

New Setup for Dart Chamber in ArDM

A. Gendotti, B. Radics, C. Regenfus, Y.A. Rigaut, A. Rubbia, A. Stauffer, T. Viant

30.04.2019

SUMMARY:

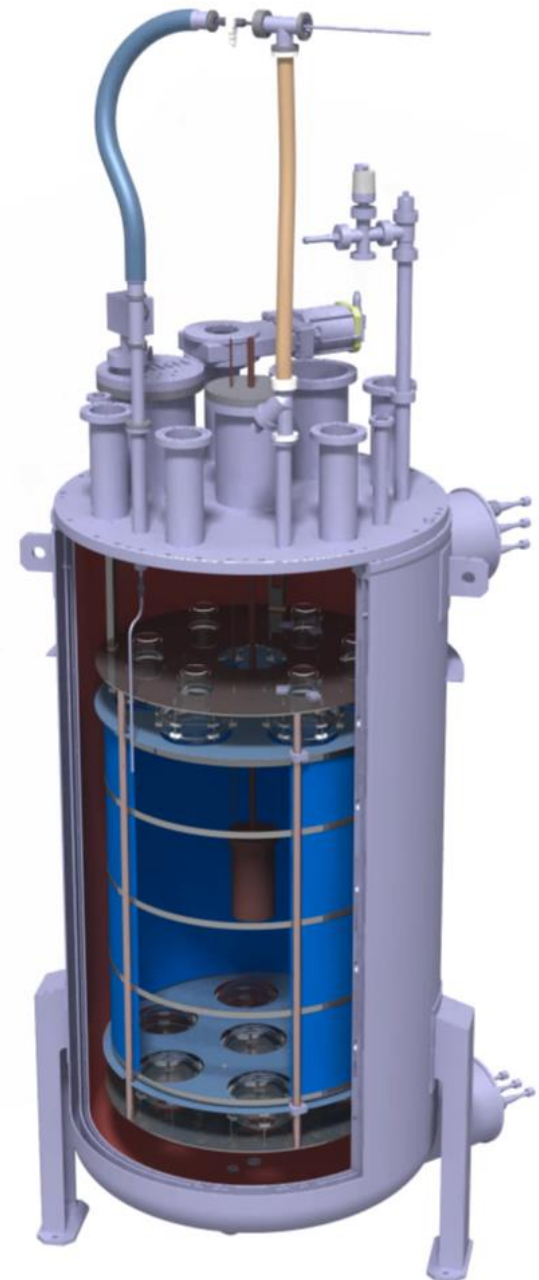
Design (slide #3 to #10)

- Overview
- Top Flange

Production Status (slide #11)

Time Scale (slide #12)

Assembly Procedure (slide #13 to #20)



DESIGN:

4 x Pillars Flange to PMT Array:
~1.7 Kg Stainless Steel per Pillar
Top and Bottom insulated with PEEK

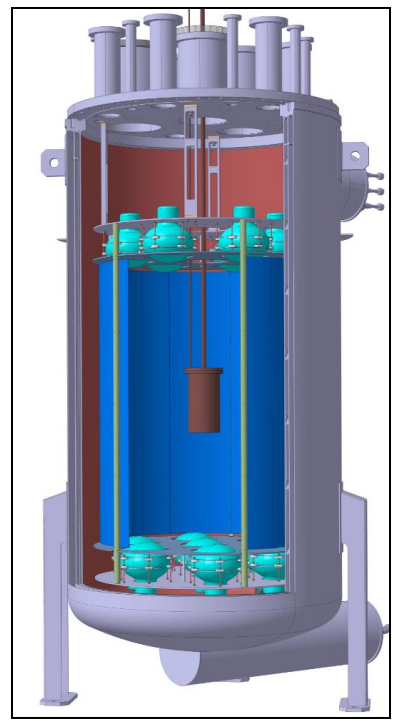
Top PMTs Array:
- 6 PMTs
- No PMT in Center

