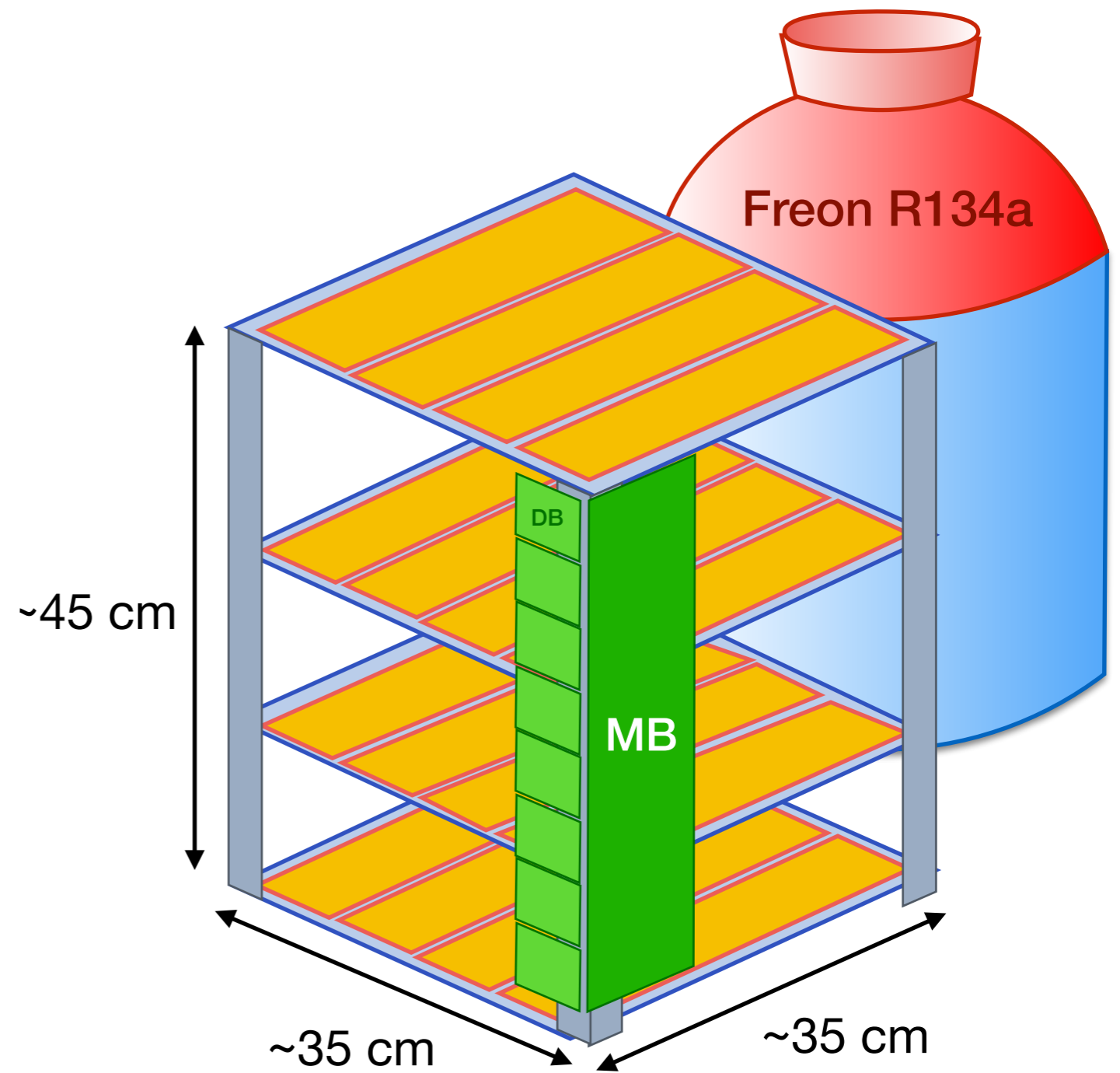
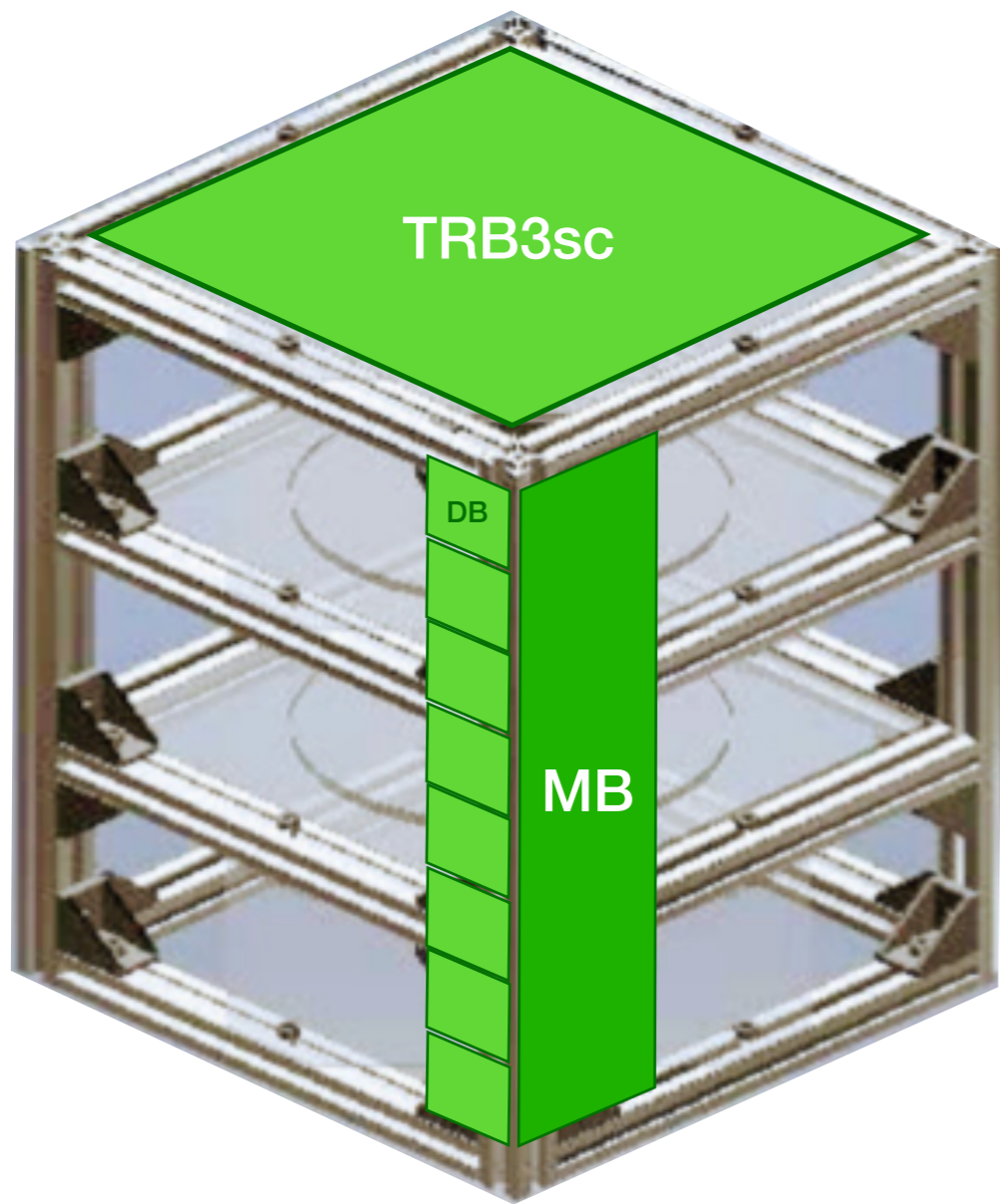
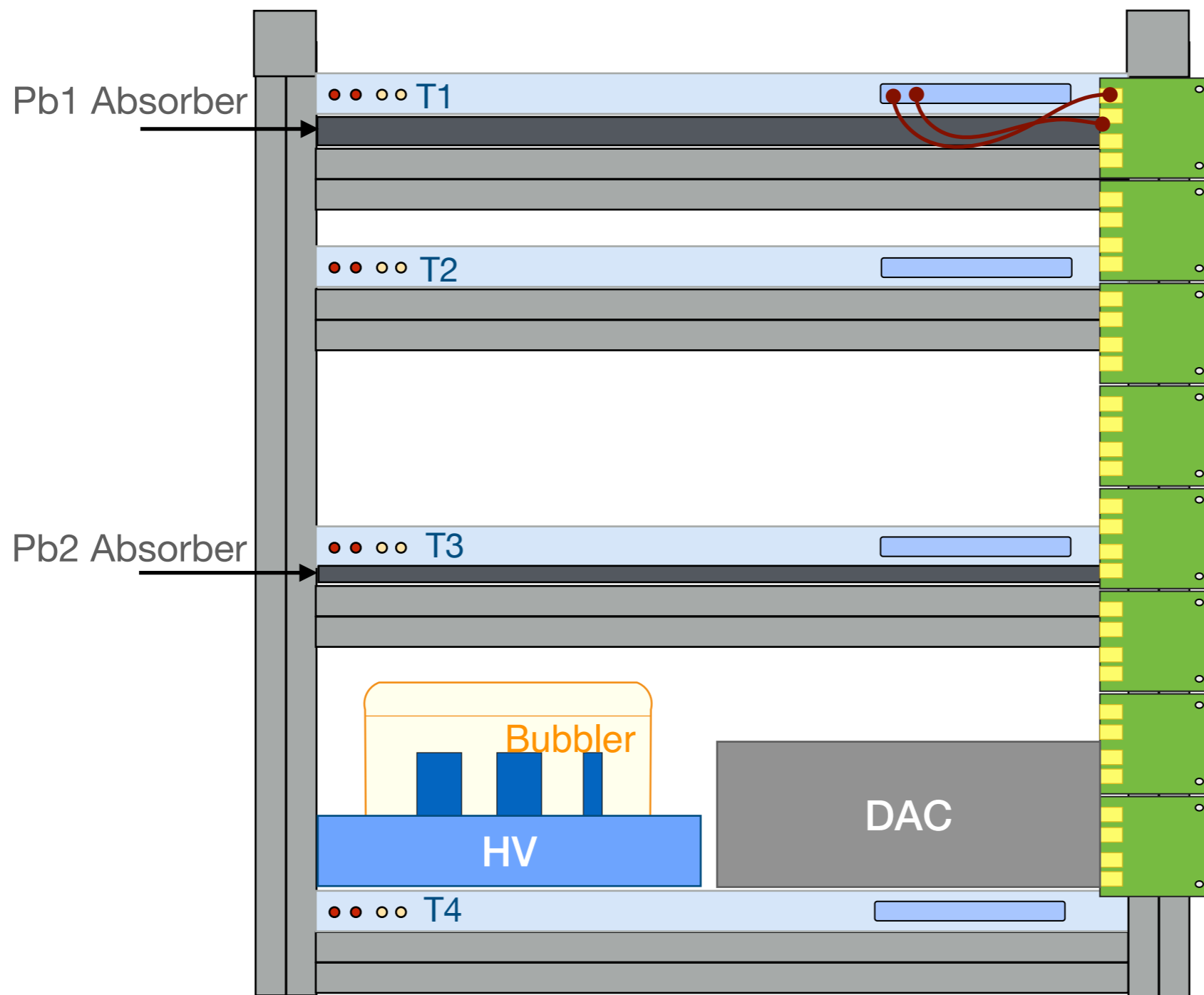
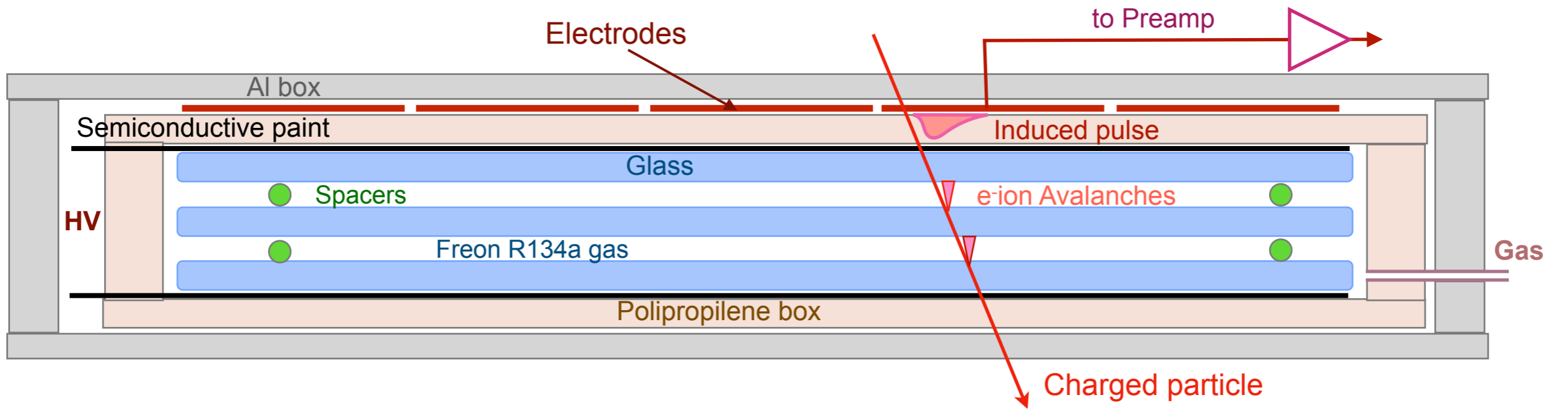


