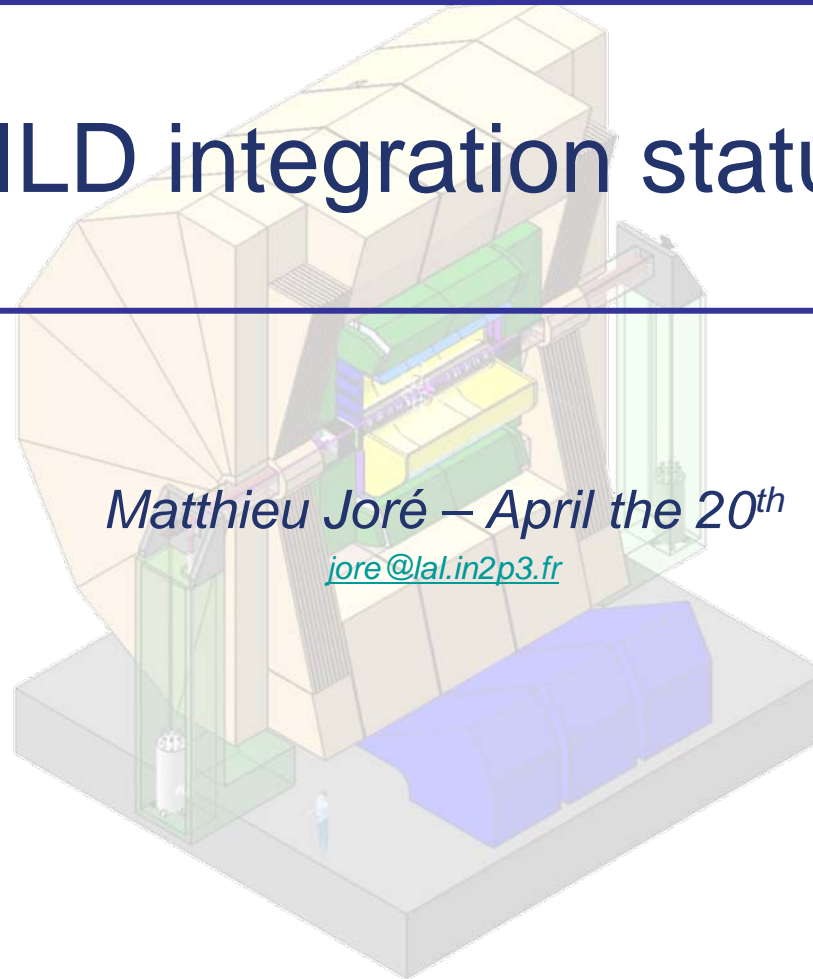




ILD integration status



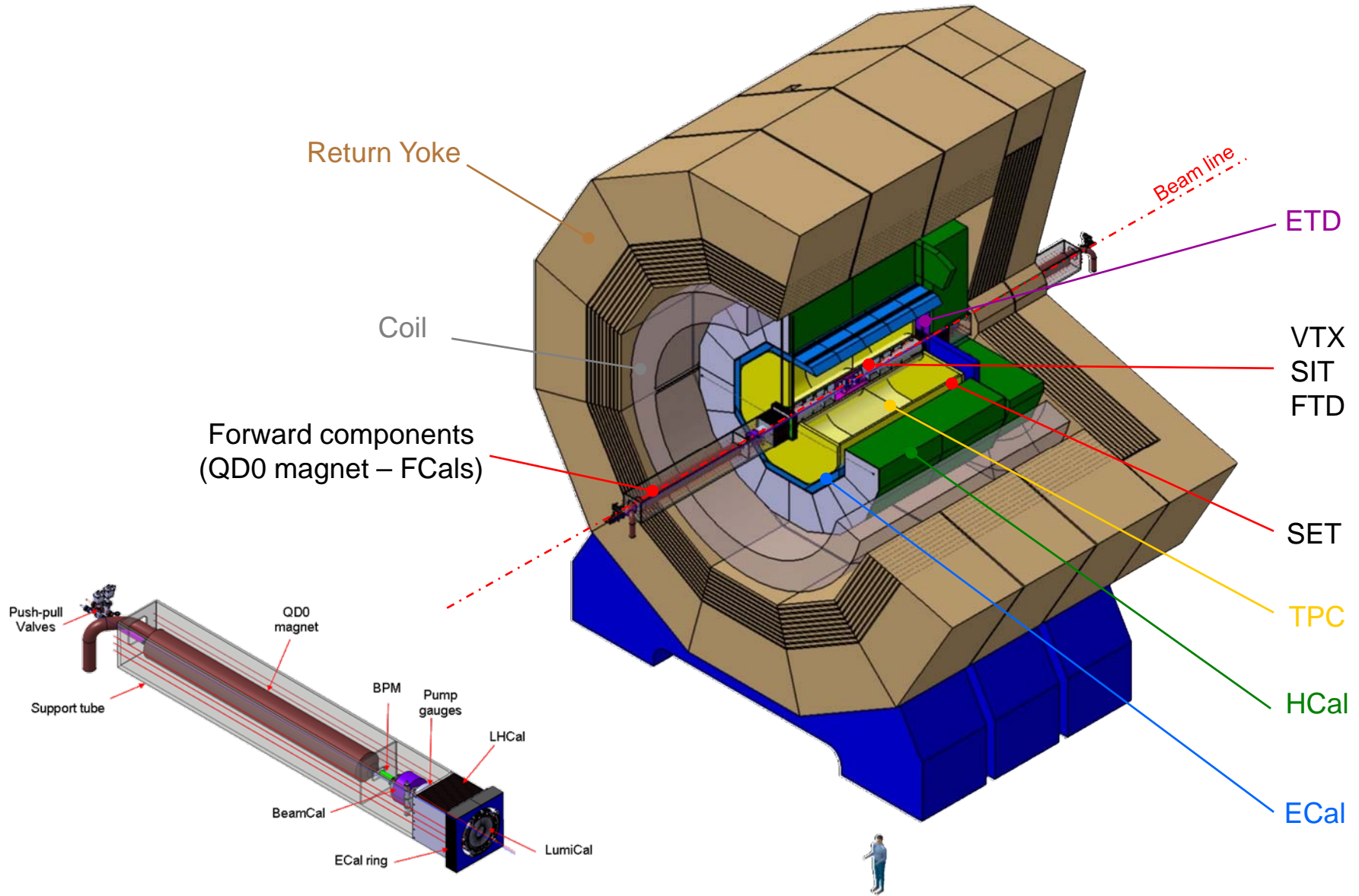


Outline

- Introduction
- Status of the integration studies
- Recent updates
 - **Hcal design**
 - AHCaI
 - DHCaI
 - **ETD design and fixation**
- Inner region
 - **Status**
 - **Assembly**
 - **Some issues**
- Conclusions



