

# LDC Integration Efforts

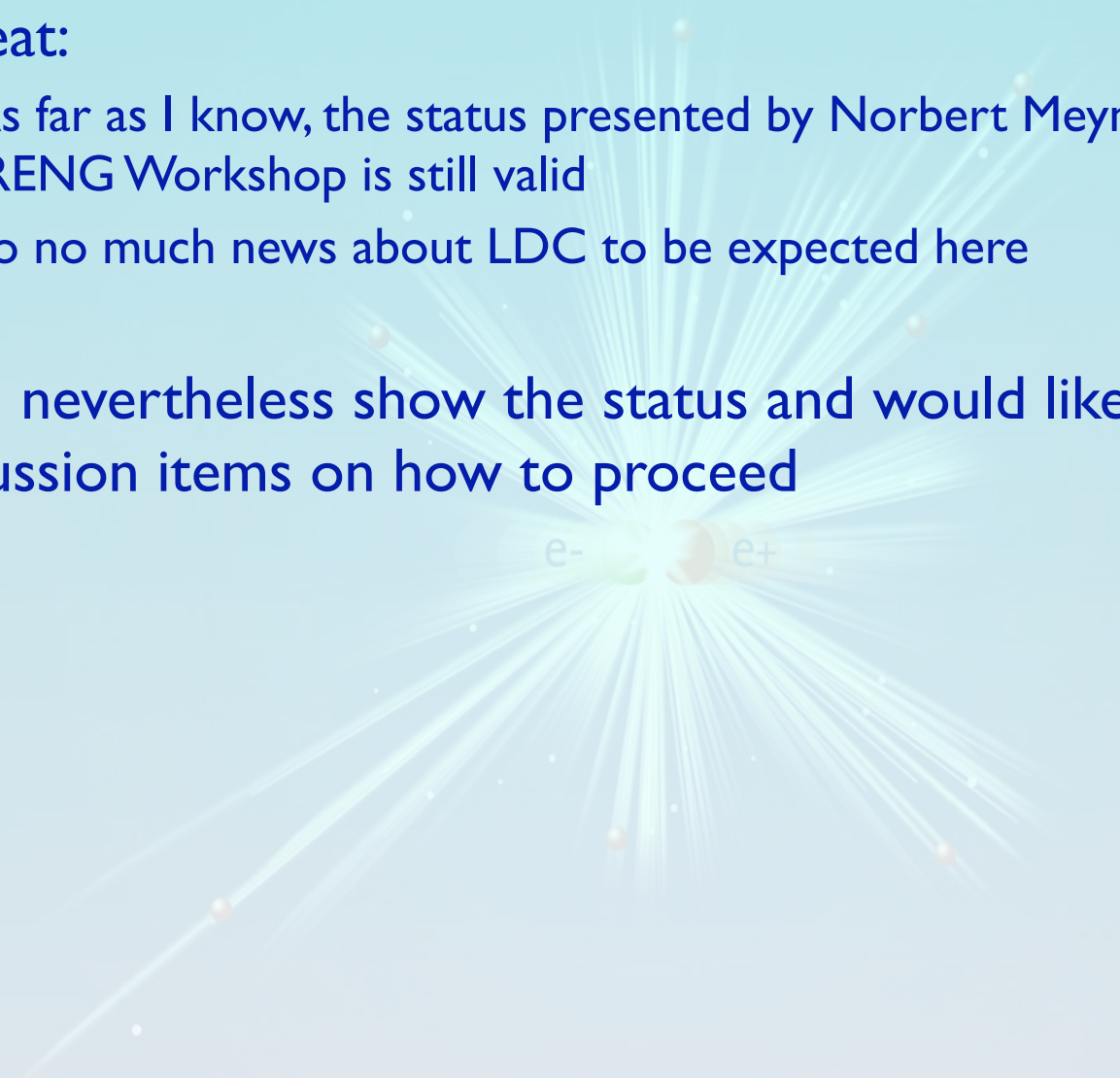
## Discussion Items

Karsten Buesser



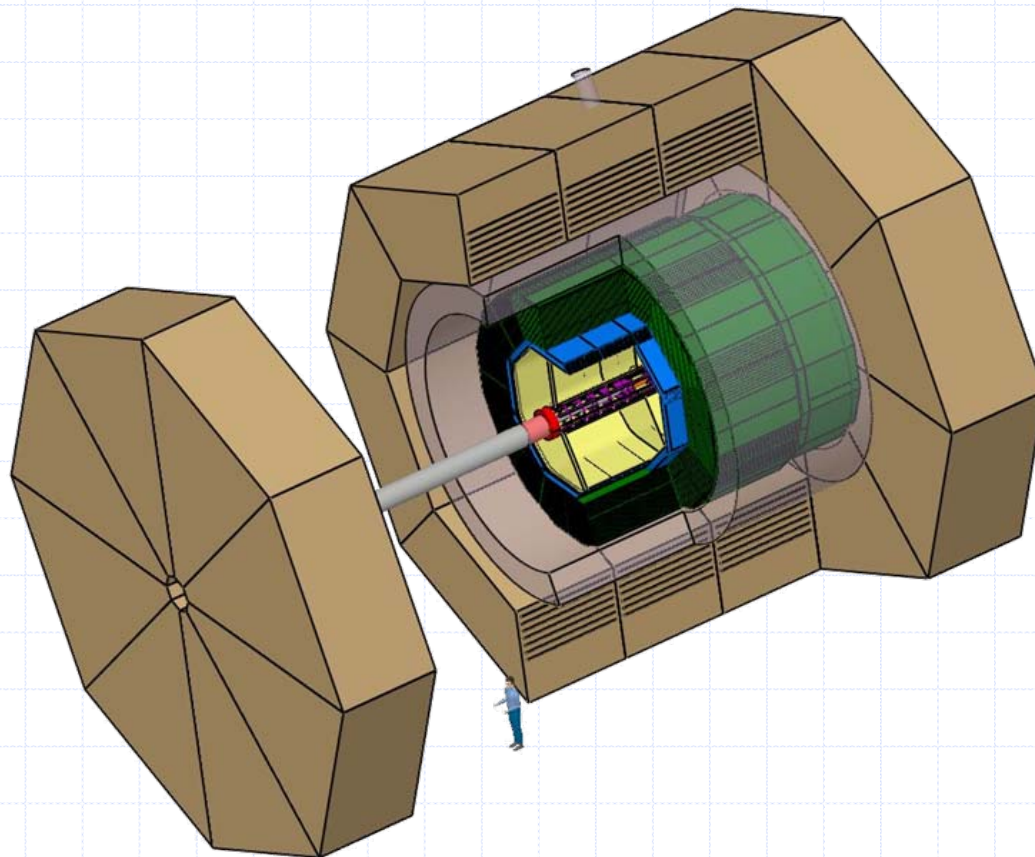
ILD MDI/Integration  
16. November 2007

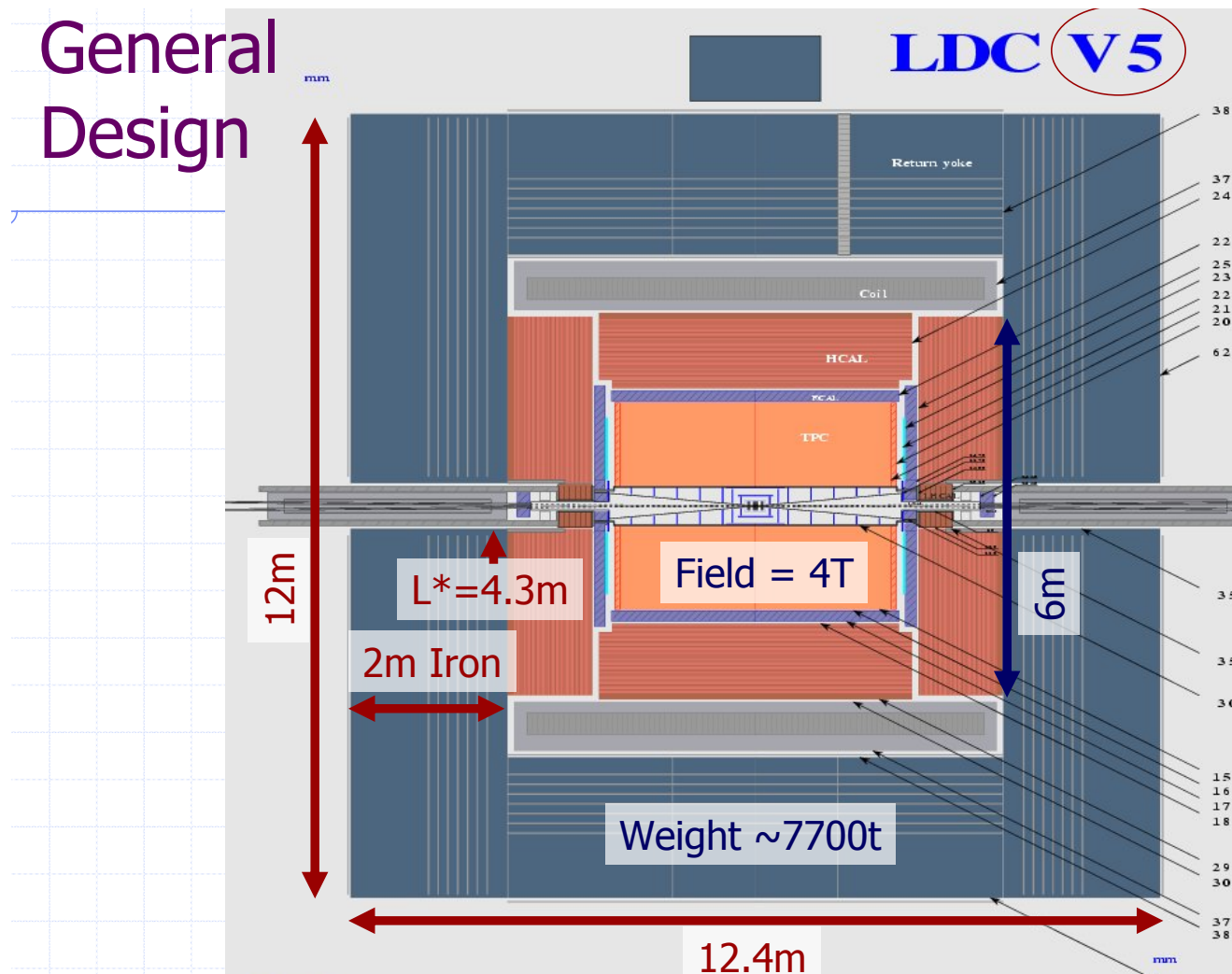
- Caveat:
  - As far as I know, the status presented by Norbert Meyners at the IRENG Workshop is still valid
  - So no much news about LDC to be expected here
- I will nevertheless show the status and would like present some discussion items on how to proceed



