



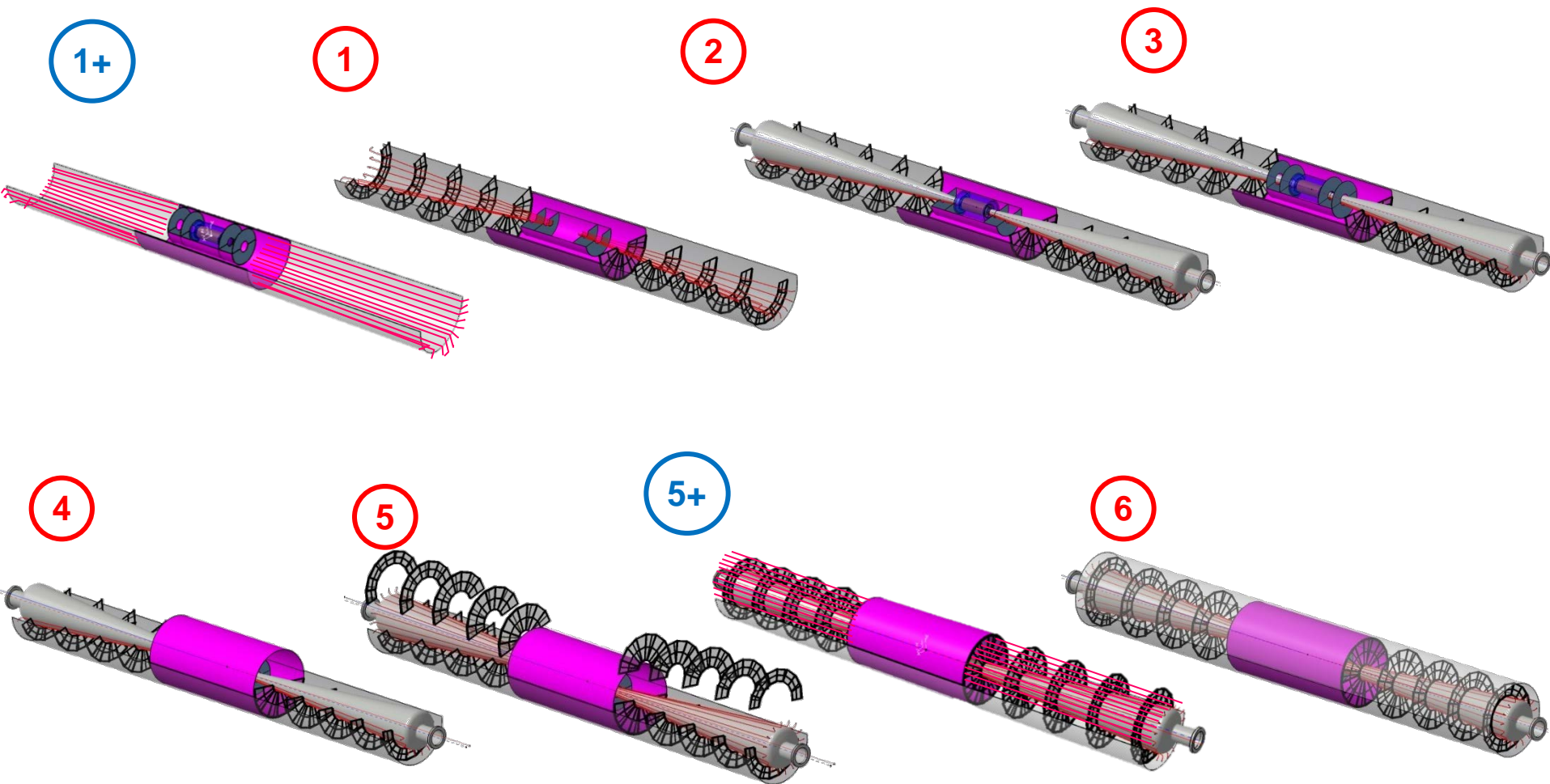
ILD

Summary of inner parts status

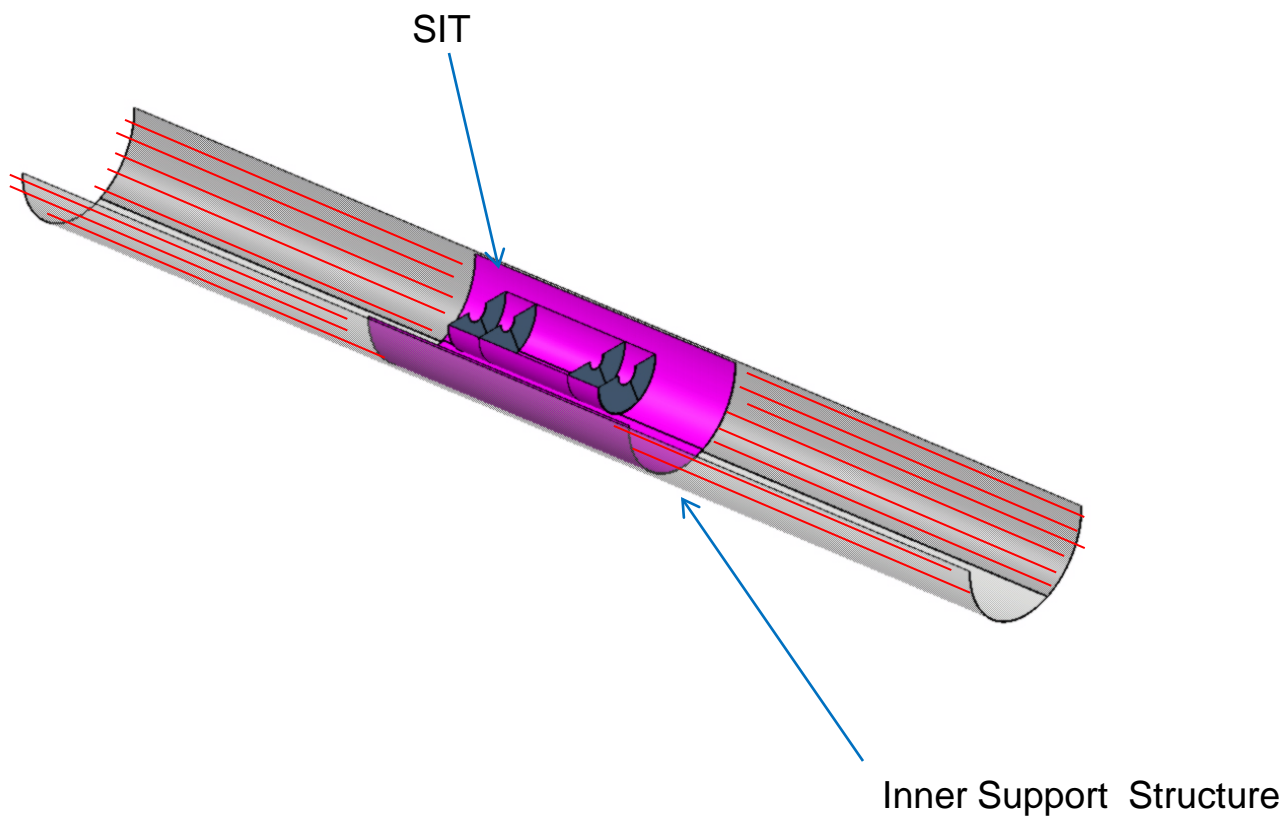
Outline:

- **Assembly procedure,**
- **Inner services,**
- **Integration procedure,**
- **Alignment procedure,**
- **Conclusion.**

- Assembly procedure :

