

Update on 6x6x6 design and integration

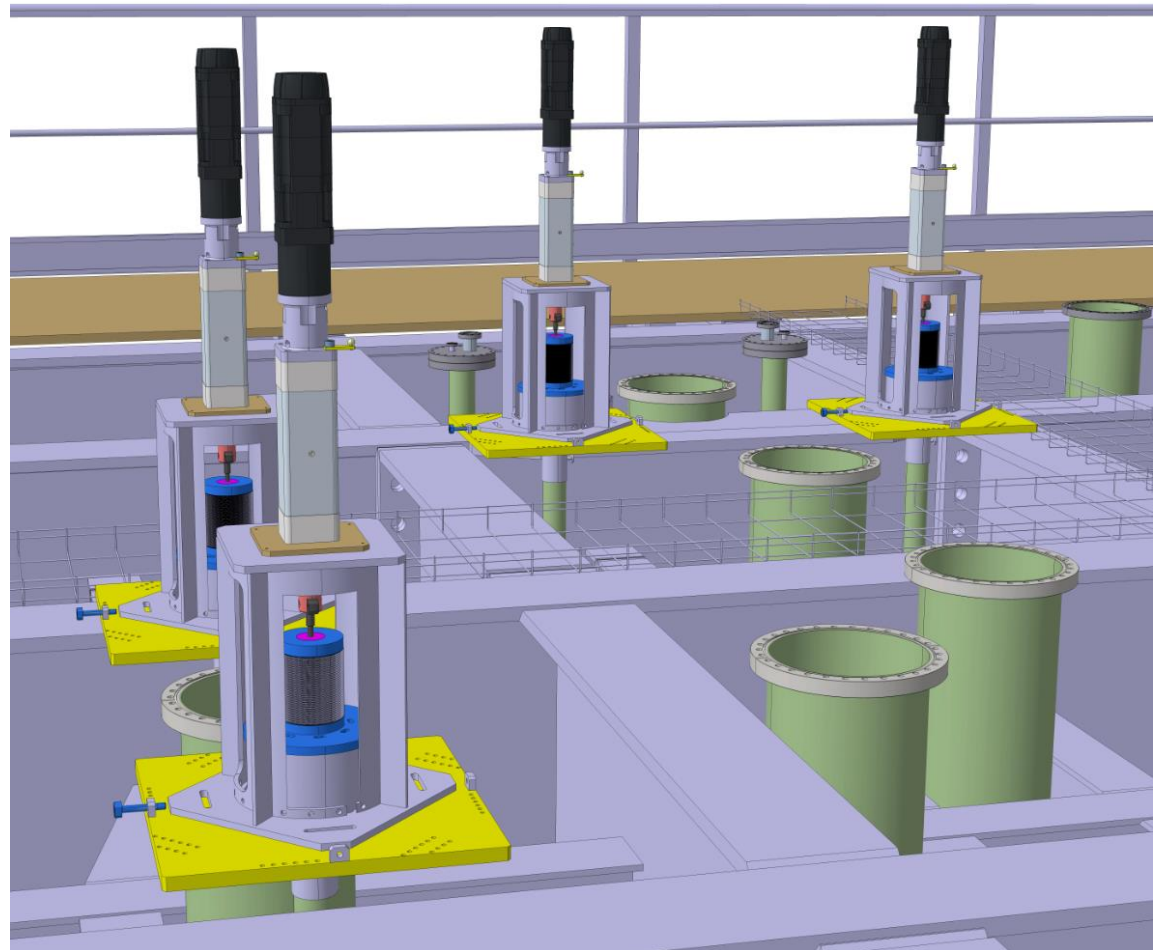
C. Cantini, A. Gendotti, L. Molina Bueno, S. Murphy, A. Rubbia, C. Regenfus, F. Sergiampietri