The minitrasGo concept





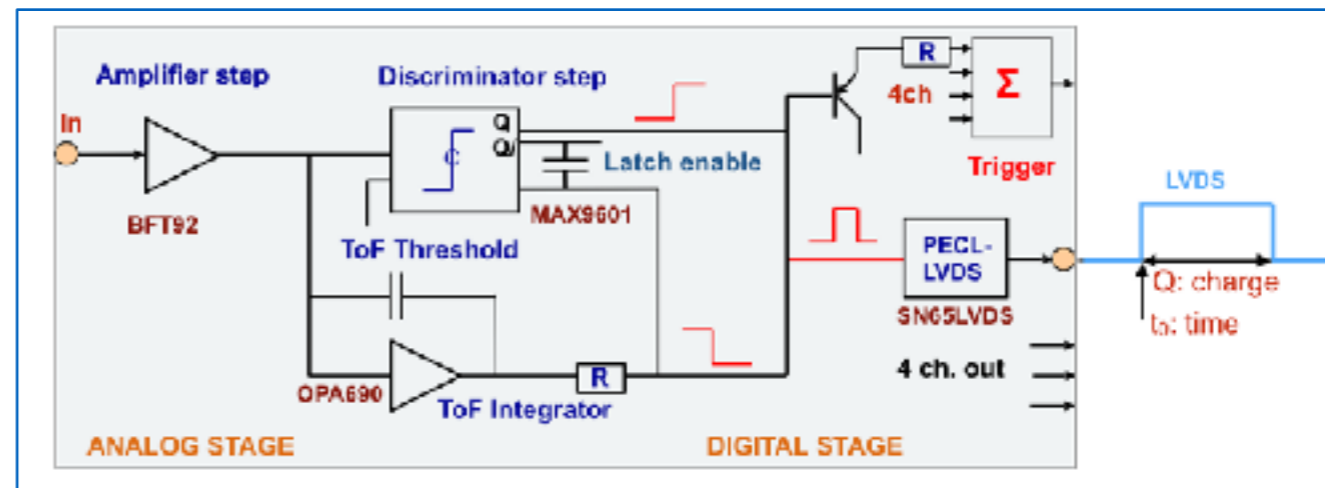
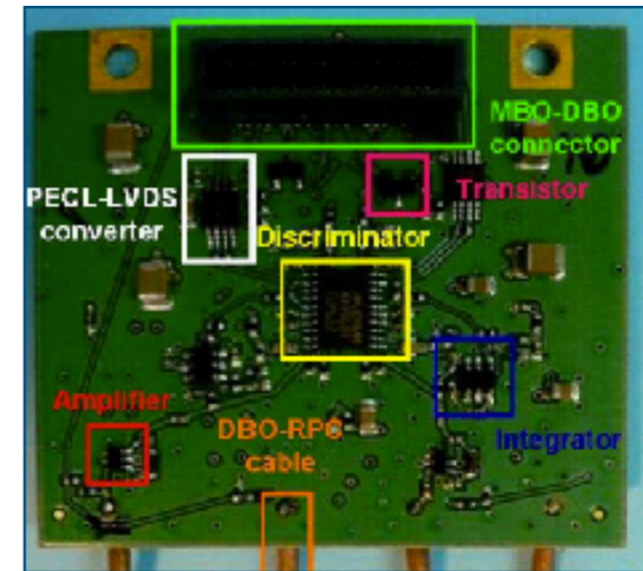
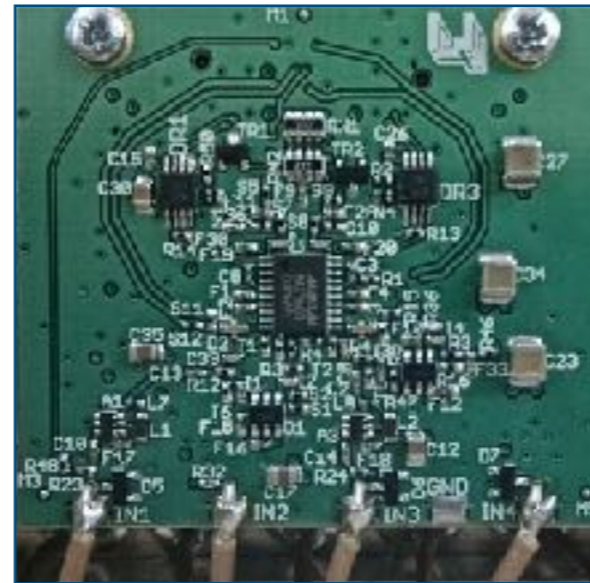
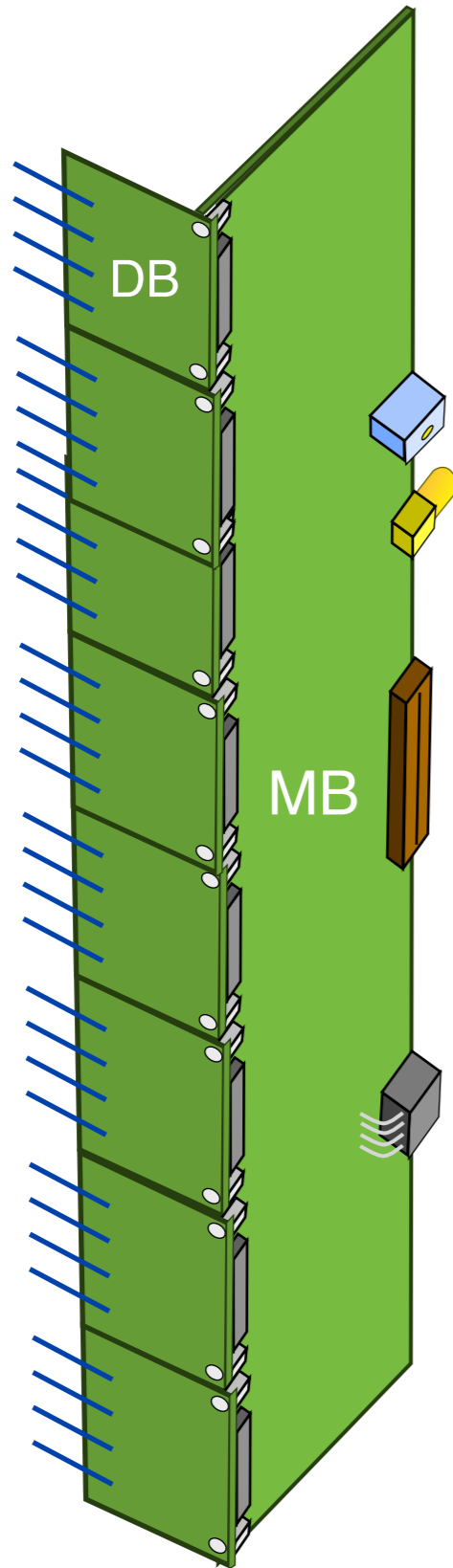