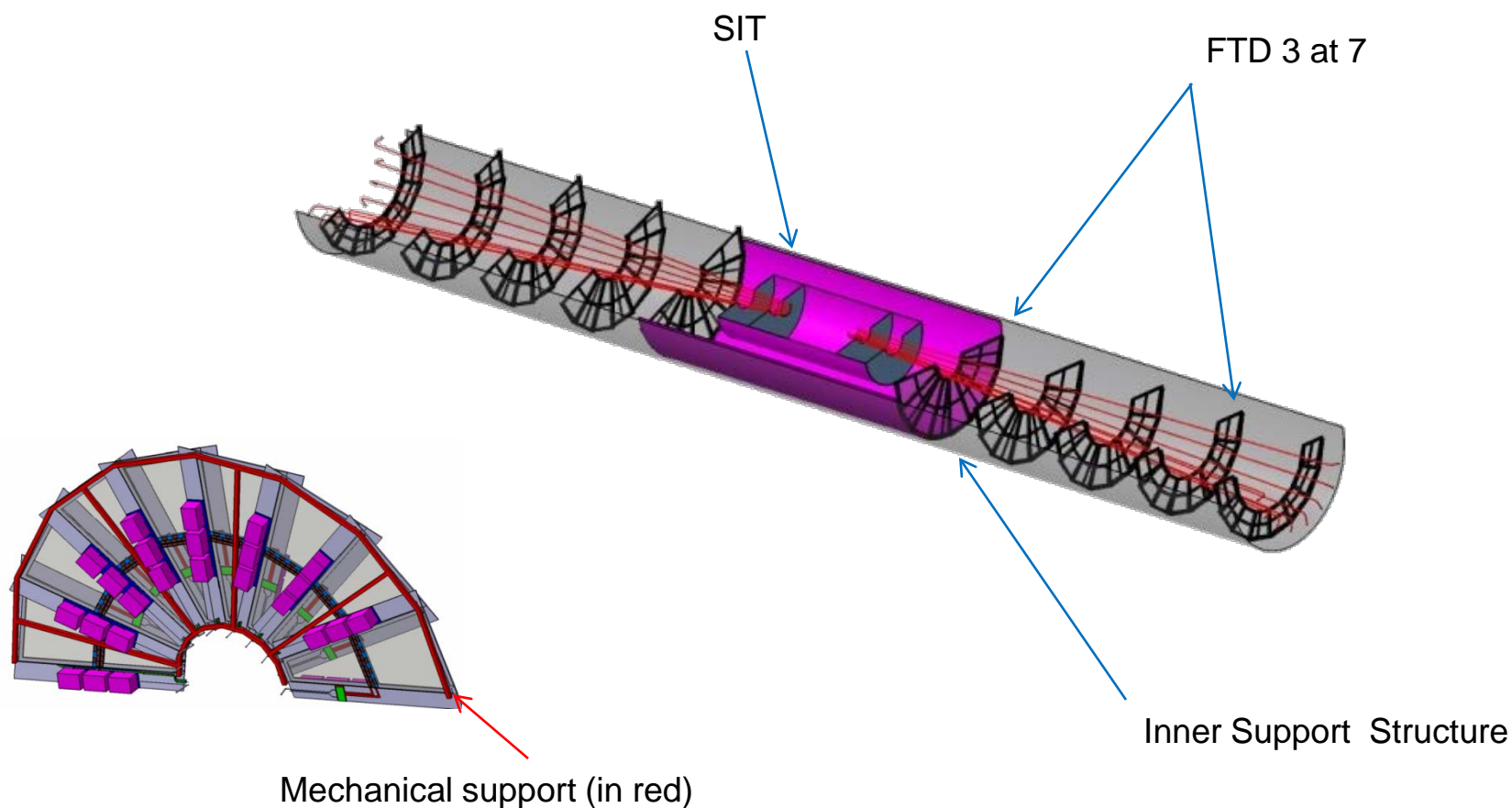


Assembly procedure details :