ETH zürich

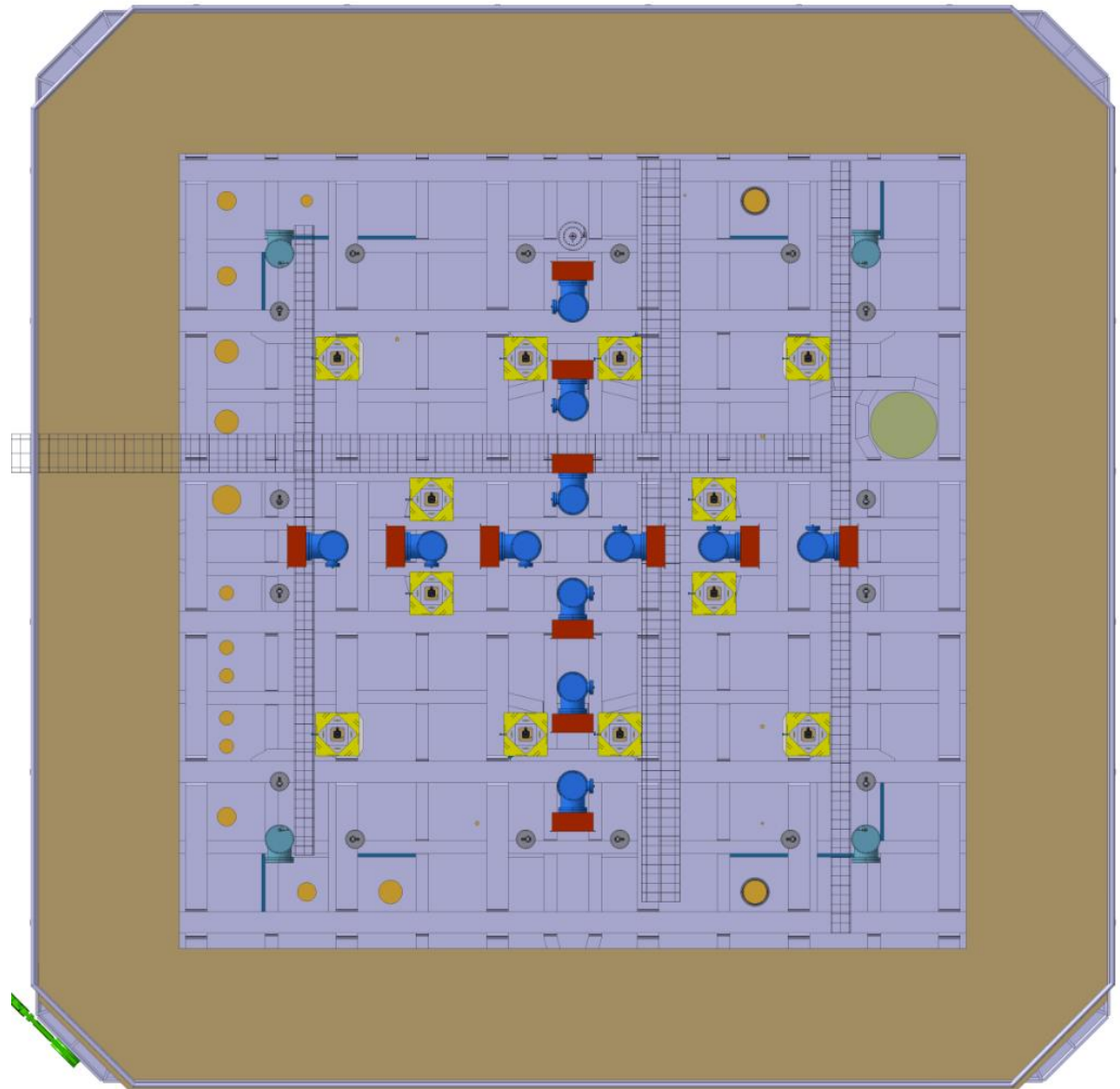
19.10.2016

- Last integration updates
 - CRP SPFTs
 - Top Cryostat Cable Trays
 - Internal Cryostat Cable Trays and Purity Monitors
 - CryoCamera and LEDs
 - Update at the Clipping Alu profile at the Field Cage
- TO-DO LIST of remaining design details for detector integration subdivided for all detector items
 - Top Fts
 - CRP
 - DP- Field Cage
 - Cathode
 - Groundgrid
 - PMts
 - Internal Instrumentation
 - Cryostat Interfaces

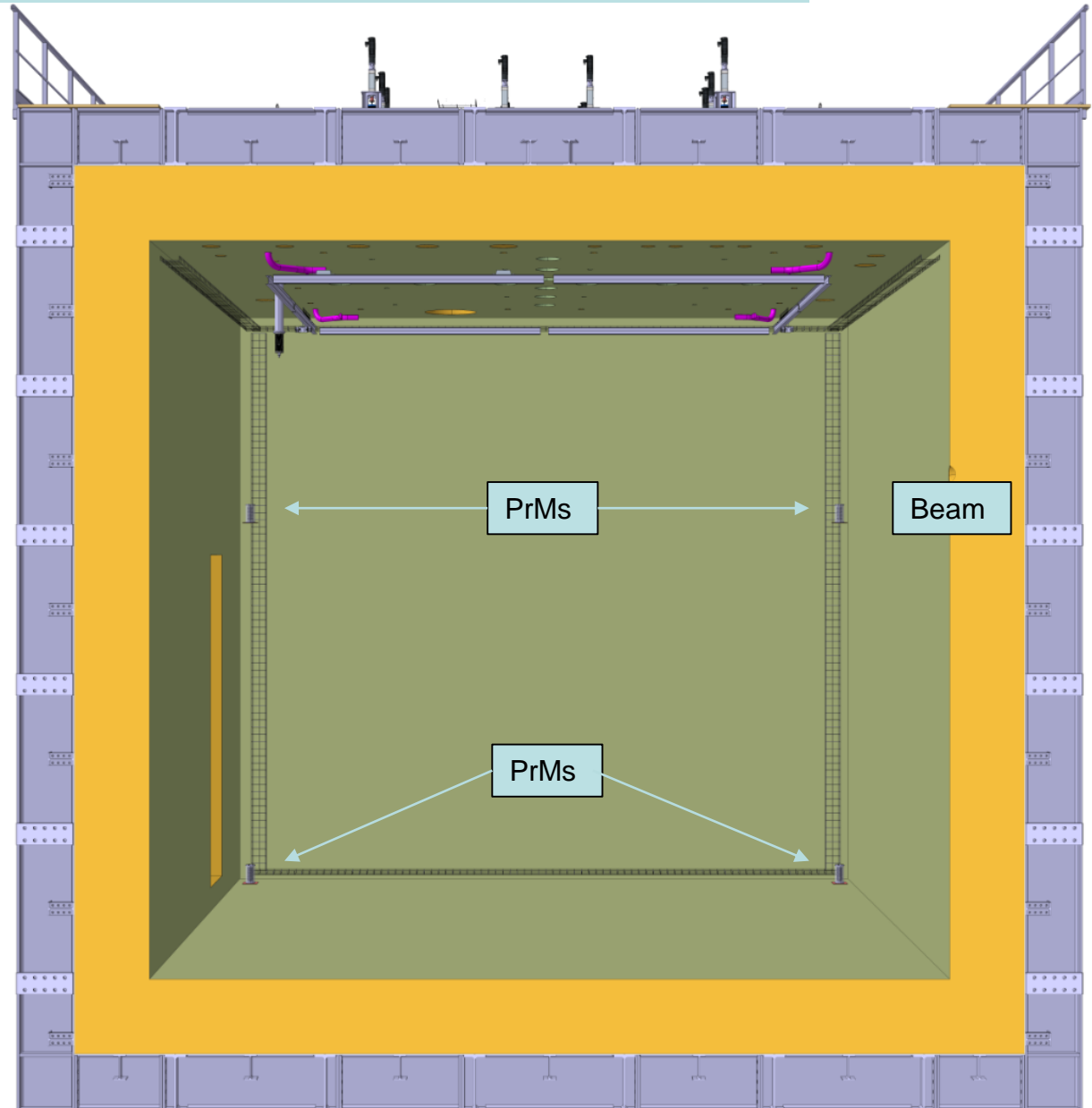
- Yellow Fixing plate tight welded welded directly to the Crossing Pipe (instead of a CF-Flange)
- Small supports/fixing is needed at the Cryostat
- Height can be still defined



- Cable trays Layout is not final
- Important to have them (space requirement)

