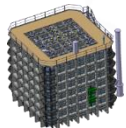


# ProtoDUNE-DP: Layout of HV on roof

Yann-Axel RIGAUT on behalf of ETHZ group

14/09/2017

Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zurich



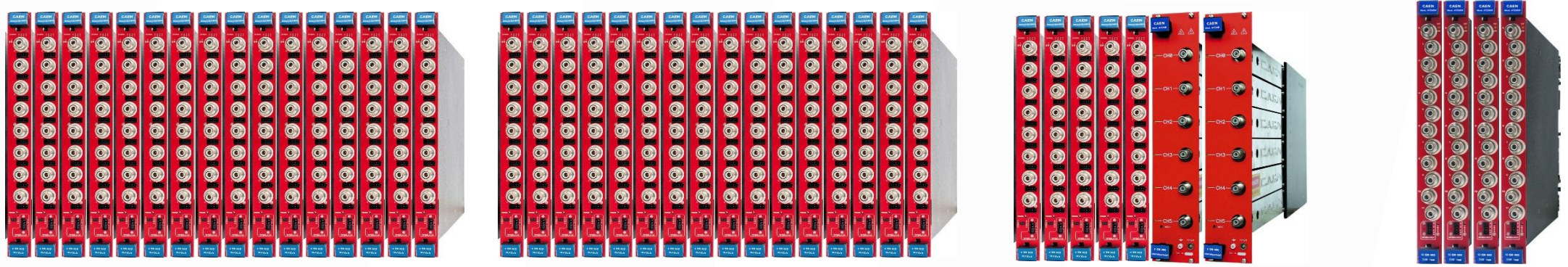
14.09.2017

Y. RIGAUT, IWG Meet. "ProtoDUNE-DP: Layout of HV on roof"

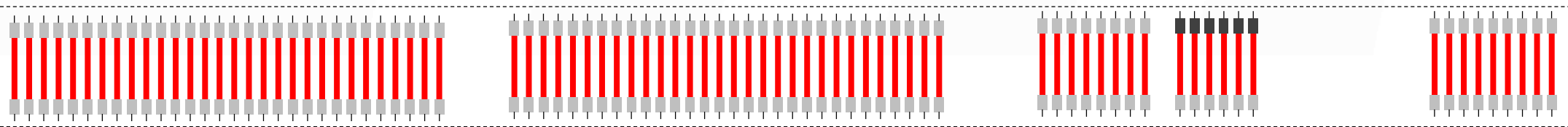
## MAINFRAME



## BOARD



## CABLE

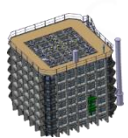


## OBJECT

LEMs

Purity  
GRID, FFS

PMTs



**TOTAL PRICE (without cables): €220,000**

## MAINFRAME

\* Already bought by ETH for the 3m x 1m x 1m.



€11,000\*



€11,000

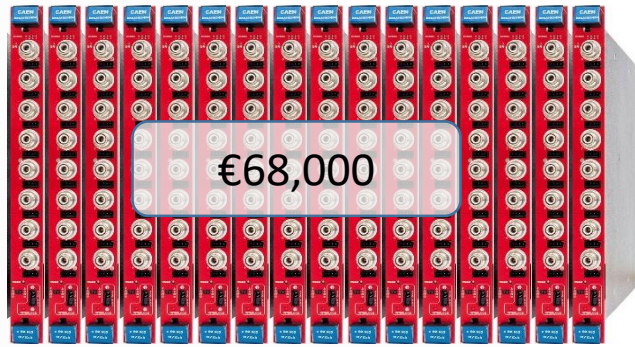


€11,000



€7,000

## BOARD



€68,000



€68,000

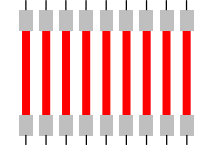
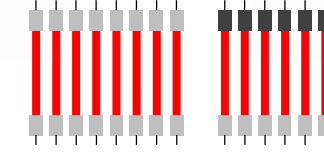
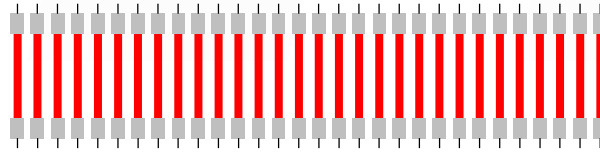
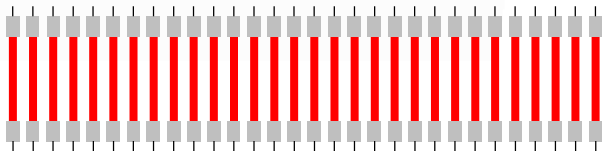