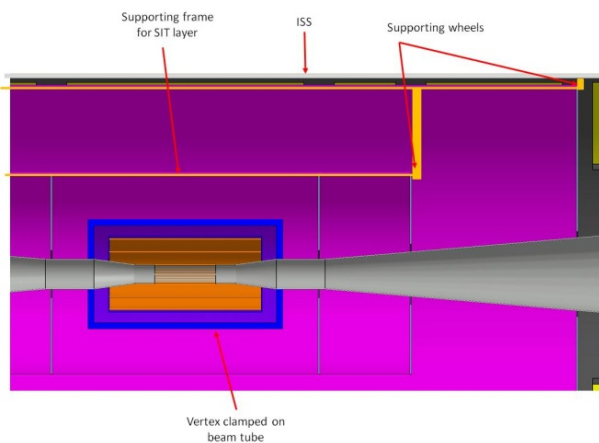
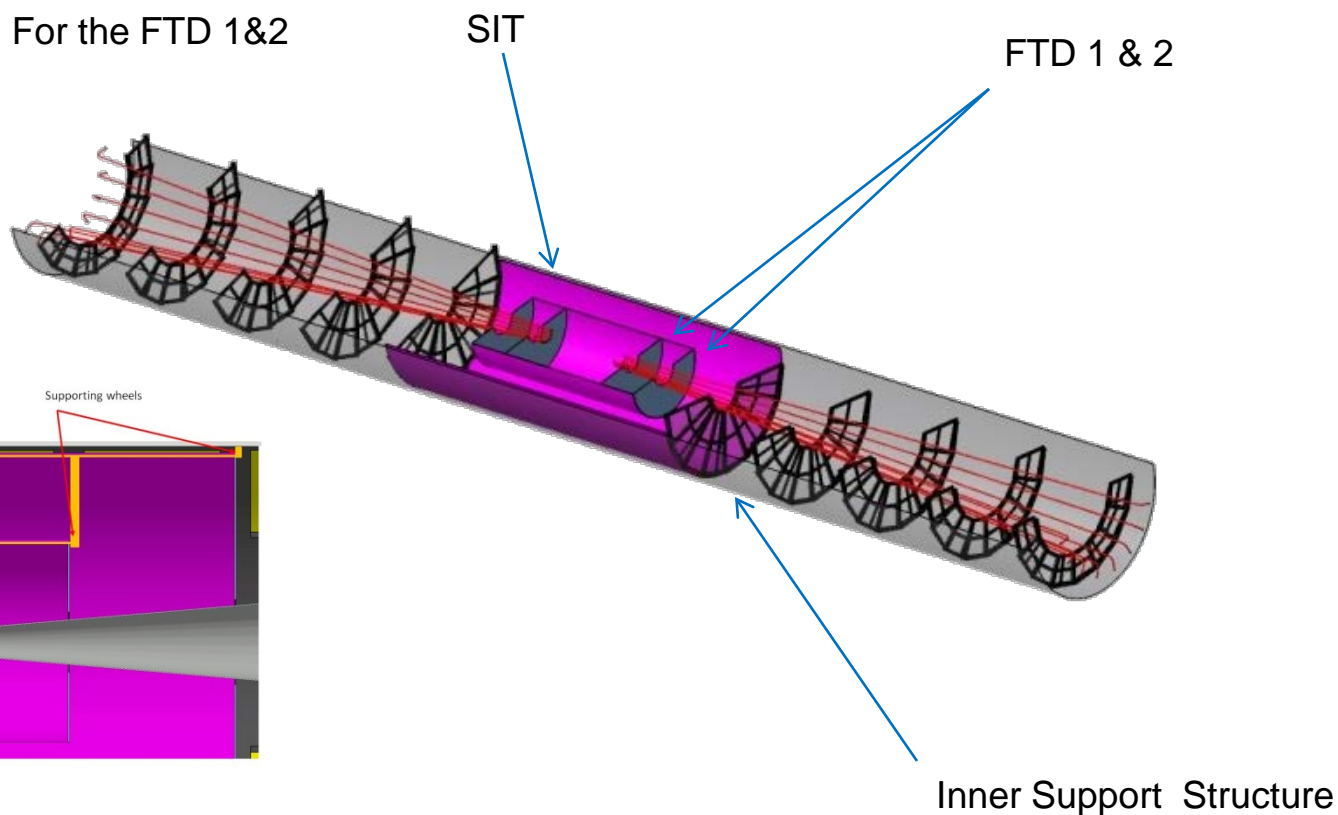
Assembly procedure details:

- Level 1
 - **FTD 3 at 7 fixed and located on ISS (external mounting)**



Assembly procedure details:

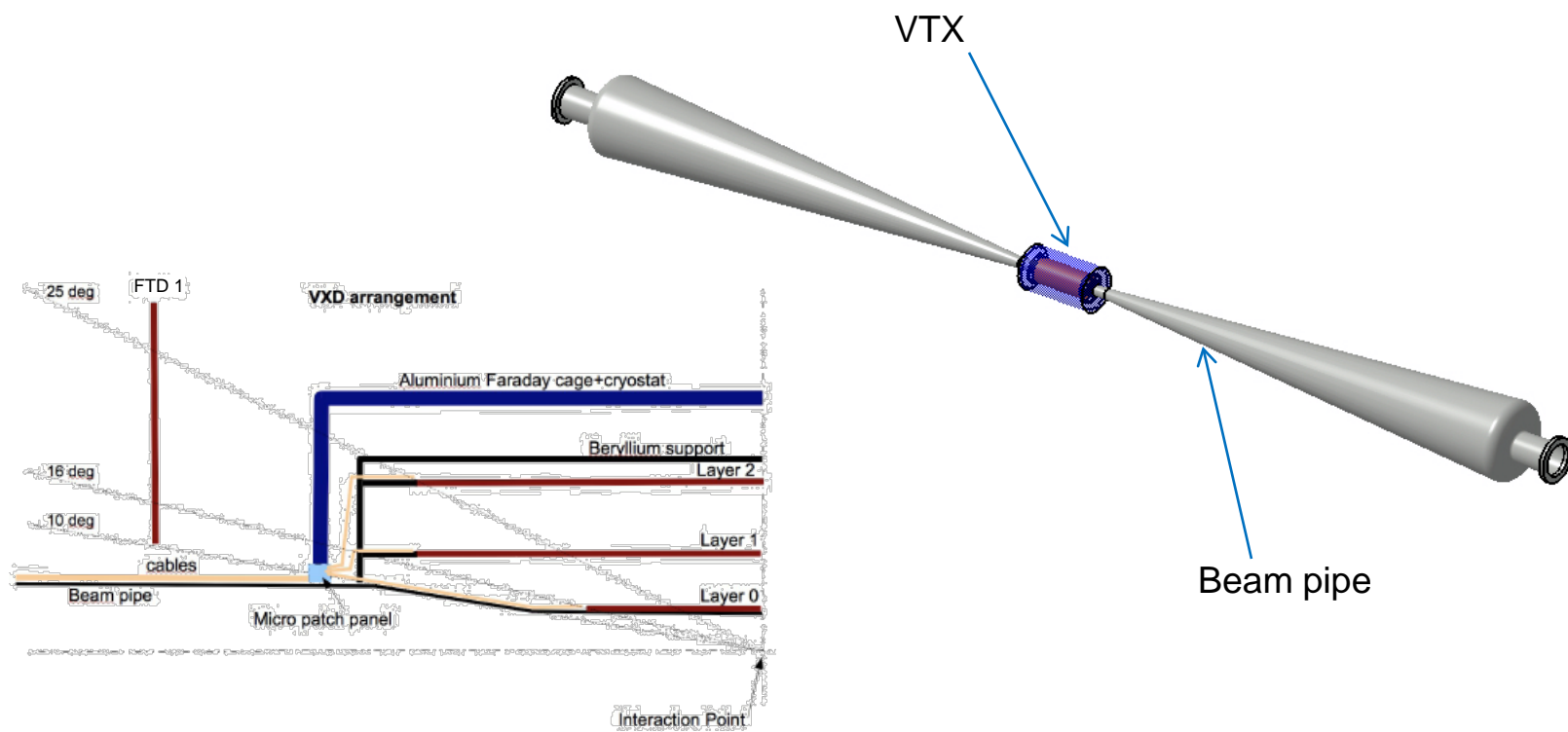
- Level 1
 - « **Supporting wheels** » fixed and located on the ISS
 - For the SIT (half part)
 - For the FTD 1&2



Mechanical support (in yellow)