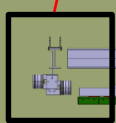
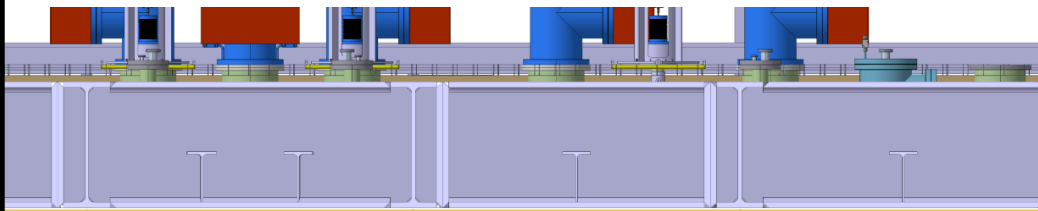
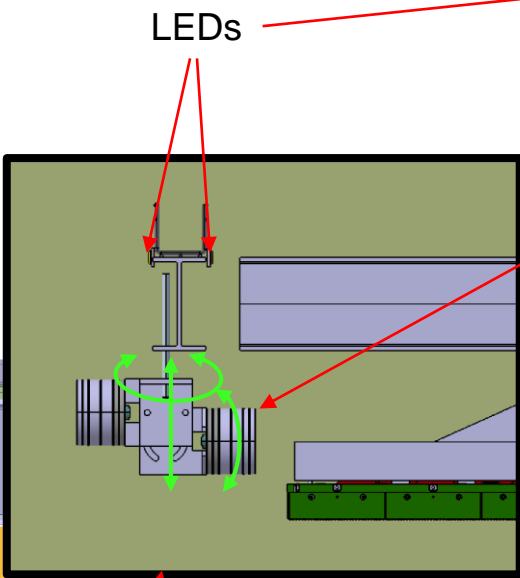
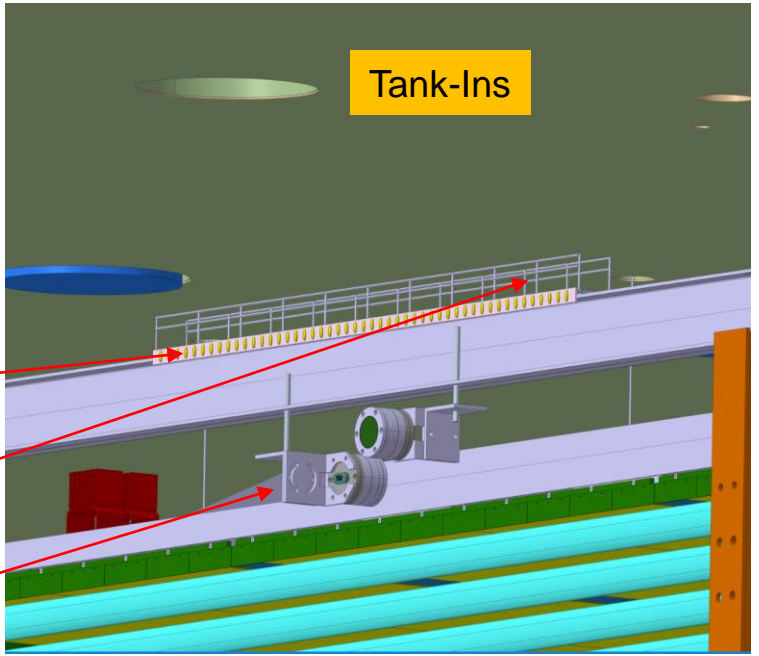


- Cable Tray of 200mm
- Along 3 Cryostat Corner on Top (horizontal)
- Along 2 Vertical Corner
- Along 1 corner on the Bottom (horizontal)
- 2x Purity Monitors on the Bottom
- 2x PMs at Height near to the Corners (now set at 5m height)
- Fixation of those parts is not yet designed → Position will be sent to Dimitar and he will get



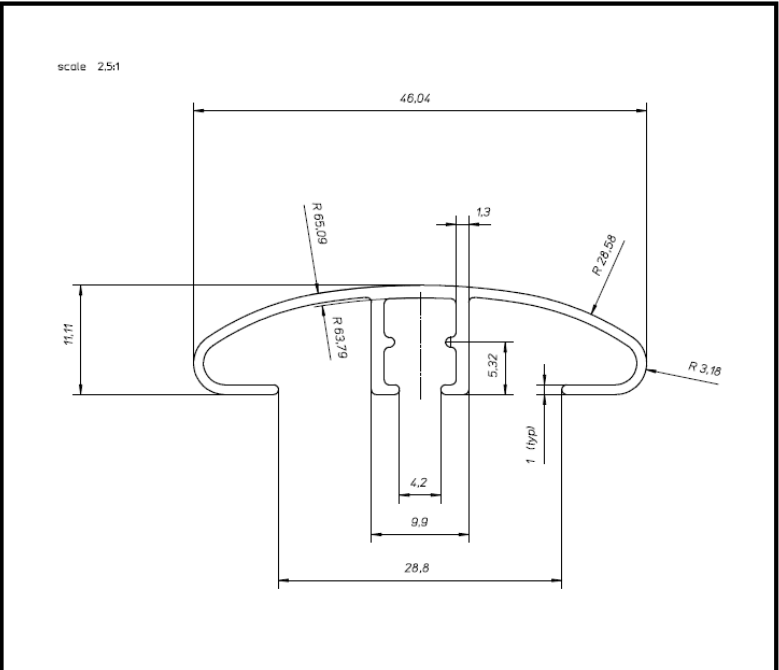
Integration Updates: CryoCamera and LEDs

- 2x Camera under each Tank-Ins FT
- Cable length ~3m (less than 4m)
- Connect to the Horizontal SS I-Beam of the Field Cage
- Camera can Rotate and move in z-axis
- ~1.3m far from HVFT



HVFT

- Design of the Alu profile (from F.Pietropaolo)
- Offer for the Straight Clipping Profile received (3 Oct)
- MIFA confirmed that they can bend the Profile
- We have to provide the Profile Shape of the Clip



CAD file from customer is used and is mastergeometry for missing dimensions refer to this CAD file (except for dim 28.8)
 non specified radii : R 0.5

scale 1:1

Din. Tol. EN-12020 (not for wallthickness)	
> 0 ~ 10	+/- 0.15
> 10 ~ 15	+/- 0.20
> 15 ~ 30	+/- 0.25
> 30 ~ 45	+/- 0.30
> 45 ~ 60	+/- 0.40
> 60 ~ 90	+/- 0.45
> 90 ~ 120	+/- 0.50
> 120 ~ 150	+/- 0.60
> 150 ~ 180	+/- 1.00