€30,000



€14,000

## CABLE



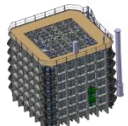
## OBJECT

LEM<sub>s</sub>

Purity

GRID, FFS

PMT<sub>s</sub>



## MAINFRAME



## BOARD



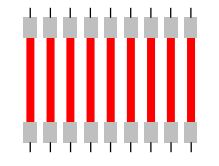
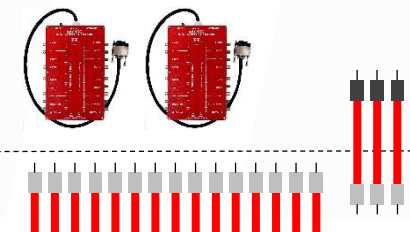
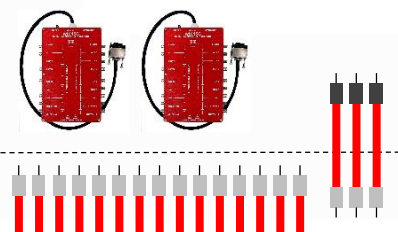
+4 SPARE LEFT



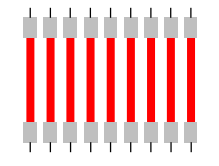
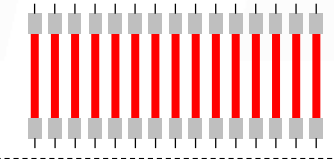
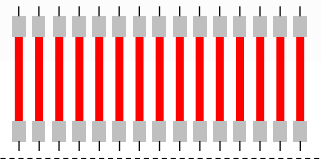
+4 SPARE LEFT



## CONVERTER



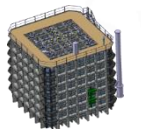
## CABLE



## OBJECT

LEMes, Purity, Grid, FFS

PMTs



TOTAL PRICE (without cables): €171,000

MAINFRAME



€11,000\*




€11,000




€7,000

\* Already bought by ETH for the 3m x 1m x 1m.

BOARD



€46,000 +4 SPARE LEFT

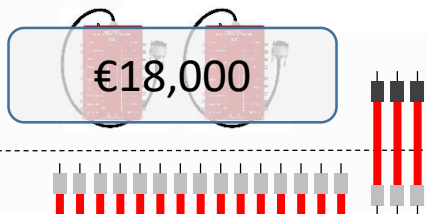


€46,000 +4 SPARE LEFT

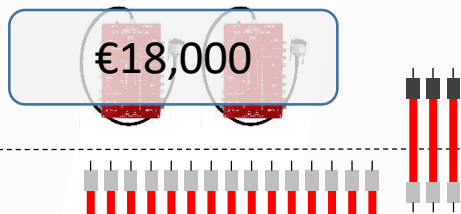


€14,000

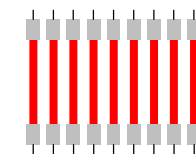
CONVERTER



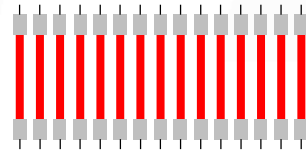
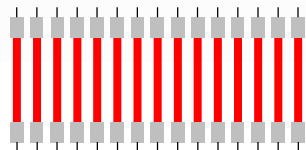
€18,000



€18,000



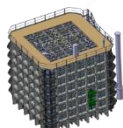
CABLE



OBJECT

LEMes, Purity, Grid, FFS

PMTs





**TOTAL PRICE (without cables): €171,000**

## MAINFRAME



€11,000\*




€11,000



€7,000

\* Already bought by ETH for the 3m x 1m x 1m.

## BOARD



€46,000 +4 SPARE LEFT



€46,000 +4 SPARE LEFT



€14,000

## CONVERTER

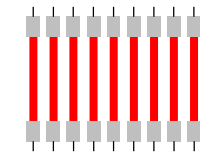
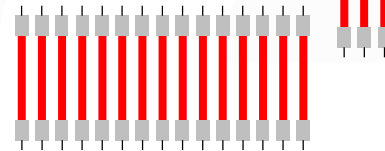
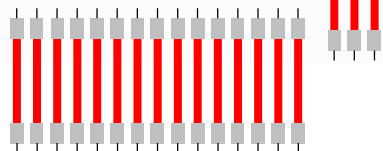


