



# DFX transport & installation brainstorming

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***WP6a : integration meeting #3***

# DFX installation

Each IP1 and IP5 sides equipped with 2 cold powering chains of cryostats

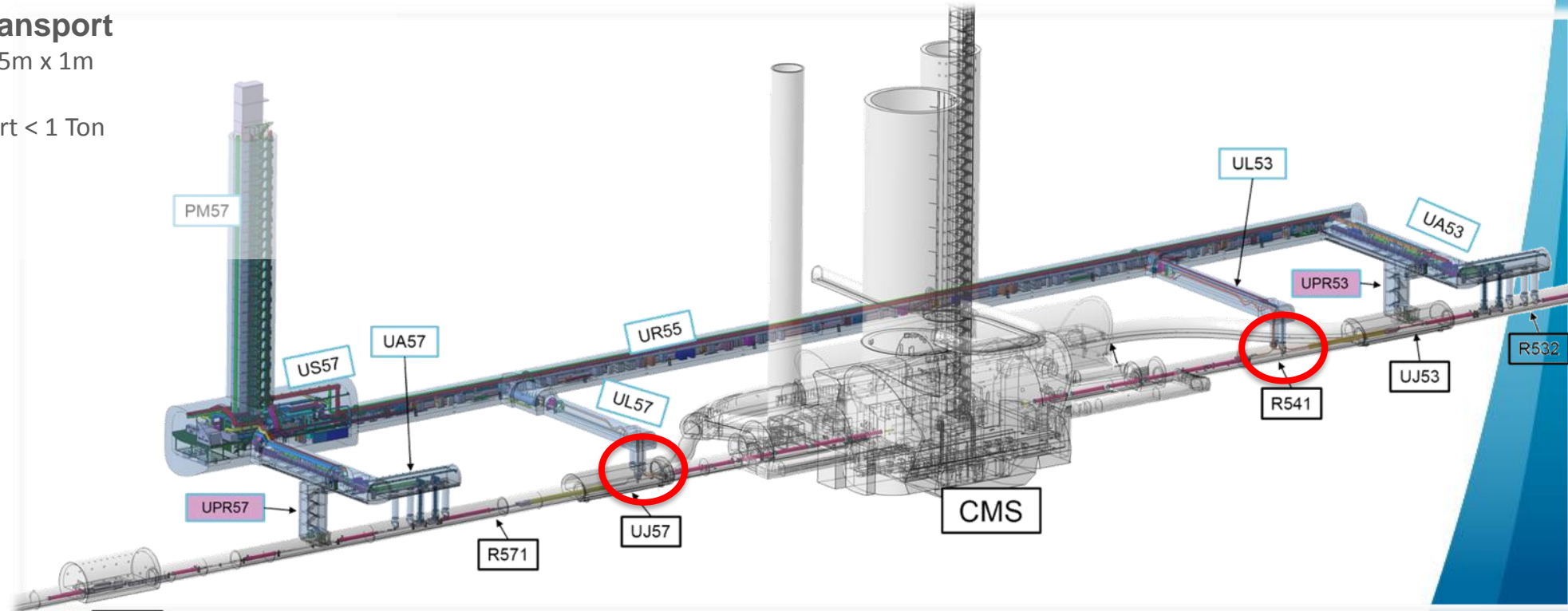
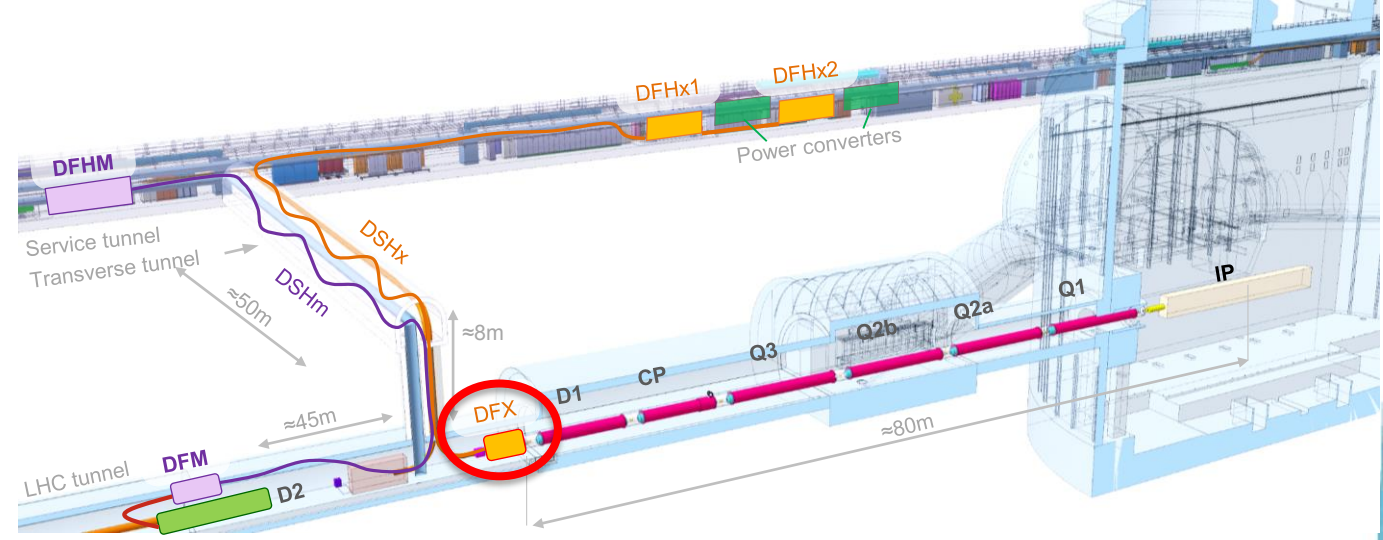
- Triplet insertion : DFHx – SC Link (DSH) – DFX
- Matching sections : DFHm – SC Link - DFM

