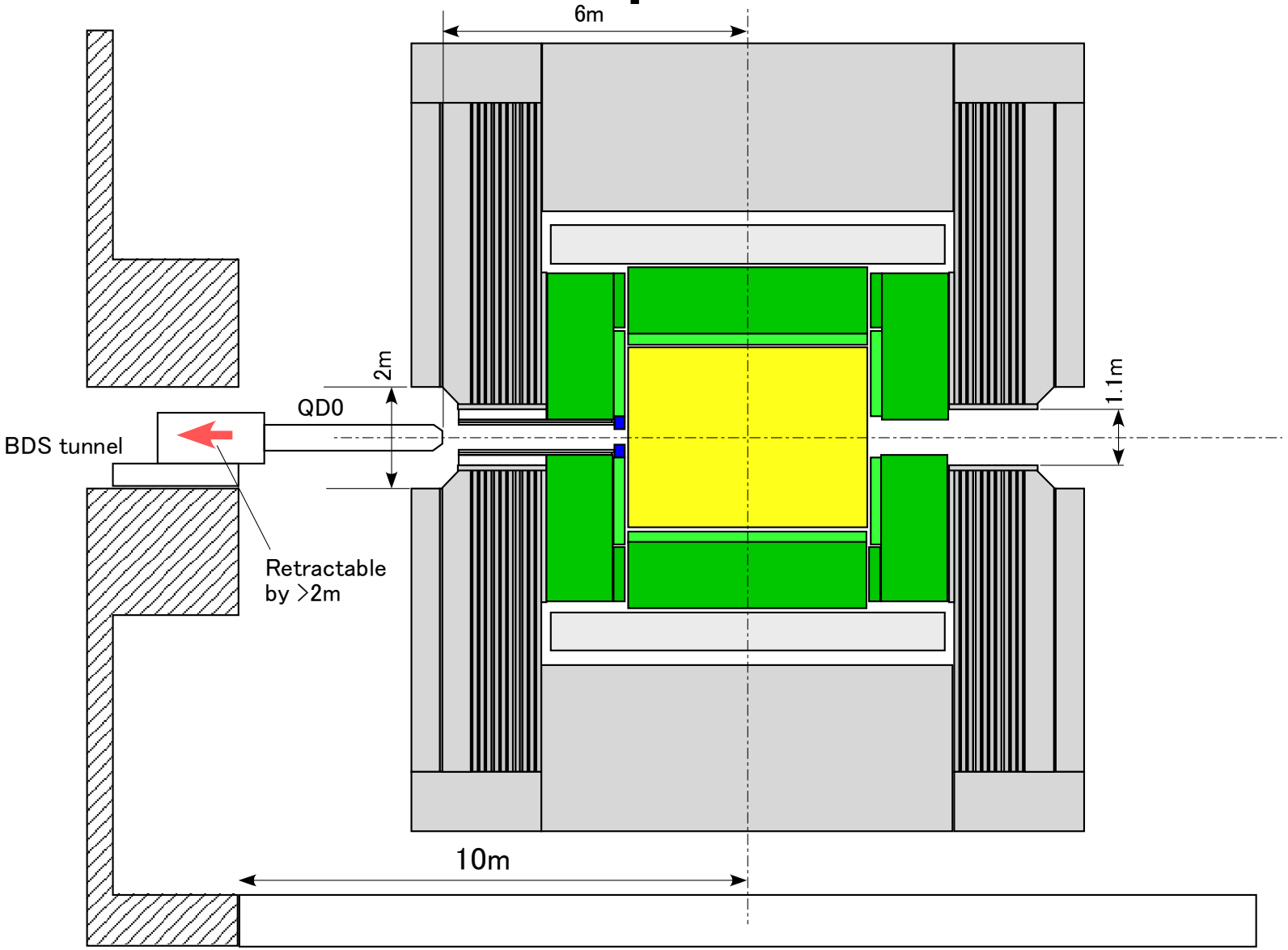
Problem (2)

- Is splitting endcap realistic?
  - Space for support legs
  - Stability against earth quake
  - Lowering method using gantry crane