Mass widths and radiation lengths

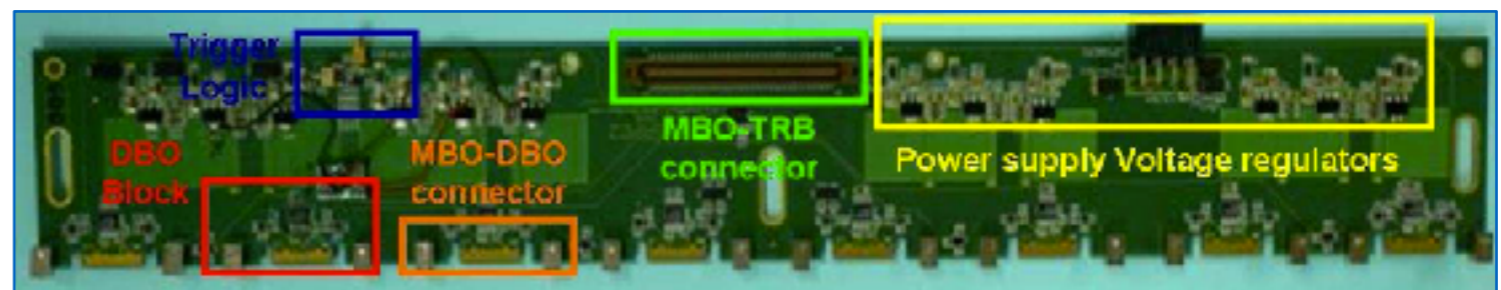
RPC layout	Width/mm	Density/(gr/cm ³)	Mass width/(gr/cm ²)	X ₀ /cm	ΔX ₀
Al	2	2.70	0.54	8.9	0.022
Foam	10	0.3	0.30	142	0.007
Cu	0.03	8.96	0.03	1.43	0.002
PCB (FR4)	1.57	2.6	0.40	31.8	0.005
Polipropilene	1	0.9	0.09	~40	0.003
Glass	1.9	2.5	0.47	3.2	0.059
R134a	1	0.0045	0	26.5	0.004
Glass	1.9	2.5	0.47	3.2	0.059
R134a	1	0.0045	0	26.5	0.004
Glass	1.9	2.5	0.47	3.2	0.059
Poipropilene	1	0.9	0.09	~40	0.003
Al	2	2.70	0.54	8.9	0.022
Total	25.7	-	3.40	-	0.249

minGO: FEE

(HADES Exp. GSI- Darmstadt)



Daughterboards



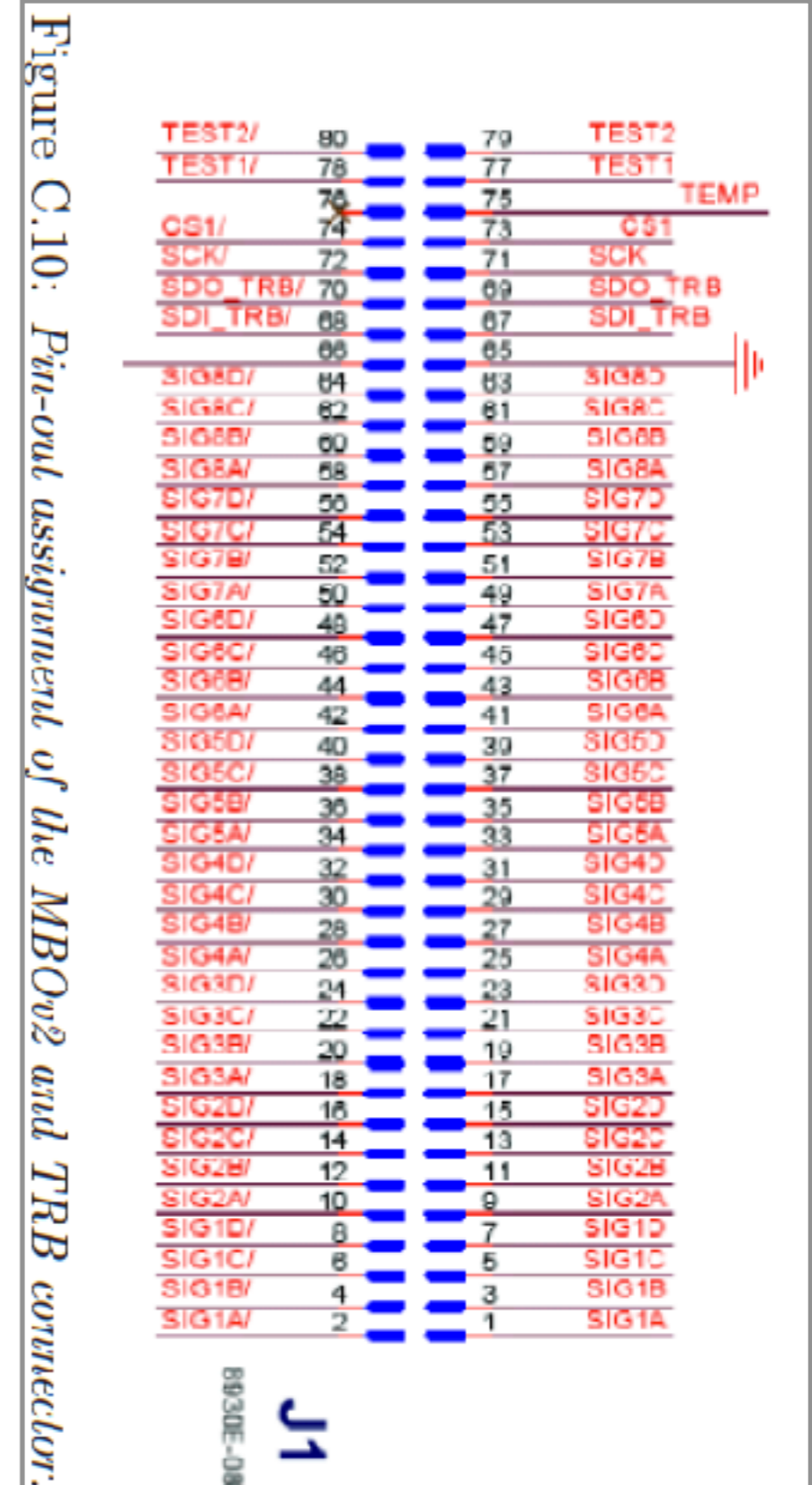
Motherboards

FEE

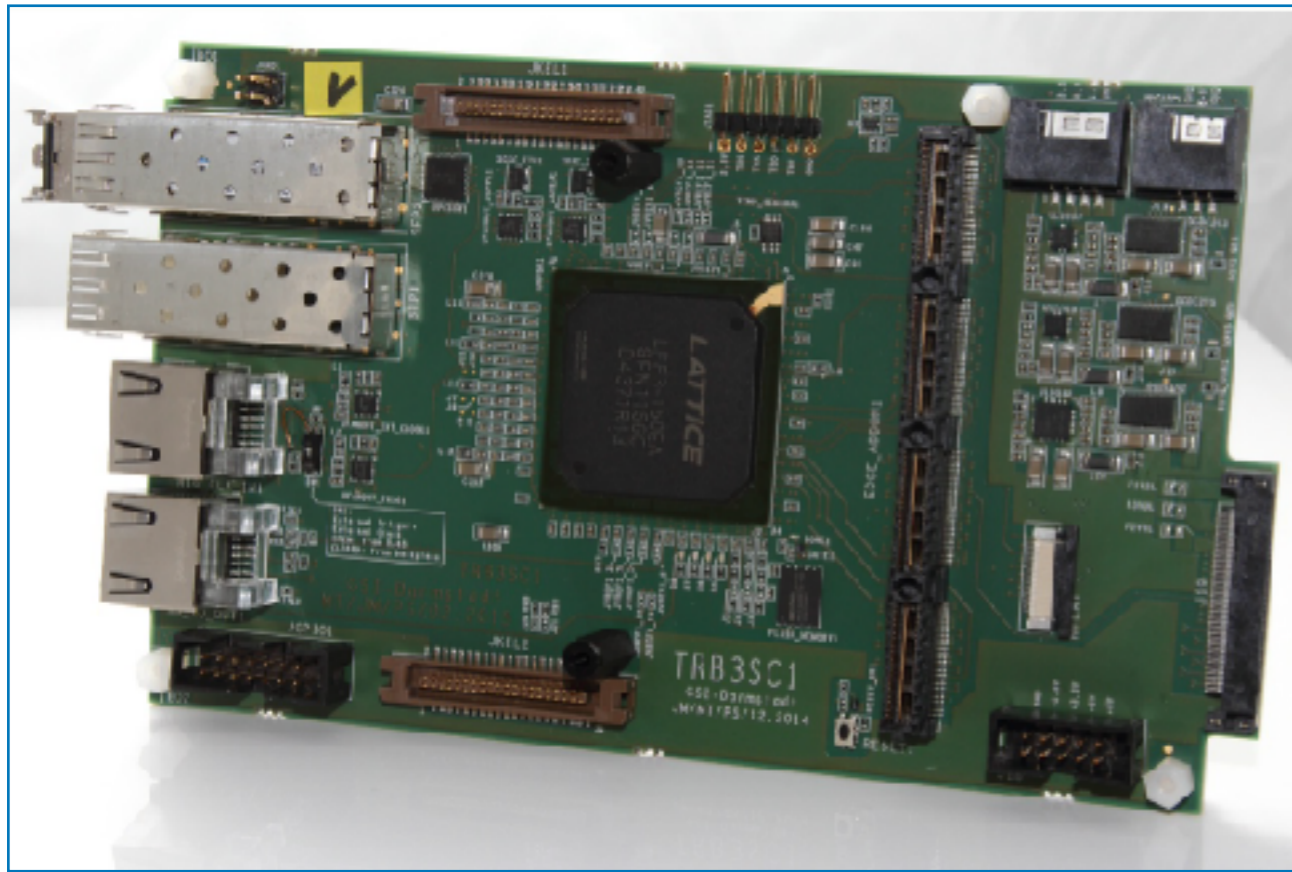
(HADES Exp. GSI- Darmstadt)

GND	1	2	GND
ToF/ToT B high	3	4	ToF/ToT A high
ToF/ToT B low	5	6	ToF/ToT A low
GND	7	8	GND
+5 V	9	10	-5 V
+5 V	11	12	-5 V
Test Signal A/B	13	14	-5 V
GND	15	16	Threshold ToF A
Threshold ToF B	17	18	Threshold ToT A
Threshold ToT B	19	20	Threshold ToF C
Threshold ToF D	21	22	Threshold ToT C
Threshold ToT D	23	24	GND
GND	25	26	Multiplicity-4
Test Signal C/D	27	28	GND
+3.3 V	29	30	+5 V
+3.3 V	31	32	+5 V
GND	33	34	GND
ToF/ToT D high	35	36	ToF/ToT C high
ToF/ToT D low	37	38	ToF/ToT C low
GND	39	40	GND