<input type="checkbox"/> A Standard quality	<input type="checkbox"/> Anodize quality	<input type="checkbox"/> Cosmetic quality	<input type="checkbox"/> Sliding quality
<input checked="" type="checkbox"/> B Anodize quality	<input checked="" type="checkbox"/> Cosmetic quality	<input checked="" type="checkbox"/> Sliding quality	

2	Tolerances according to EN 12020-2 unless otherwise stated		
1	Alloy: 6060 T6	Area: 102.3 mm ²	Date: 20-09-16
No.	Modifications	Date par.	Weight: 0.275 kg/m
MIFA [®] ALUMINIUM PRECISION EXTRUSION		Customer: CERN	Customer drawing no: pr. Neutrino proto Dune
		Customer drawing no: 38098	Drawing no: 38098

Thank you for your recent enquiry. We are pleased to offer the following quotation.

1. Description : PROFILE Neutrino external clip
Drawing : See below Rev. : -

Material : EN 573-3 AW 6060-T6 acc. EN 755-2
 Surface : SURTEC 650
 Length : 3000±5 mm
 Extrusion tolerances : EN12020-2 unless otherwise agreed

2. Description : PROFILE Neutrino external clip (with bending)
Drawing : See below Rev. : -

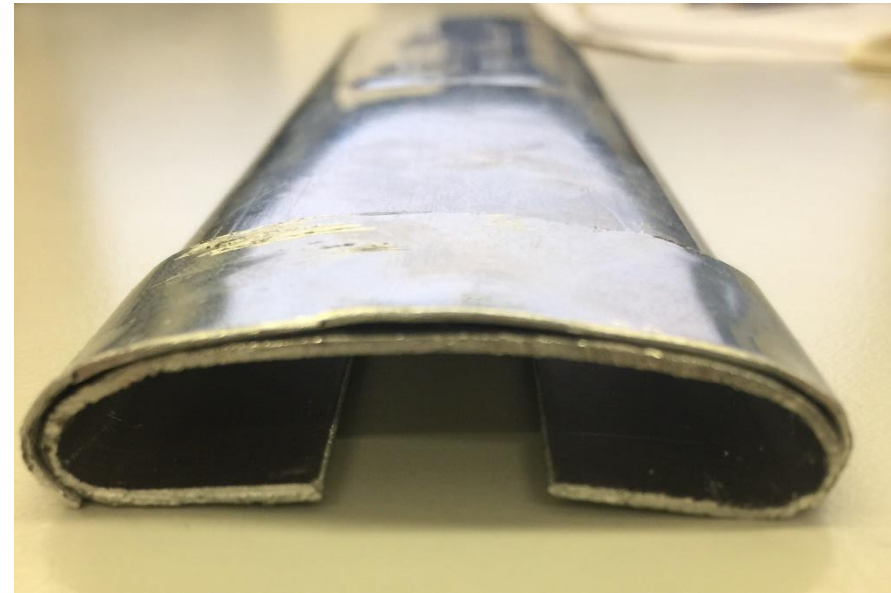
Material : EN 573-3 AW 6060-T6 acc. EN 755-2
 Surface : SURTEC 650
 Length : 400±2 mm before bending
 Extrusion tolerances : EN12020-2 unless otherwise agreed

- Prototype clip using existing Alu Profile from CERN (external geometry is the same)
- Design the Geometry corresponding to the clip