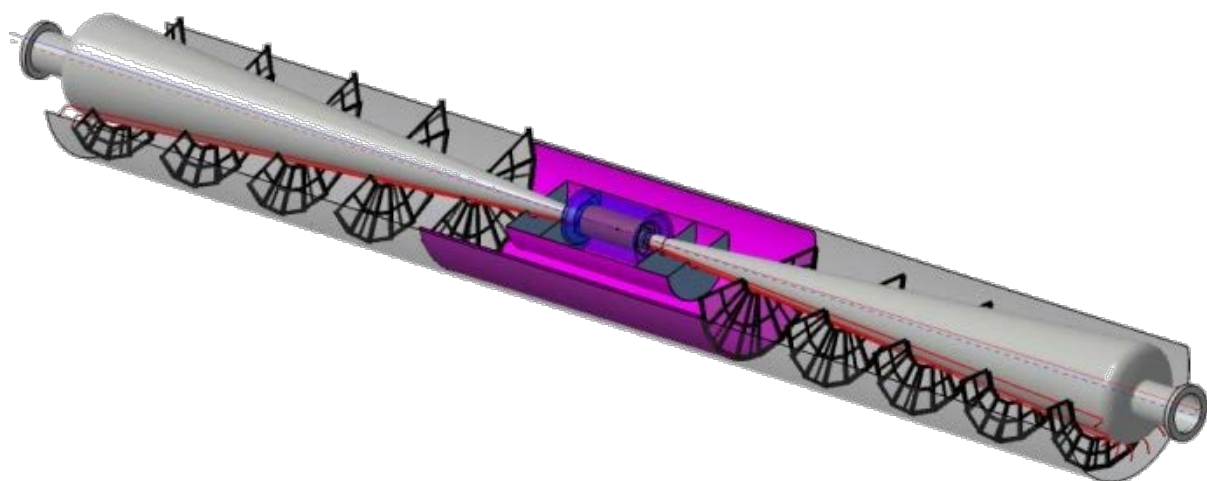
Assembly procedure details:

- Level 2
 - **Beam pipe with VTX assembled and mounted upon 1st assembly: Vertex clamped around the Beam pipe**
 - Require tools and a special support



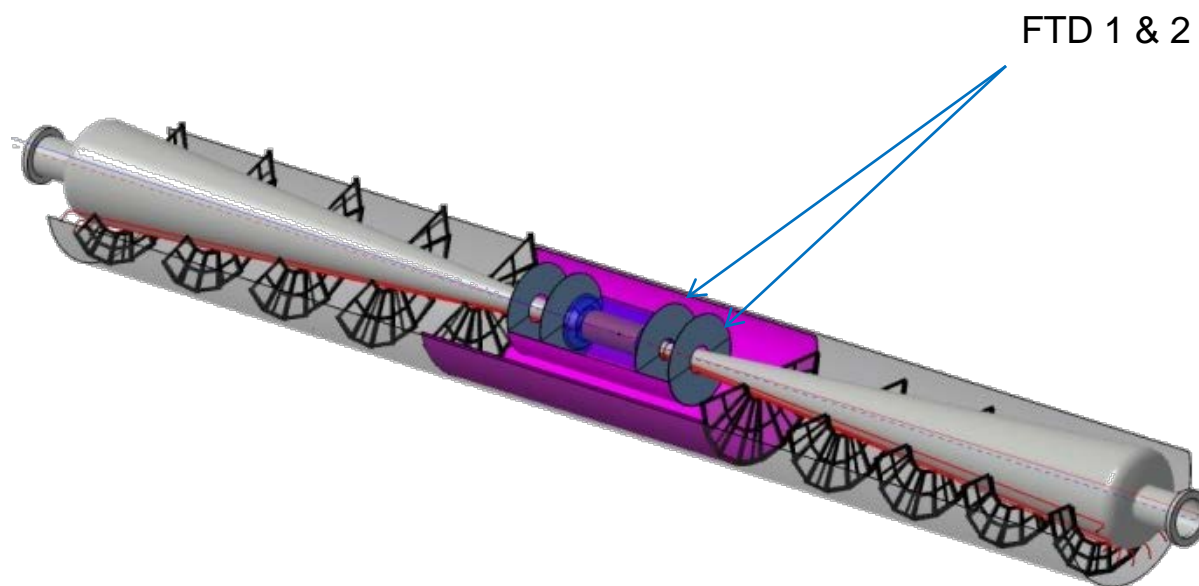
Assembly procedure details:

- Level 3
 - **Beam pipe with VTX assembled and located on the 1st assembly**
 - By cables or « striplines » or « tie rod » on the ISS