ILD overview



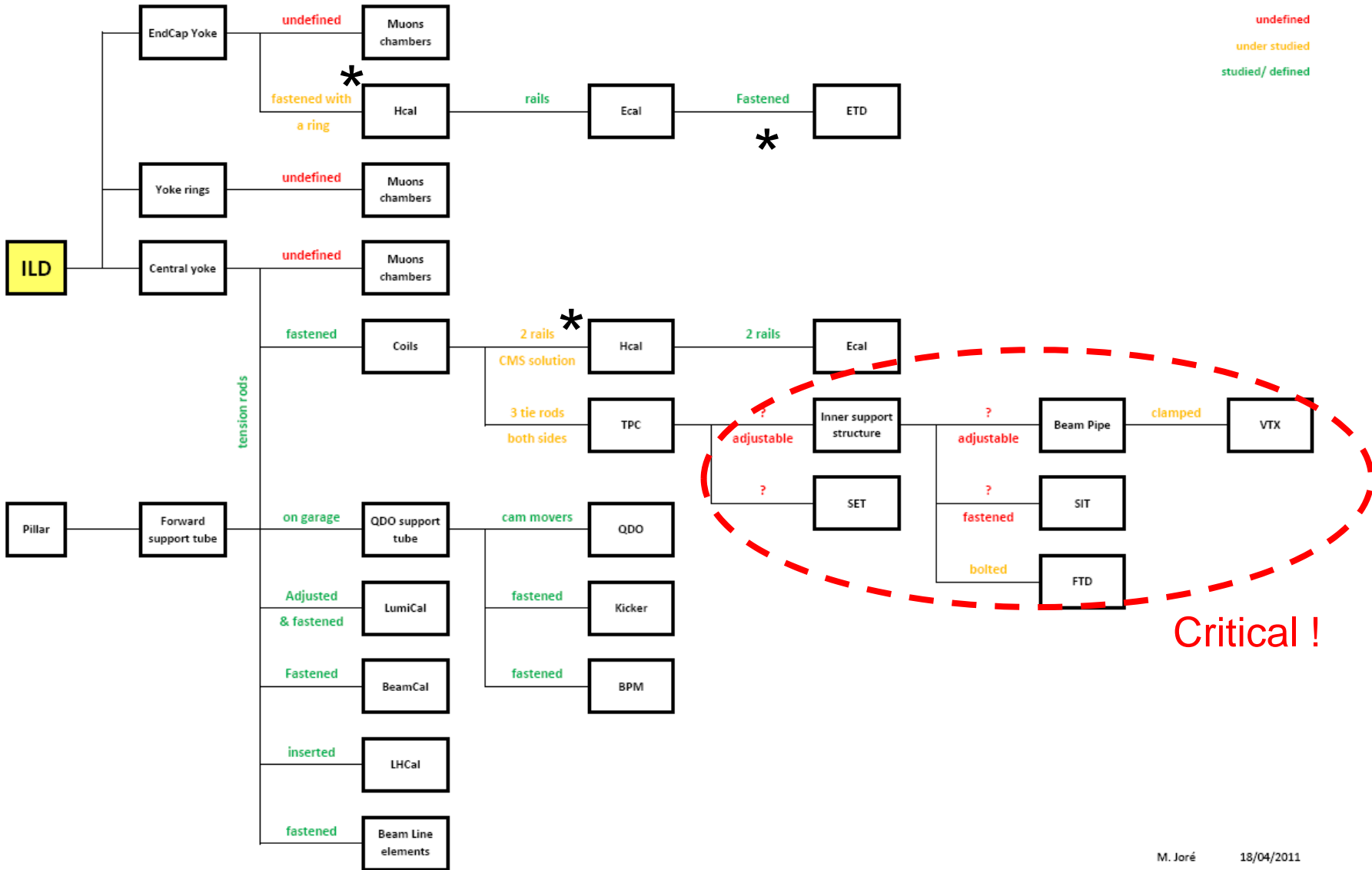


Goals for the integration studies

- For 2012 :
 - **Complete basic mechanical integration of the baseline design accounting for insensitive zones such as the beam holes, support structure, cables, gaps or inner detector material**
 - **Develop a realistic simulation model of the baseline design, including the identified faults and limitations**
- So for the ILD workshop in May :
 - **Define a software baseline for mass production (Ties)**
 - **Needed to estimate as much as possible the insensitive material**
 - Especially for the inner region !



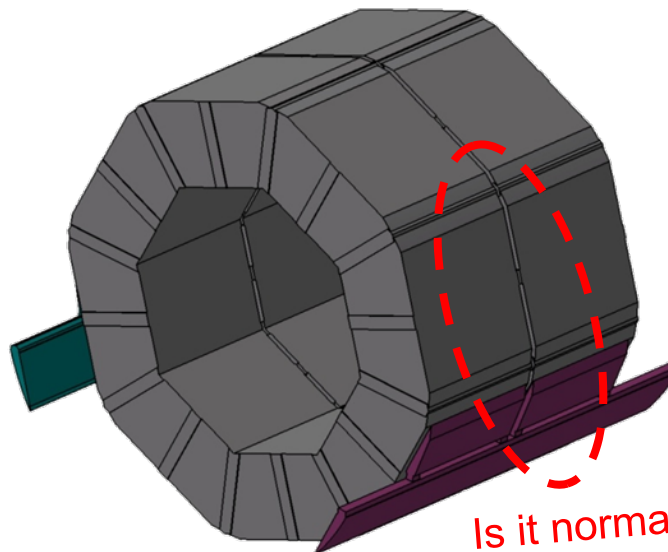
ILD Integration tree



Critical !



- CAD model for the barrel has been recently provided by K. Gadow
- Will be soon integrated