Follow the profile shape

Clipping end



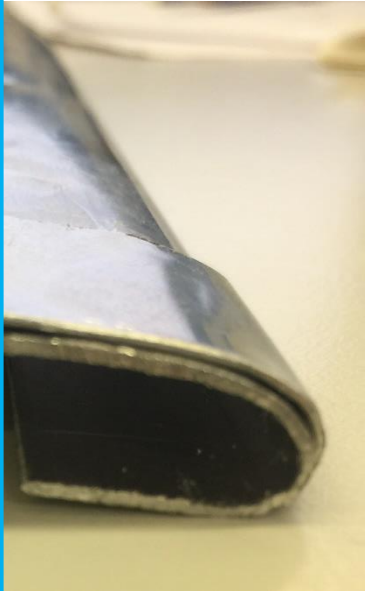


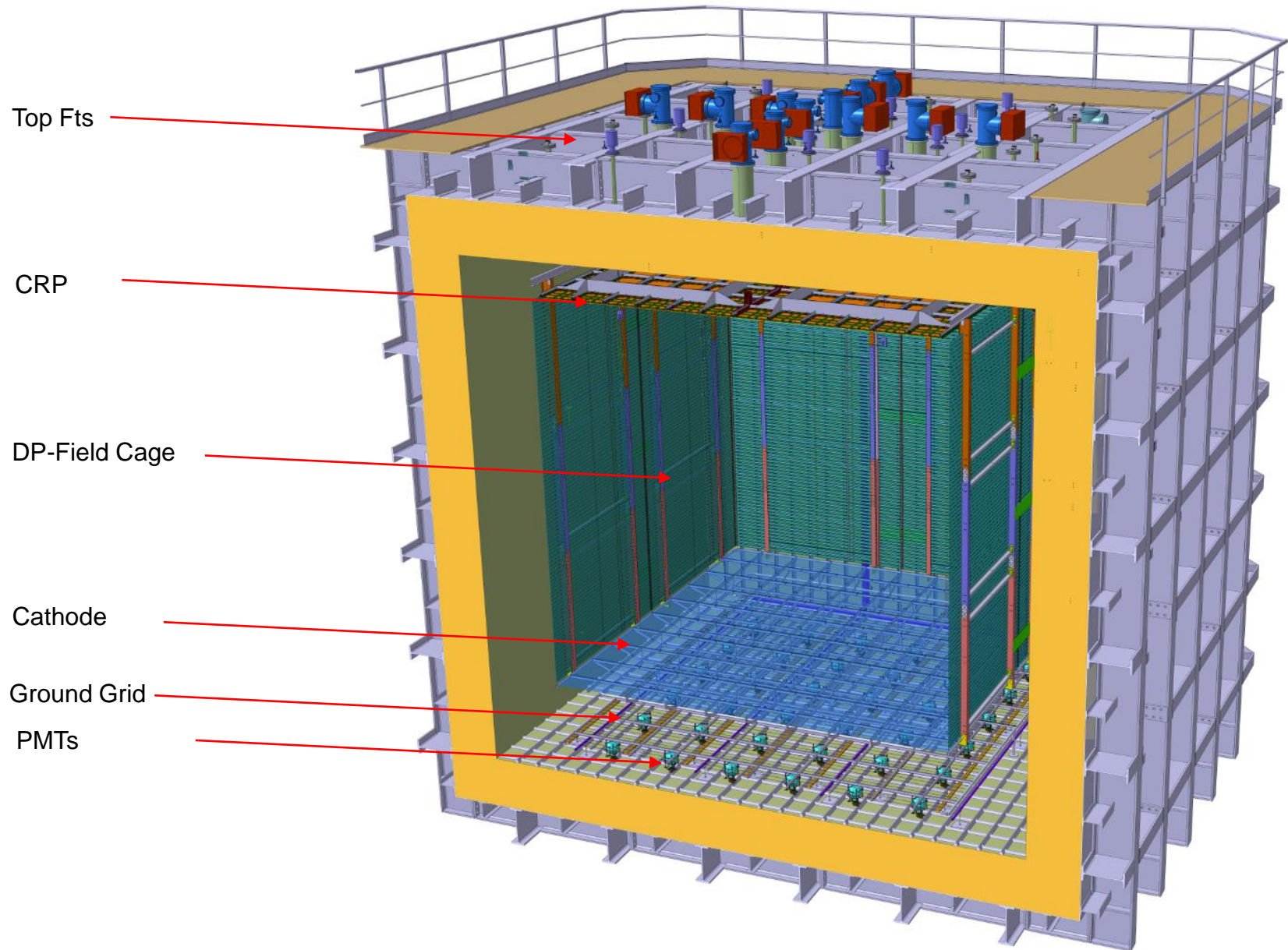
Integration Updates: Alu Profile Clip

- Prototype clip using existing Alu Profile from CERN (external geometry is the same)
- Design the Geometry corresponding to the clip

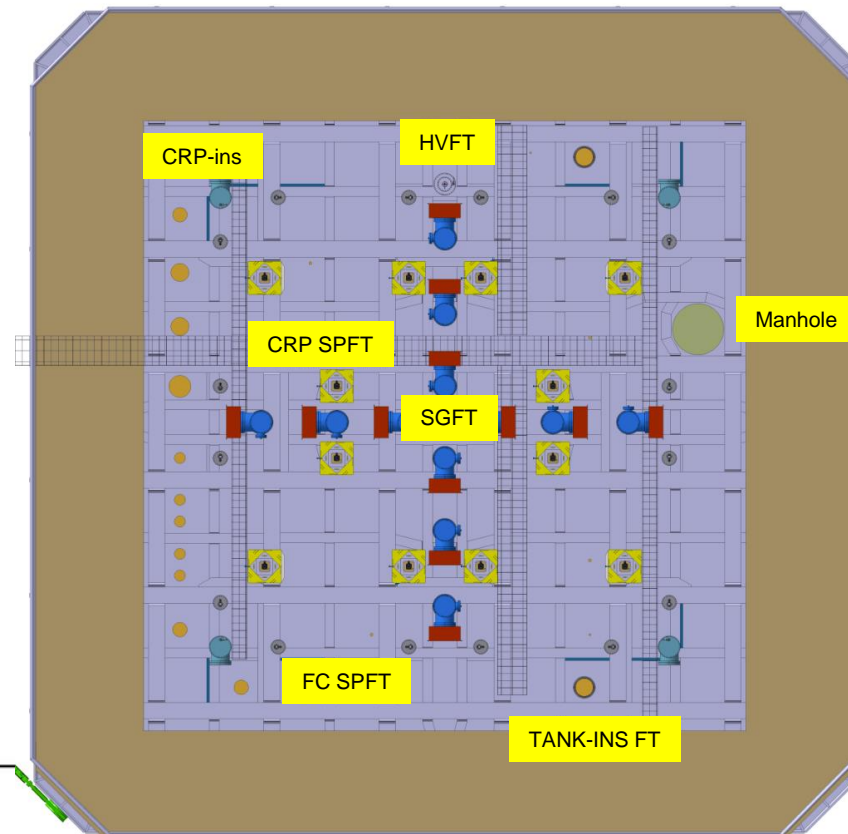
Follow the profile shape

Clipping end

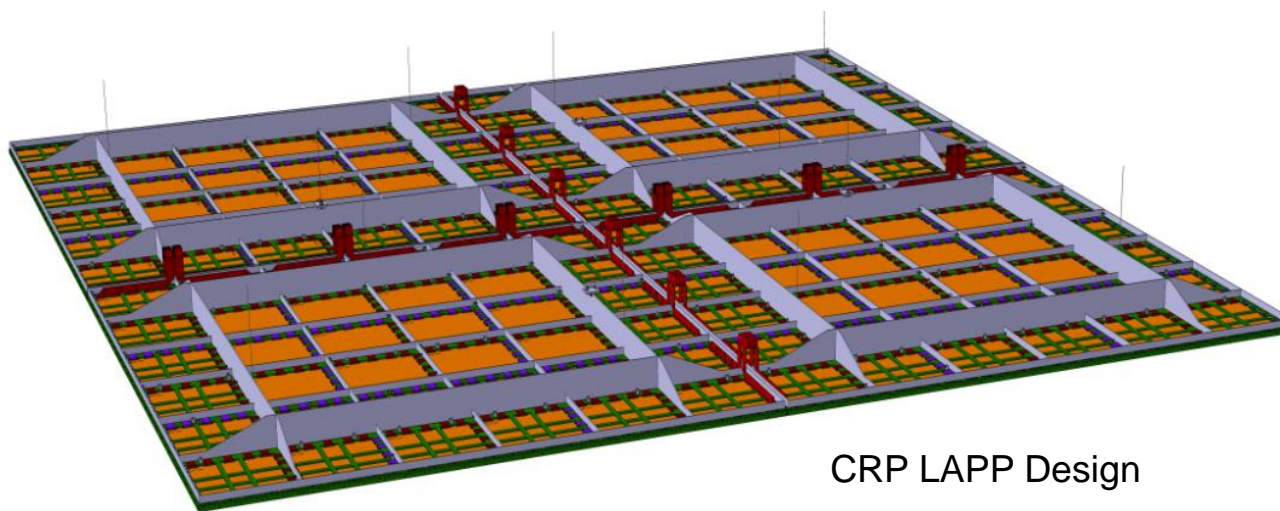
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- CERN will order prototypes of clipping profiles
 - We will have as well Field Shaper Profiles
 - Build a corner and straight connection test mockup
 - Use the «Test Dewar» in BLG 182 for cold test