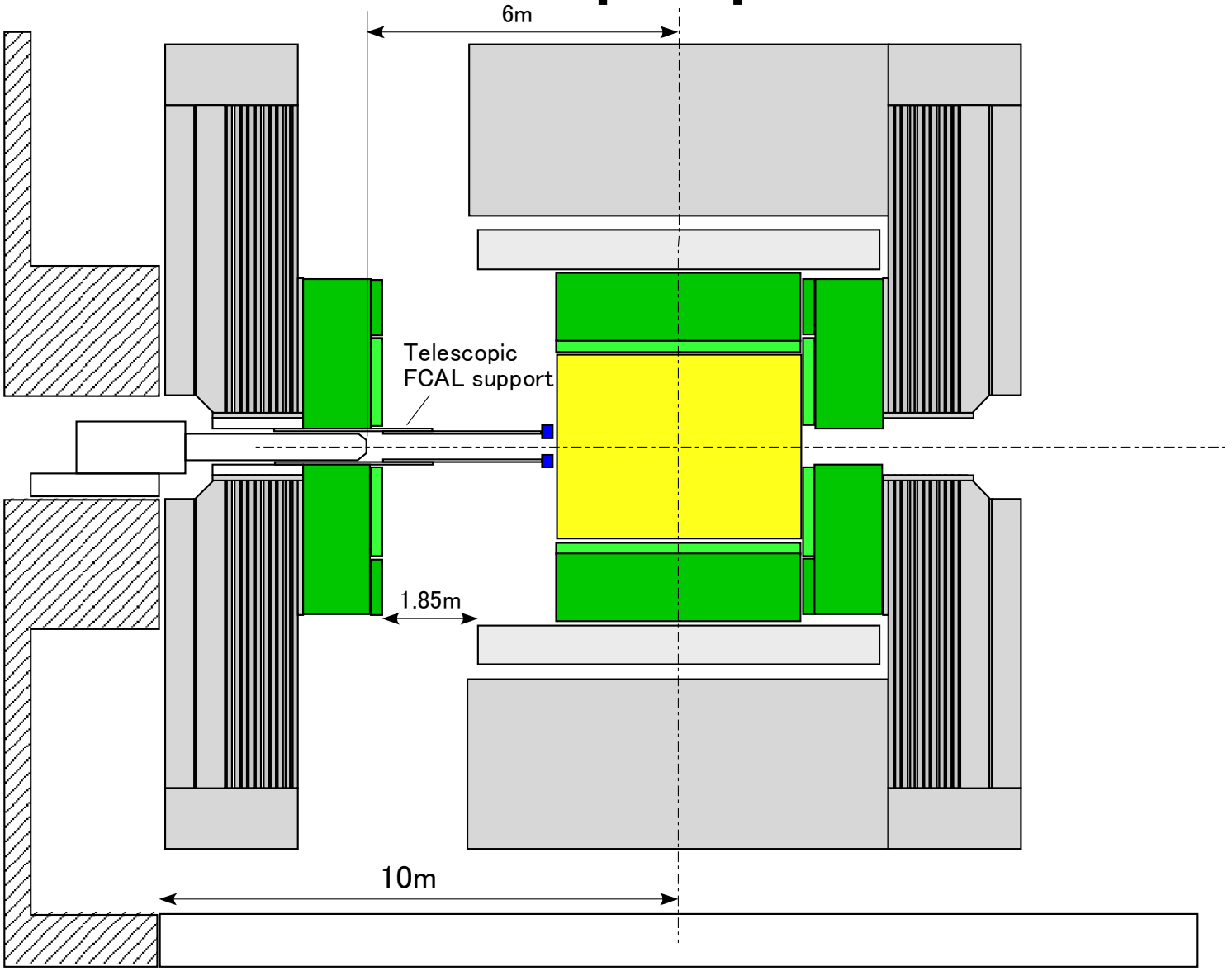


LONGER L* OPTION

Endcap closed



Endcap open



Summary

- QD0 support pillar causes engineering challenges (or risks) for ILD end-cap opening
- Supporting QD0 from the beam tunnel with longer L*, and getting rid of the pillar is an attractive solution to mitigate the risks
- Supporting QD0 from the detector (end-cap) might be another solution, but has not been considered for ILD