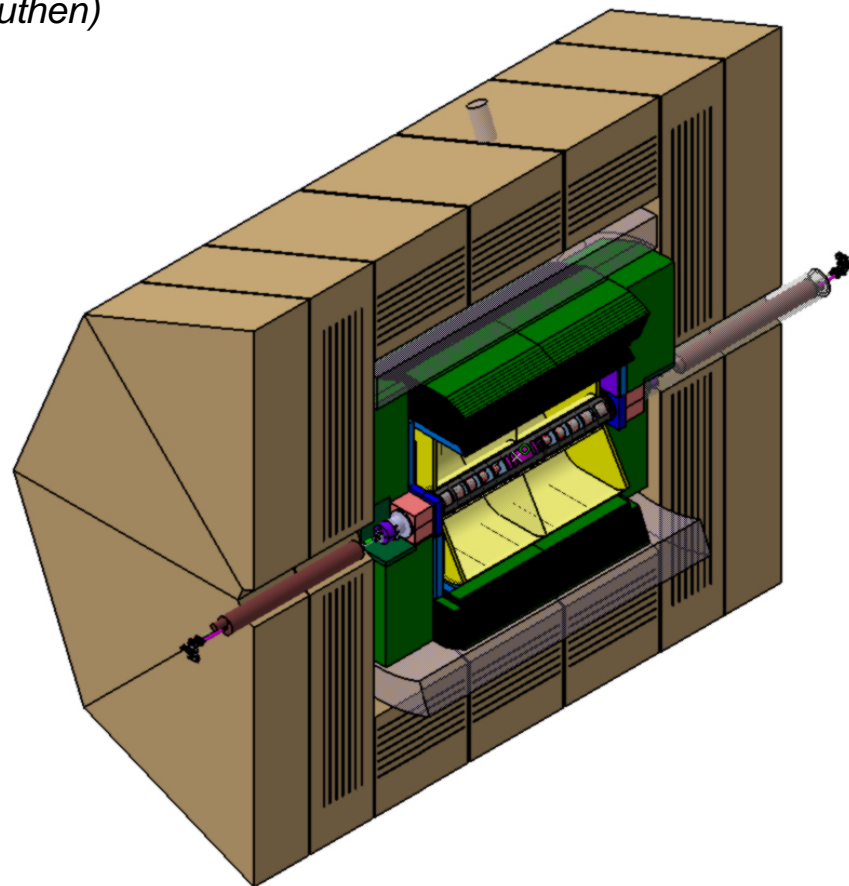
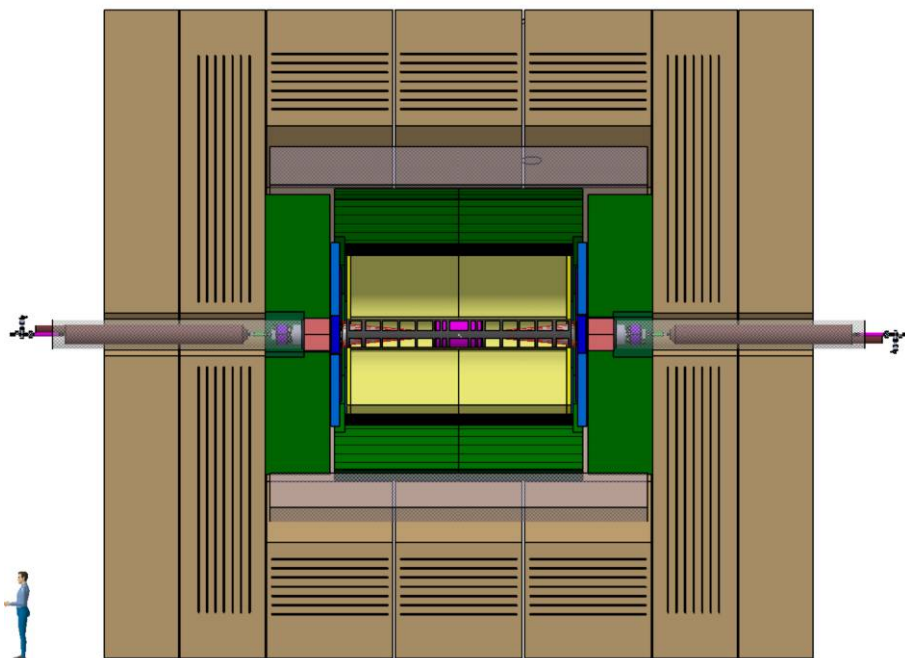


# *ILD2 model status & MDI*

TILC 08 - March 1/6 in Sendai

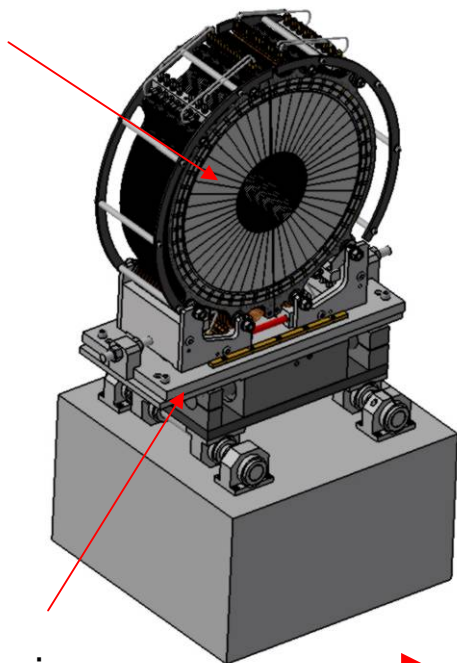
- ILD2 model status
  - **First integration of CAD model & feedback**
  - **Beam line design**
  - **First FEA calculation on beam pipe**
  - **Proposal for support tube**
  - **New EndCap (longitudinal structure)**
- MDI
  - **Questions on Cryo Line**
  - **Integration issues in Cavern**
  - **Opening scenarios**
- Conclusions

- Overview (*no significant change from Zeuthen*)



- First integration of sub-component in ILD2 model
  - **LumiCal Step file** (sent by W. Wierba)
    - How do we hang to support tube ? (*under discussed*)
    - Can we remove the alignment device ?