DETECTOR ITEMS	ITEMS	Responsible Institute	Deadline	Status
Top FTs	ITEMS	Responsible Institute	Deadline	Status
	12 x CRP Suspension FTs	LAPP	2016 Nov.	Almost Final
	16 x FC Suspension FTs	ETHZ	2016 Nov.	Preliminary
	4 x CRP-Ins. FT	not covered yet	2016 Nov.	Not Designed
	12 x SGFT	ETHZ	2016 Nov.	Based on 3x1x1
	2 x Tank-Ins FT	not covered yet	2016 Nov.	Not Designed
	1 x HVFT	ETHZ	2016 Nov.	Almost Final
	1 x Manhole	CERN	2016 Nov.	Based on 3x1x1

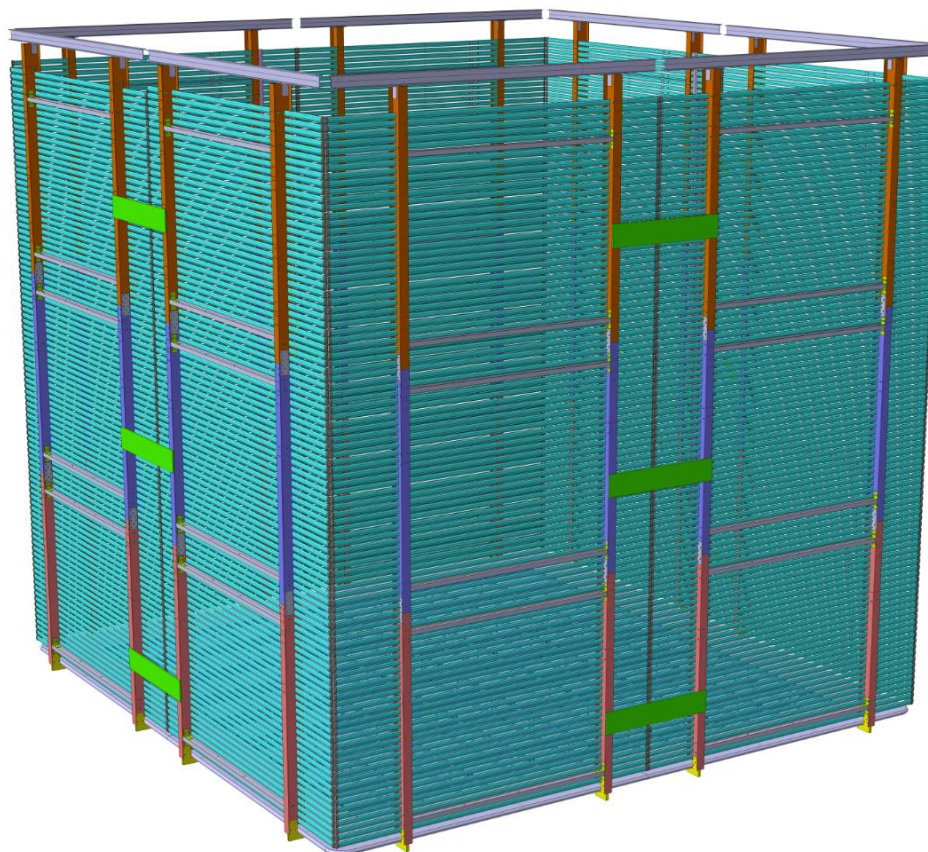


CRP	ITEMS	Responsible Institute	Deadline	Status
	Complete 3D design	LAPP	2016 Nov.	Almost Final
	CRP Cabling (sensor to Patch Panel)	LAPP	2016 Nov.	Almost Final
	Slow Control Sensors	ETHZ/LAPP	2016 Nov.	Almost Final
	Transportation Box	ETHZ/LAPP	2016 Nov.	Preliminary
	Assembly and Installation Procedure	LAPP	2016 Nov.	Preliminary
	3x3 CRP Parts List and Total Weight	LAPP	2016 Nov.	Preliminary
	Structural Analysis	LAPP	2016 Nov.	Preliminary