DFX/DFM basic functions:

- **Electrical interface** between SC Link and superconducting magnets
- **Supply cryogenics** to the SCLink

**Total : 4 DFX boxes to install**

- **Weight < 2 Tons**
- **Biggest component to transport**
  - Helium inner vessel :  $\varnothing 0.5\text{m} \times 1\text{m}$
  - Flexible :  $\varnothing 0.3\text{m} \times 8\text{m}$
  - Heaviest independent part < 1 Ton



# DFX properties

## DFX nominal location

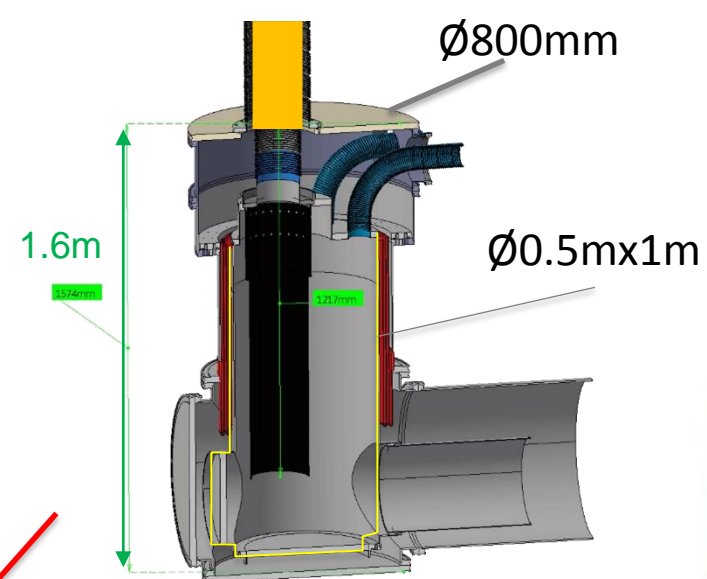
- Each side of IP1 & IP5
- Underneath the vertical shaft

