DAPHNE Test

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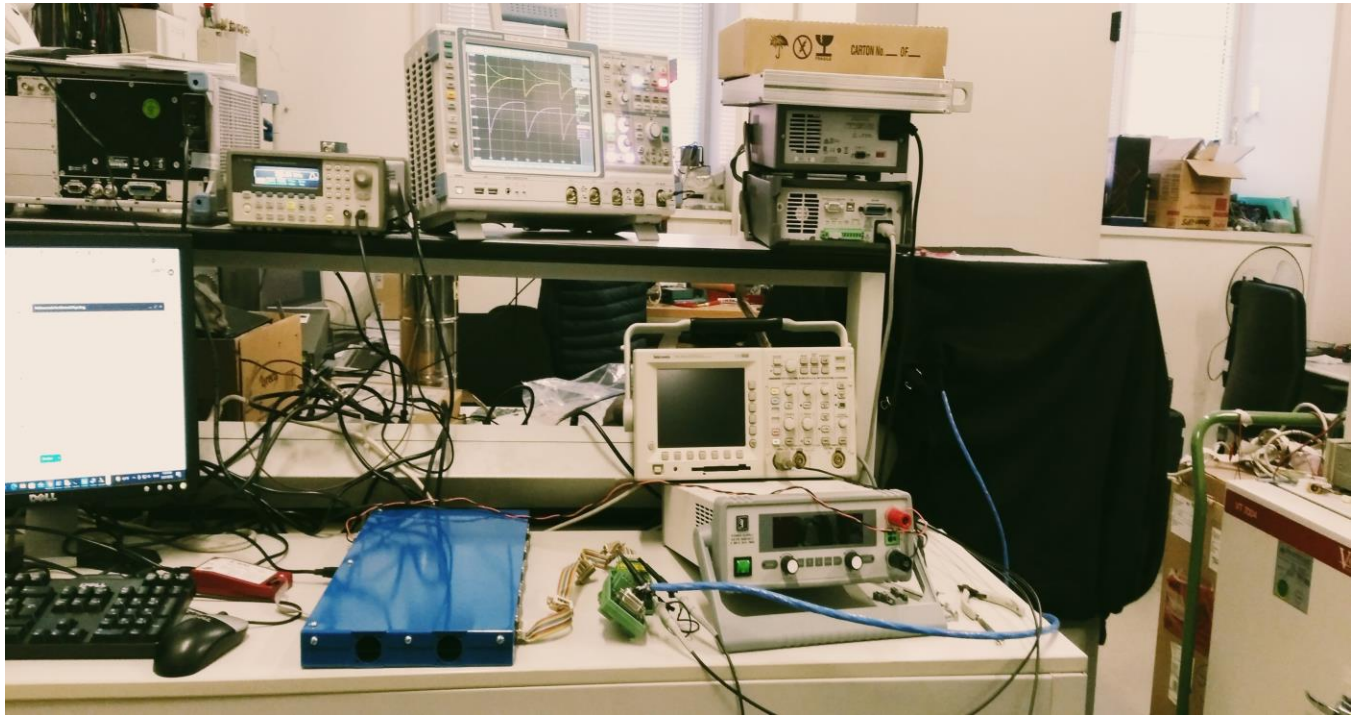
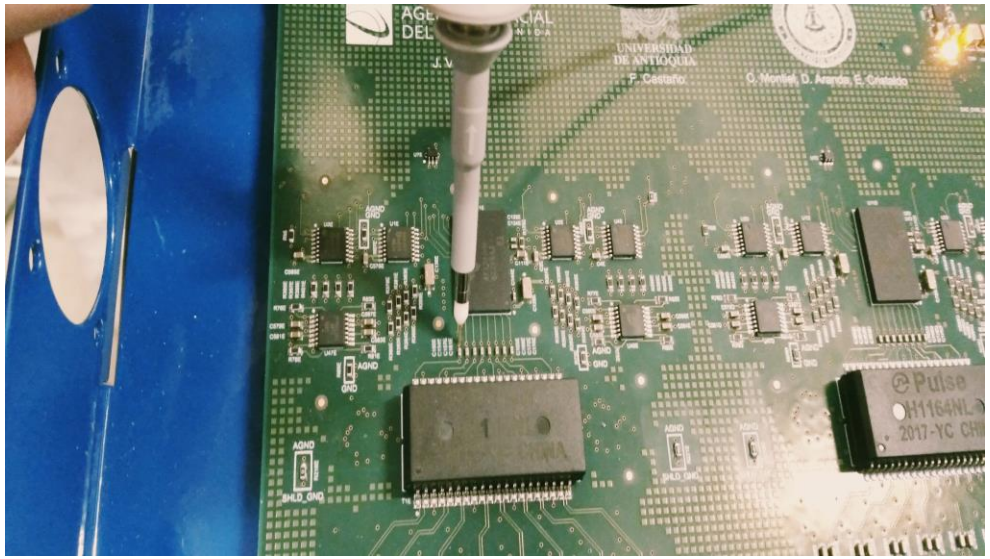
14 March, 2022