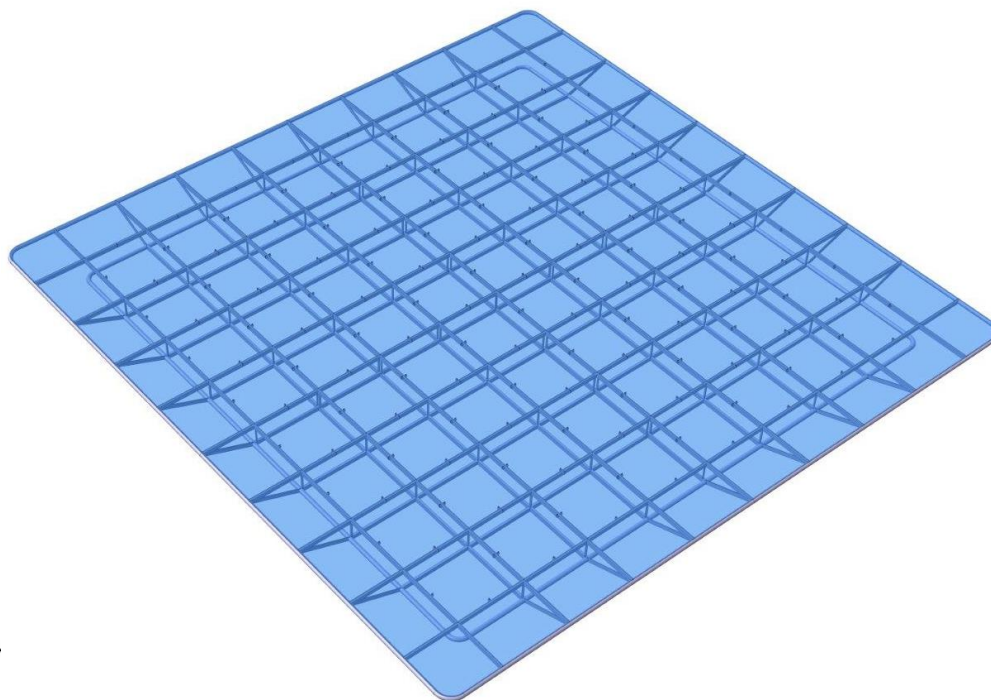


CRP LAPP Design

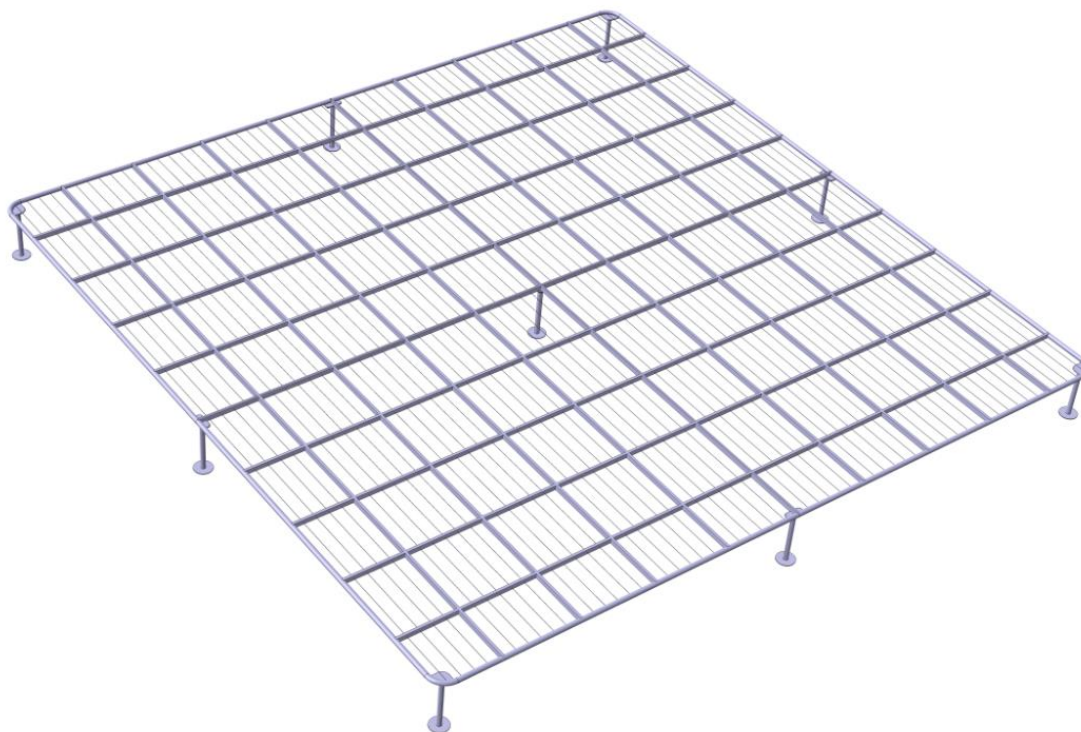
DP-Field Cage	ITEMS	Responsible Institute	Deadline	Status
	Complete 3D Design	ETHZ	2016 Nov.	Almost Final
	Transportation Box for Modules	ETHZ	2016 Nov.	Not Designed
	Beam Plug Interface		2016 Nov.	Not Designed
	Hanging System	ETHZ	2016 Nov.	Preliminary
	Electrical Components	UTA	2016 Nov.	Preliminary
	Assembly and Installation Procedure	UTA/ETHZ	2016 Nov.	Preliminary
	Parts List and Total Weight	UTA/ETHZ	2016 Nov.	Preliminary
	Structural Analysis	ETHZ	2016 Nov.	Preliminary



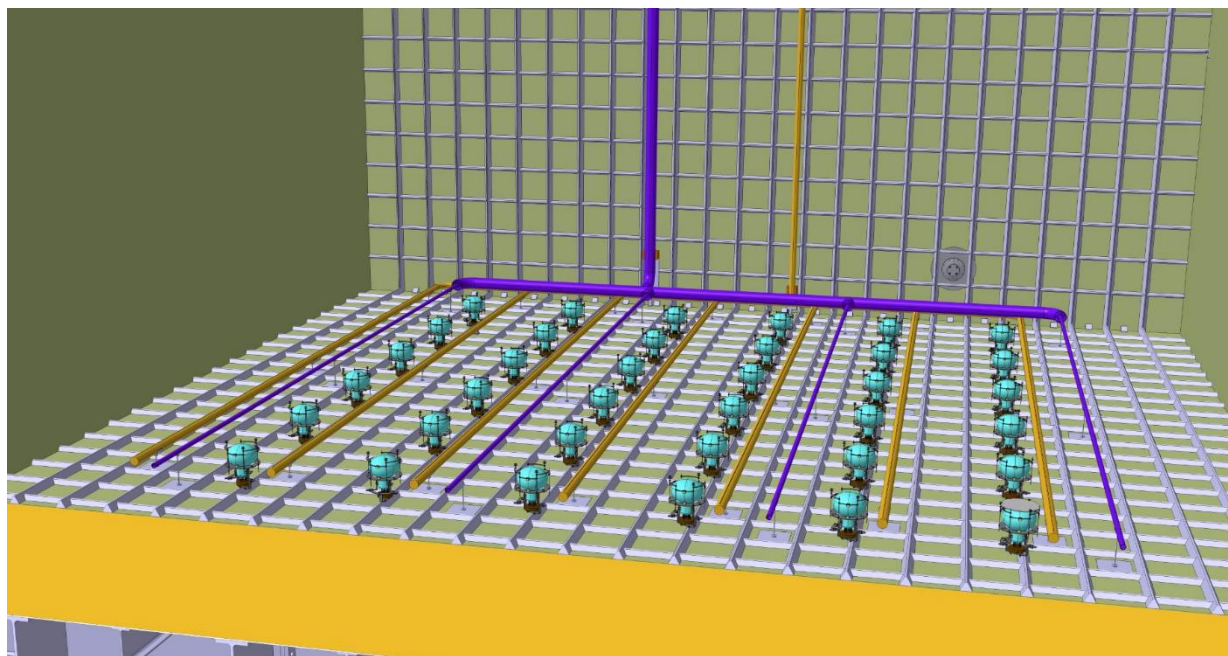
Cathode	ITEMS	Responsible Institute	Deadline	Status
	Complete 3D Design	ETHZ	2016 Nov.	Almost Final
	Transportation Box for Modules	ETHZ	2016 Nov.	Not Designed
	HVFT connection	ETHZ	2016 Nov.	Not Designed
	Assembly and Installation Procedure	ETHZ	2016 Nov.	Preliminary
	Parts List and Total Weight	ETHZ	2016 Nov.	Preliminary
	Structural Analysis	ETHZ	2016 Nov.	Preliminary