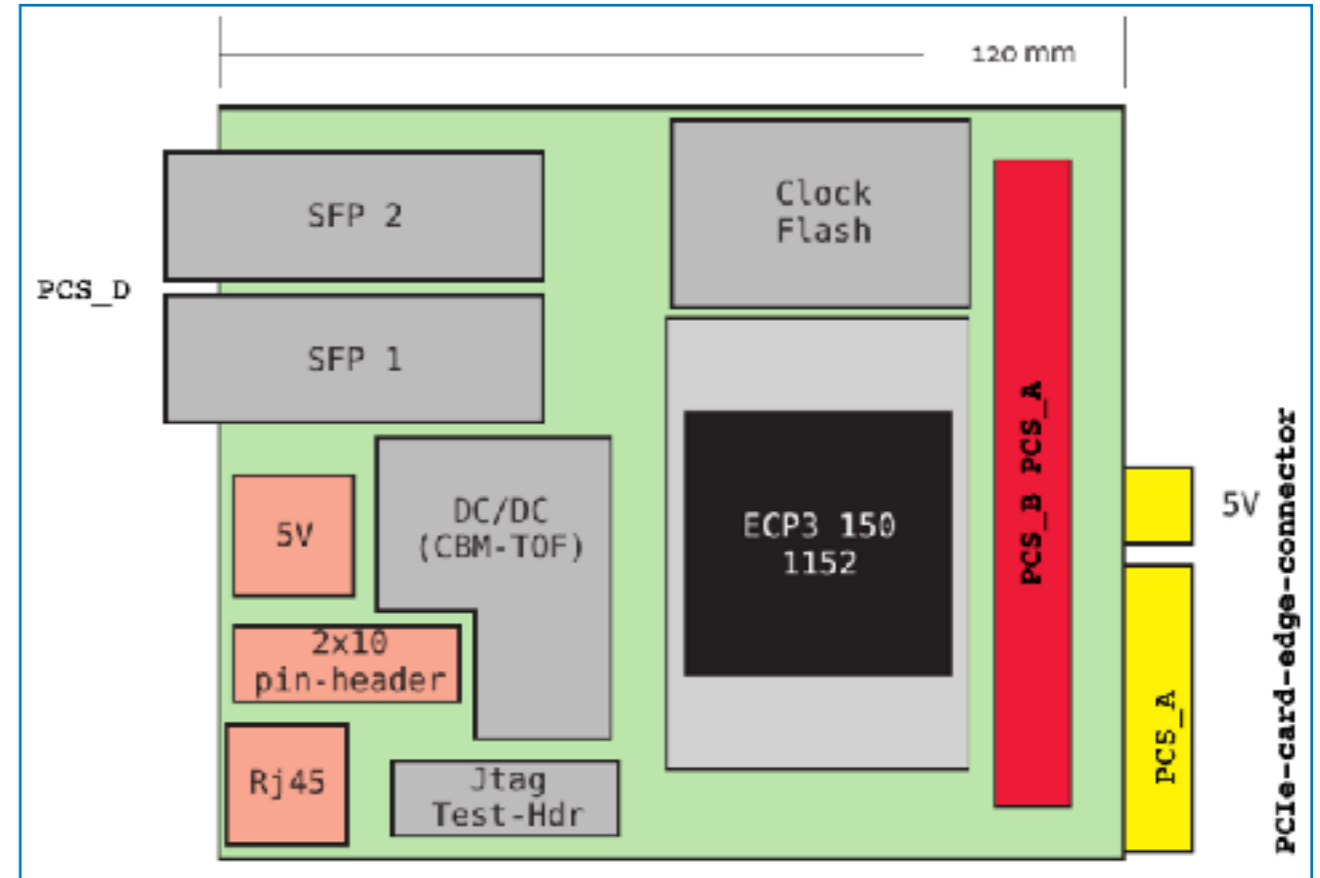
Pin-out assignment for the MBOv2 and DBO-STEP5



TRB3sc-based DAQ

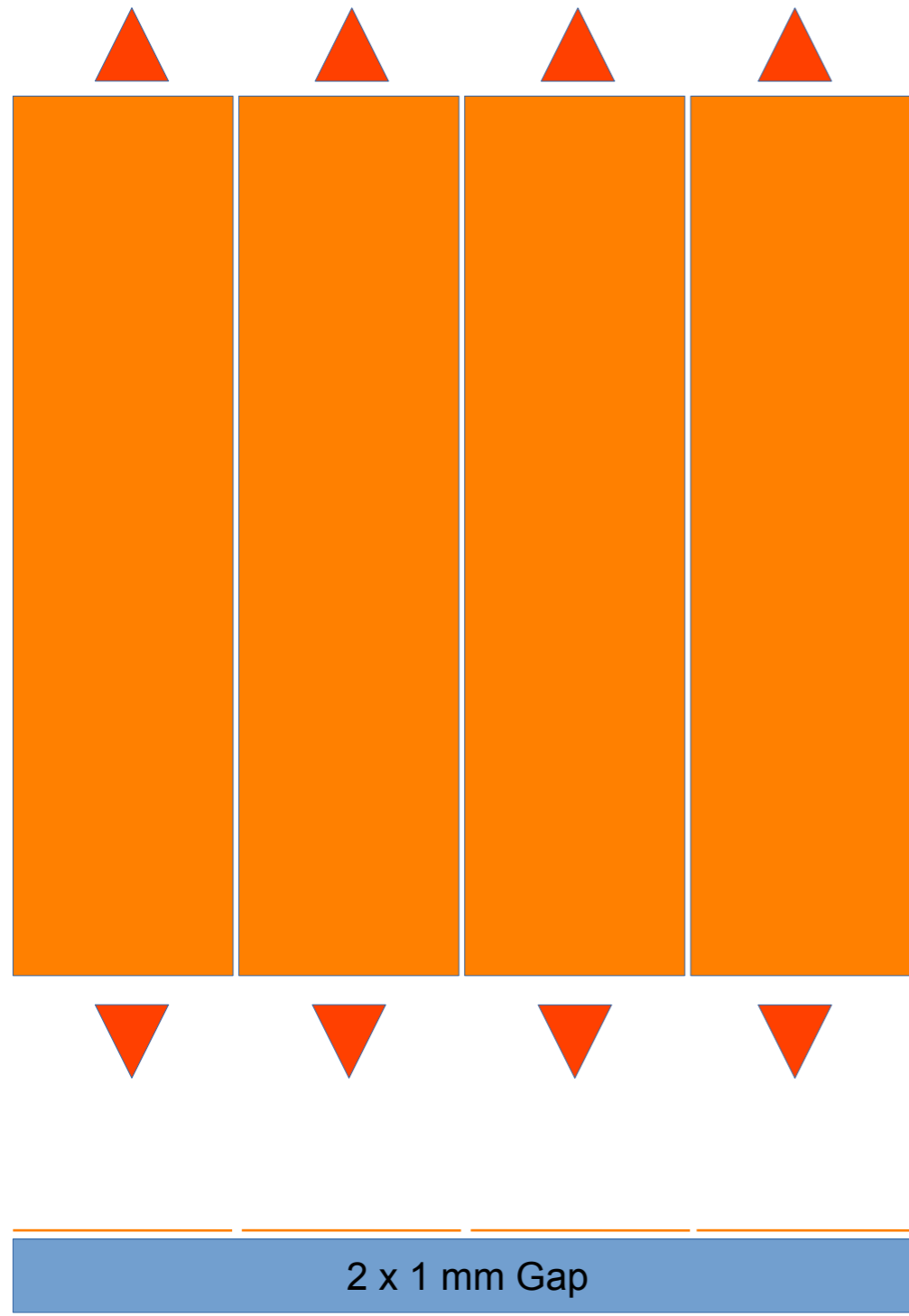


TRB3sc board



TRB3sc layout

minGo basic features

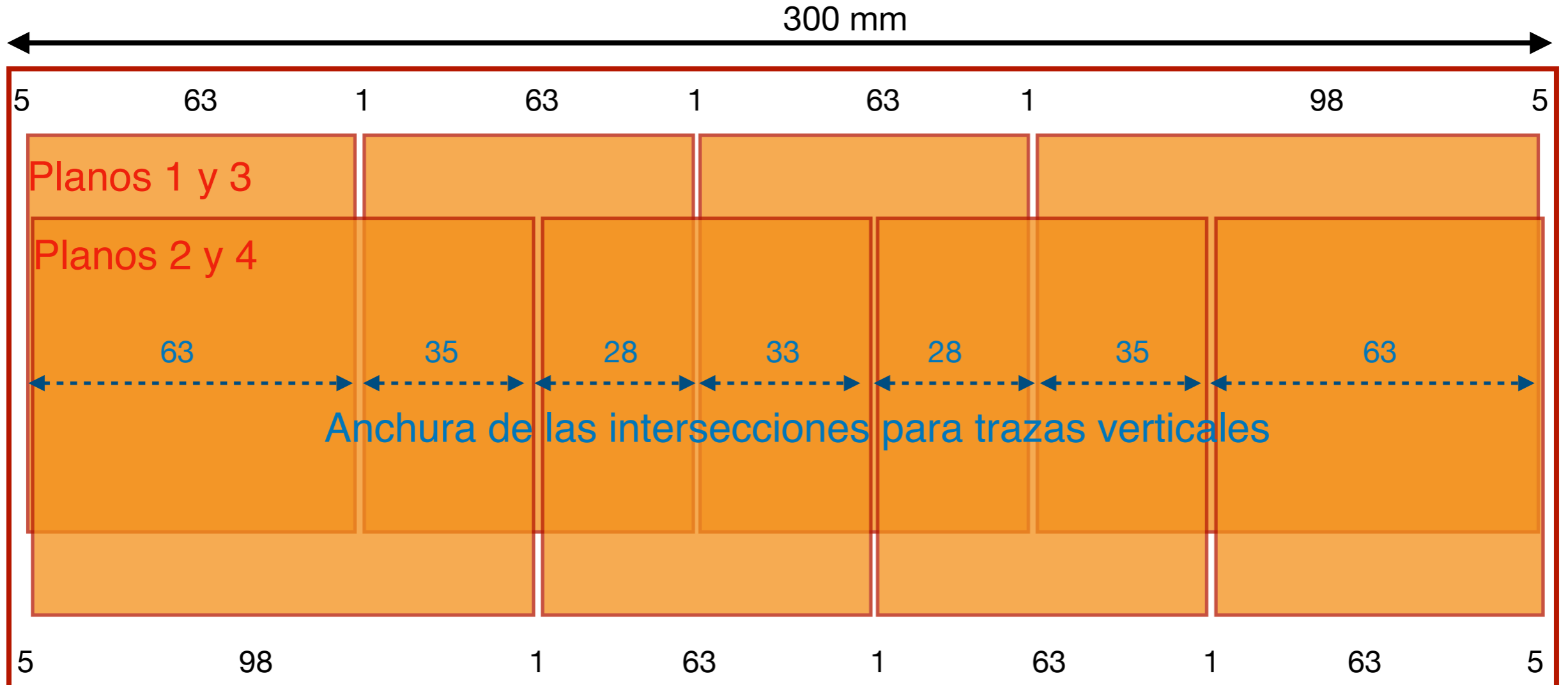


- 30x30 cm (active area) 2x1mm Gap RPC
- 4 + 4 timing ch/plane => 32 ch, 1 MB/minGo
- Coax cables from RPC to MB, located fixed to the common structure.
- 1 HV PS supply all RPC.
- Gas injected with calibrated holes + flow-monitors in the output (mutom like) + common bubbler.
- Couple of T and P sensors (STRATOS like).
- 1 TRB3sc readout + odroidC2. (watchDog + relay + USB(RJ45)+I2C 3 ways)