5 x Cu Pillars: 25mm Dia
~5.3Kg per pillar

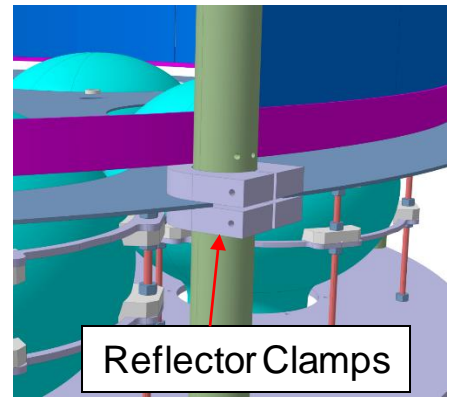
Vertical Reflector

5 x SS rings Vertical Reflector supports:
- SS plate 20mmx2mm
- ~0.8 Kg per Ring

Bottom PMTs Array:
- 7 PMTs

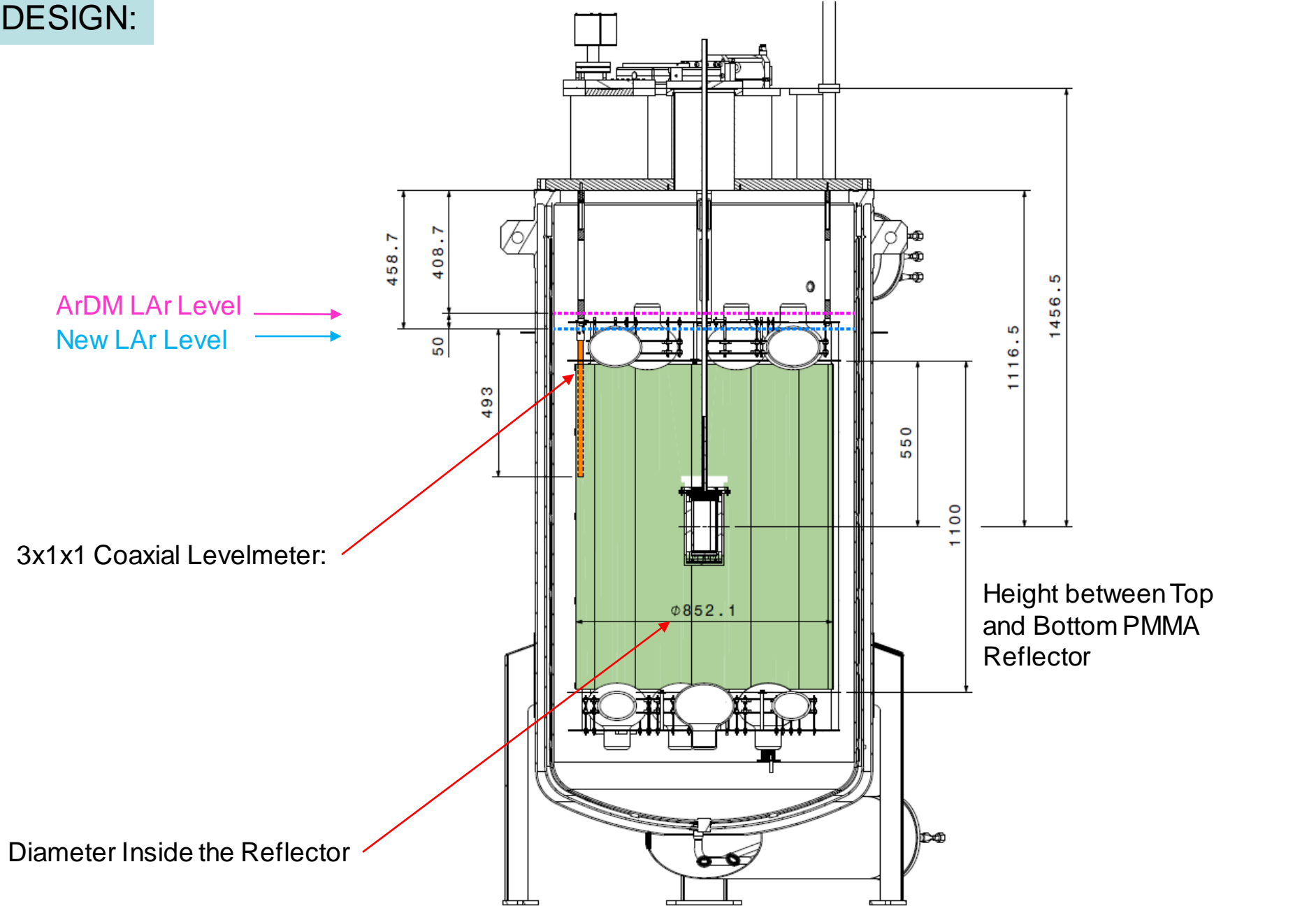


PMT Reflector:
- PTFE 1.5mm thick



Reflector Clamps

DESIGN:



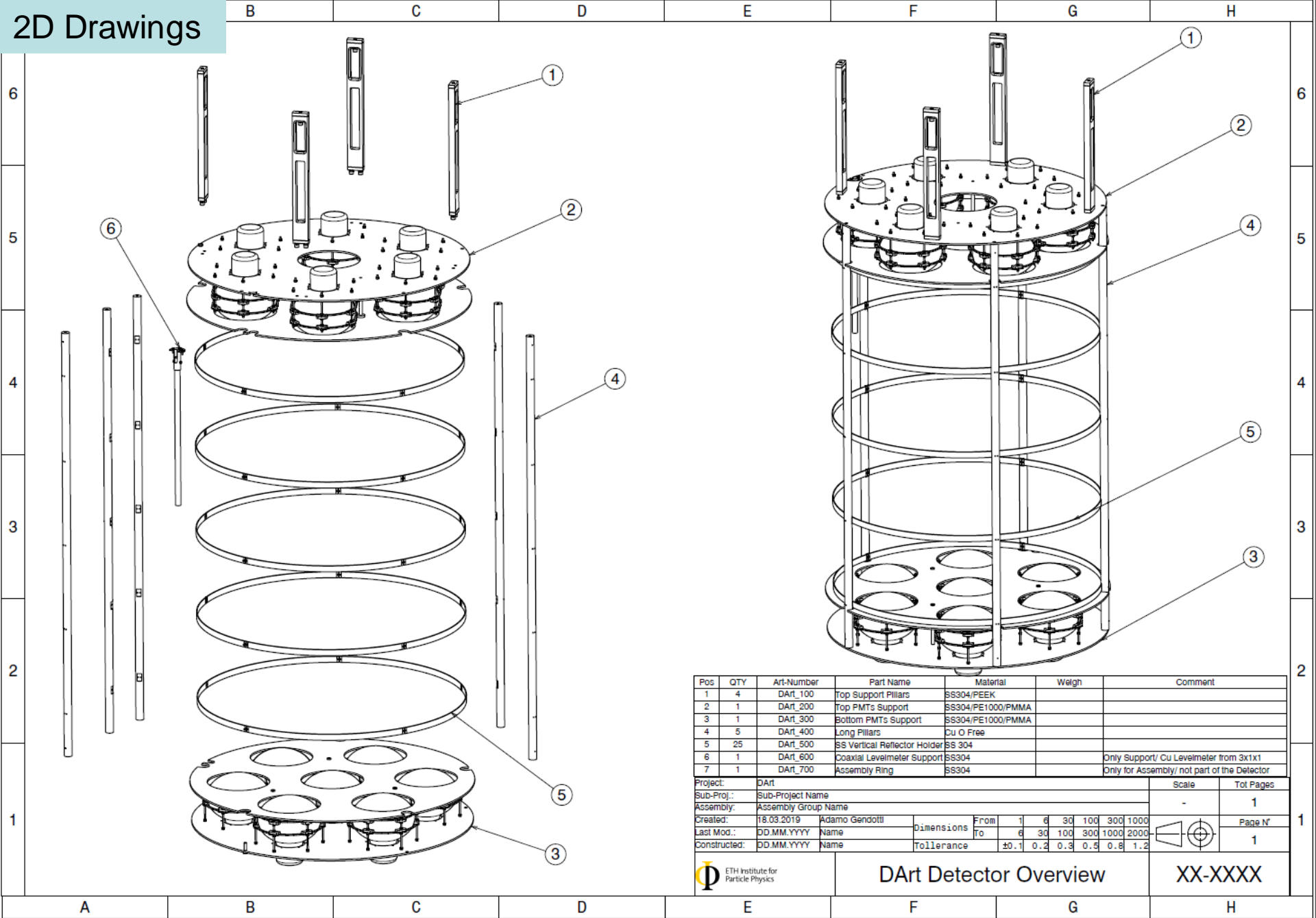
ArDM LAr Level →
New LAr Level →

3x1x1 Coaxial Levelmeter: →

Diameter Inside the Reflector →

Height between Top and Bottom PMMA Reflector

2D Drawings



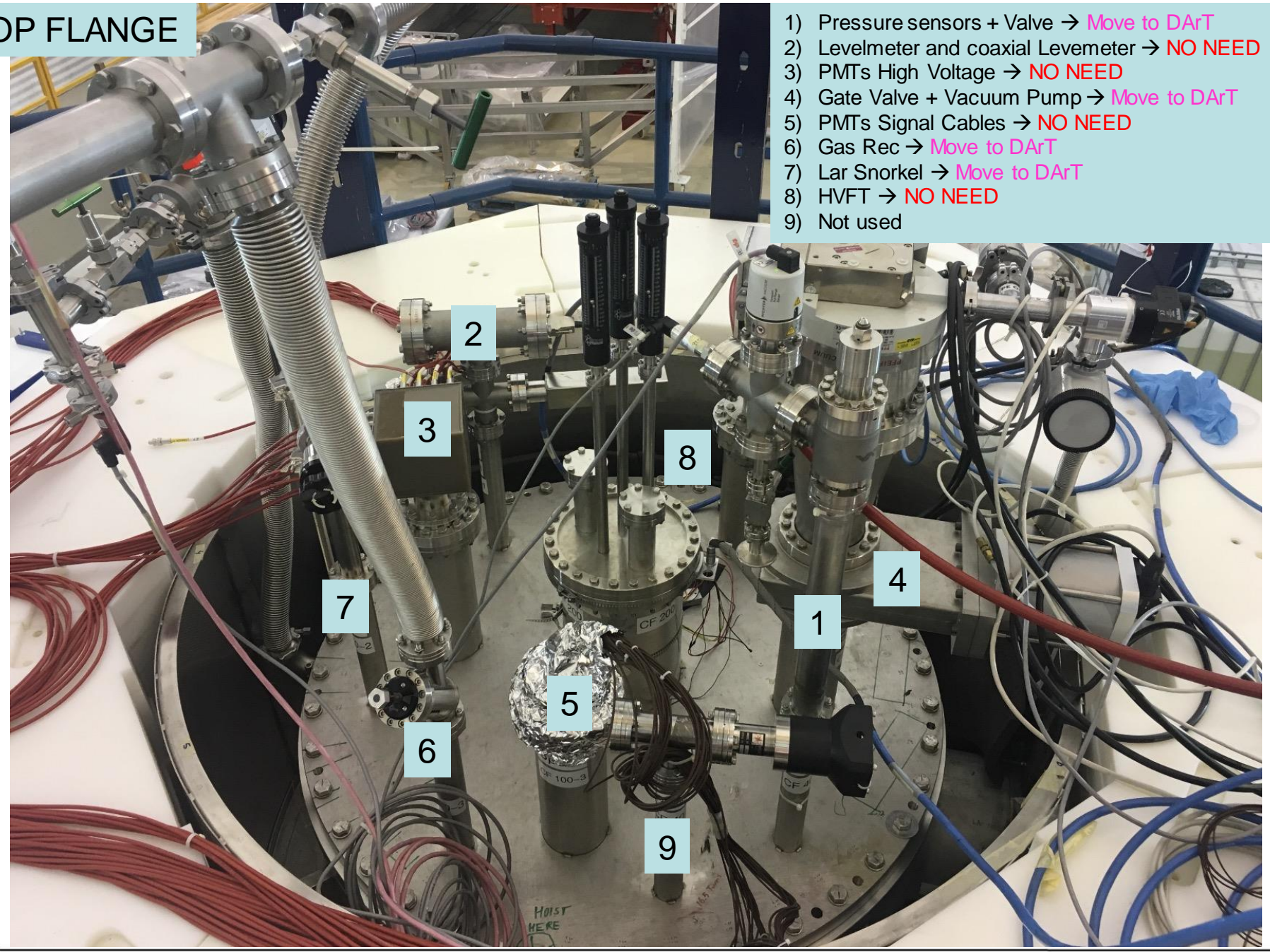
Pos	QTY	Art-Number	Part Name	Material	Weight	Comment
1	4	DArt_100	Top Support Pillars	SS304/PEEK		
2	1	DArt_200	Top PMTs Support	SS304/PE1000/PMMA		
3	1	DArt_300	Bottom PMTs Support	SS304/PE1000/PMMA		
4	5	DArt_400	Long Pillars	Cu O Free		
5	25	DArt_500	SS Vertical Reflector Holder	SS 304		
6	1	DArt_600	Coaxial Levelmeter Support	SS304		Only Support/ Cu Levelmeter from 3x1x1
7	1	DArt_700	Assembly Ring	SS304		Only for Assembly/ not part of the Detector