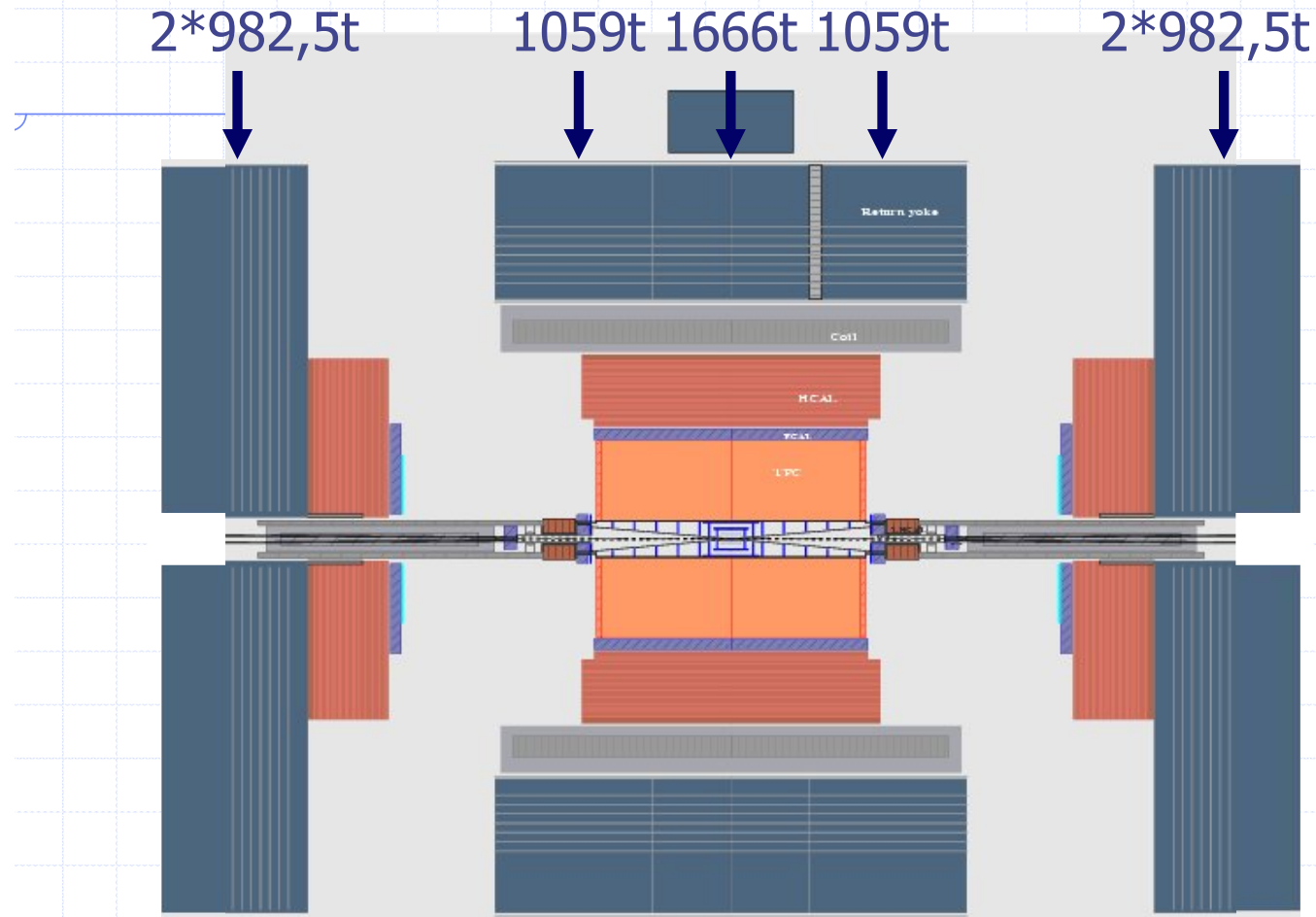
## Now (Work in Progress)

H. Videau, C. Clerc, M. Anduze, LLR; M. Jore, LAL; K. Sinram, N.Meyners, DESY; work on the Engineering Model (all part time)