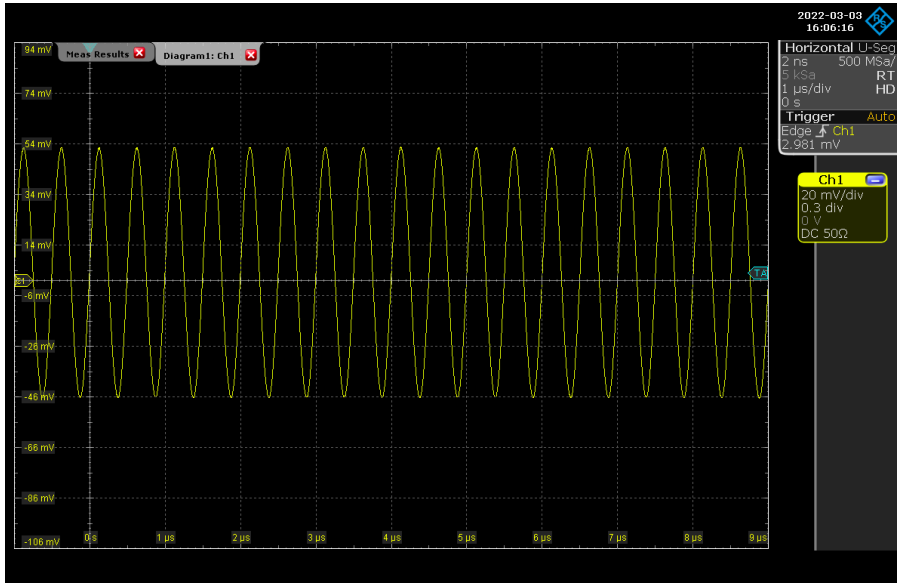
Tests Setup

1. Offset Test
2. Gain Channel
3. Test Pulse Cold amplifier
4. Next Steps



Setup to measure



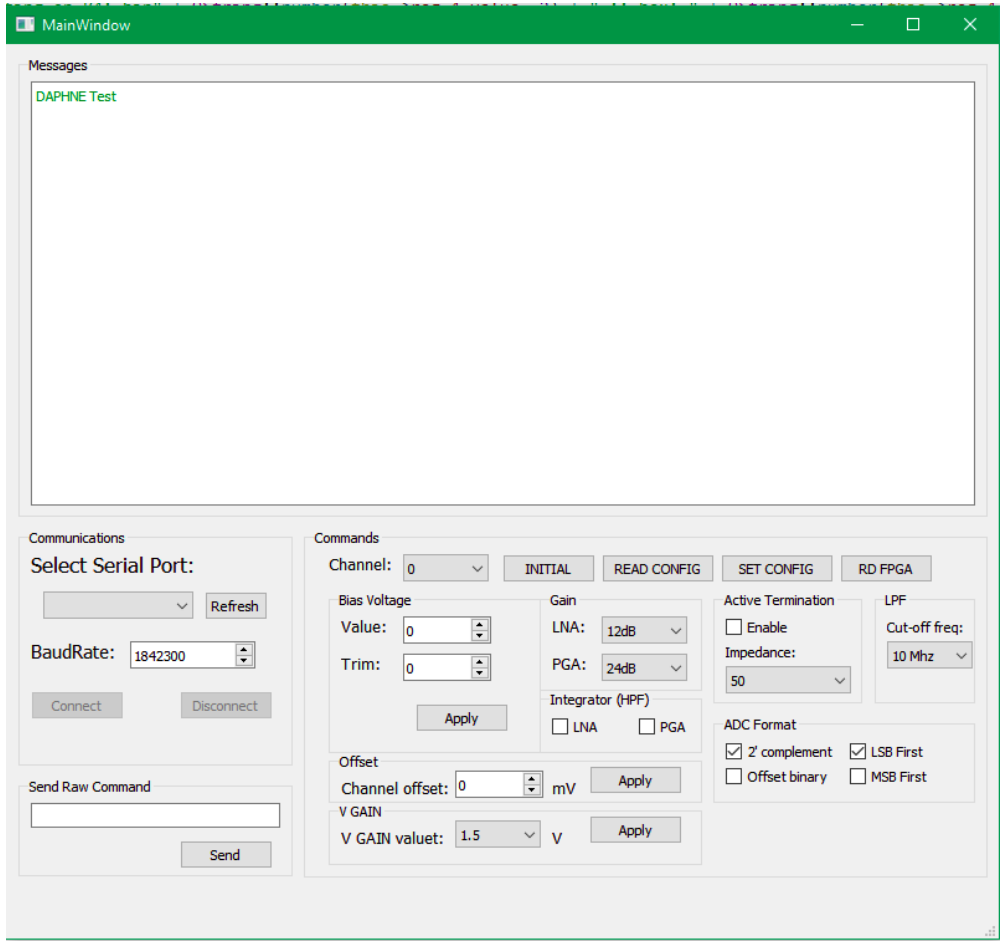


Setup to measure

An interface was made to test the iteration matrix with the DC integrator of the two amplifiers: LNA and PGA.