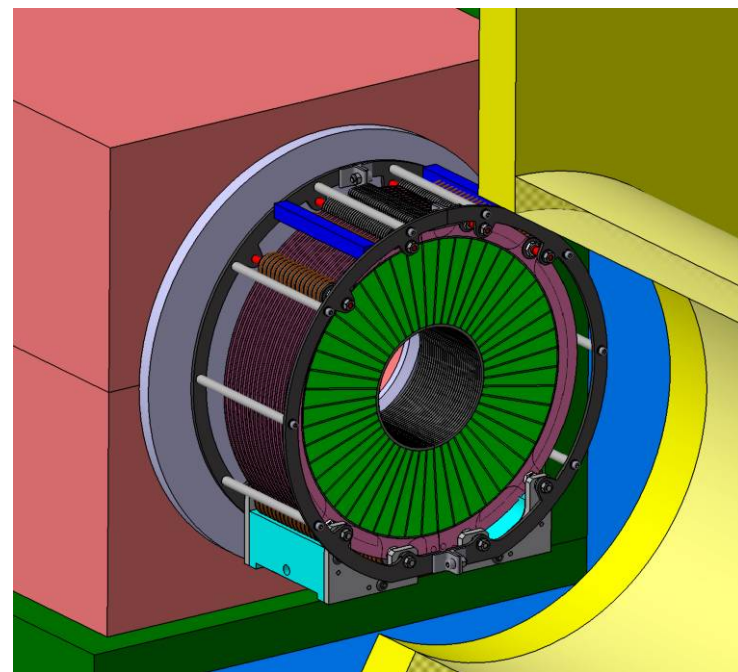
LumiCal



Alignment device



Integration in ILD2



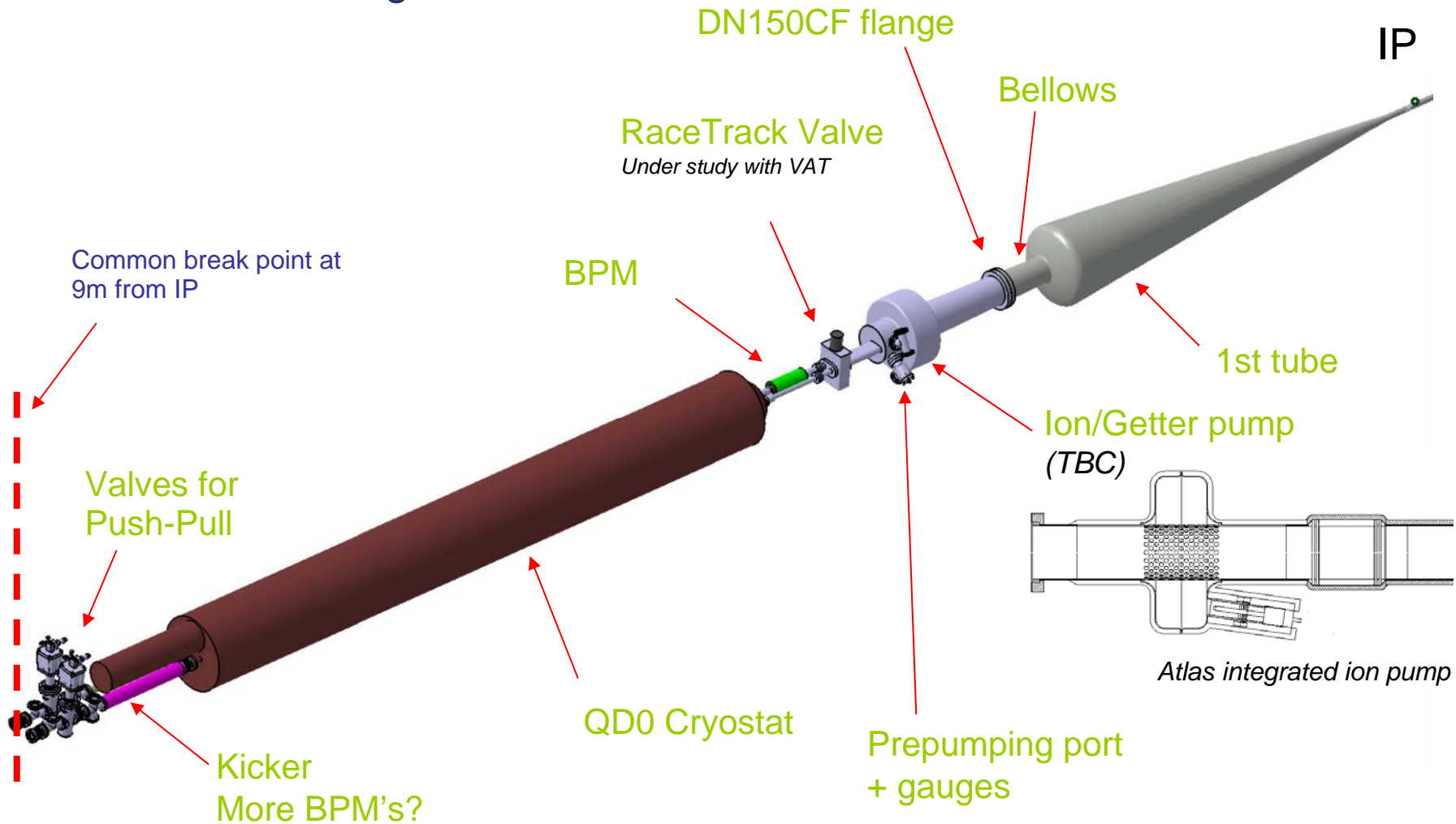
– **QD0 cryostat Step file** (sent by B. Parker)

- How do we fasten to the support tube ?
- Micro positioning device?
- Is it possible to add flanges in CAD model ?



- Feedback on integration of CAD model
  - **Define rules for exchanging files, avoid**
    - **.** / **#** in the name
    - Conflicts between file names
  - **Discussion with sub-component team on**
    - How do we support ?
    - What are the interfaces ?
    - How do you align ?
    - Cables/Power supply
    - Etc...
  - **Using light CAD model** (*about 300 parts for LumiCal !*)
    - External shape
    - Interfaces (flanges, support system, cables, cooling, etc..)

- Beam line design for 14mrad and  $L^* 4,5m$

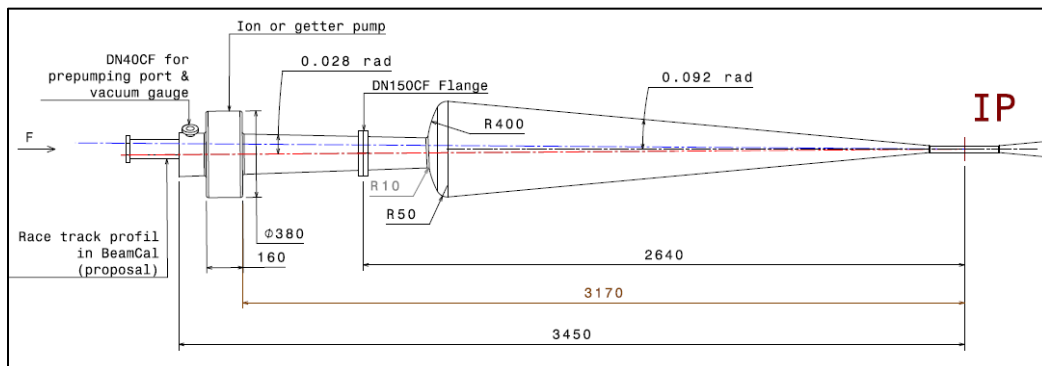
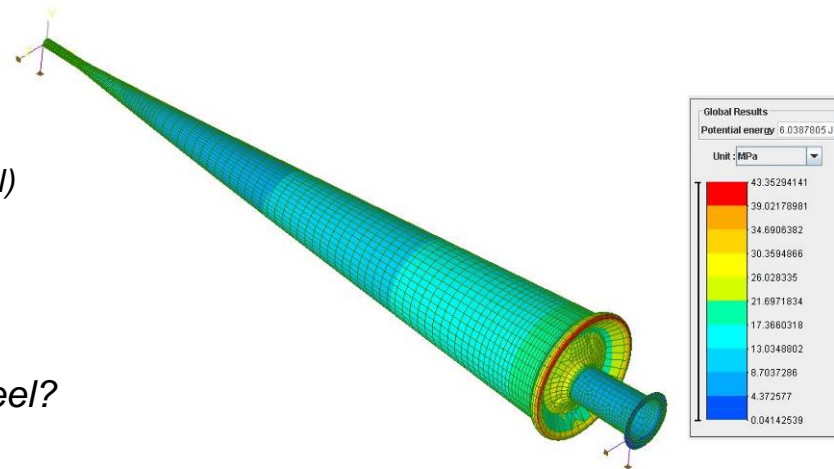