## Proposal assembly sequence

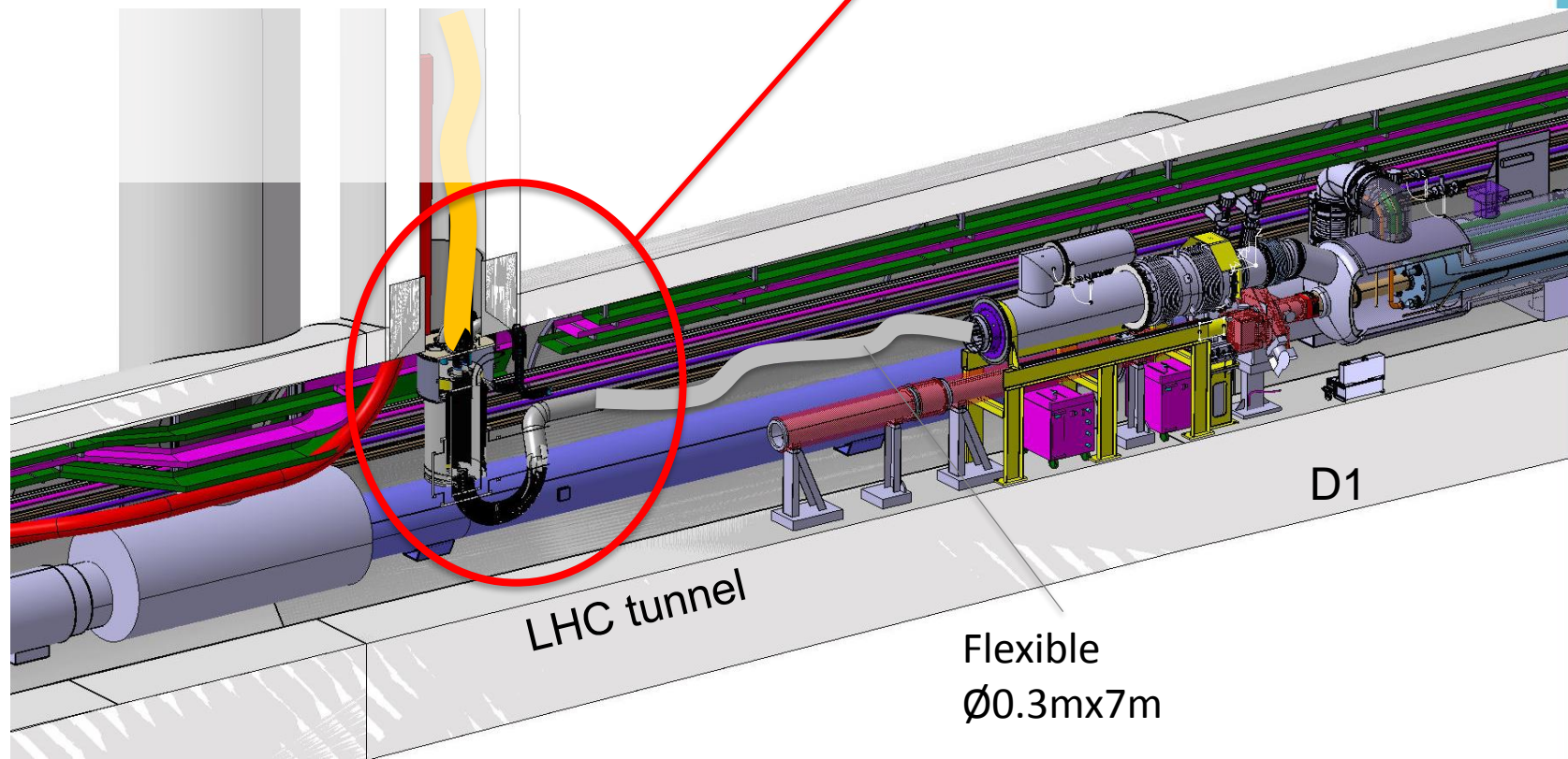
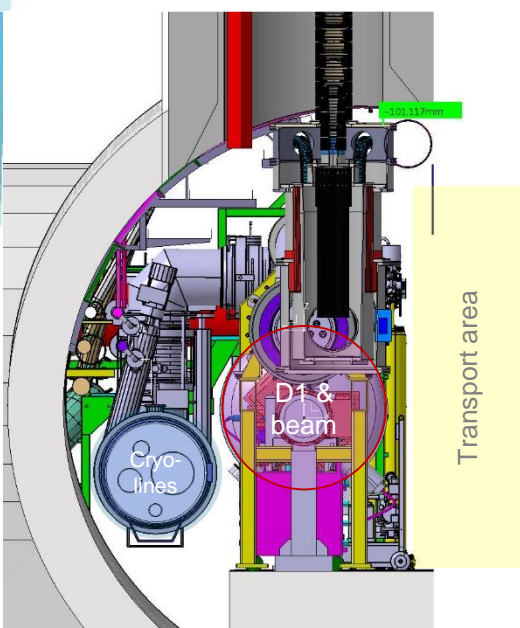
- After magnet and cryolines installation
- Before beam pipes installation