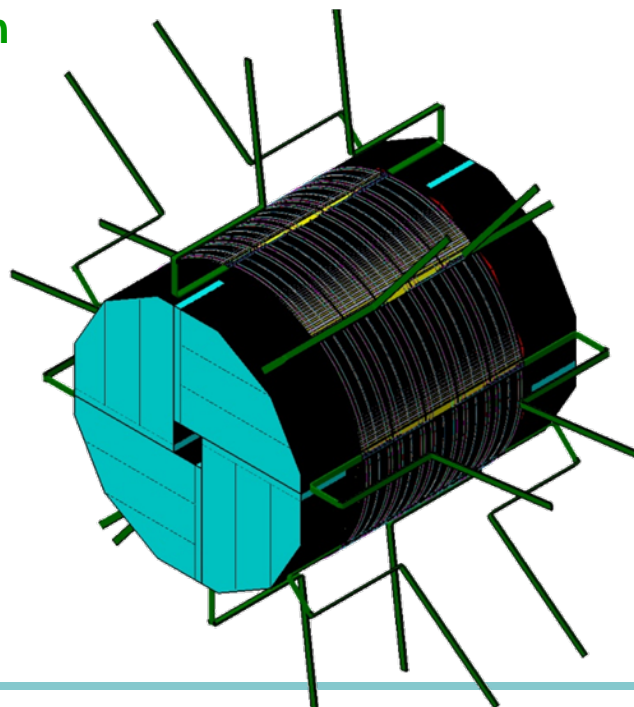


Is it normal to have a crack here?

- Dimensions are not correct
 - **Rin : 1948 must be 2058**
 - **Rout : 3212 must be 3345**
 - **Z : 2215 with electronic must be 2420**

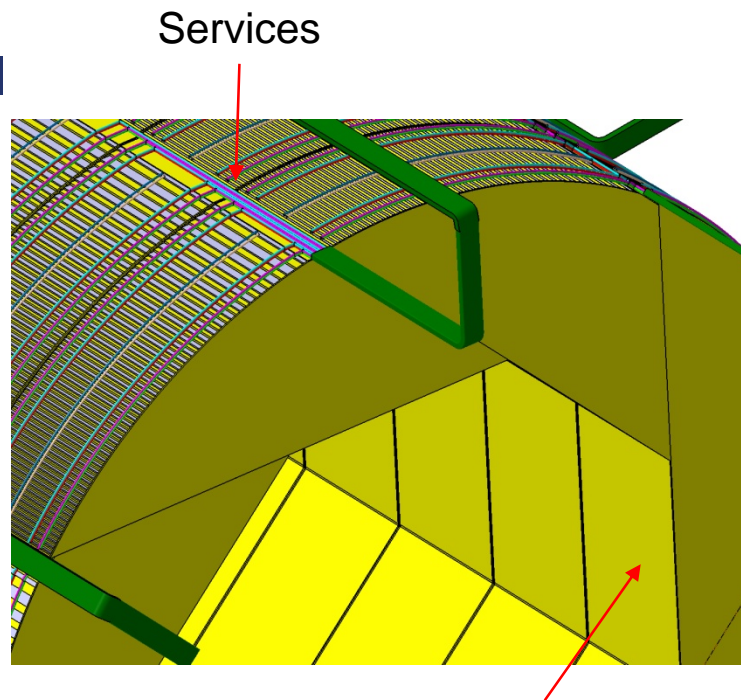


- We had an integration meeting end of 2010
 - **Still a lot of work to be done for understanding the mechanical structure**
- CAD model has been sent on Monday by JC Ianigro (IPNL)
 - **Barrel + EndCap**
 - **Services of Barrel**
- DHCal fixation on EndCap Yoke under studied
 - **Must avoid constraint when magnet is on**
 - **Could be used for the AHCal version**
- Dimensions seem OK

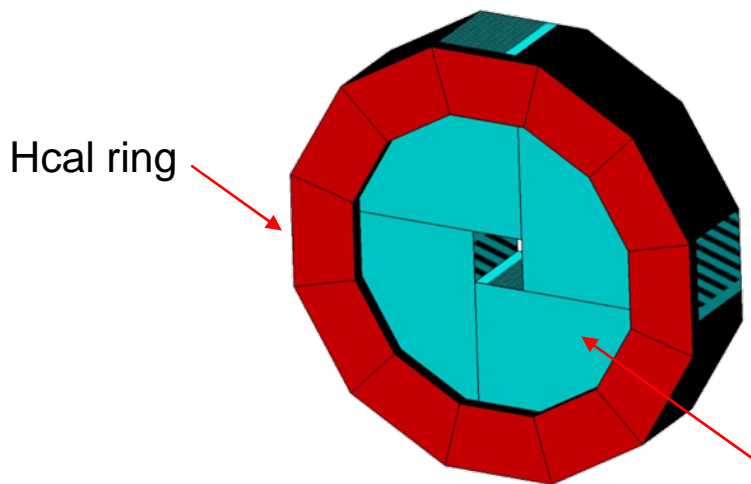




- Structure « à la Videau » for the barrel
 - **Modules assembled to get 5 wheel**
 - **Services between Hcal and Cryostat**
 - Allow to reduce the overall region
- First design of the EndCap Hcal
 - **Build in 4 module**
 - **Fixation to the yoke under studied**
 - Must decouple yoke and HCal