- Beam pipe issues

- **Very first FEA calculation** (M. Anduze)

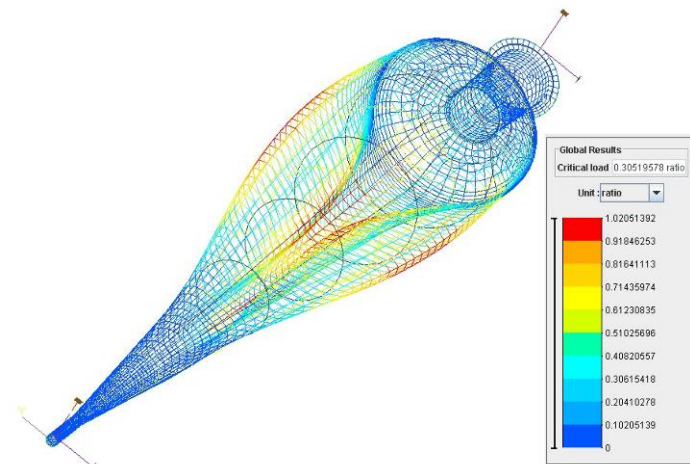
- Stress OK with this configuration (1mm thick in Al)
    - BUT problems with buckling calculation
      - » Add rigid structure ?
      - » Increase thickness ?
      - » Change material : Al / *Stainless Steel*?
      - » Change design ?



Published on [www.ilcild.org](http://www.ilcild.org)

- **Need feedback on**

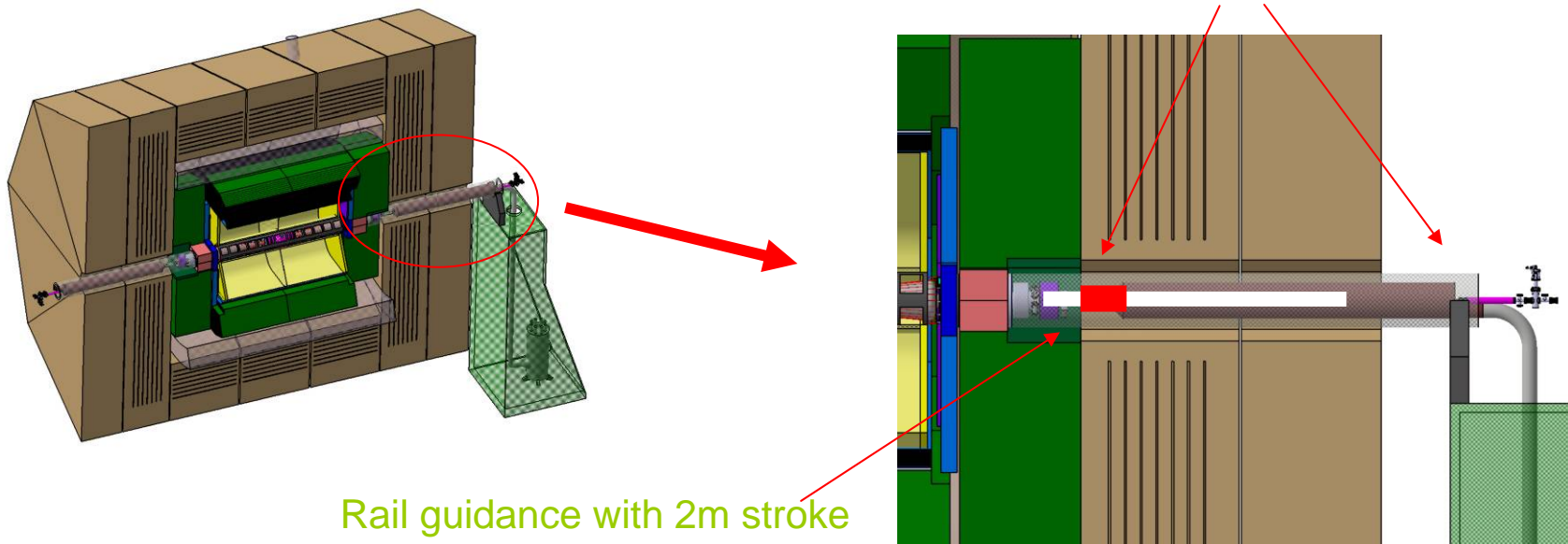
- Vacuum (see Yusuke Suetsugu's talk)
    - Wakefield
    - Background





- Proposal for support tube solution :
  - Rails guidance with 2m stroke
  - Isostatic “macro” positioning system
  - First support on EndCap entrance
  - Second support with structure from floor to support tube
  - Integrate Service cryostat + platform for access
  - Avoid vibrations (no cantilever)

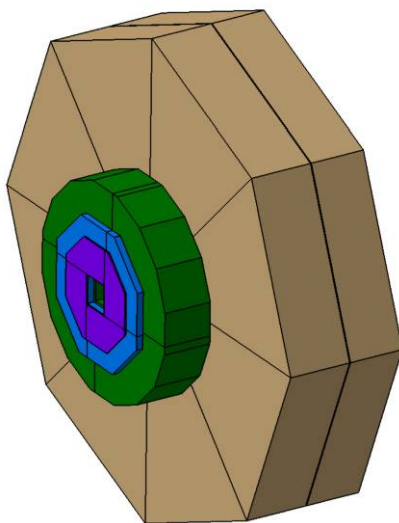
– **Mechanical study will be performed**



- New EndCap longitudinal design (*H. Videau*)