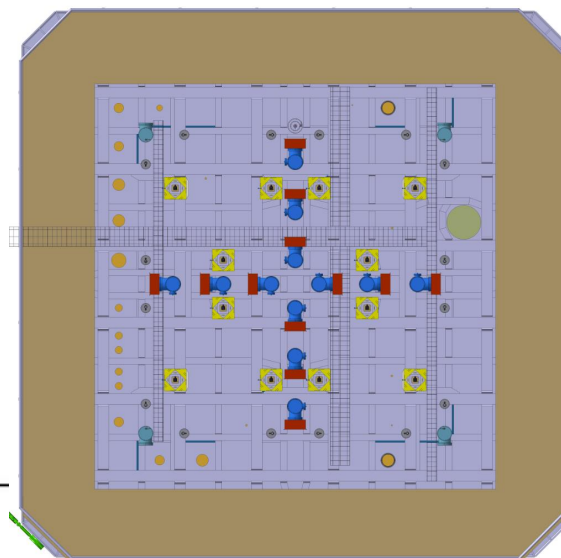
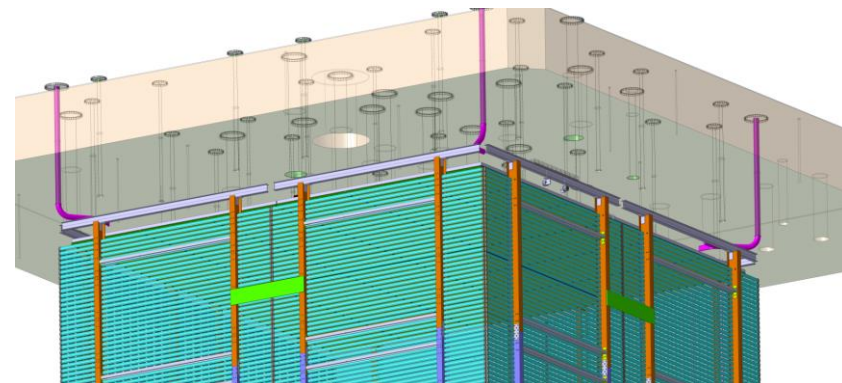
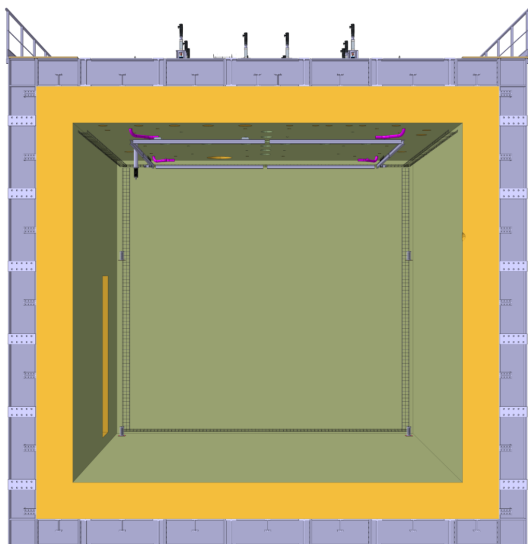
Ground Grid	ITEMS	Responsible Institute	Deadline	Status
	Complete 3D Design	ETHZ	2016 Nov.	Almost Final
	Transportation Box for Modules	ETHZ	2016 Nov.	Not Designed
	Assembly and Installation Procedure	ETHZ	2016 Nov.	Preliminary
	Parts List and Total Weight	ETHZ	2016 Nov.	Preliminary
	Sturctural Analysis	ETHZ	2016 Nov.	Preliminary



PMTs	ITEMS	Responsible Institute	Deadline	Status
	Complete 3D Design	CIEMAT/IFAE	2016 Nov.	Preliminary
	Final Position of the PMTs	CIEMAT/IFAE	2016 Nov.	Preliminary
	Fixing System at the Membrane	CIEMAT/IFAE	2016 Nov.	Preliminary
	Cable Route	CIEMAT/IFAE	2016 Nov.	Not Yet
	Assembly and Installation Procedure	CIEMAT/IFAE	2016 Nov.	Preliminary
	Parts List and 2D Drawings	CIEMAT/IFAE	2016 Nov.	Not yet



Cryostat Interfaces	ITEMS	Responsible Institute	Deadline	Status
	Cable Trays on Top Cryostat	ETHZ		Preliminary
	Layout of Instrumentation Top of Cryostat	ETHZ		Not Integrated
	Cable Trays inside the Cryostat	ETHZ	2016 Nov.	Preliminary
	Cable Route inside the Cryostat	ETHZ		Not Integrated



Comments

- Excel List (in pdf) and Sensor List are uploaded on the Indico page
- Updated Complete step file of the Cryostat and Detector is uploaded on the plone:

http://lbnodemo.ethz.ch:8080/Plone/wa105/6x6x6m3-demonstrator/stp-files/dp-integration-step-files/WA105%206x6x6%20Complete%2019_10_2016.rar/view

- And also a 3D pdf for whom doesn't have a CAD Program:

http://lbnodemo.ethz.ch:8080/Plone/wa105/6x6x6m3-demonstrator/stp-files/dp-integration-step-files/WA105%206x6x6%20Complete%2019_10_2016.pdf/view

Next Steps

- Keep finalizing the missing Details
- Have a preliminary Complete Installation sequence by the next TB (02.11.2016)
 - Discussion between the different groups is already on going

Thank you.....