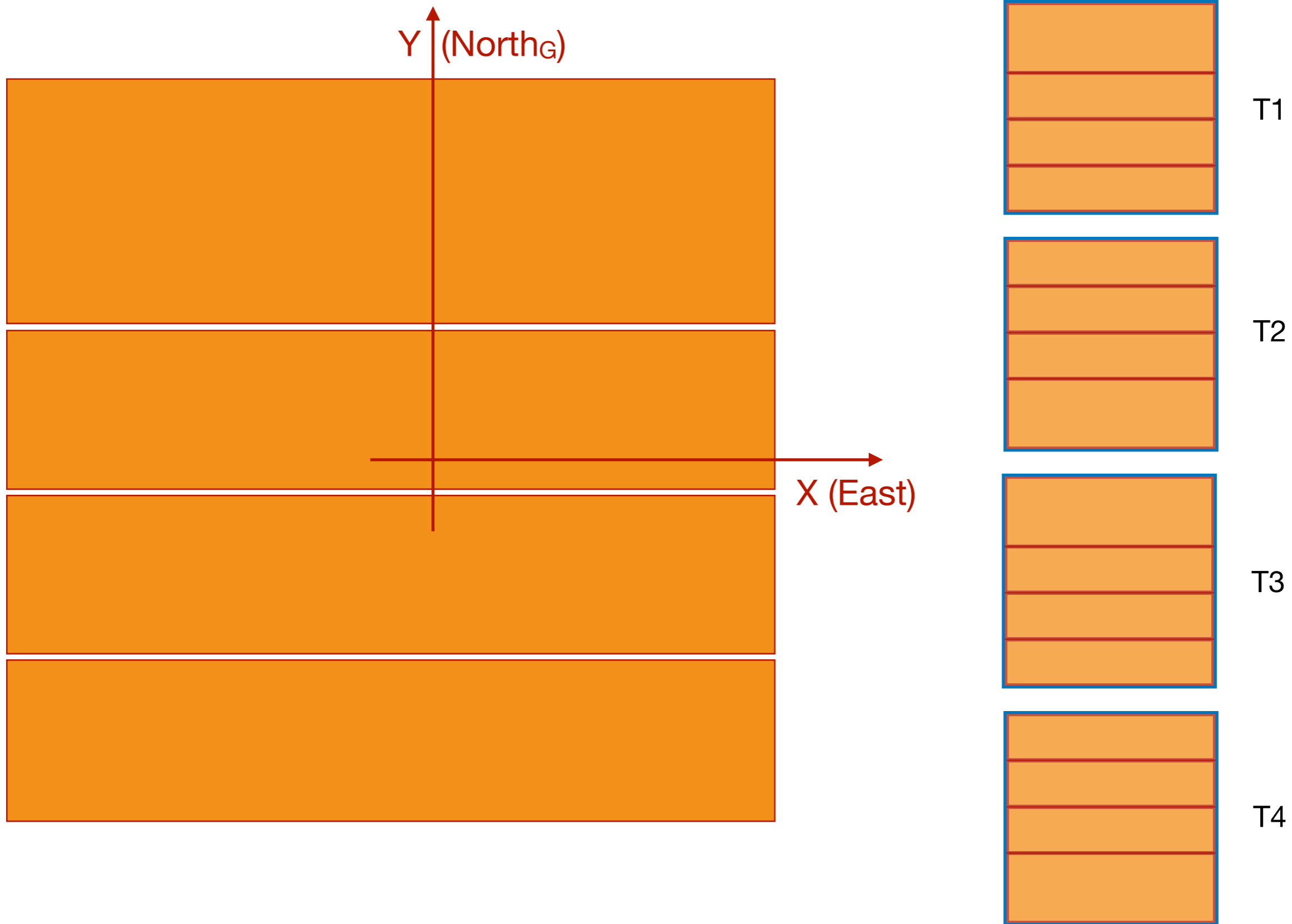
Propuesta de Alberto Blanco/LIP-Coimbra, Marzo 22

Strips layout

Strips de anchura asimétrica para optimizar la resolución espacial en la zona central