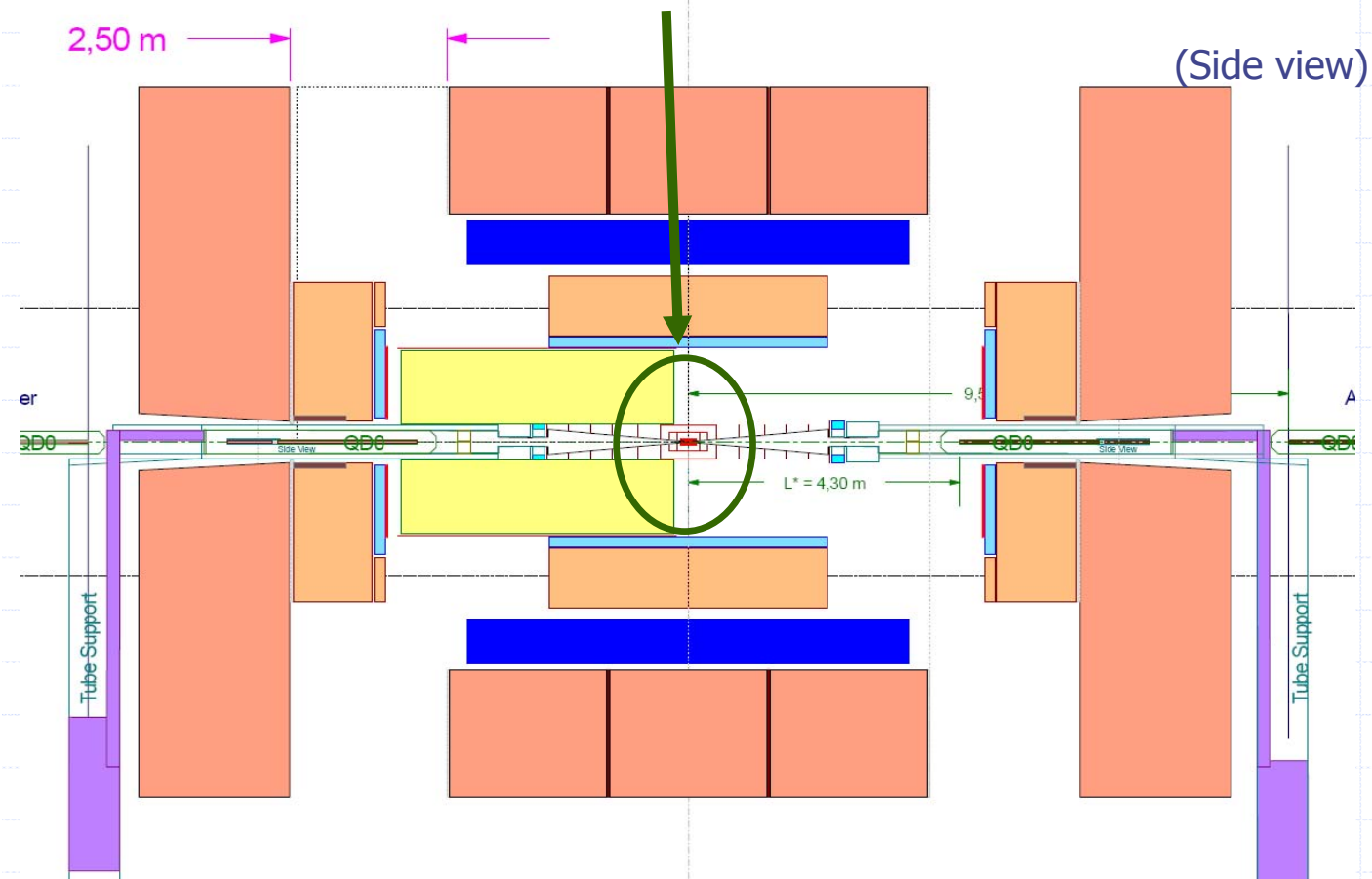
## Surface Assembly a la CMS



If not split the end cap pieces would be the heaviest part to be lowered!

## Detector Opening (Vertex Detector Maintenance)

2.5m detector opening would just allow to maintain the vertex detector in the garage position **without breaking the vacuum**.  
 (Pumping the central beam pipe is assumed to be very time consuming.)