Project:		DArt		Scale		Tot Pages	
Sub-Proj.:		Sub-Project Name		-		1	
Assembly:		Assembly Group Name					
Created:	18.03.2019	Adamo Gendotti	Dimensions	From	1	30	100
Last Mod.:	DD.MM.YYYY	Name	To	6	30	100	300
Constructed:	DD.MM.YYYY	Name	Tolerance	±0.1	0.2	0.3	0.5

ETH Institute for Particle Physics	DArt Detector Overview			XX-XXXX

TOP FLANGE

- 1) Pressure sensors + Valve → Move to DAiT
- 2) Levelmeter and coaxial Levemeter → NO NEED
- 3) PMTs High Voltage → NO NEED
- 4) Gate Valve + Vacuum Pump → Move to DAiT
- 5) PMTs Signal Cables → NO NEED
- 6) Gas Rec → Move to DAiT
- 7) Lar Snorkel → Move to DAiT
- 8) HVFT → NO NEED
- 9) Not used

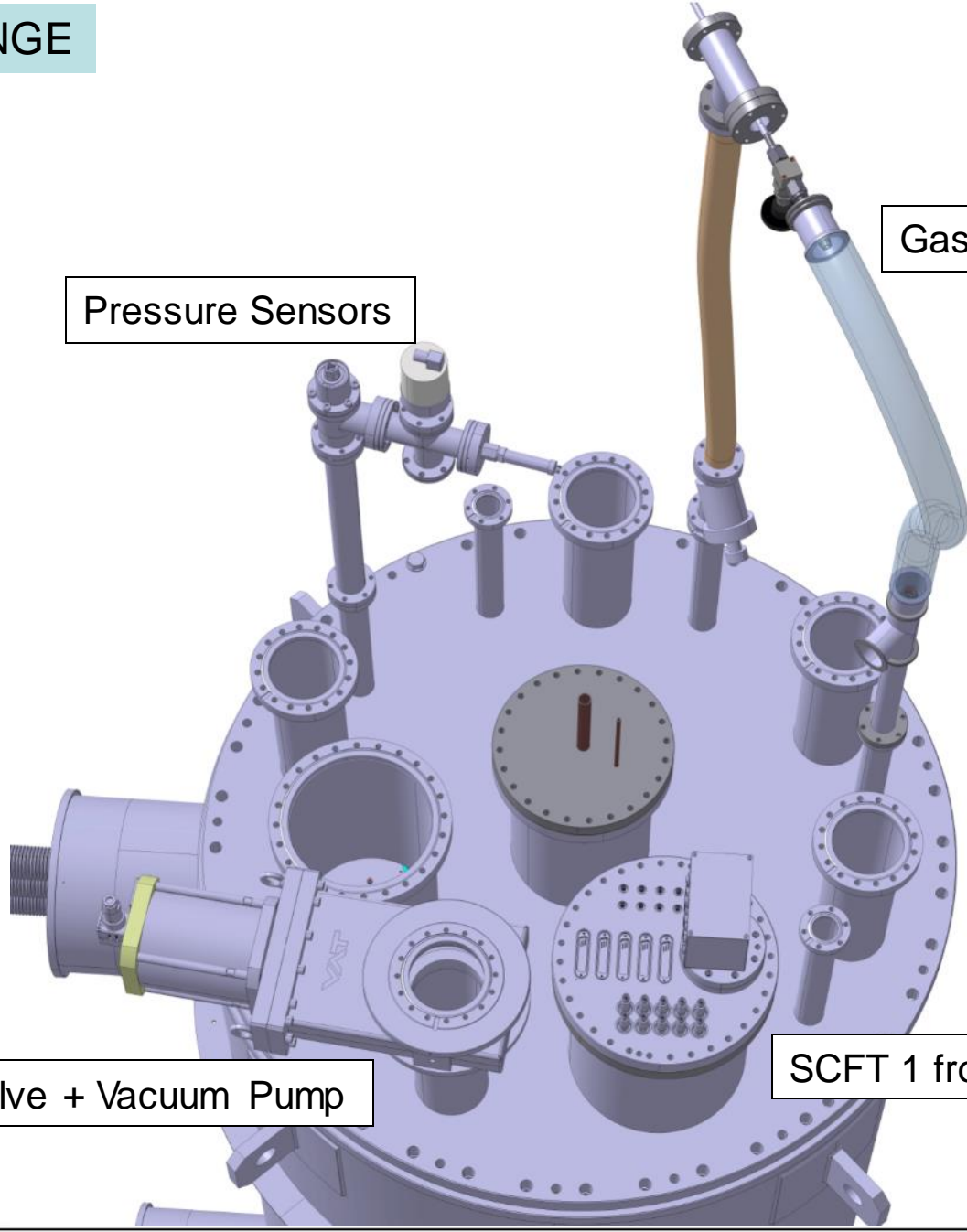


Pressure Sensors

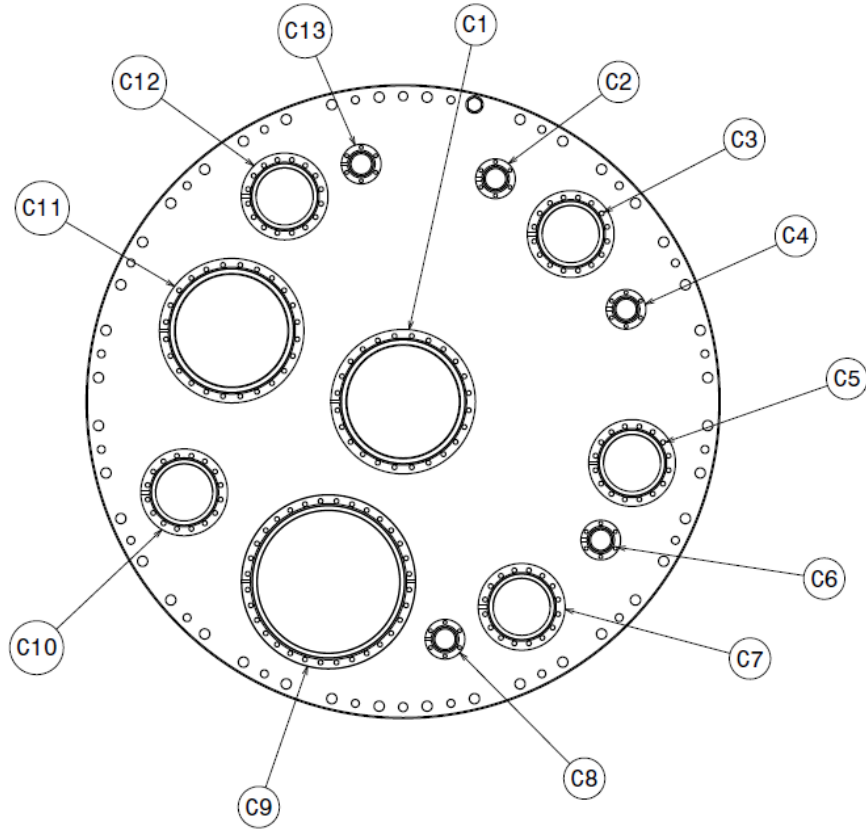
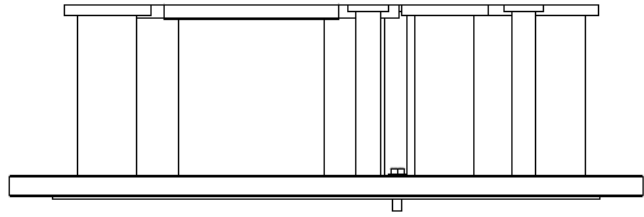
Gas Rec. and LAr snorkel

Gate Valve + Vacuum Pump

SCFT 1 from 3x1x1