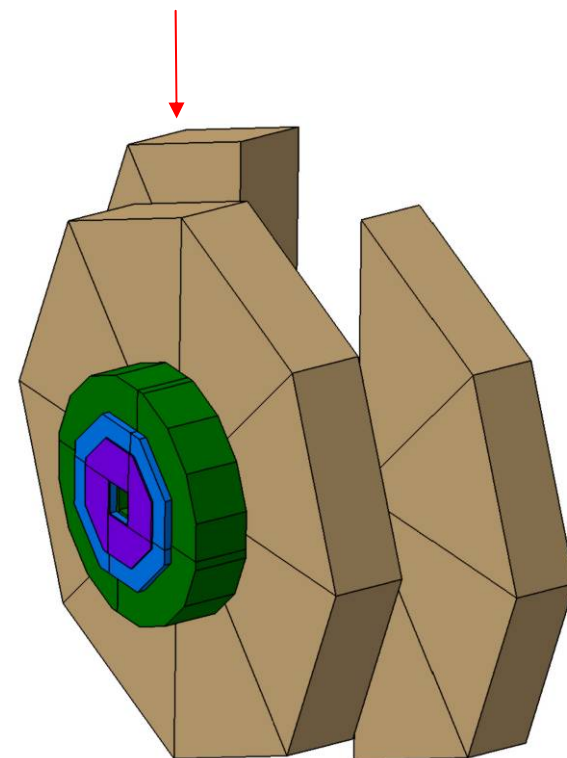
- **Split in 3 parts :**

- 2 half EndCap for Flux return
- 1 with muons chambers & Calorimeters



Rigid Yoke

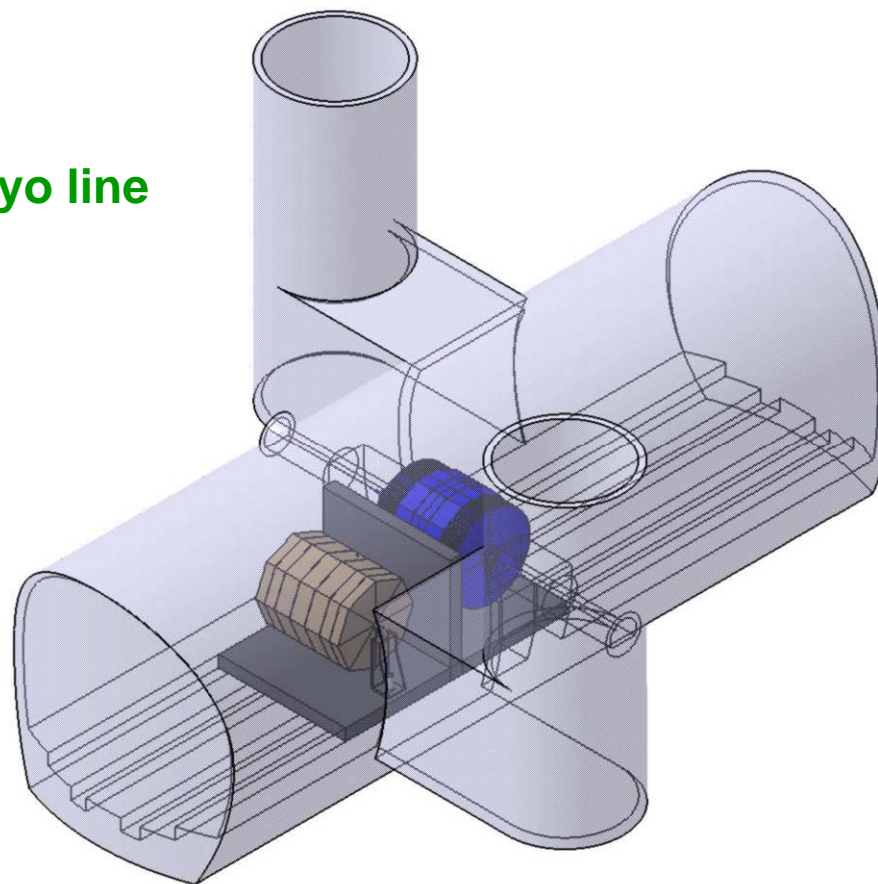
Split return yoke



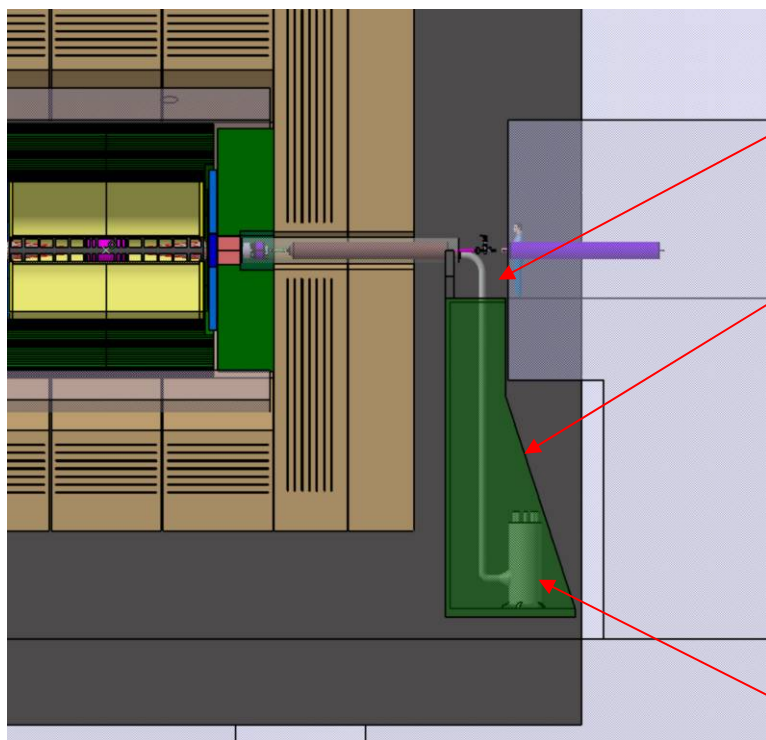
- **Pros**

- Reduces the weight of each piece (for assembly)
- Rigid structure for muon chambers and calorimeters
- More space for opening on beam (see forward)

- ILD detector in ILC Cavern *(based on RDR & IRENG07 dimensions)*
  - **Push-Pull platform**
  - **Shielding Wall**
  - **QF1**
  - **Service Cryostat & Cryo line**



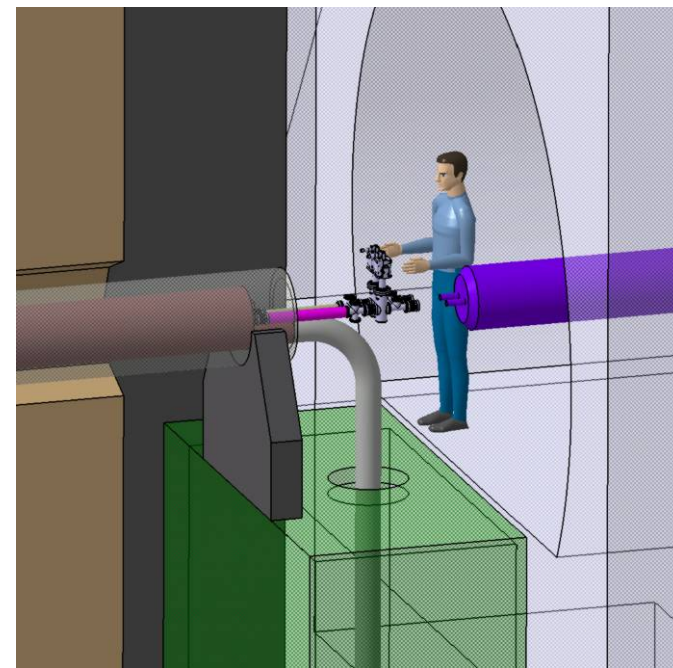
- Cryo supply line
  - Add chicanes for shielding
  - Cryo line is slightly flexible (B.P.)