## Transport

- Transported in several parts
- Assembled in situ
- Dimensions of main parts:
  - Helium inner vessel :  $\varnothing 0.5\text{m} \times 1\text{m}$
  - Flexible :  $\varnothing 0.3\text{m} \times 8\text{m}$
  - Heaviest independent part < 1 Ton



Transport path to be discussed



DFX Vertical v3.2 - Components	Quantity	OD [mm]	Thickness [mm]	Unit Mass [kg]	Total Mass [kg]
Vacuum Vessel - Top Flange	1	800	22	78	78
Vacuum Vessel - Top Ring Flange	1	800	22	8	8
Vacuum Vessel - Retractable - Intermediate Ring Flange	2	800	22	8	16
Vacuum Vessel - Retractable Wall Section 1	1	758	4	15.2	15.2
Vacuum Vessel - Retractable Wall Section 2	1	758	4	15.8	15.8
Vacuum Vessel - Retractable - Bottom Ring Flange	1	758	4	14.1	14.1
Vacuum Vessel - Retractable - Floating Ring Flange	1	740	22	24	24
Vacuum Vessel - Middle Section - Top Ring Flange	1	675	22	12	12
Vacuum Vessel - Middle Section - Wall	1	608	4	23.2	23.2
Vacuum Vessel - Middle Section - Bottom Ring Flange	1	720	22	19.1	19.1
Vacuum Vessel - Bottom Cross - Large Ring Flanges	3	720	22	10.6	31.8
Vacuum Vessel - Bottom Cross - Small Ring Flanges	3	600	22	5.9	17.7
Vacuum Vessel - Bottom Cross - Large Blank Flange	1	720	22	70	70
Vacuum Vessel - Bottom Cross - Small Blank Flange	1	600	22	48.3	48.3
Vacuum Vessel - Bottom Cross - Body	1	660	4	49.6	49.6
Vacuum Vessel - Horizontal Section	1	560	4	41.8	41.8
Vacuum Vessel - Vacuum Break	1	608	2	72.45	72.45
Vacuum Vessel - Flexible Hose - Ring Flange	6	180	1.5	0.52	3.12
Cold Vessel - Bottom Cross - Body	1	508	4	46.3	46.3
Cold Vessel - Upper Body Extension	1	508	4	9	9
Cold Vessel - Side Hatch Blank Flange	1	320	22	14.75	14.75
Cold Vessel - Bottom Hatch - Ring Flange	1	508	22	9.7	9.7
Cold Vessel - Bottom Hatch - Blank Flange	1	430	22	26.4	26.4
Cold Vessel - Top Flange	1	508	22	18	18
Cold Vessel - Top Flange Extension - Wall	1	326	3	3.3	3.3
Cold Vessel - Top Flange Extension - Flange	1	326	22	6.7	6.7
Cold Vessel - Flexible Hose Wall	1	78	1.5	3	3
Cold Vessel - Horizontal Section	1	304	2	7.6	7.6
SC Link - Cold Vessel - Weldable Flange	1	250	15	4.35	4.35
SC Link - Vacuum Vessel - Mounting Flange	1	310	15	4.3	4.3
SC Link - Inner Flexible Collar	1	150	2	0.42	0.42
SC Link - Outer Flexible Wall (per metre length)	8	220	1.5	18.4	147.2
SC Link - Inner Flexible Wall (per metre length)	8	160	1.5	12.3	98.4
SC Link - Rigid Sleeve	1	254	2	10.1	10.1
<b>Vacuum Vessel - Total Mass</b>					<b>560.17</b>
<b>Cold Vessel - Total Mass</b>					<b>144.75</b>
<b>SC Link Flexible - Total Mass</b>					<b>264.77</b>
<b>Total Mass - (without liquid + cables/splices)</b>					<b>969.69</b>