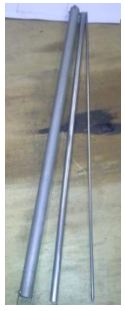
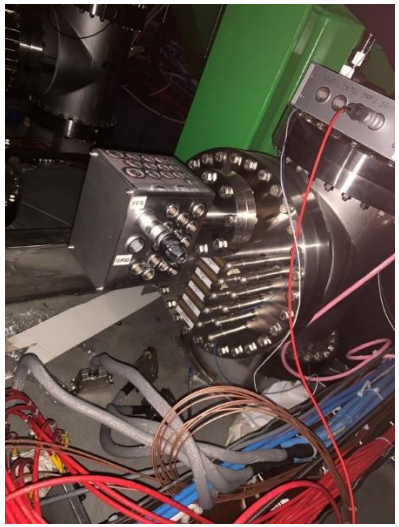
TOP FLANGE



Pos	Flange Size	Use	Comment
C1	CF200	DArT CHamber	
C2	CF40		
C3	CF100		
C4	CF40	Gas Recirculation Valve	
C5	CF100		
C6	CF40	LAr Snorkel	
C7	CF100		
C8	CF40		
C9	CF250	SCFT 1 from 3x1x1	
C10	CF100	VAT Valve + Vacuum Pump	
C11	CF200		
C12	CF100		
C13	CF40	Pressure Sensors Dewar	

Project:	Project Name							Scale	Tot Pages			
Sub-Proj.:	Sub-Project Name							1:1	1			
Assembly:	Assembly Group Name								Page N°			
Created:	DD.MM.YYYY	Name	Dimensions	From	1	6	30		100	300	1000	1
Last Mod.:	DD.MM.YYYY	Name		To	6	30	100		300	1000	2000	
Constructed:	DD.MM.YYYY	Name	Tolerance	±0.1 0.2 0.3 0.5 0.8 1.2							1	

ETH Institute for Particle Physics	<h2>DArT Top Flange</h2>	<h1>XX-XXXX</h1>
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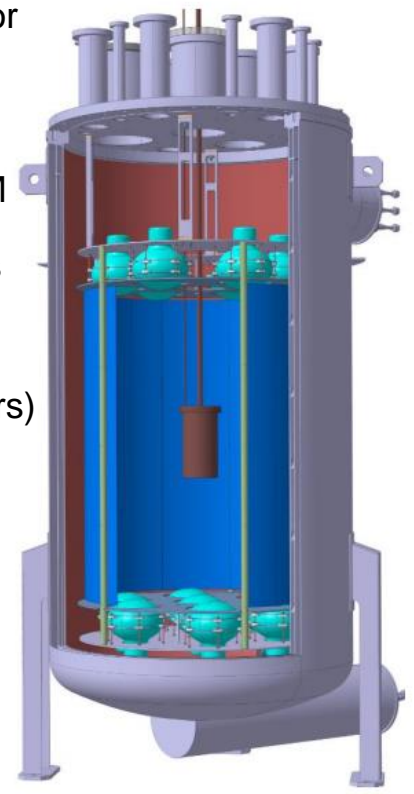
Pressure sensor