Cryo line

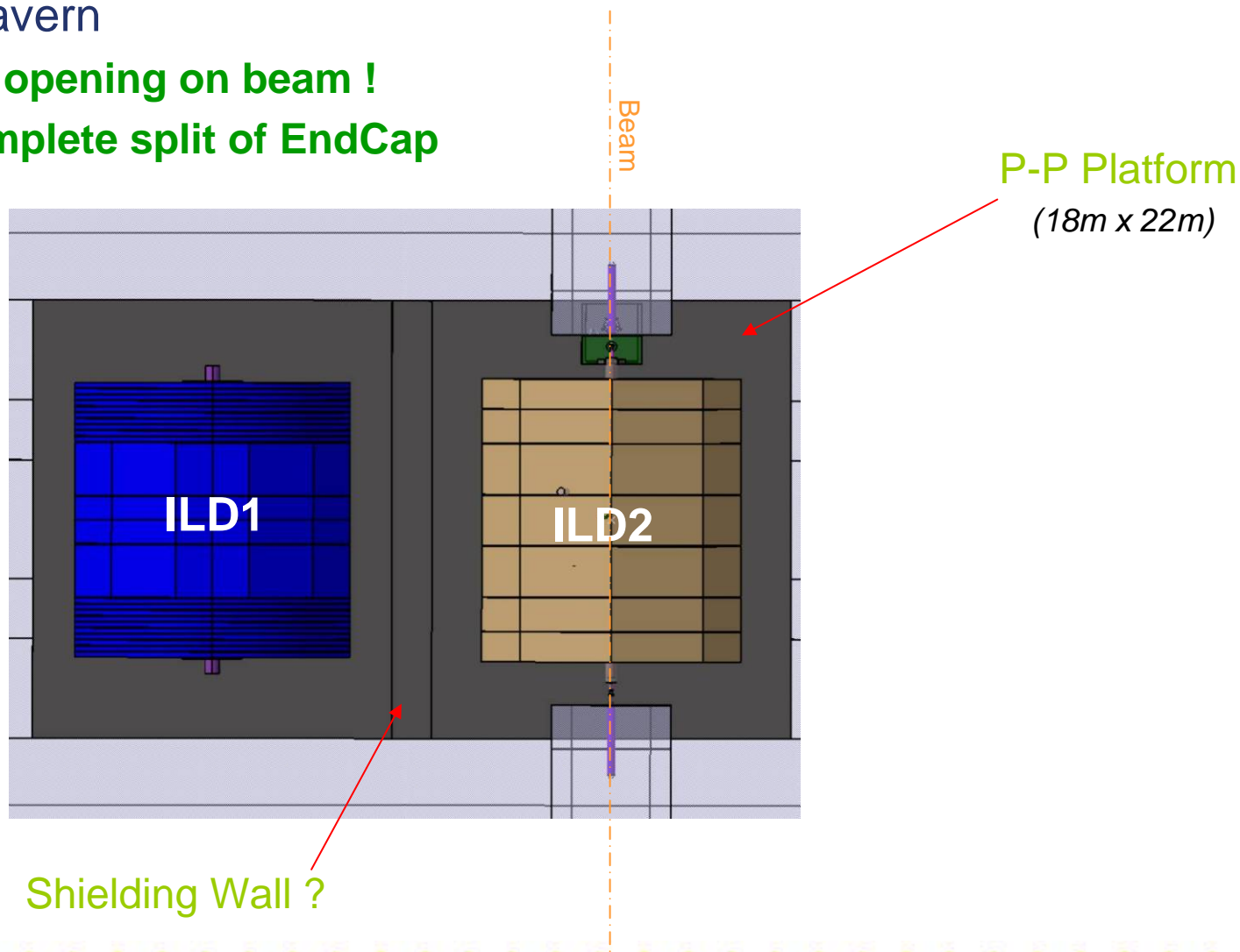
Pillar

Services cryostat



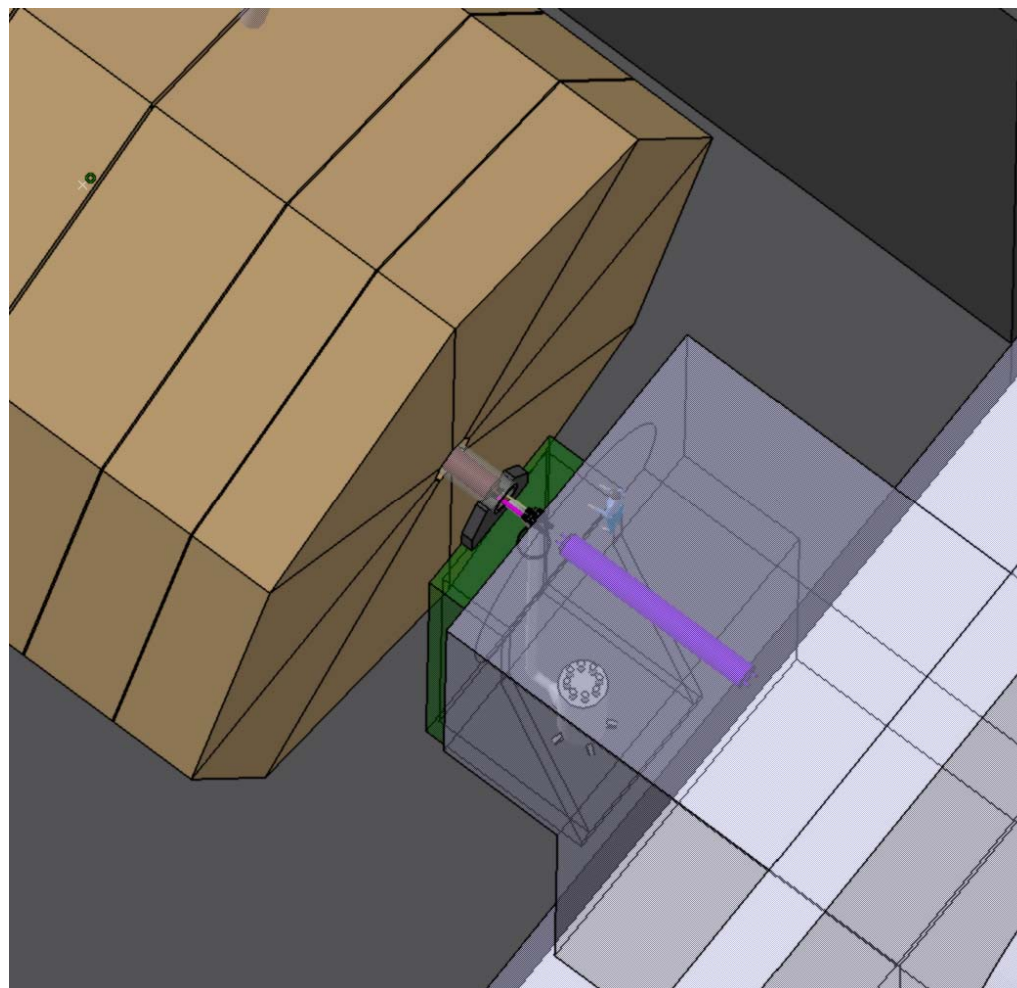


- ILDs in Cavern
  - **PB for opening on beam !**
  - **No complete split of EndCap**