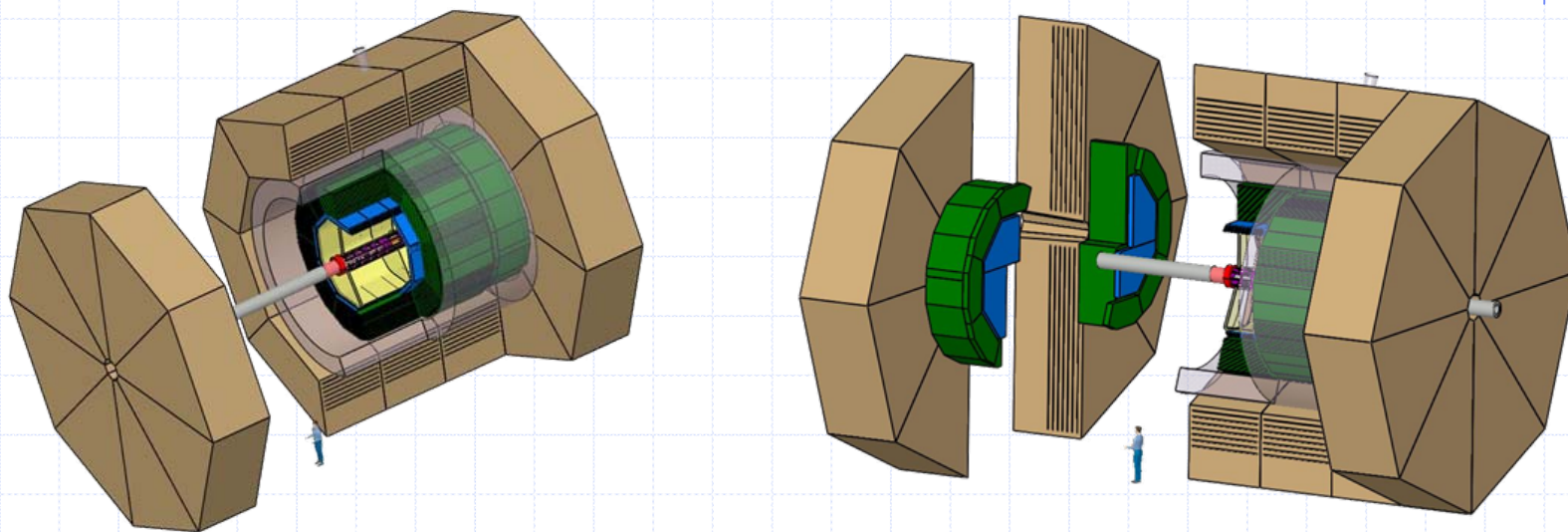




## End Cap Yoke split or not

### Under Study!

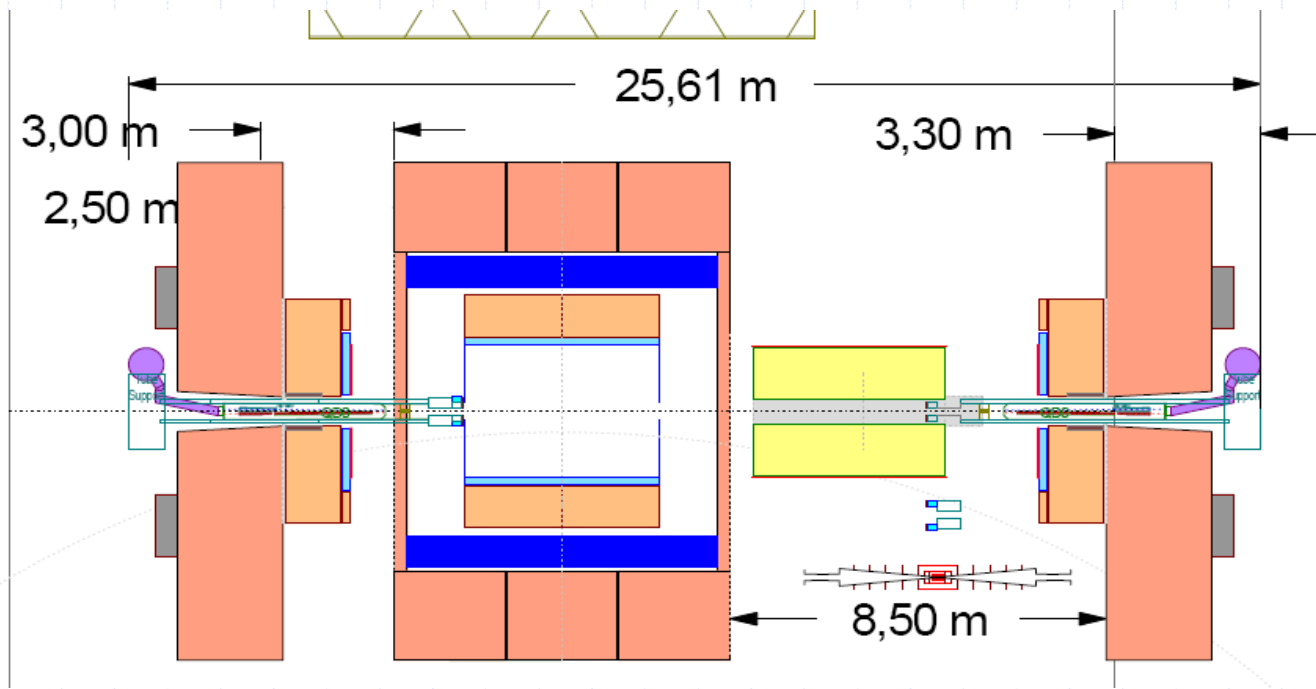
- The structure of the detector should allow both.  
Factor 2 more bending if split!



At the moment we prefer end cap halves bolted together with the possibility to open in an major operation if necessary!