Capacitive LM

6 PMTs

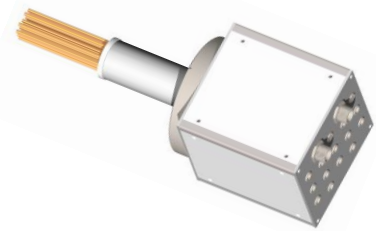
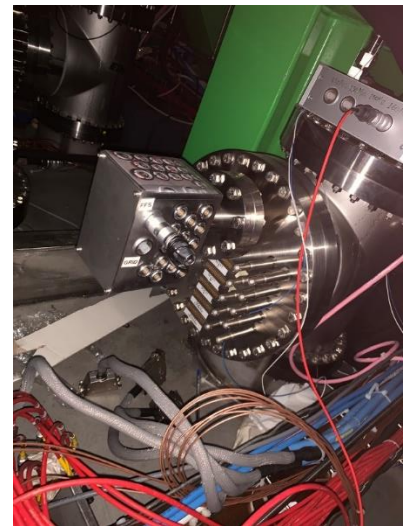
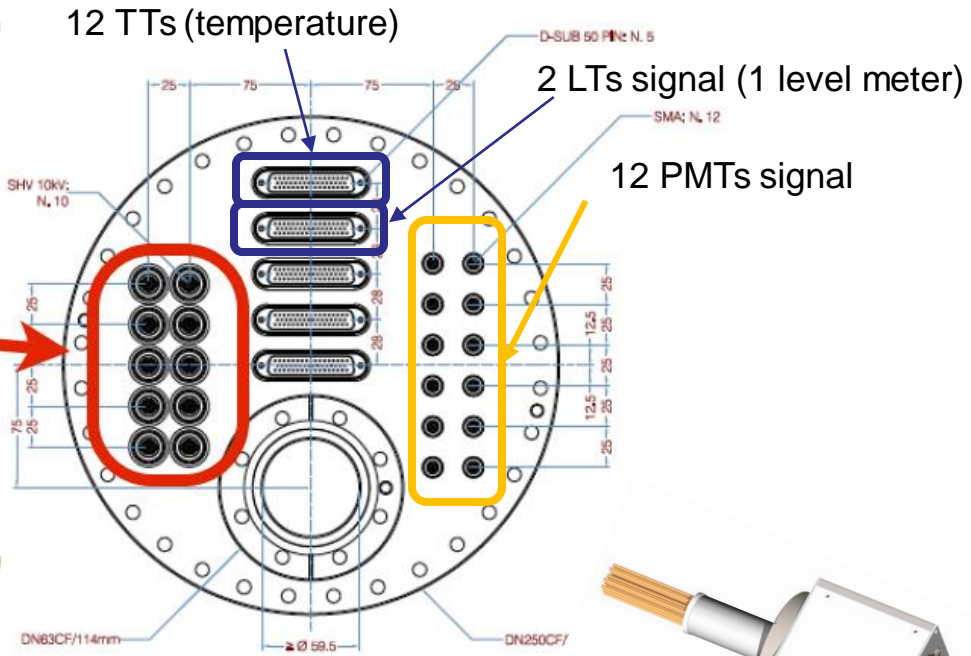
(12 Temperature sensors)

7 PMTs



Y. RIGAUT, IWG Meet. "ArDM run II: Weekly report"

HV 10kV double ended not use in the 311 due to HV discharges
Here they will be used for PMTs signal = 1 PMTs signal



13 HV connections for PMTs (directly molded inside dedicated flange)

DN250CF version currently in application (3m x 1m x 1m)



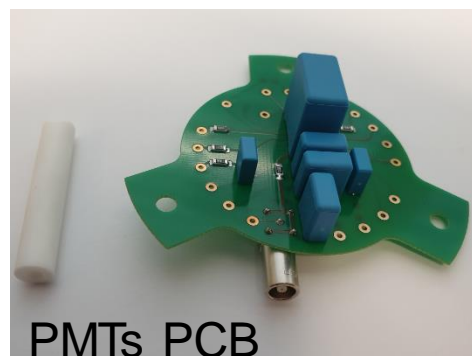
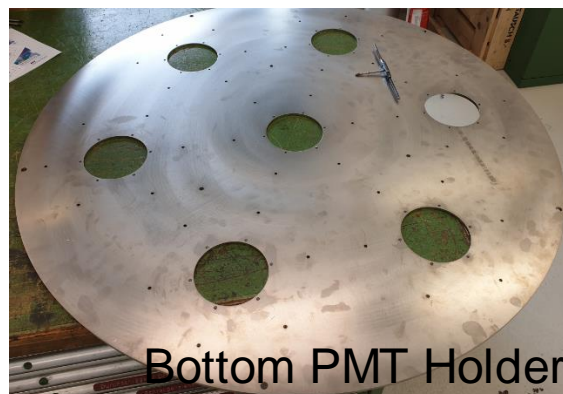
Y. RIGAUT, IWG Meet. "ArDM run II: Weekly report"

PRODUCTION STATUS

- All the material arrived and already in production process.
- PMT PCBs → ready for Test in GAR
- PMTs and Disk Reflector need to be coated at CERN
- Vertical reflector foils are already at LSC (old ArDM single phase detector)



- Teflon Reflector
- PE1000 protection for PMTs
- Ring Holder for PMTs



- All parts should be ready by middle of May
- Cleaning
- Assembly of the PMTs Top and Bottom Array at ETH (Minimum 1 Week)
- Prepare for shipping
- **Goal** → Everything ready to ship by the beginning of June 2019.