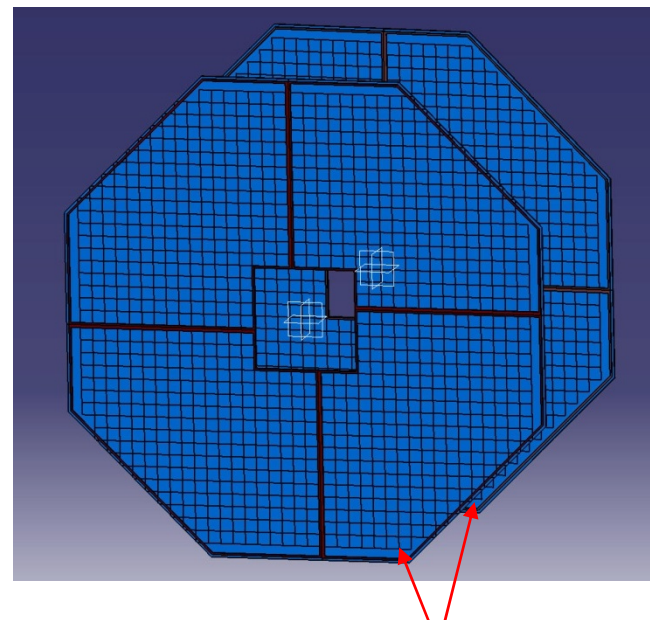
Mechanical structure à la Videau



EndCap Hcal module



- LPNHE will restart the mechanical studies
- ETD actual baseline :
 - **3-layers XUV of single sided micro-strips**
 - **Fixed to Ecal endcap with screws**
 - **Octagonal shape to fit to Calo design**
 - **Rout : less than Ecal Rin (1843)**
- Discussions between 2 or 3 layers :
 - **2 seems to be chosen/enough (XY) ?**
 - **Each layers is 15mm thick**
 - **Total thickness 45mm>30 mm**



ETD layers for the XY solution
(from P. Ghislain – LPNHE)