€18,000



€18,000

## CABLE



## OBJECT

LEM s, Purity, Grid, FFS

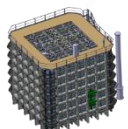
PMTs

**ADVANTAGES:**

- + Price
- + Cabling
- + Space (-1 Mainframe)
- + Spare for board
- + Spare channels

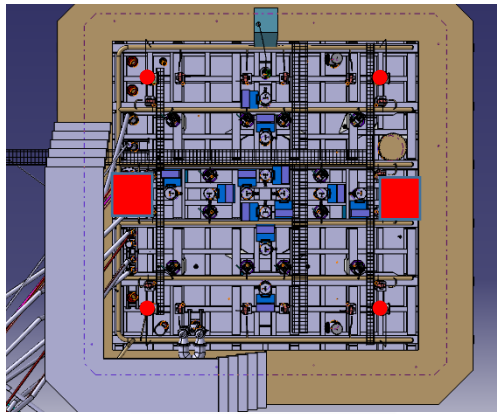
**DISADVANTAGES:**

- Channels group /16
- Not tested

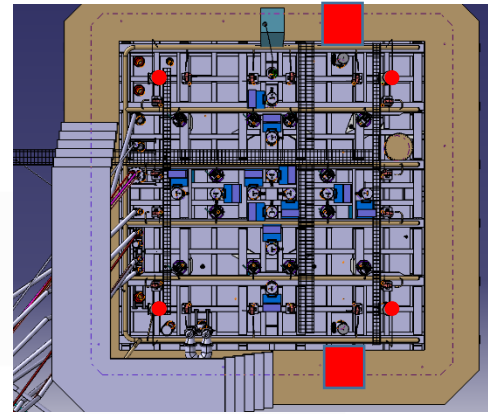




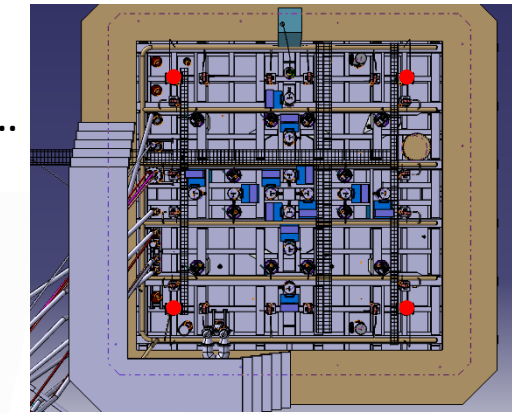
# WHERE WILL BE MAINFRAME ?



Case 1



Case 2

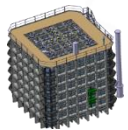


Case 3



		Nombre de metres	Coaxiaux LEMs	Prix unitaire (CHF/m)	Total (CHF)
In middle	INST_CRP_1	7	72	1.2	604.8
	INST_CRP_2	7	72	1.2	604.8
	INST_CRP_3	7	72	1.2	604.8
	INST_CRP_4	7	72	1.2	604.8
TOTAL:					2419.2
tank Inst	INST_CRP_1	2	72	1.2	172.8
	INST_CRP_2	15	72	1.2	1296
	INST_CRP_3	2	72	1.2	172.8
	INST_CRP_4	20	72	1.2	1728
TOTAL:					3369.6
Inside racks	INST_CRP_1	35	72	1.2	3024
	INST_CRP_2	35	72	1.2	3024
	INST_CRP_3	35	72	1.2	3024
	INST_CRP_4	35	72	1.2	3024
TOTAL:					12096

**(Without connectors)**





## 09.41.32.A - CONNECT. HAUTE TENSION LEMO-10 KV AUTO-VERROUIL. FAIBLE ENCOMBREMENT

[Pour toute demande d'information complémentaire - cliquez ici](#)

SECON CBI 130-1 accouplé  
 I nom. : 0,2 A  
 U nom. max.: 10 kVcc ou crête ca  
 U ESSAI : 10,6 kV eff. -50 Hz  
 CONTACT : 4,5 mOhm  
 TEMPERATURE DE SERVICE : -40 à +80 °C  
 MATIERE ISOLANTE : PEK  
 TANCHEITE : - Test hélium : 10<sup>-4</sup> Torr 1/s  
 - Test pression : 4 bar  
 CONDITIONS DE DESACCOUPLMENT : -Tension = 0 V ou  
 -Courant < 5 mA  
 Energie < 10 J


NE PAS UTILISER SUR LE RESEAU 220-380 V



CABLE HTC-50-2-1 ROUGE [04.31.51.760.9](#)