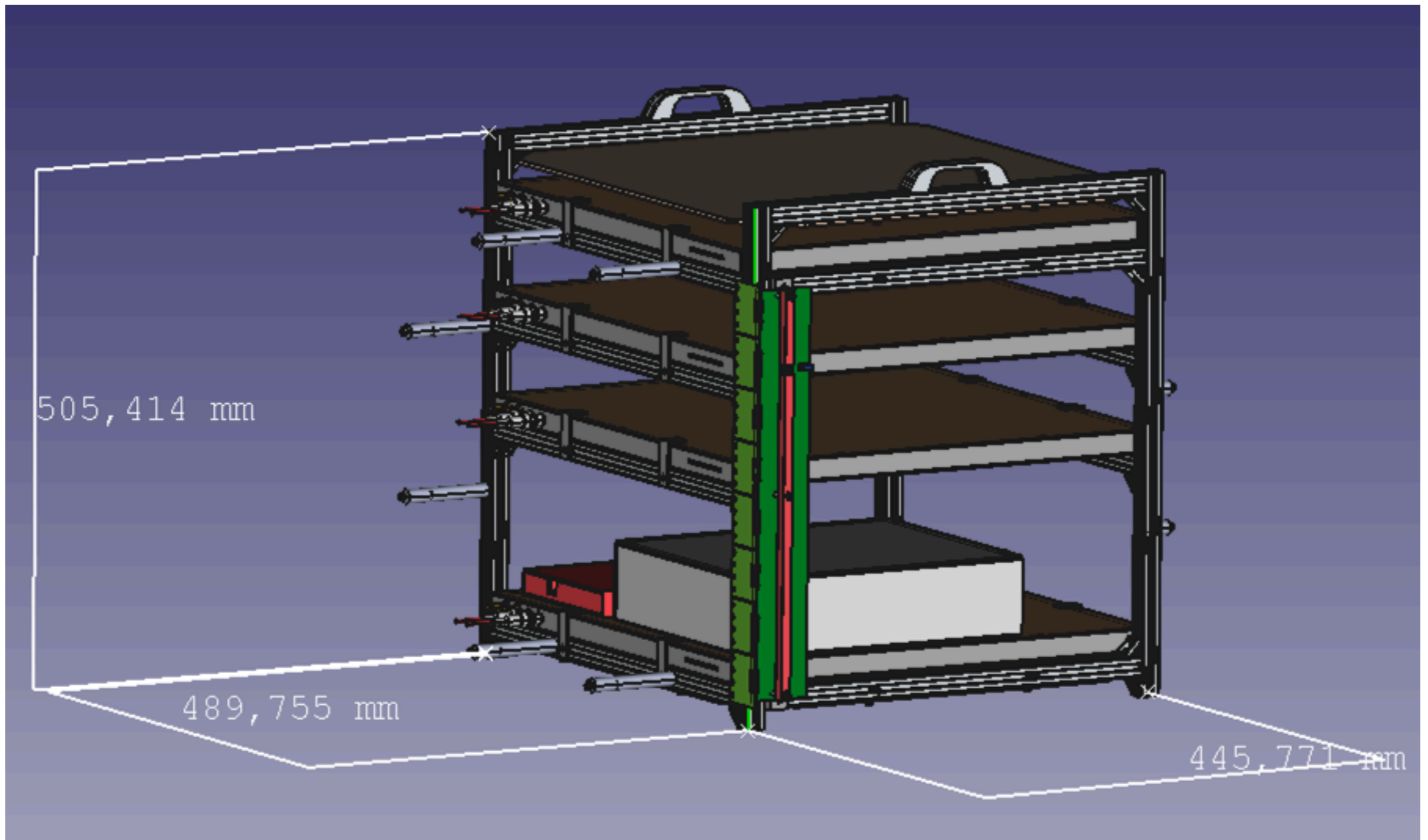
PID coordinate system



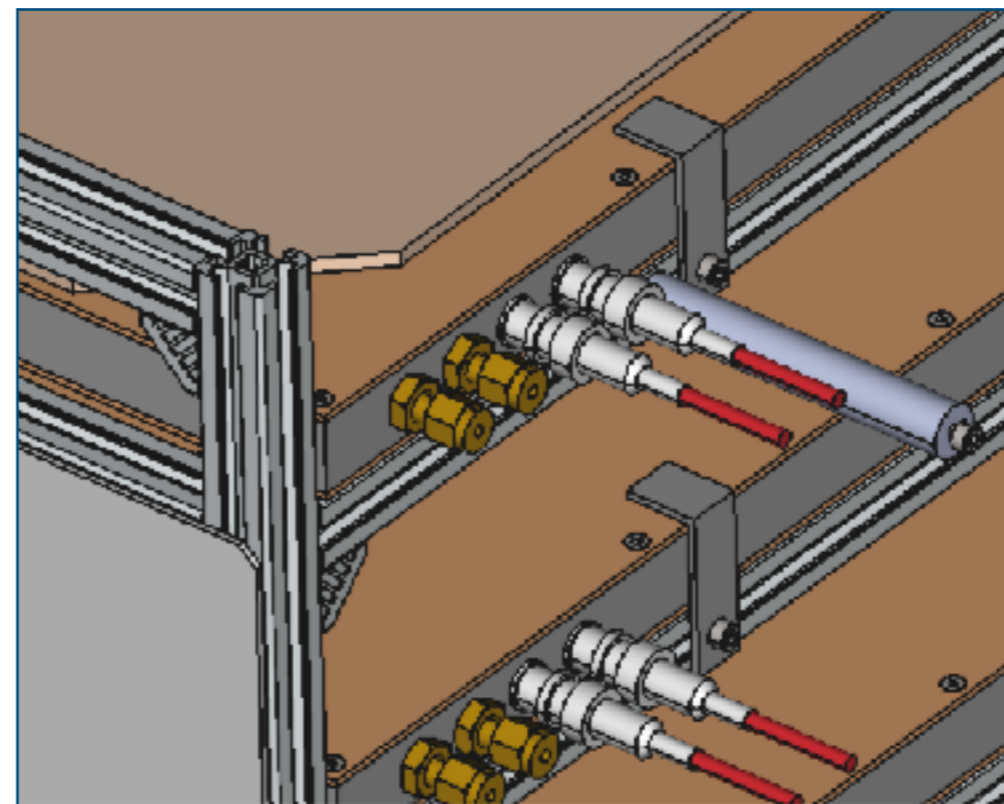
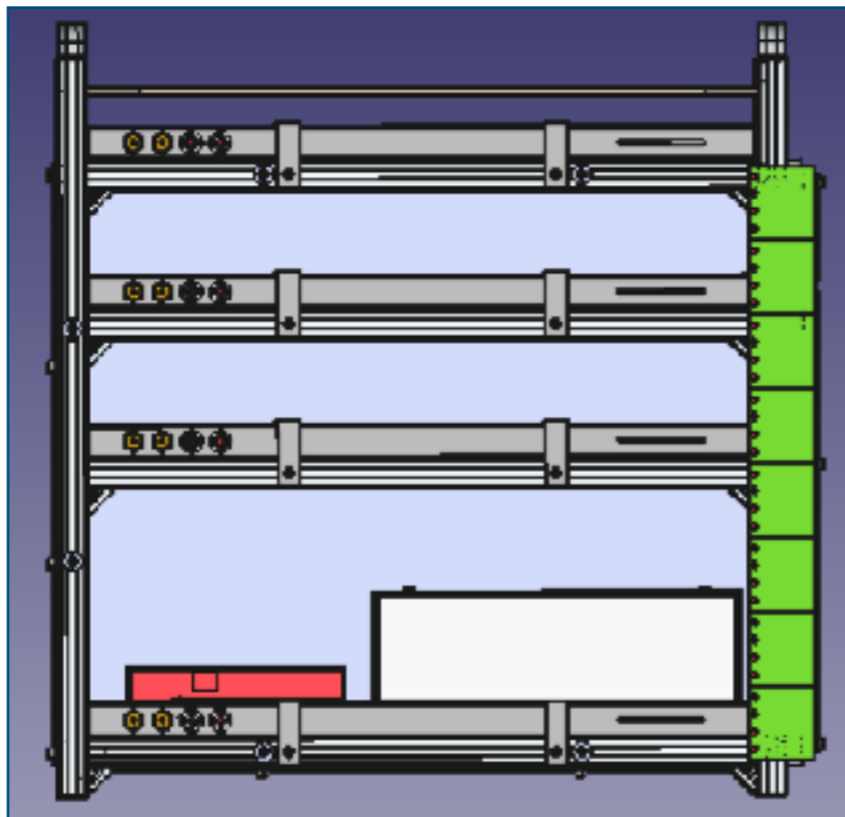
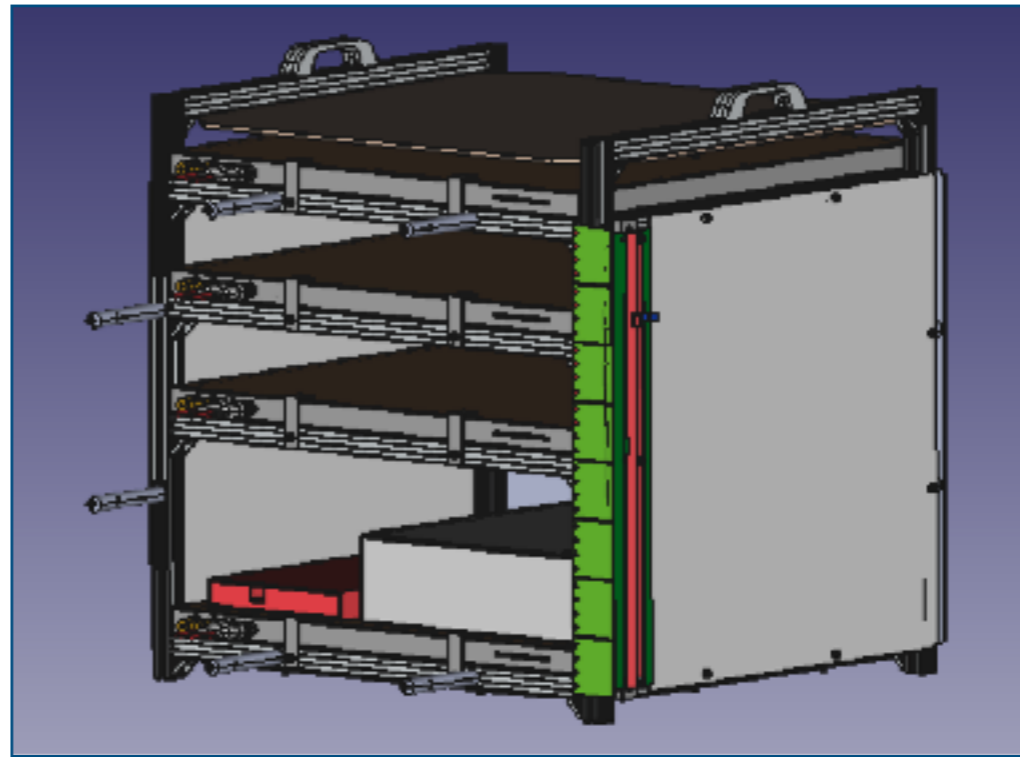
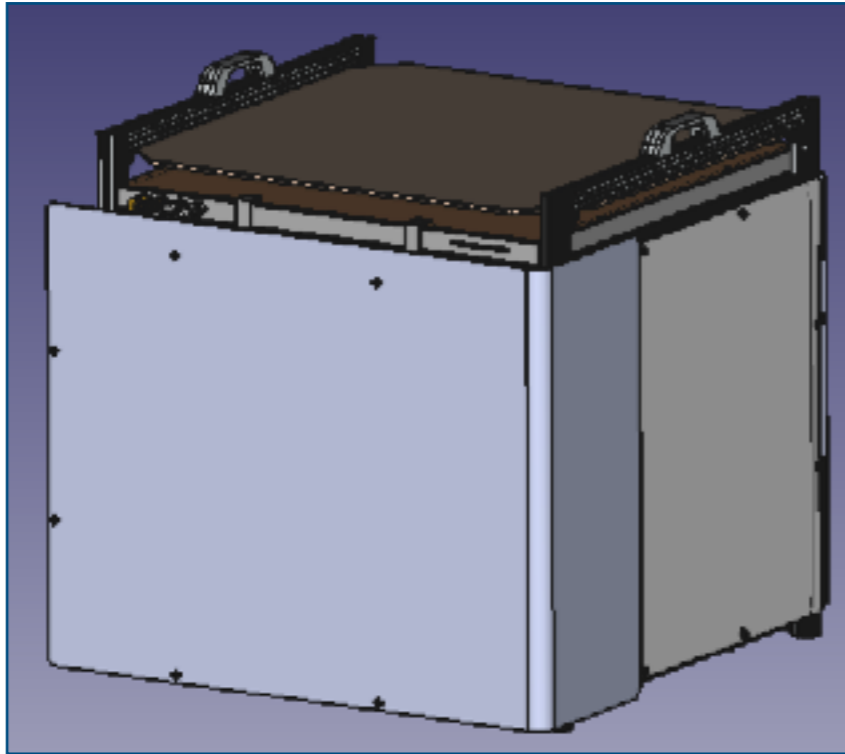
minGo: Angular resolutions

Angulo $\theta / ^\circ$	$\delta x / \text{mm}$	$\delta \theta_x / ^\circ$	$\delta y / \text{mm}$	$\delta \theta_y / ^\circ$
0	7.5	2.3	9.5	2.9
6	7.5	2.3	9.4	2.9
11	7.5	2.2	9.2	2.7
17	7.5	2.1	8.8	2.5
22	7.5	2.0	8.2	2.2
27	7.5	1.8	6.6	1.6
31	7.5	1.7	5.6	1.3
35	7.5	1.5	4.6	1.0
39	7.5	1.4	3.6	0.7