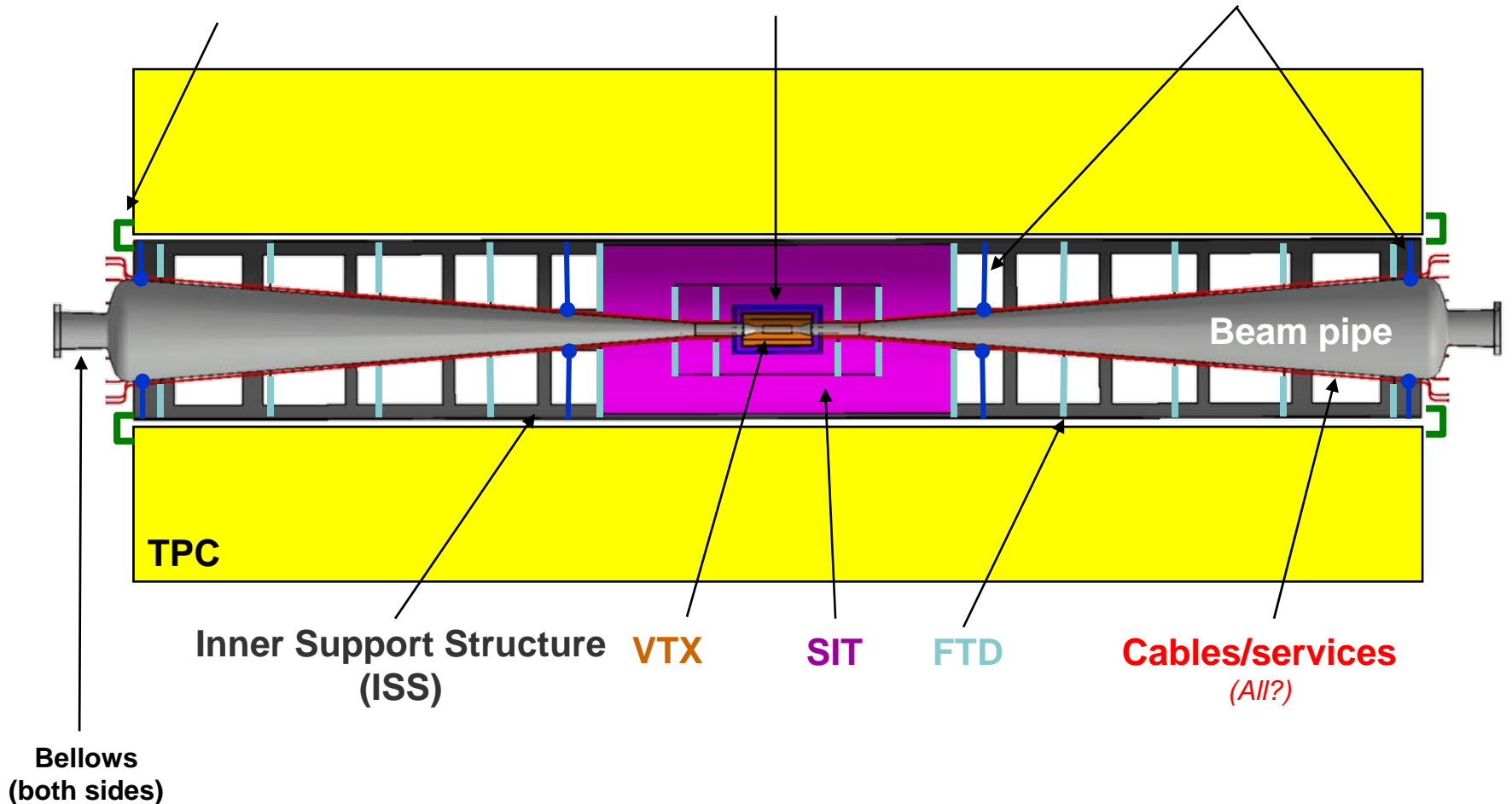


Inner region - reminder

Fixation of ISS on TPC endplates or inner diameter

VTX fixed on beam tube

BP hang by small cables. Could be adjusted to beam axis.



Bellows (both sides)

Inner Support Structure (ISS)