# Detector Opening (End Cap Yoke NOT split)

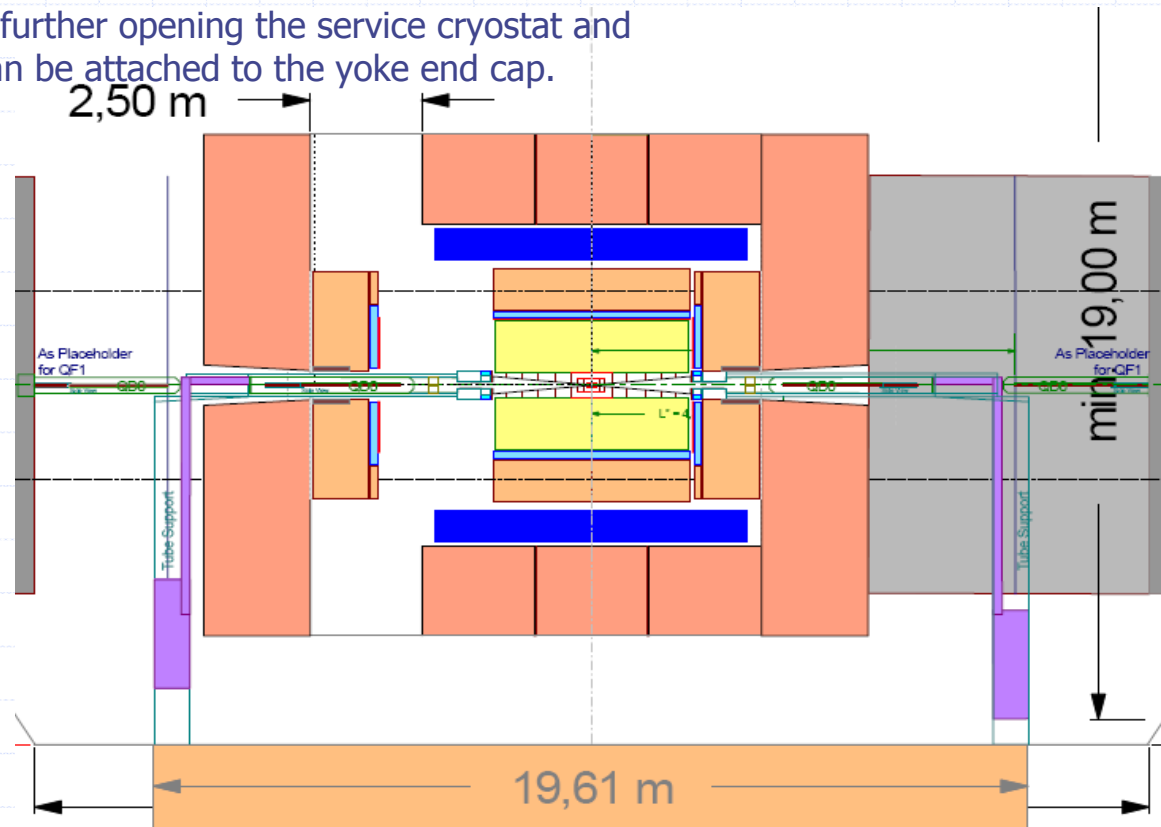
- If not split, the end cap yoke has to be moved 8,5m longitudinal (or aside) for TPC exchange!
- QD0 and service cryostat have to go with the end cap yoke while the Helium supply line is not cut!





## QD0 Supply, "Umbilical"

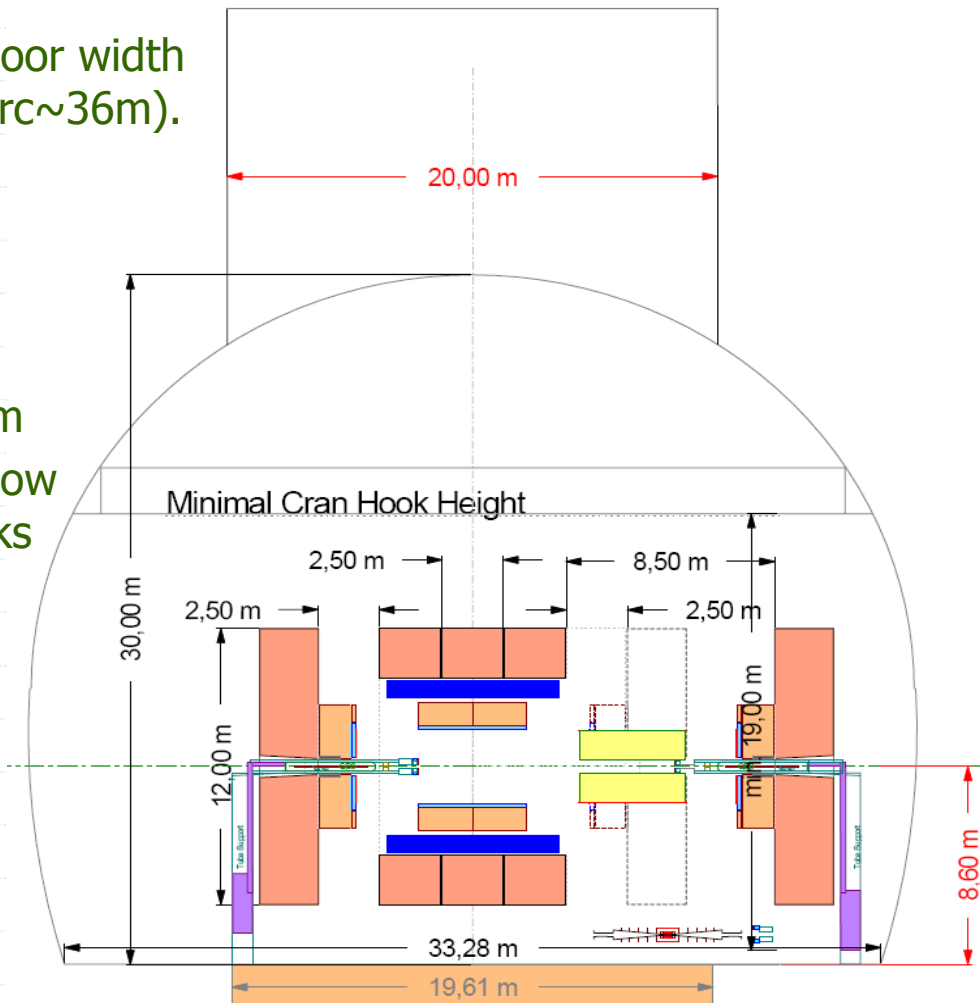
- The supply lines from the service cryostat to the QD0s go from the bottom through the shielding.
- The cryostats are connected via flexible lines to Helium supply.
- To allow a further opening the service cryostat and the QD0 can be attached to the yoke end cap.