The AFE 0 channel 0 was fed with:

- Sinusoidal wave input of 400 mV_{pp} with a frequency of 2MHz.
- Waveform (*pulse generator*) input of 750 mV_{pp} with a frecuency of 300kHz.
- Cold amplifier signal

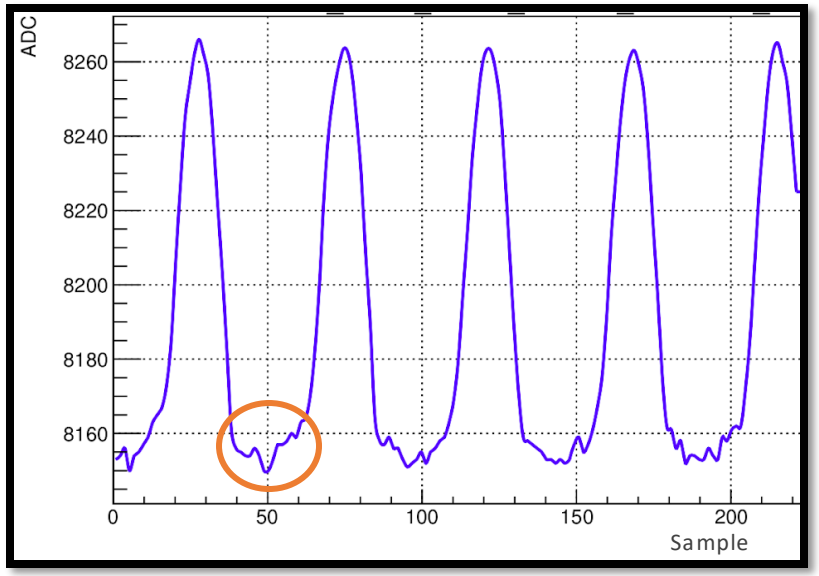


1. Offset Test :

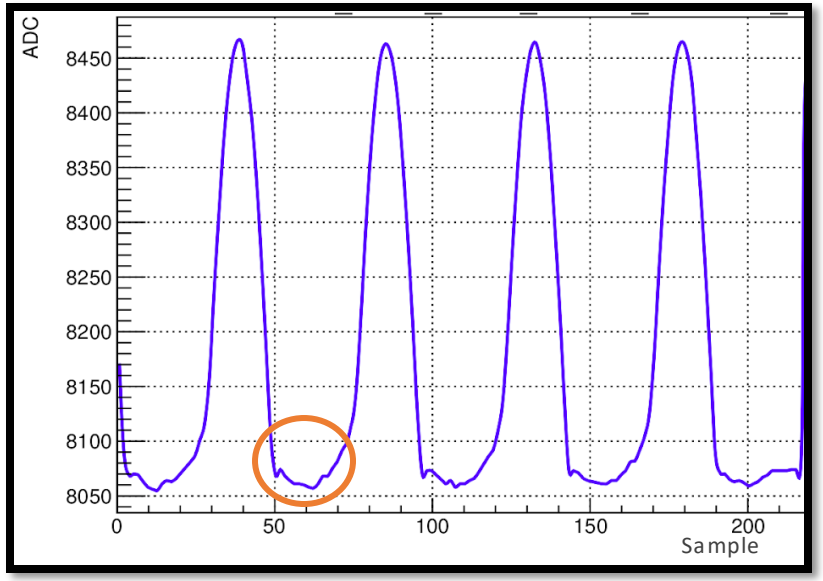
The setting of the AFE is:

VGAIN=4000 (1.5 V)
LNA Gain=18 dB
PGA Gain=24 dB
LNA Integrator Reg 52[12]= Enable
PGA Integrator Reg 51[4]=Enable
Active termination Reg 52[8]=Enable
Active termination Reg 52[7:6]= 100 Ohm
Amplitude:400 mVpp differential

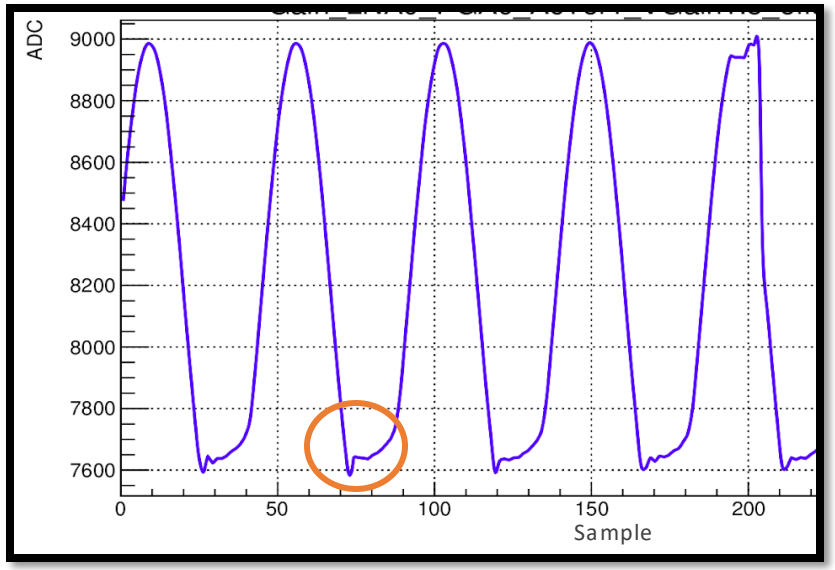
Offset 200



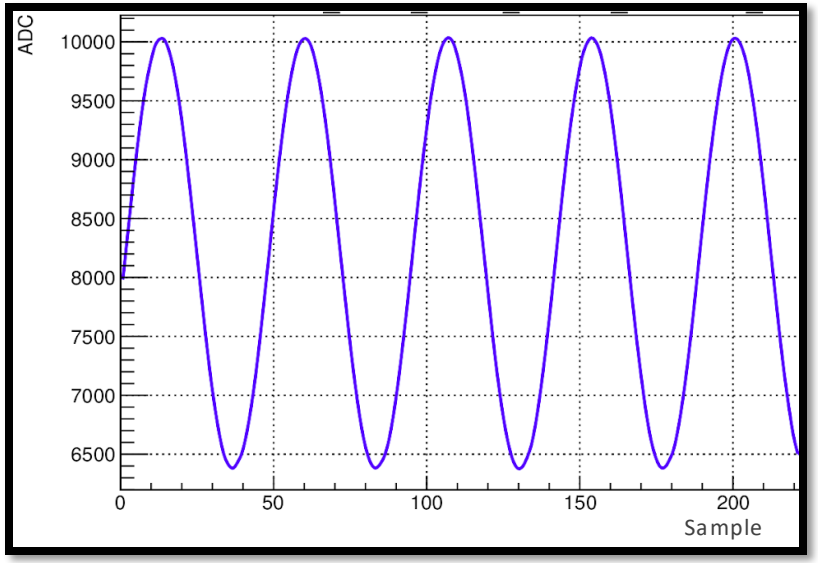
Offset 500



Offset 1450



Offset 2047

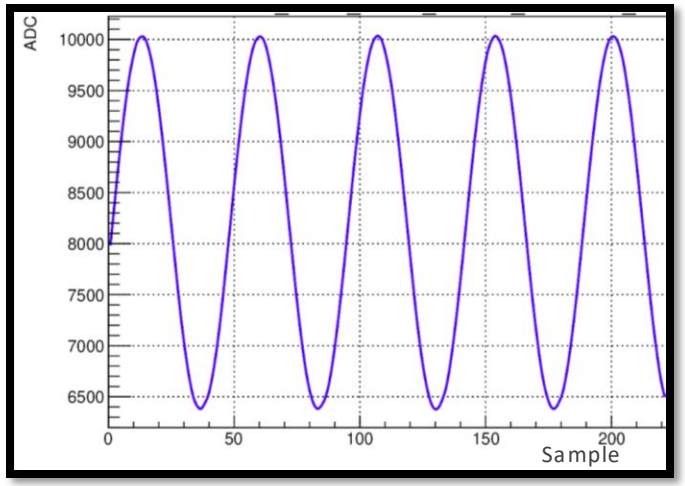


2. Gain Channel:

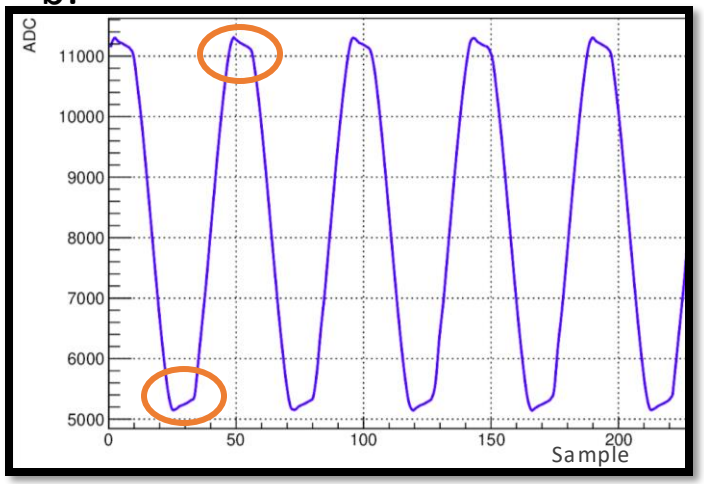
400 mVpp, offset 2047, LNA Gain=18 dB, PGA Gain=24 dB

	LNA_I	PGA_I	A_T :52[8]	Gain *
a	Enable	Enable	Enable	0.56
b	Enable	Enable	Disable	0.94
c	Disable	Enable	Disable	0.93
d	Disable	Disable	Disable	1.0
e	Enable	Disable	Enable	0.6

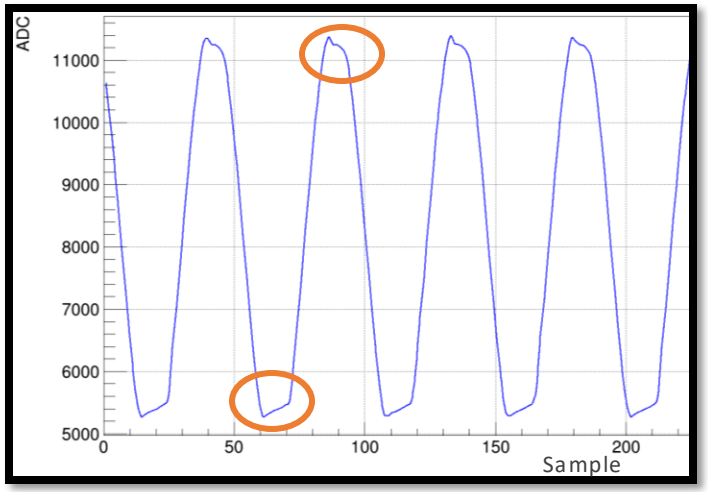
a.



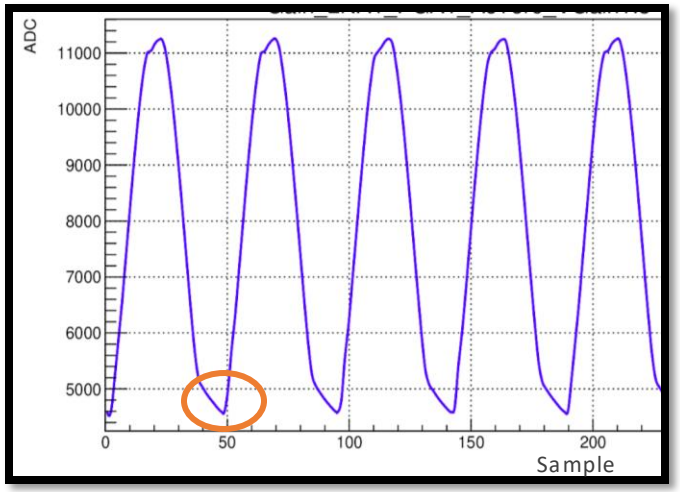
b.



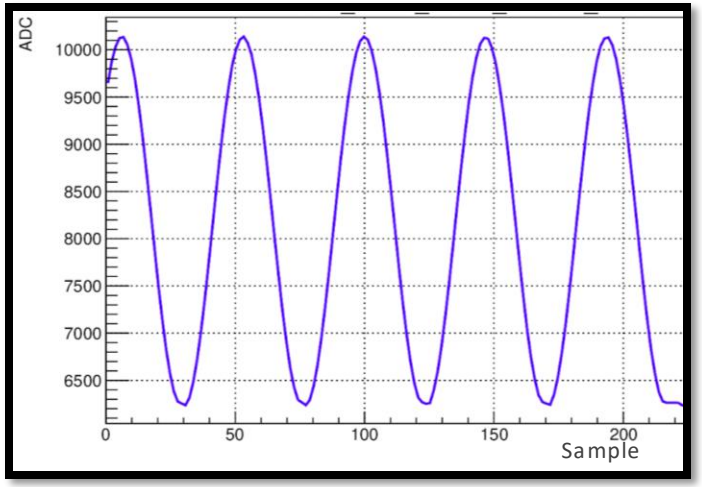
c.



d.