VTX

SIT

FTD

Cables/services (All?)

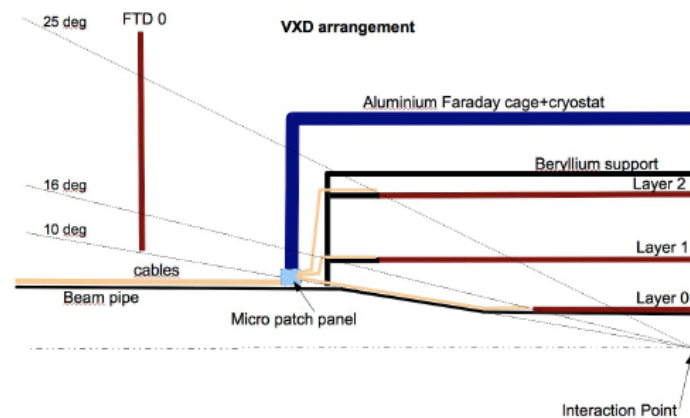
Beam pipe



Status of inner region integration

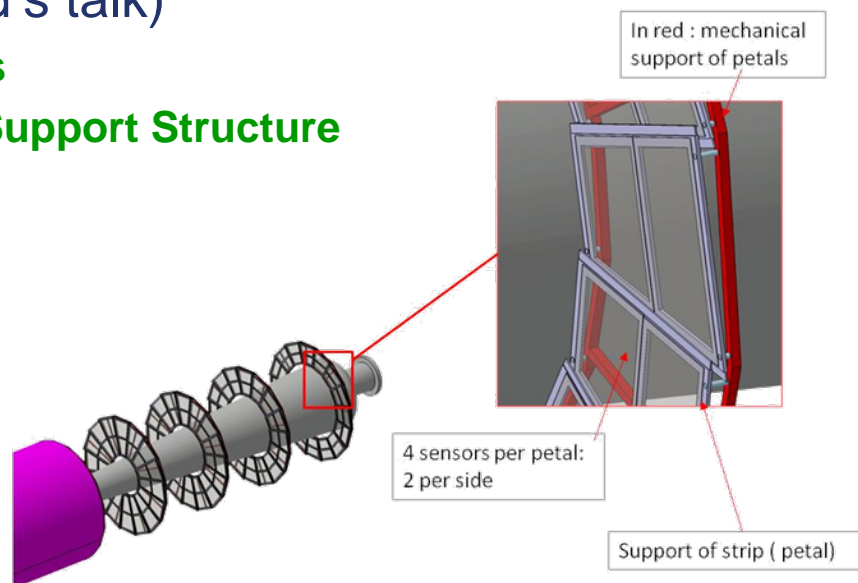
- Some progress has been made on VTX (see Jerome's talk)