a few CAD images



a few CAD images

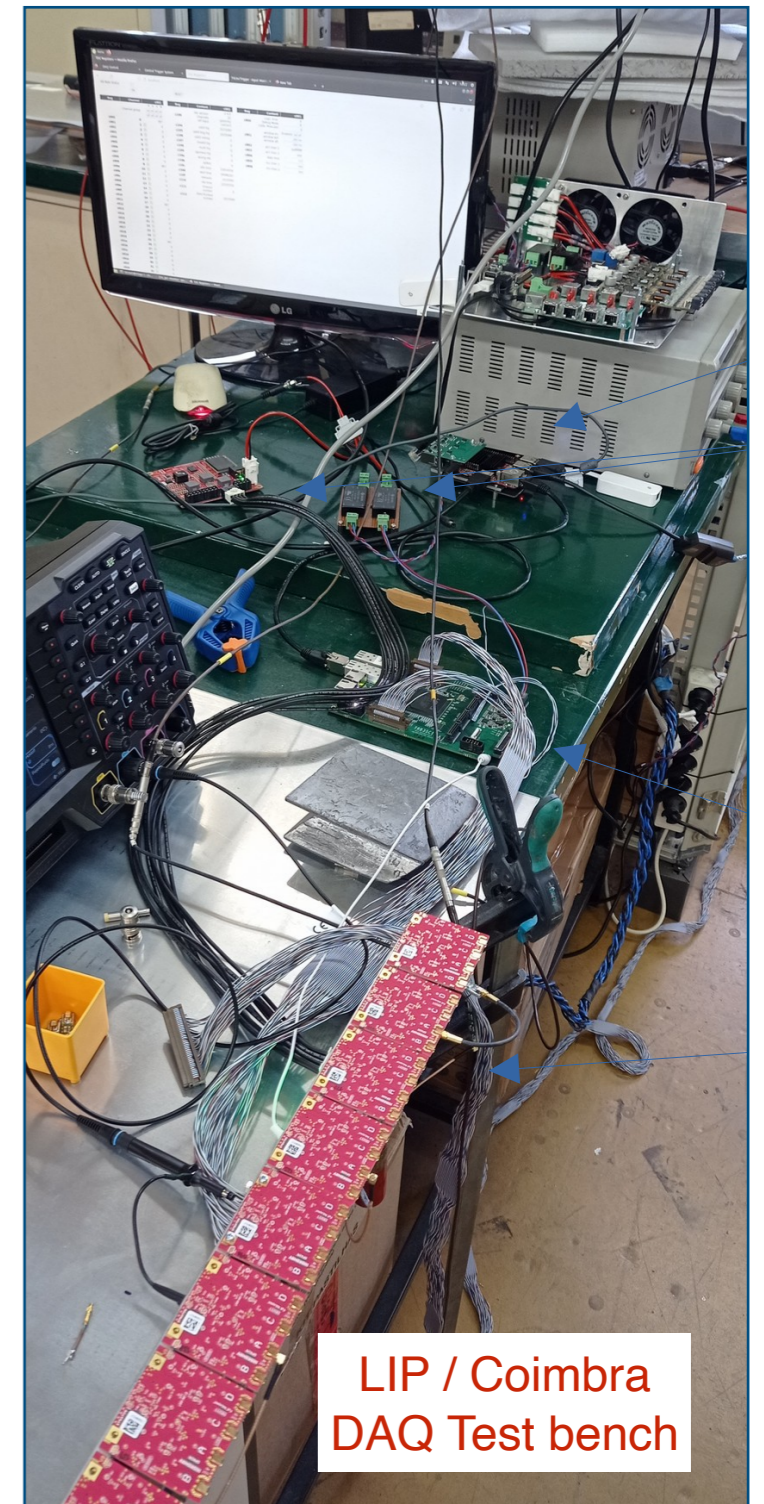
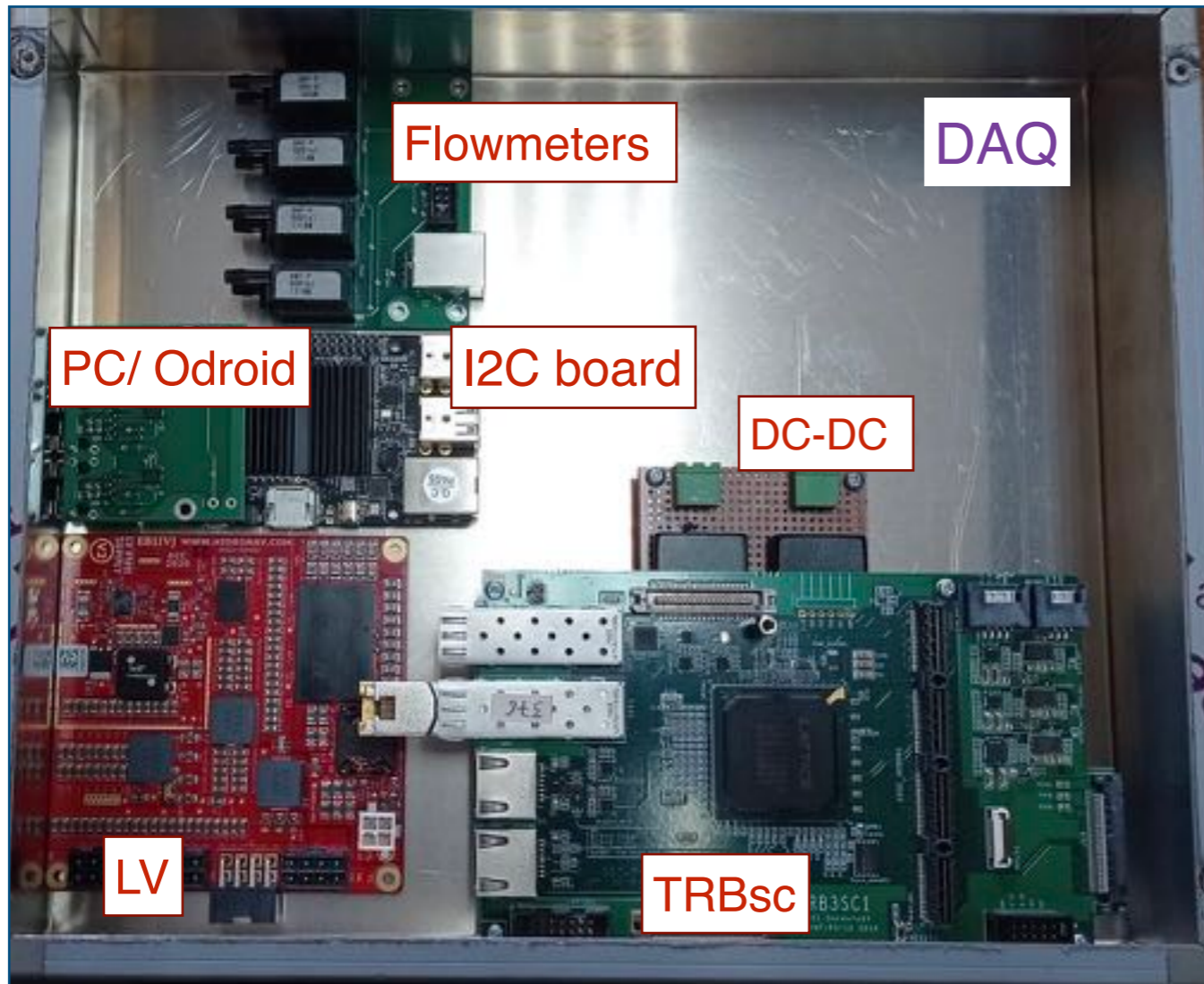
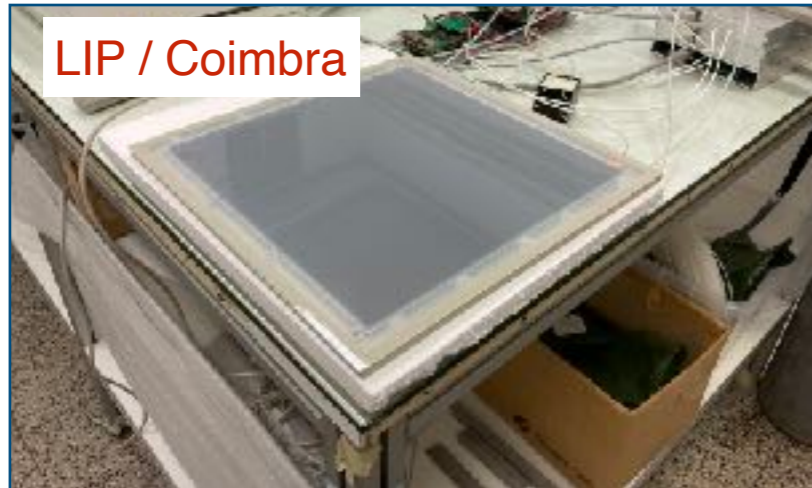