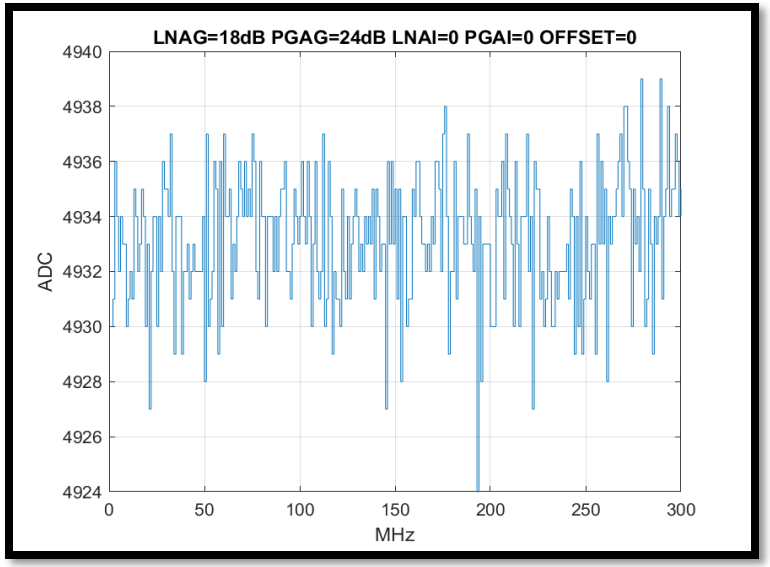
e.