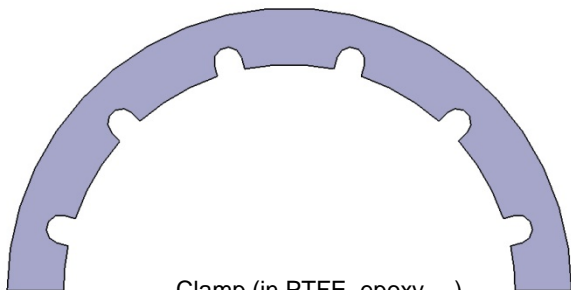
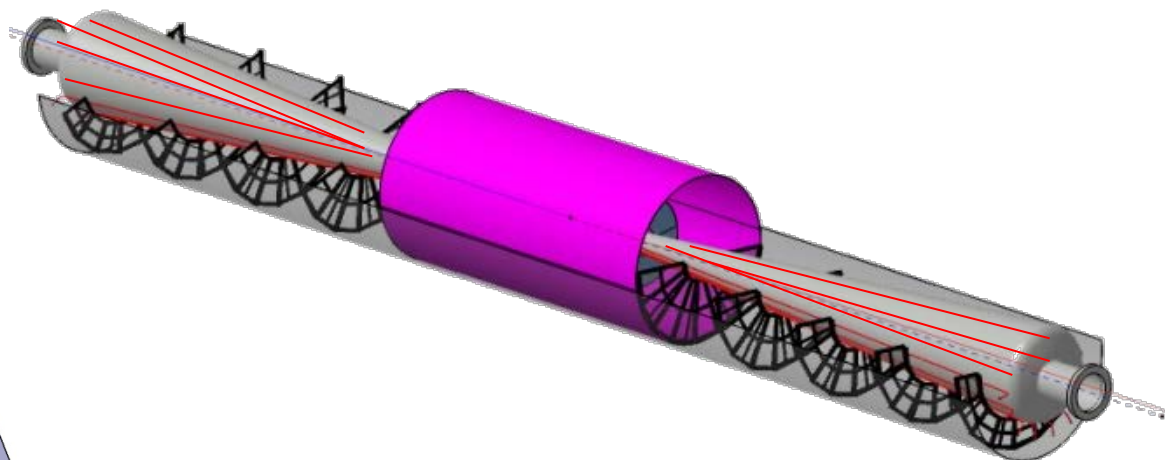
Assembly procedure details:

- Level 4
 - **Close the FTD 1 & 2**
 - Located and fixed to the lower half part



Assembly procedure details:

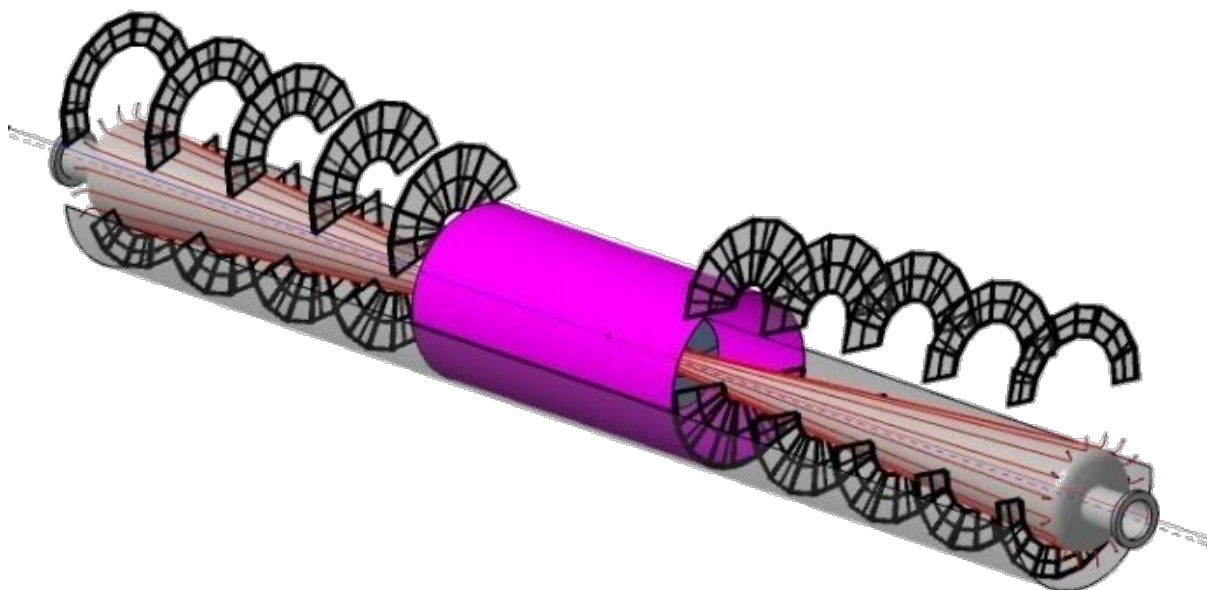
- Level 5
 - **Close the SIT (inner and outer)**
 - « Supporting wheels »
 - Maybe FTD 3 ? Interactions with SIT ?
 - **Cables fixed on the Beam pipe**
 - With a clamp
 - **Cooling ?**



Clamp (in PTFE, epoxy,...)