first pictures

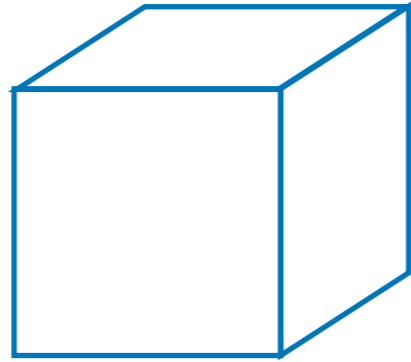
First RPC cells at LIP - Coimbra



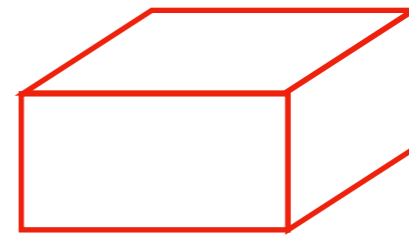
miniTrasgos: a few pictures



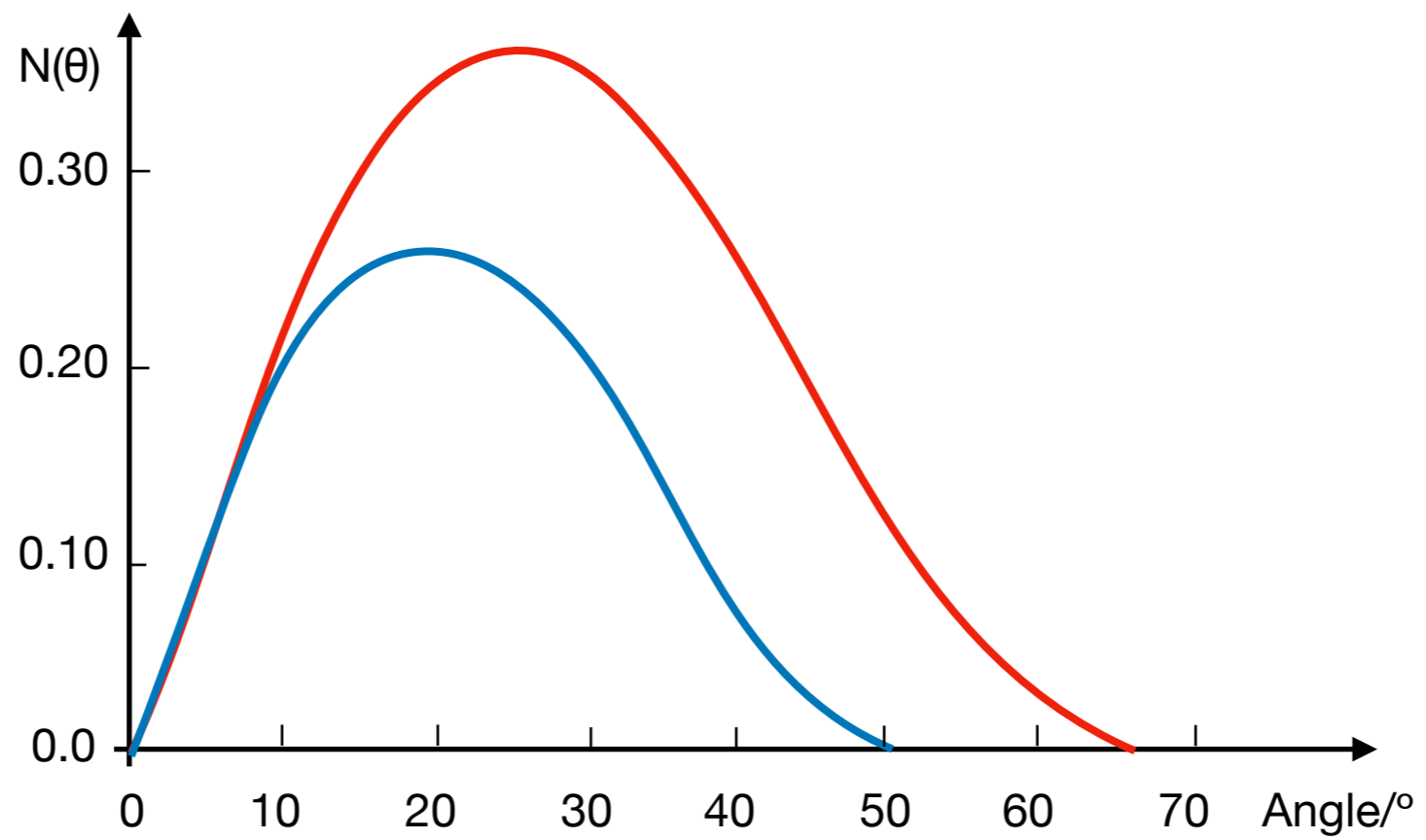
Directional diagrams



Cubil detector



Semi-cubic detector



miniTrasgos

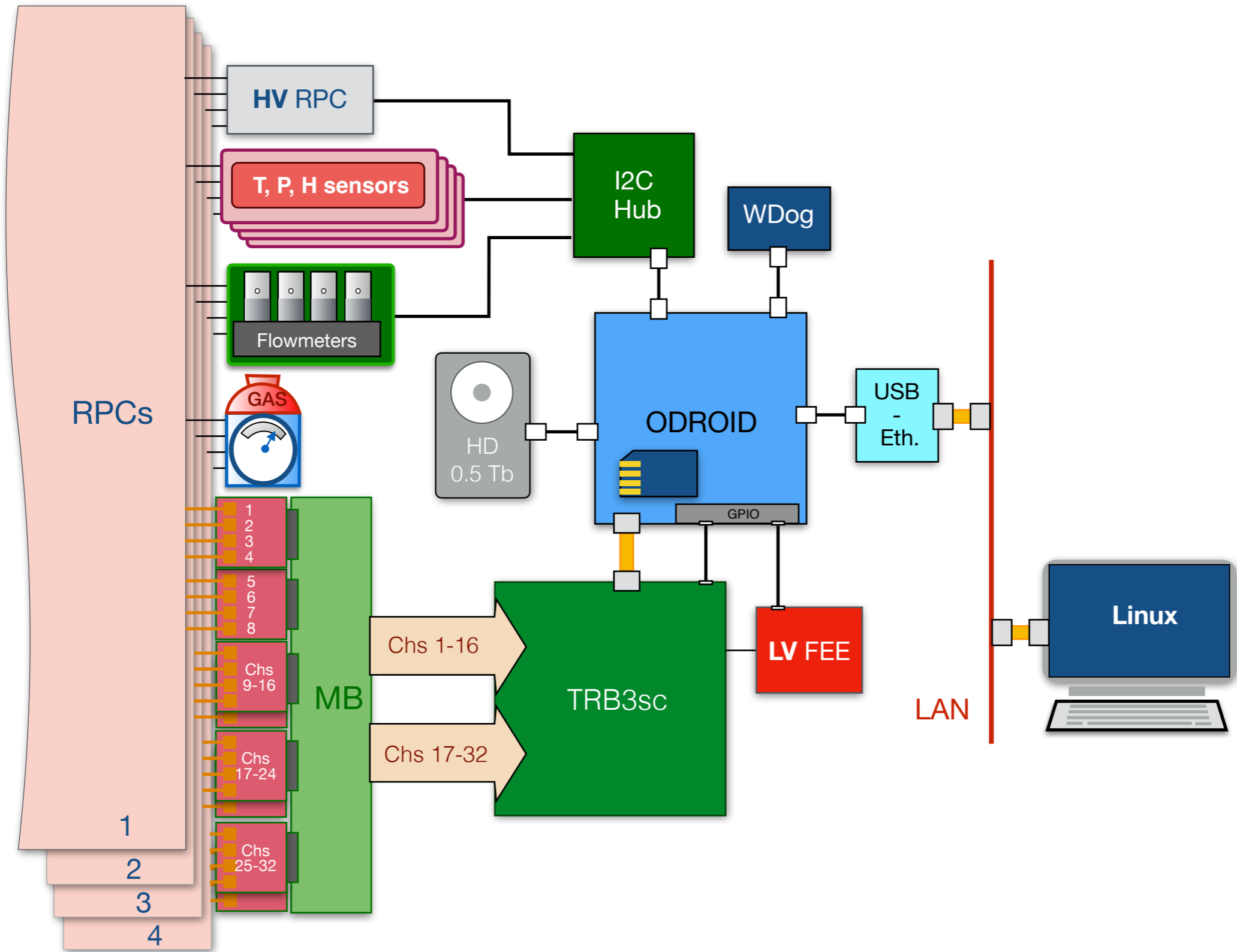
miniTrasgo. Expected count rates
(Expected rate of a 0.1 m² detector: 5 particles/s)

Expected resolutions for effects of different intensity: $100/\sqrt{N}$

Time interval	Total rate		Effect: 5%		Effect: 2%		Effect: 1%		Effect: 0.5%	
	Count N.	$100/\sqrt{N}$	Count N.	$100/\sqrt{N}$	Count N.	$100/\sqrt{N}$	Count N.	$100/\sqrt{N}$	Count N.	$100/\sqrt{N}$
10 min	3000	2	150	8	60	13	30	18	-	-
1 h 1/24 Accep.	18000	0.7	900	3.3	360	5	180	7.5	90	11
1 día	430 000	0.2	2200	0.7	8600	1	4300	1.5	1200	3

Summary: sensitive with a resolution better than 1% to hourly changes in the total rate or for daily effects higher than 2%.

mTrasgo: Data flow and logic

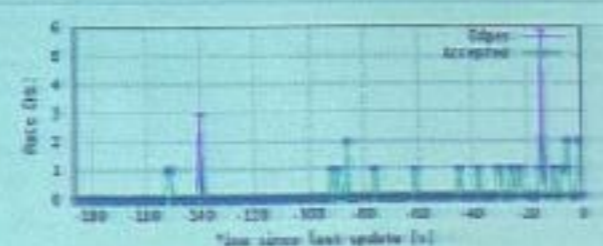


Central Trigger System

Status overview

Counter	Counts	Rate
Trigger asserted	551 cnts	0.302 MHz
Trigger rising edges	511 edges	0.00 Hz
Trigger accepted	502 events	0.00 Hz

Last Idle Time	200761000 ns	
Last Dead Time	4750 ns	255.20 kHz
Total Dead Time	0 ns	0.0%



Throttle: Limit Trigger Rate to: Ignore all events

Full Stop: Ignore all events

Display CTS Configuration: TibCrd scripts as shell script

Trigger Channels

#	Enable	Trig. Cond.	Assignment	Trigger Type	Asserted	Edges
0	<input type="checkbox"/>	R. Edge	Periodical Pulser 0	Dut_physics_trigger	100.00 MHz	0.00 Hz
1	<input type="checkbox"/>	R. Edge	Periodical Pulser 1	Dut_physics_trigger	100.00 MHz	0.00 Hz
2	<input type="checkbox"/>	R. Edge	Periodical Pulser 2	Dut_physics_trigger	100.00 MHz	0.00 Hz
3	<input type="checkbox"/>	R. Edge	Random Pulser 0	Dut_physics_trigger	0.00 cnts	0.00 Hz
4	<input type="checkbox"/>	R. Edge	Trigger Multiplexer 0	Dut_physics_trigger	27.70 MHz	17.46 Hz
5	<input type="checkbox"/>	R. Edge	Trigger Multiplexer 1	Dut_physics_trigger	26.14 MHz	26.27 Hz
6	<input type="checkbox"/>	R. Edge	Trigger Multiplexer 2	Dut_physics_trigger	46.28 MHz	37.00 Hz
7	<input type="checkbox"/>	R. Edge	Trigger Multiplexer 3	Dut_physics_trigger	26.03 MHz	33.04 Hz
8	<input type="checkbox"/>	R. Edge	Trigger Multiplexer 4	Dut_physics_trigger	18.46 MHz	3.00 Hz
9	<input type="checkbox"/>	R. Edge	Trigger Multiplexer 5	Dut_physics_trigger	25.27 MHz	4.00 Hz
10	<input checked="" type="checkbox"/>	R. Edge	Consistency Module 0	Dut_physics_trigger	0.00 cnts	0.00 Hz
11	<input checked="" type="checkbox"/>	R. Edge	Consistency Module 1	Dut_physics_trigger	0.00 cnts	0.00 Hz
12	<input checked="" type="checkbox"/>	R. Edge	Consistency Module 2	Dut_physics_trigger	0.00 cnts	0.00 Hz
13	<input checked="" type="checkbox"/>	R. Edge	Consistency Module 3	Dut_physics_trigger	0.00 cnts	0.00 Hz

Trigger Inputs

#	Source	Req. Rate	Invert	Delay	SPRRATE	Override
0	int_trig0	17.46 Hz	<input type="checkbox"/>	0 ns	0 ns	Bypass
1	int_trig1	26.27 Hz	<input type="checkbox"/>	0 ns	0 ns	Bypass
2	int_trig2	37.00 Hz	<input type="checkbox"/>	0 ns	0 ns	Bypass
3	int_trig3	33.04 Hz	<input type="checkbox"/>	0 ns	0 ns	Bypass
4	int0	2.62 Hz	<input type="checkbox"/>	0 ns	0 ns	Bypass
5	int1	4.00 Hz	<input type="checkbox"/>	0 ns	0 ns	Bypass