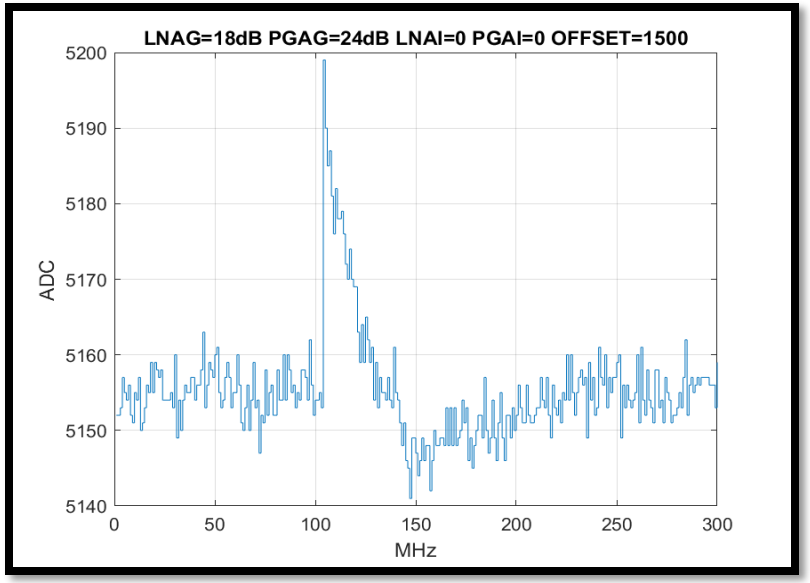


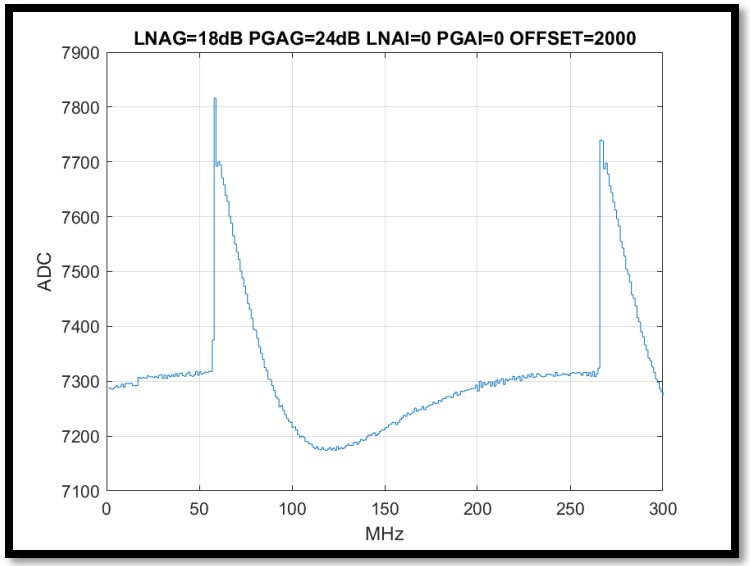
*David Christian,January 4, 2022

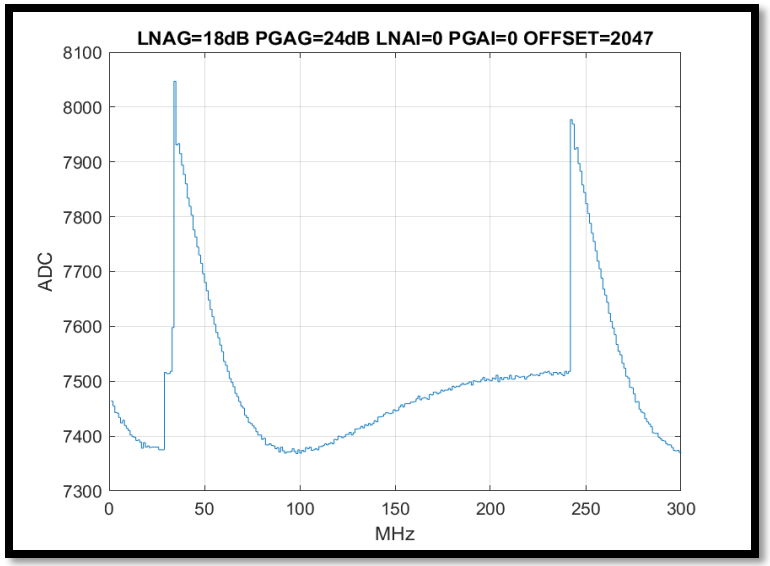
1b. Offset Test : Waveform

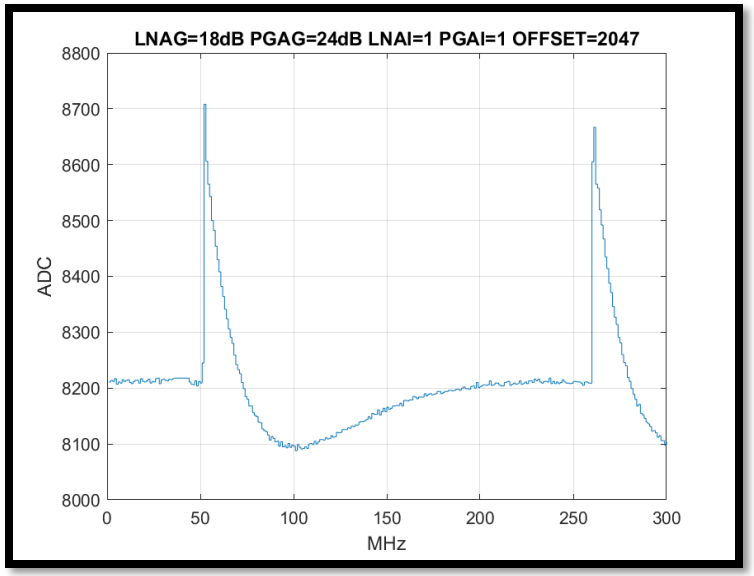
LNA_G = 18dB
PGA_G= 24dB
VGAIN = 1.3
Gain = 2.2dB
frecuency = 300kHz
Amplitude= 750mVpp