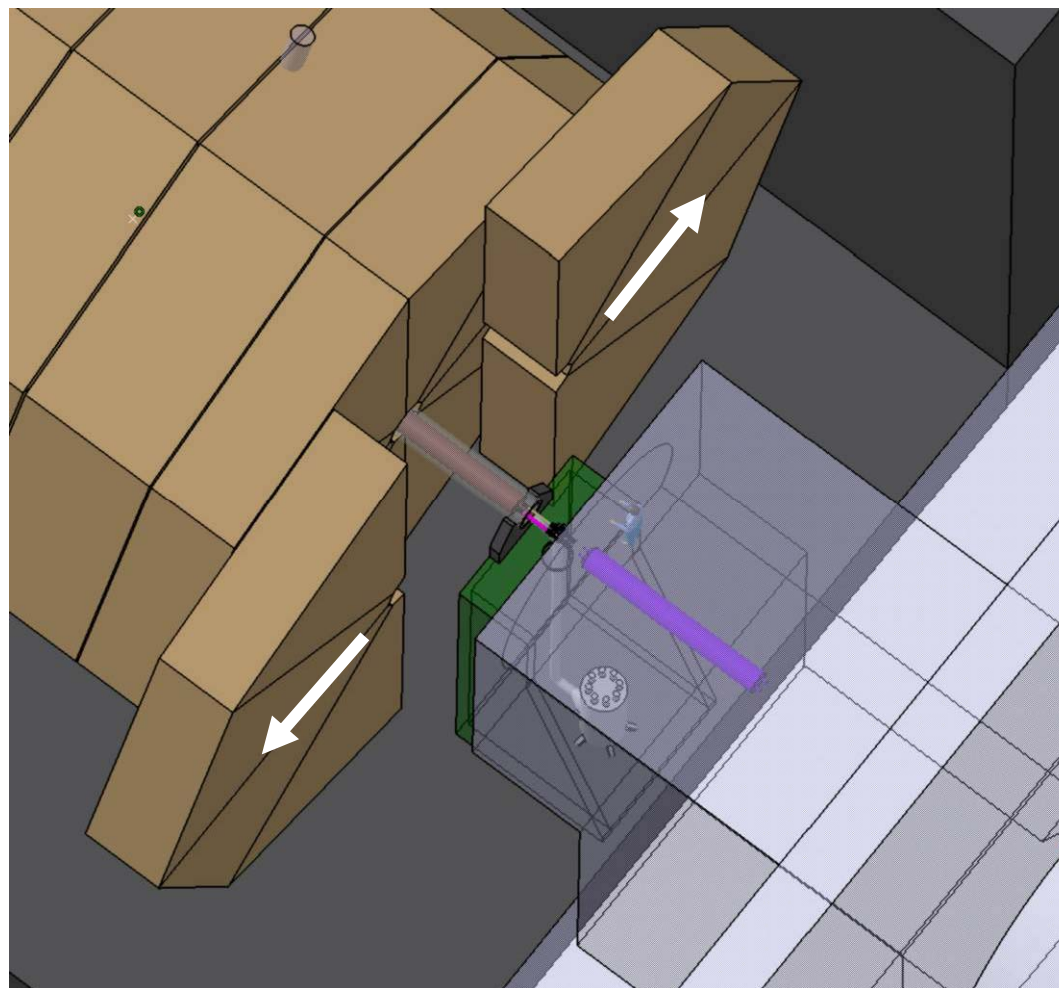
- No Vertex maintenance on beam position
  - **Only in garage position** (*annual maintenance*)
- “Light” maintenance on beam line
  - **TPC Endplates**
  - **Forward Detectors** (*LumiCal, LHCAL, BeamCal*)
  - **HCal / ECal electronics ?**
  - **Pumping system**
  - **Inner part services** (*power, cooling, etc...*)
  - **Muons chambers ?**
  - **EndCap detectors** (*ECAL, HCal, ETD, muons chambers*)