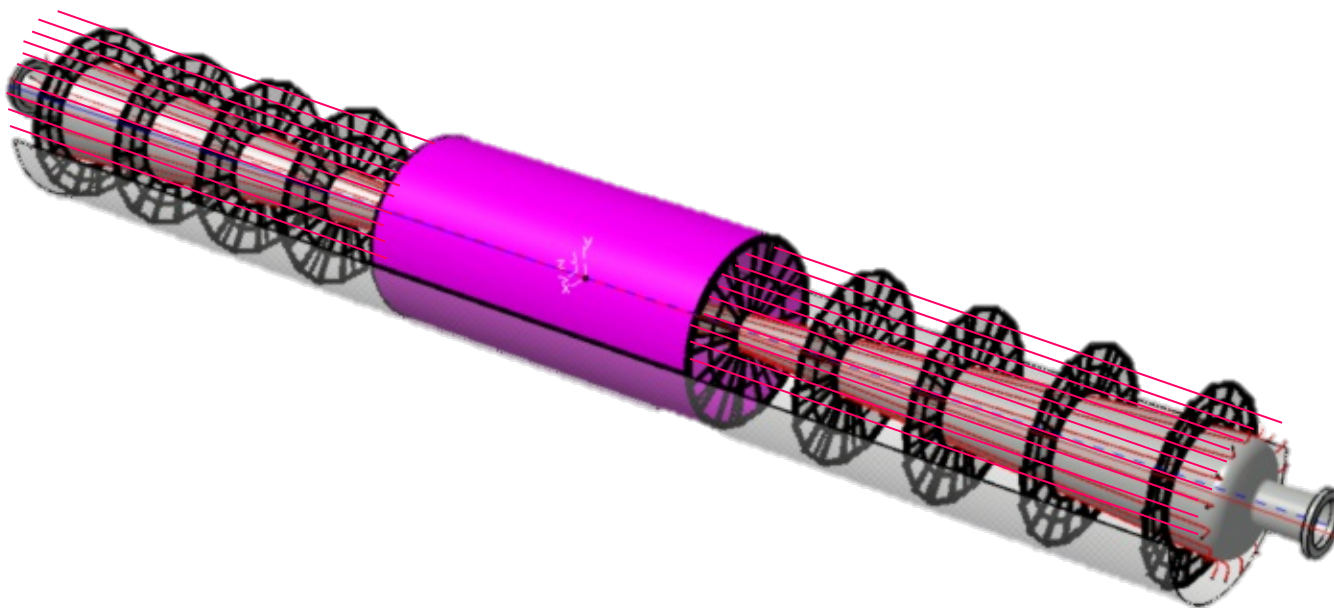
Assembly procedure details:

- Level 5
 - **Close the FTD 3 at 7 with ISS (same process)**
 - FTD fixed on the ISS ?



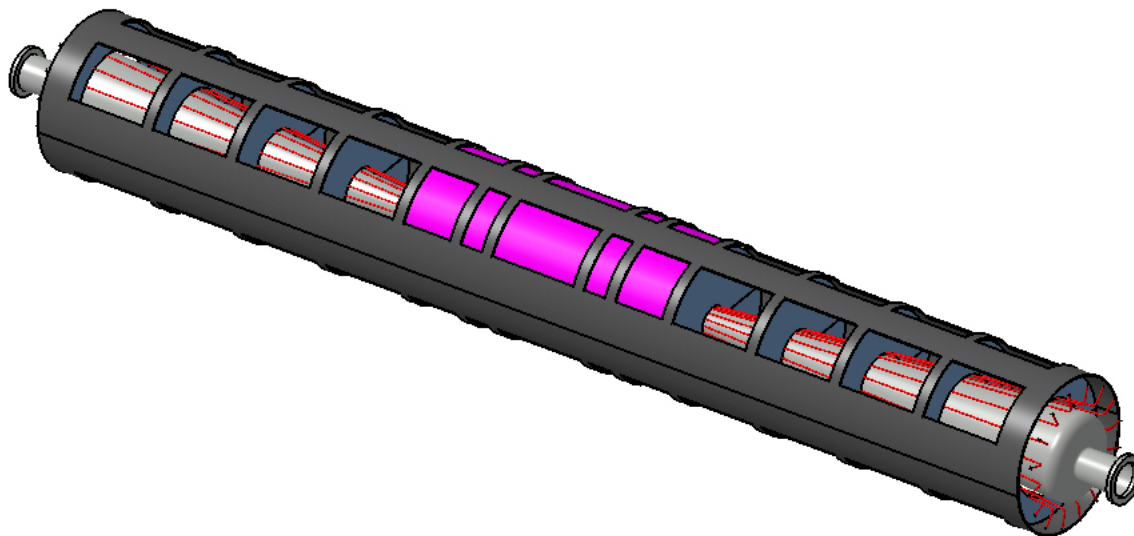
Assembly procedure details:

- Level 5+



Assembly procedure details:

- Level 6
 - **Close the ISS**
 - Fixed beam pipe on the ISS (to see level 3)
 - Controls and adjust
 - Install and calibrate the alignment apparatus: laser+ sensors



- **Inner services:**

- **Power distribution, number cables by side:**

Vertex	= 30 cables
SIT 1	= 44 cables
SIT 2	= 88 cables
FTD 1 & 2	= 96 cables / FTD
FTD 3 to 7	= 32 cables/FTD

Total cables by side: = **514 cables**

(thank's Catherine for the values)

- **Signal (Optique fibers):**

Number ?

Connectors fixed on patch panel?

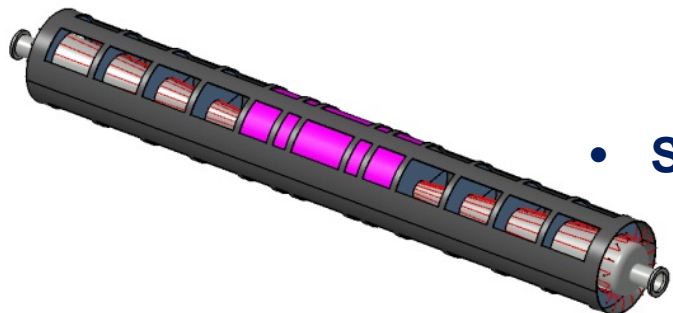
- **Cooling :**

Numbers? Design?