- Estimation of mechanical material
- First estimation of cables



- And on FTD3->7 (see david's talk)

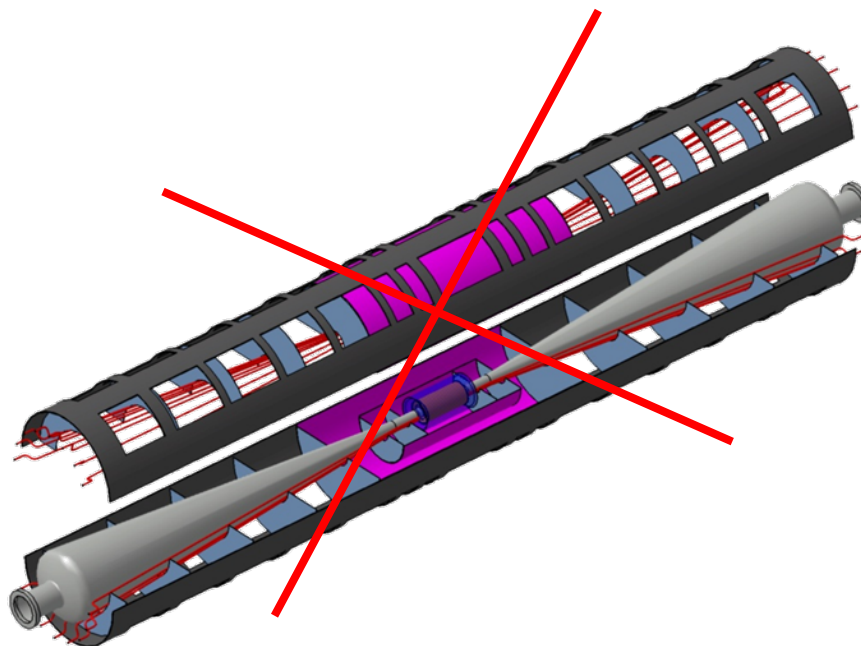
- Mechanical design of petals
- FEA calculations on Inner Support Structure





Assembly procedure

- Each half of FTD disk will be fastened together
- Assembly procedure in 2 halves shell couldn't be used