- Detector closed



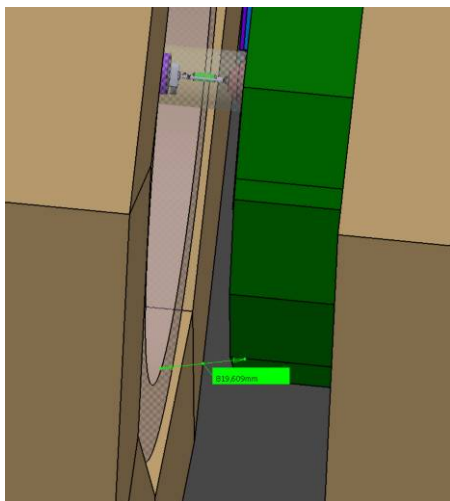


- Splitting of last return yoke



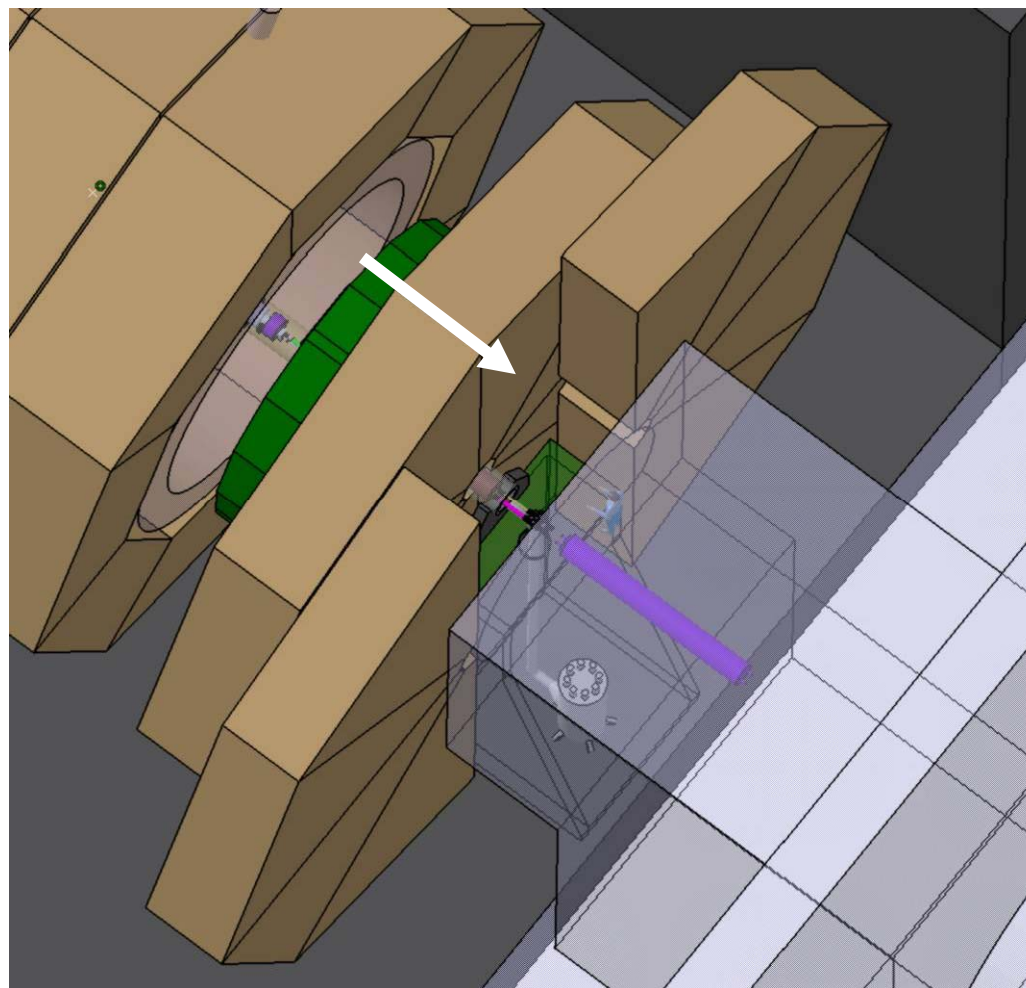
4m splitting

- Opening the yoke (2m)

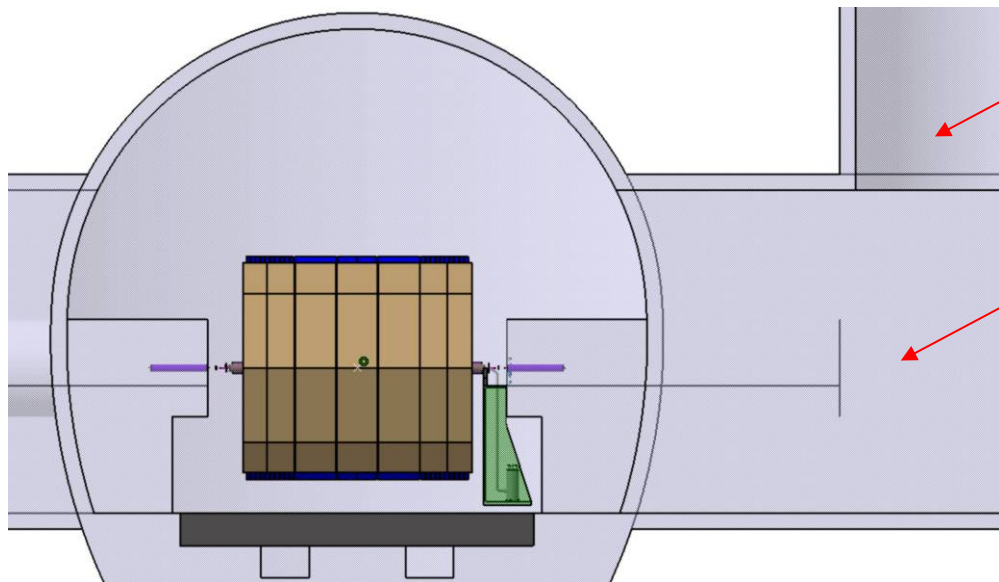


**80 cm for access**

→ Enough ?



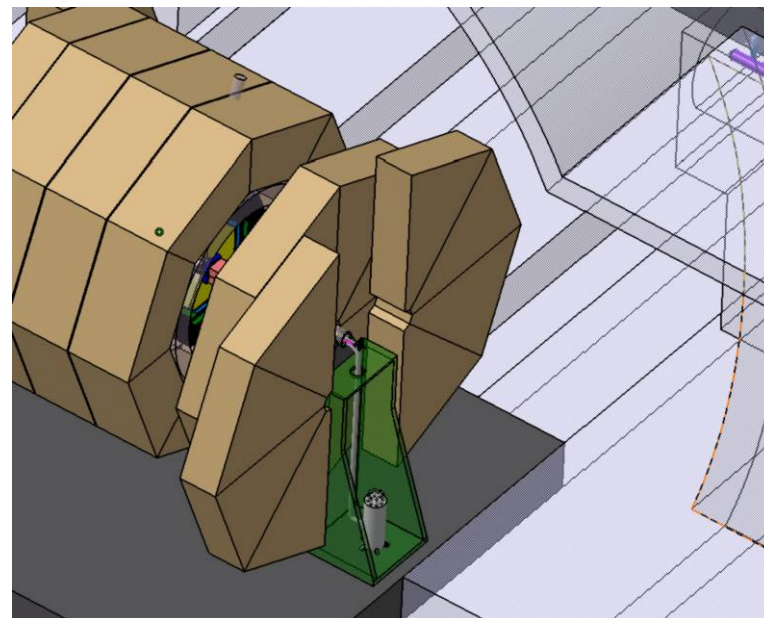
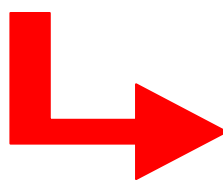
- Opening the doors