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## Underground Cavern Size

- Recommend ~30m floor width with inclined walls (arc~36m).
- Length: 120m
- Height: 30m
- Beam height (8.6m) is just sufficient.
- Shaft diameter: >20m
- Two 80t cranes to allow bigger shielding blocks (2 x 40t enough for LDC)
- ~19 hook height
- Floor prepared for air pad use



- Which Tasks need to be completed before we can submit an Lol?
  - General assumptions about assembly (CMS style or not)
  - Opening and closing procedure
  - Common forward region design
  - (...)
- We do not need to have a full engineering design ready but a conceptual design should exist
  - i.e. we should be persuasive enough that the detector we propose could actually be built and has no major show-stoppers
- What about push-pull? Do we really need to define technical solutions for that on the Lol timescale?

- I discussed the way forward with some colleagues at DESY and would like to present on the following slides my very personal proposal on how to proceed

- Define the general concept first:
  - Size of the detector - parametrise where necessary
  - What needs to be accessed when?
  - When do we need access to where?
  - What needs to be done on detector side for push-pull?
  - Assembly procedure
  - Agree on common forward region
  - Set boundary conditions for the underground and surface halls (sizes, cranes, access, etc.)
  - How to support and supply the final focus magnets
- Form task groups:
  - Tackle detector integration issues: e.g. how to support the calorimeters, where will we need dead areas for cables, chimneys, etc.
  - Where to put electronic trailers, need for service caverns, etc.
  - Concentrate on engineering solutions for specific items, e.g. support of QD0 and calorimeters, etc.

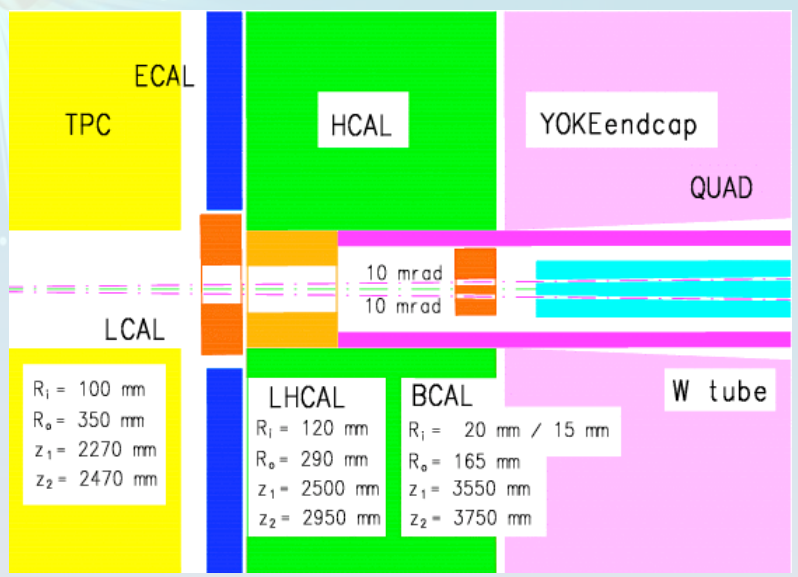
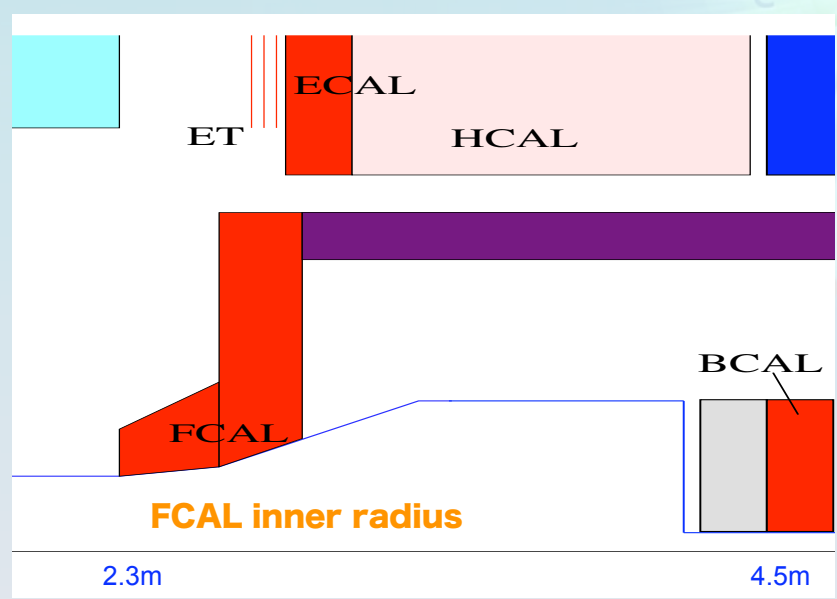
- Boundary conditions:
  - ILC baseline only (x-angle, push-pull, etc.)
  - Be ready for Lol by late summer of 2008
- Implementation guideline:
  - Do not start from scratch! Use what has been done before!
- Having regular face-to-face meetings is important!
- Have first meeting at ILD workshop in January in Zeuthen (extra day?)
  - Try to agree on the general concept questions there!
- Use future ILC workshops (Sendai, Warsaw, ...) and hold extra meetings if needed
- Have regular phone meetings in between