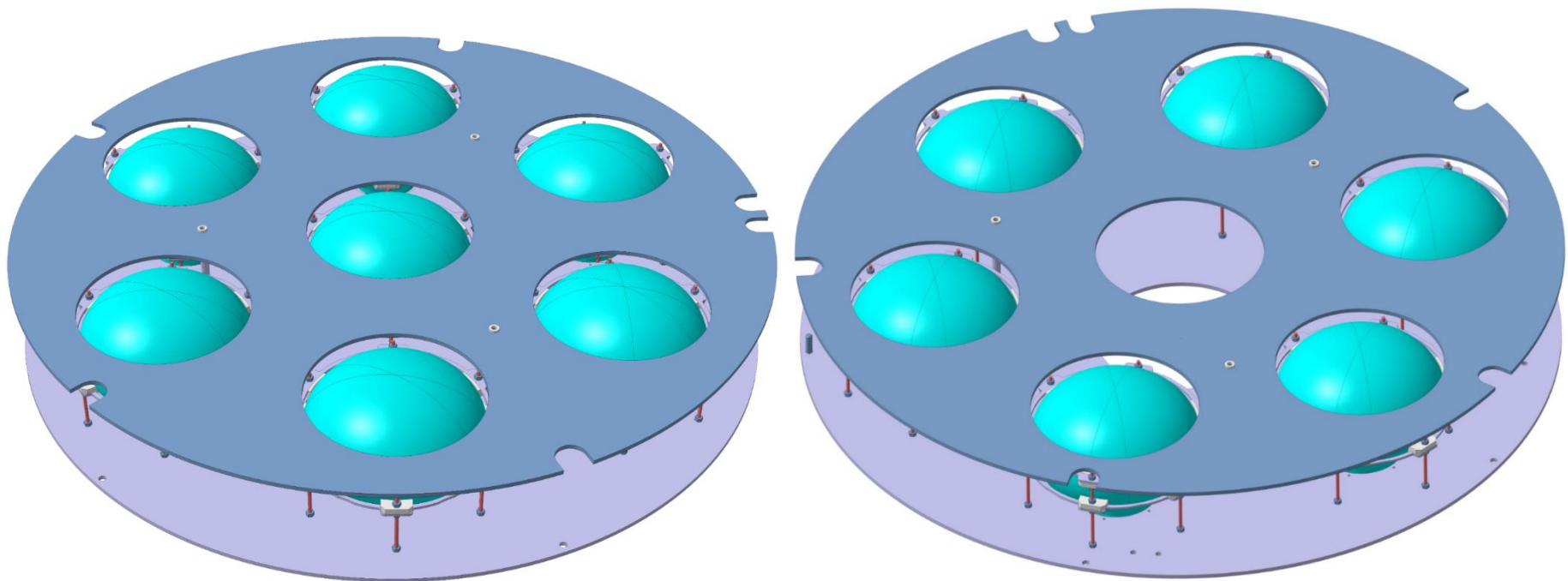
Assembly Work at LSC:

Not yet planned (estimated 2/3 Weeks of Work)

ASSEMBLY PROCEDURE

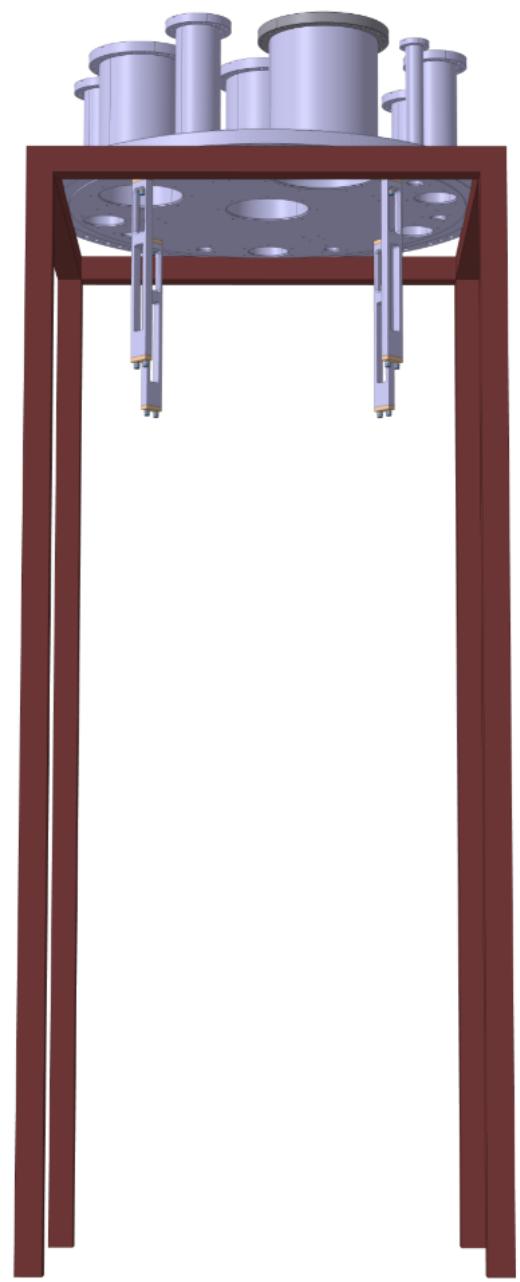
STEP 1:

- Top and Bottom PMTs array assembled in the clean room (ETH or CERN)
- Packed and Shipped ready for assembly to LSC



STEP 1:

- Top Flange on the Support Shower
- 4x SS Pillar



STEP 2:

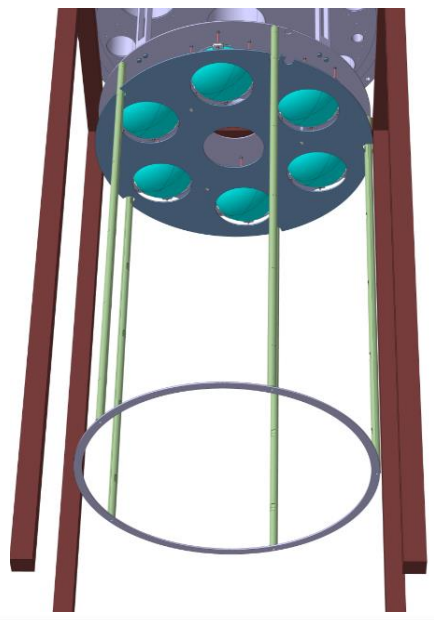
- Top PMTs array



STEP 3:

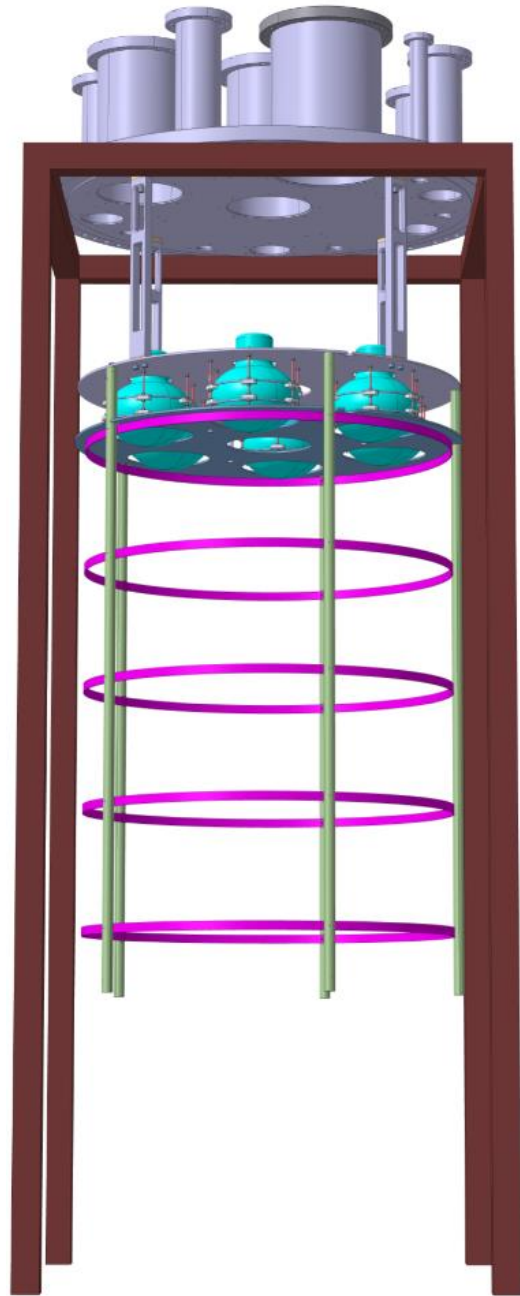
- 5 x Cu Pillars

Comment: eventually simple Bottom SS ring can be installed in order to keep aligned the pillars



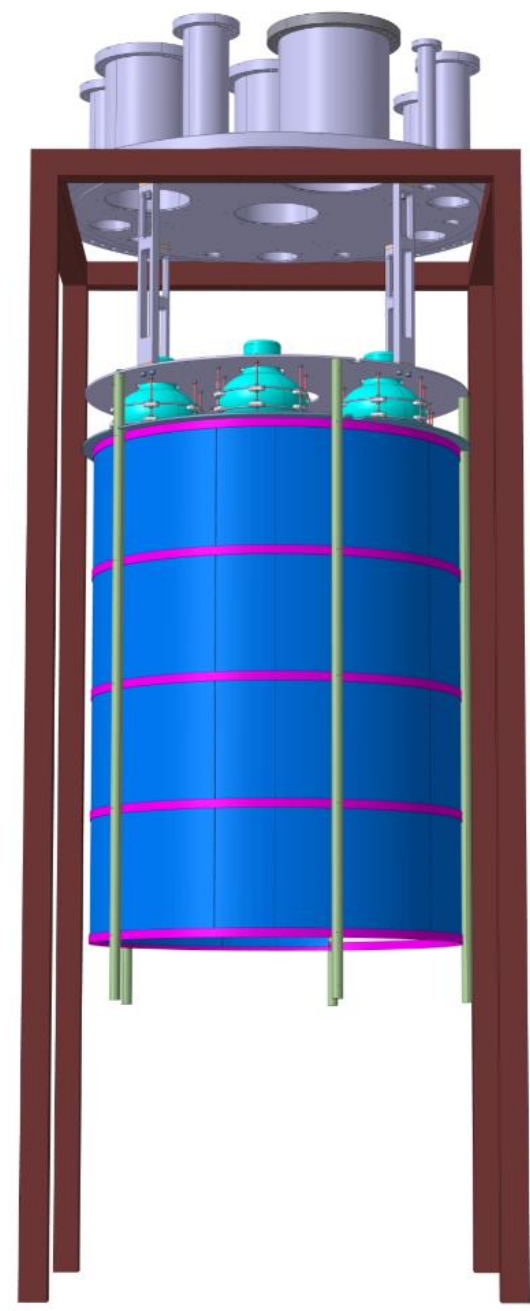
STEP 4:

- Vertical Reflector supports rings



STEP 5:

- Vertical Reflector installed from inside



STEP 6:

- Bottom PMTs array
- Coaxial Levelmeter
- Cabling
- Cover Top and Bottom PMTs array with Teflon Tape

STEP 7:

- Insertion in ArDM Dewar