Access shaft

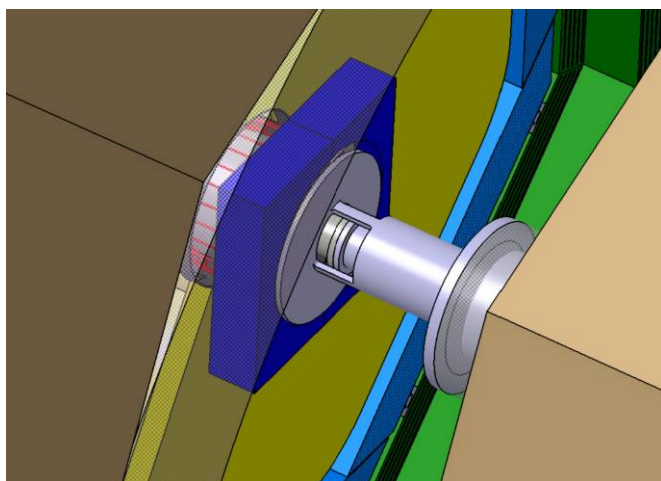
Transfer tunnel

1

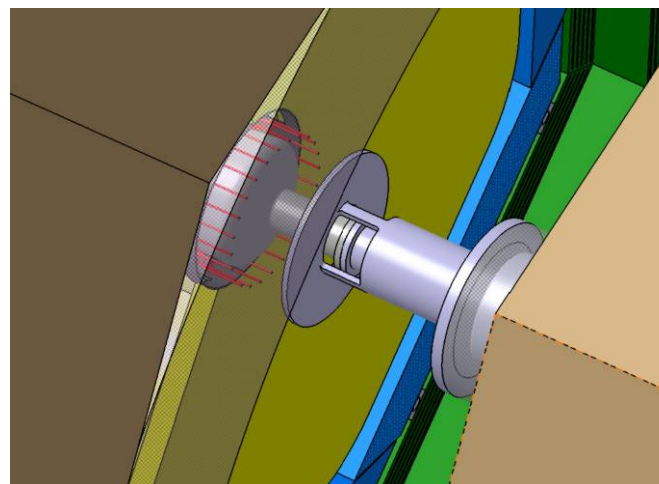




- Dismounting
  - **Forward Calorimeters**
  - **Flange**



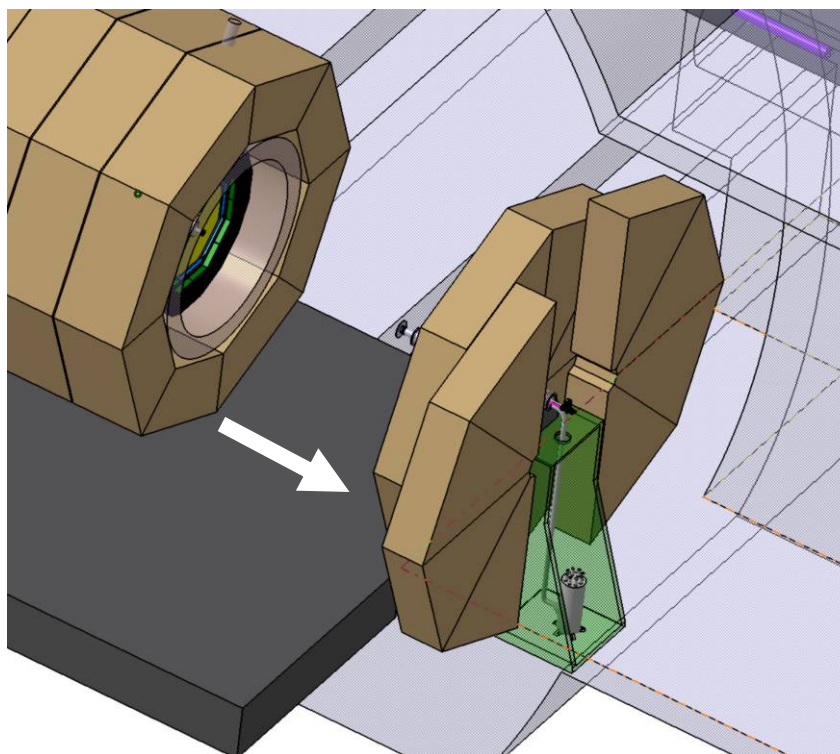
2



3

- Questions
  - **Vacuum**
  - **Time consuming on dismounting FCals**
  - **Need adapted tools** (*impossible to access with cavern crane*)

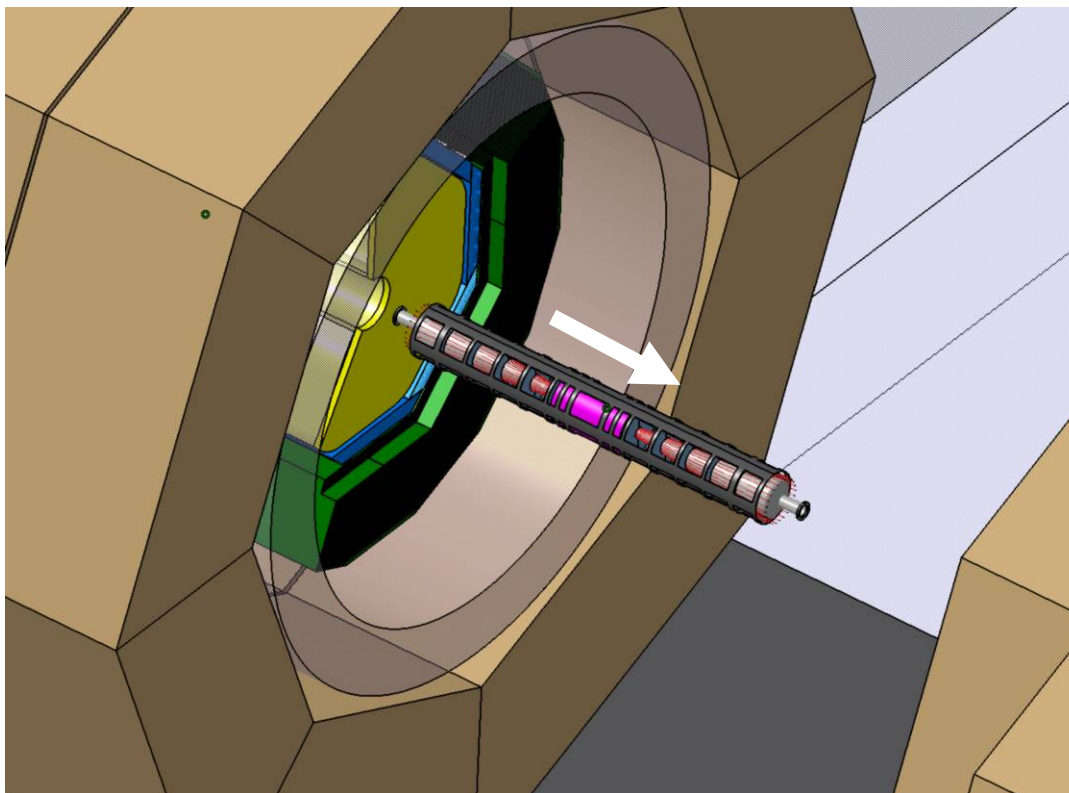
- Move back the EndCap & Cryo supply platform



4

- Questions
  - **Movement of all services/cables**

- Access to Inner detectors with adapted tooling



- Beginning of CAD Exchange
  - **Several points to discuss between integration/sub-component team**
- Mechanical integration of ILD
  - **Beam pipe under study**
  - **Beam line is well defined**
  - **First approach for support tube**
  - **EndCap design**
  - **First design of cryo supply**
- Opening scenarios depending on ILC Hall Design
  - **Vertex maintenance only possible in garage position**
  - **“Light” maintenance on beam**
  - **Is it OK with physical/technical needs of sub-detectors ?**



- Detector integration
  - Cables localization
  - Yoke mechanical design & support
  - Integration of muon chambers
  - Sub-detectors support
  - Support tube design
  - Vacuum system
  - Inner part assembly
  - BPM & Kicker
- MDI
  - Pacman Shielding
  - Integration on Push-Pull Platform
  - Services/cables in ILC Hall
  - QF1 interface
  - Cryo supply
- Etc...