- Nominate a responsible technical coordinator
  - If none found, a team could also do the job
- Define one source for models and CAD drawings
  - Nominate one person responsible for the repository
  - DESY EDMS could probably be used

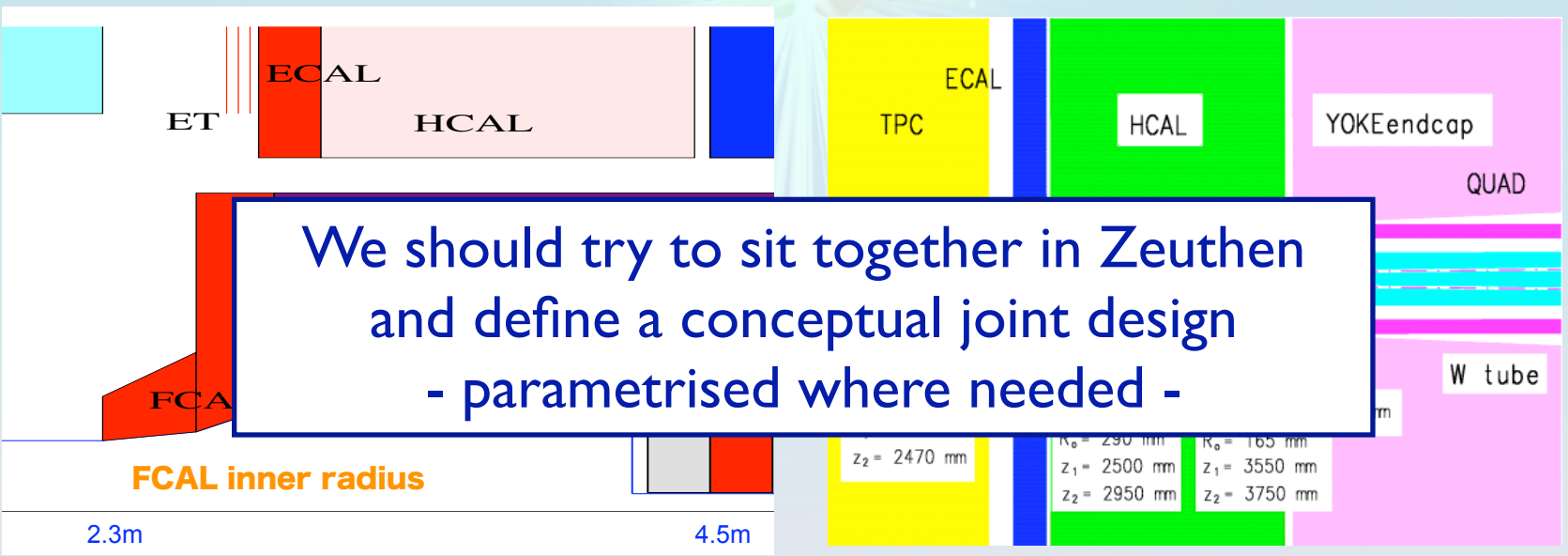
# Converging on a Forward Region

- My feeling is, that we could converge quite fast on a common design
- Main differences between LDC and GLD:
  - $L^*$
  - Beam pipe design in front of Luminosity Calorimeter
  - Calorimeter design (how will the FCAL collaboration fold in?)



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We should try to sit together in Zeuthen and define a conceptual joint design - parametrised where needed -

- LDC has already a quite advanced conceptual integration concept
- Joining forces for ILD needs to be organised
- Try to agree on a plan to move forward and draft it in a note
  - Submit to JSB?
- Define responsibilities: technical coordinator (team) and responsible person for the CAD model of the detector
- Have face-to-face meeting with the relevant technical people in Zeuthen and regularly after that
- Define general design concept in Zeuthen
- Form task groups after that to attack specific problems