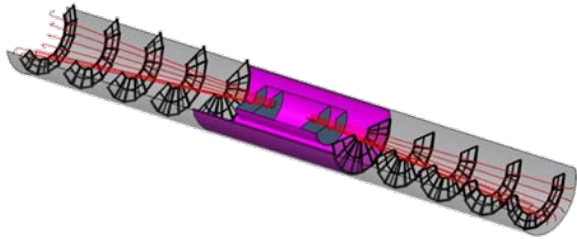


- A new procedure must be studied

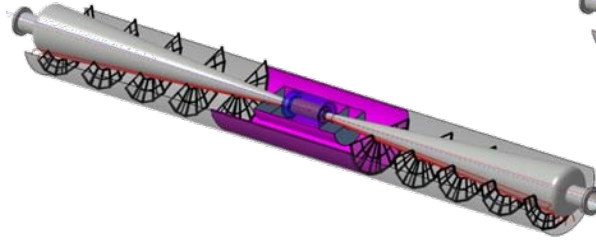


One proposal

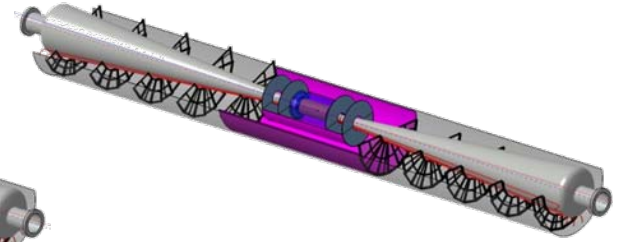
1



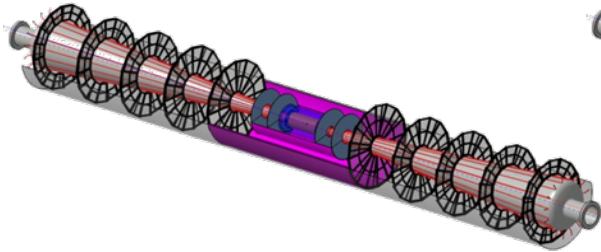
2



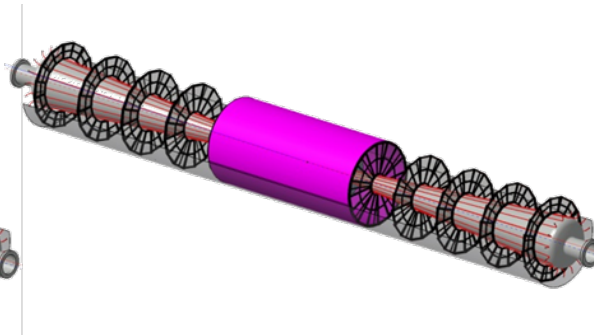
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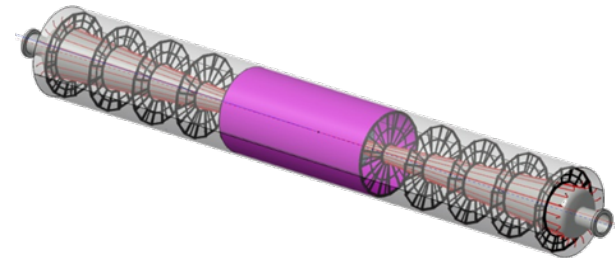
4



5



6





Some issues

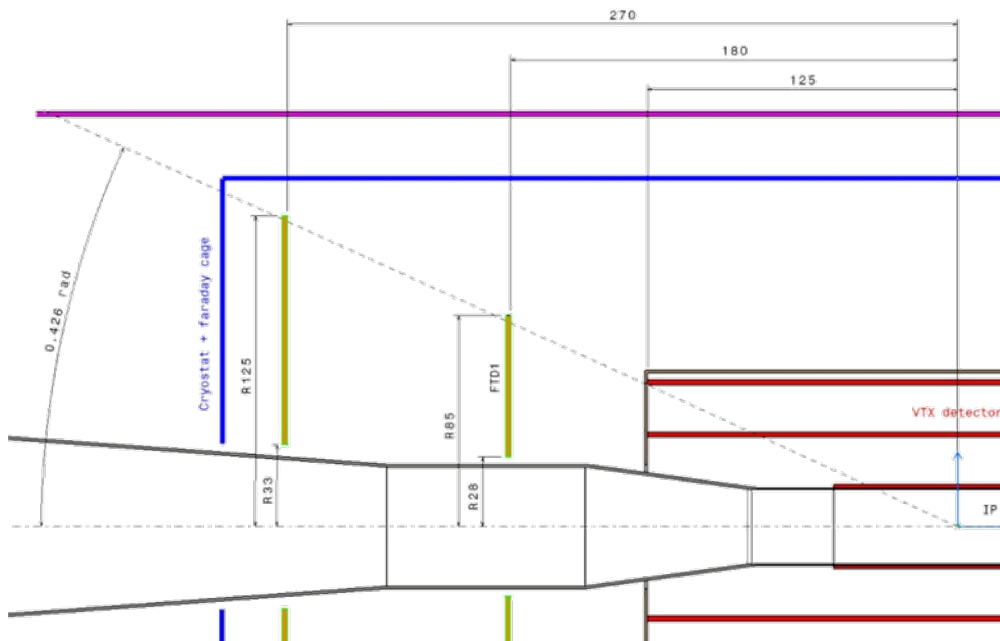
- VTX cables support : on BP?
- SIT :
 - **Mechanical structure?**
 - **Cables path?**
 - **No one identified at the moment**
- FTD1&2 cables and support?
- BP support : wires?
- Tooling
- Etc...

- Any good idea?



Discussions about FTD1&2 and VTX

- FTD1&2 use Pixel sensors
 - **Might need a cryostat and a faraday cage as the Vertex**
- Discussion ongoing to review their integration :
 - **Integrated in the same cryostat than the VTX**
 - **Position and dimensions would be modified**
 - **Integration procedure too**





Conclusions

- Effort ongoing on the integration of
 - **Calorimeters**
 - Need to integrate both alternative in the Cad model
 - AHCAL is not ready
 - DHCAL could be integrated
 - Discussions are necessary
 - **ETD**
 - Studies are restarting
- Integration of the inner region is by far the most critical point
 - **FTD3->7 and VTX design is progressing (thank you David and Jerome)**
 - **Inner support structure study ongoing**
 - **BUT impossible to get information from SIT**
 - **We cannot progress in the design if we don't have contact persons for that !!!**