- **Position measure apparatus:**

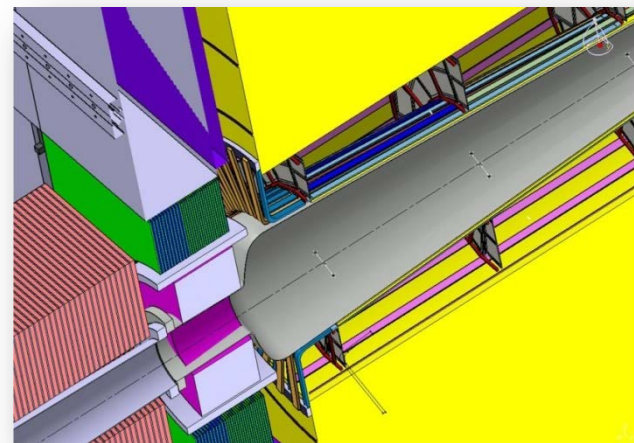
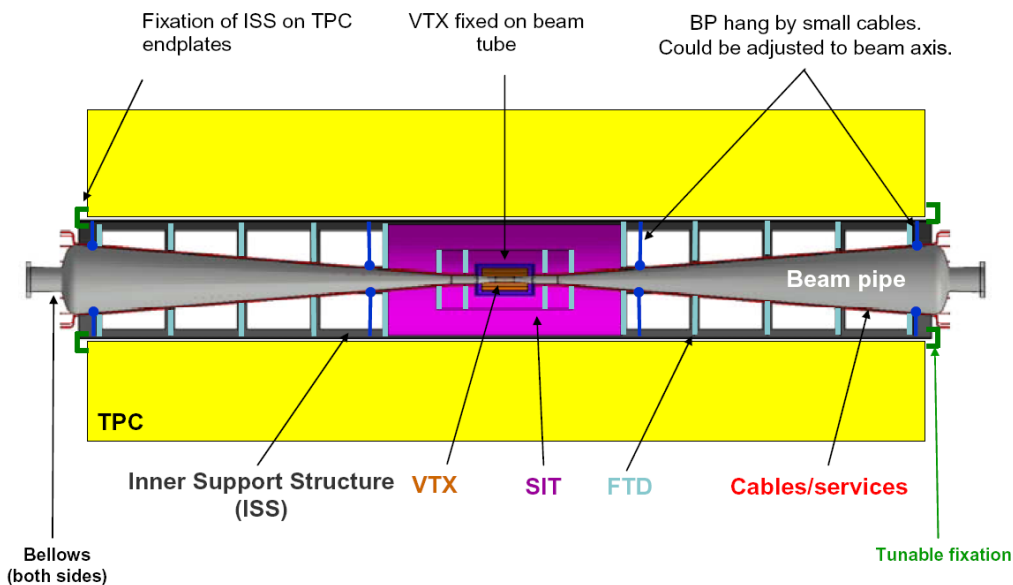
Laser,
sensors,
mirrors,

Need space for laser beam through the endcap?



- **Integration procedure :**

- Using the same TPC insertion tool, adapt on it an apparatus to support and insert the inner parts.
- Used the TPC center to guide and roll inside,
- During insertion, control the deformation, stress and alignment
- Adjusted with the TPC references
- Fixed on TPC



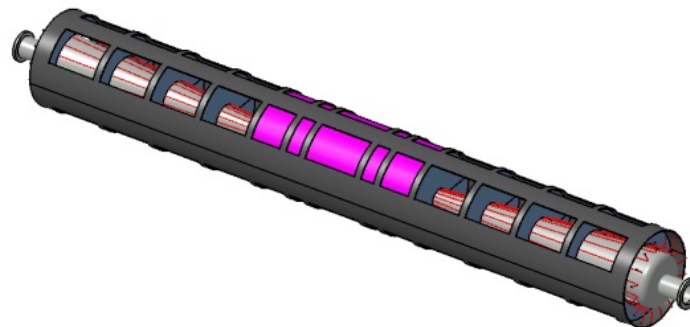
- **Alignment procedure :**

- Alignment during the assembly.

In the experiment:

- Alignement in TPC: with the geometrical survey and laser
- Calibrated and tested the laser and sensors apparatus
- Close the endcap
- Switch on the magnetic coil
- Measure the inner detector position
 - > Correct the position?
 - or make the correction by software?

- Conclusion:



Need informations :

To define the assembly scenario :

- Need information for the SIT and Vertex: design, services (cables, cooling,...)

To define the adjustment procedure:

- Studying of laser apparatus + sensors + cables
- Find some free space for all parts and for the laser beam
(ISS radius = 325mm, TPC radius= 330mm).
- Free space for the laser beam through the endcaps.

Patch panel:

- Lot of cables (514 cables by side) + optical fibers+ services,
- To be fixed at the end of the inner parts or to be fixed near the coil?

That's all but,