GAINE SILICONE [04.86.60](#)

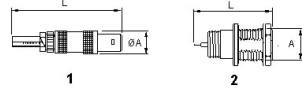
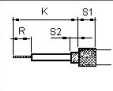
RUBAN THERMOFUSIBLE [04.94.60.A](#)

RUBAN KAPTON [04.94.70](#)

Acheter	Code SCEM	Unité	Prix Unitaire	Stock restant	Date de livraison
	<a href="#">09.41.32.100.8</a>	PC	30.0 i	6 i	15.09.2017

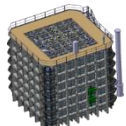
Acheter	Code SCEM	Unité	Prix Unitaire	Stock restant	Date de livraison	Livraison directe	DESIGNATION	A mm	L mm	TYPE LEMO	FIG.
	<a href="#">09.41.32.100.8</a>	PC	30.0 i	6 i	15.09.2017	>=37 i	FICHE CABLE 1 contact	12	53	FFR.1S.408.CLAE46	1
	<a href="#">09.41.32.150.8</a>	PC	20.0 i	10 i	15.09.2017	>=56 i	PRISE CHASSIS 1 contact	M12 x 1	40	ERD.1S.408.CLL	2

N°/SCEM	K	R	S1	S2
09.41.32				
100.8	37	5	8	3
150.8	24	4	3	3



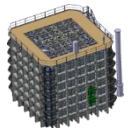
What	Lengths	Number	Cable price (CHF/m)	Cable total price (CHF)	Connector price (unit)	Total Price (Cable +Connectors)
INST_CRP_1 (LEMes)	2	72	1.2	172.8	30	4492.8
INST_CRP_1 (Grid,FFS)	2	4	1.2	9.6	50	409.6
INST_CRP_2 (LEMes)	15	72	1.2	1296	30	5616
INST_CRP_2 (Grid,FFS)	15	4	1.2	72	50	472
INST_CRP_3 (LEMes)	2	72	1.2	172.8	30	4492.8
INST_CRP_3 (Grid,FFS)	2	4	1.2	9.6	50	409.6
INST_CRP_4 (LEMes)	20	72	1.2	1728	30	6048
INST_CRP_4 (Grid,FFS)	20	4	1.2	96	50	496
INST_TANK_1 (Purity)	2	4	1.2	9.6	30	249.6
INST_TANK_1 (PMTs)	35	20	1.2	840	30	2040
INST_TANK_2 (Purity)	2	4	1.2	9.6	30	249.6
INST_TANK_2 (PMTs)	35	20	1.2	840	30	2040
				5256		27016

**22kCHF only for connectors, maybe another company than CERN can provide a large number with a better price.**



THANKS

Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zurich



## Example of company which can provide SHV:

Fournisseur: HUBER+SUHNER AG, Tumbelenstrasse 20, 8330 PFAFFIKON, CH (HUBE75, MA01)  
 Contact du fournisseur: thierry.ruef@hubersuhner.com  
 Devise \*: CHF (Swiss Franc)  
 Frais de transport \*: Les frais de transport sont inclus dans les prix unitaires de l'offre  
 Emballage \*: Les frais d'emballage sont inclus dans les prix unitaires de l'offre  
 Veuillez indiquer si cette demande concerne des travaux de "Recherche et Developpement" et/ou des prototypes ? \* **Non** Si oui, veuillez joindre à votre DAI un justificatif détaillé.

[Recommandations d'achat](#)

Il est obligatoire de demander aux magasins les articles figurant aux [catalogues du CERN](#) ou articles de même nature. Valeur totale: SFr. 14,183.00 (SFr. 14'183.00)

**Lignes de commande**

Article	Quantité	Description	Prix unitaire	Prix
1	1750	<b>SHV connector</b> for 3.3mm diameter cable, 5kV, crimp type, female Part number 11 SHV-50-2-5 Codes budgétaires:T535044, Pays d'origine:CN, Lieu de livraison:899-R-001 (BB5), Code d'achat: 02050100 - Câbles puissance Haute Tension (HT) (> 1 000V) [Matériel], Livraison effectuée: Non, Date: :15.11.2017	SFr. 8.1046	SFr. 14,183.00

⚠ Nous vous rappelons que les membres du personnel ne doivent pas retirer le matériel directement dans les locaux du fournisseur

**Informations supplémentaires**

### CERN:

300 cables x 30CHF x 2 connectors  
 = **18kCHF**

### HUBER+SUHNER:

300 cables x 10CHF x 2 connectors  
 = **6kCHF**