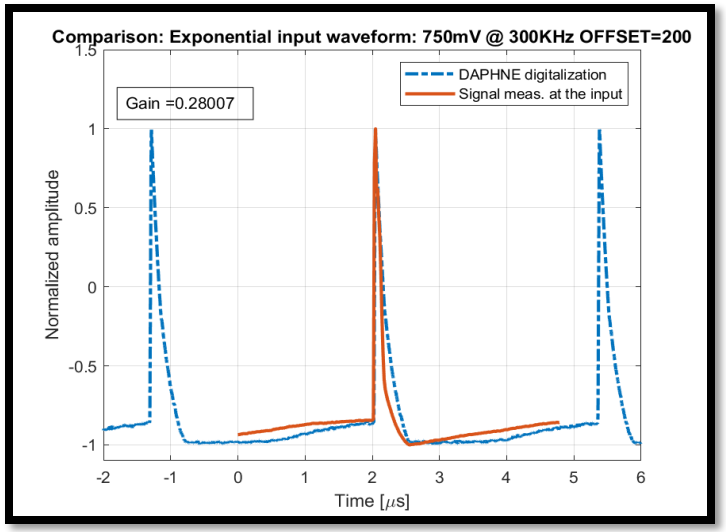


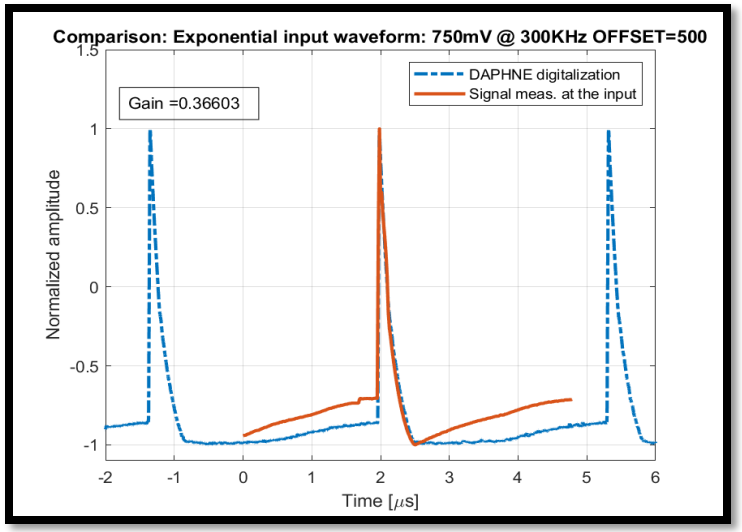


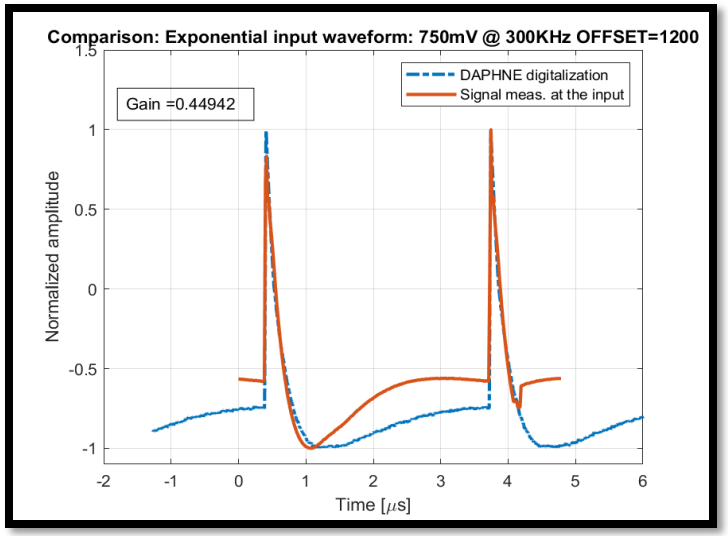


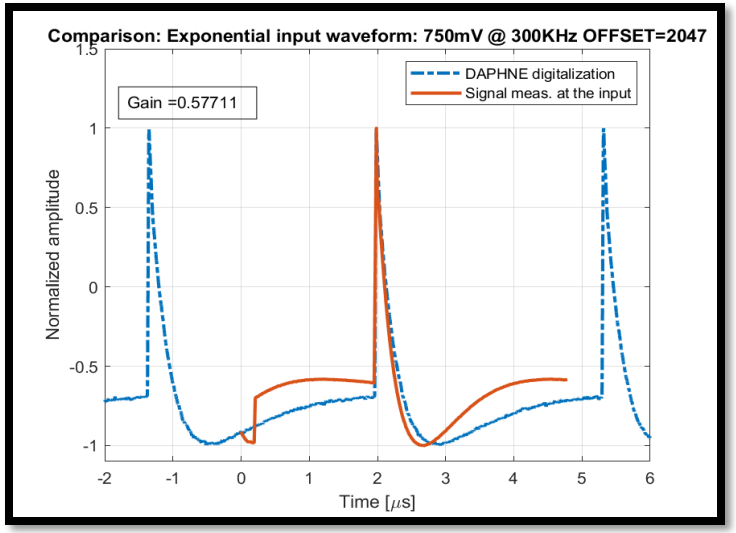
2. Gain Channel:

VGAIN=1.3 V
LNA Gain=12 dB
PGA Gain=30 dB
Gain dB= 2.22 dB
LNA Integrator Reg 52[12]= Enable
PGA Integrator Reg 51[4]=Enable
Active termination Reg 52[8]=Enable
Active termination Reg 52[7:6]= 100 Ohm
Amplitude:750 mVpp
Frecuency: 300kHz





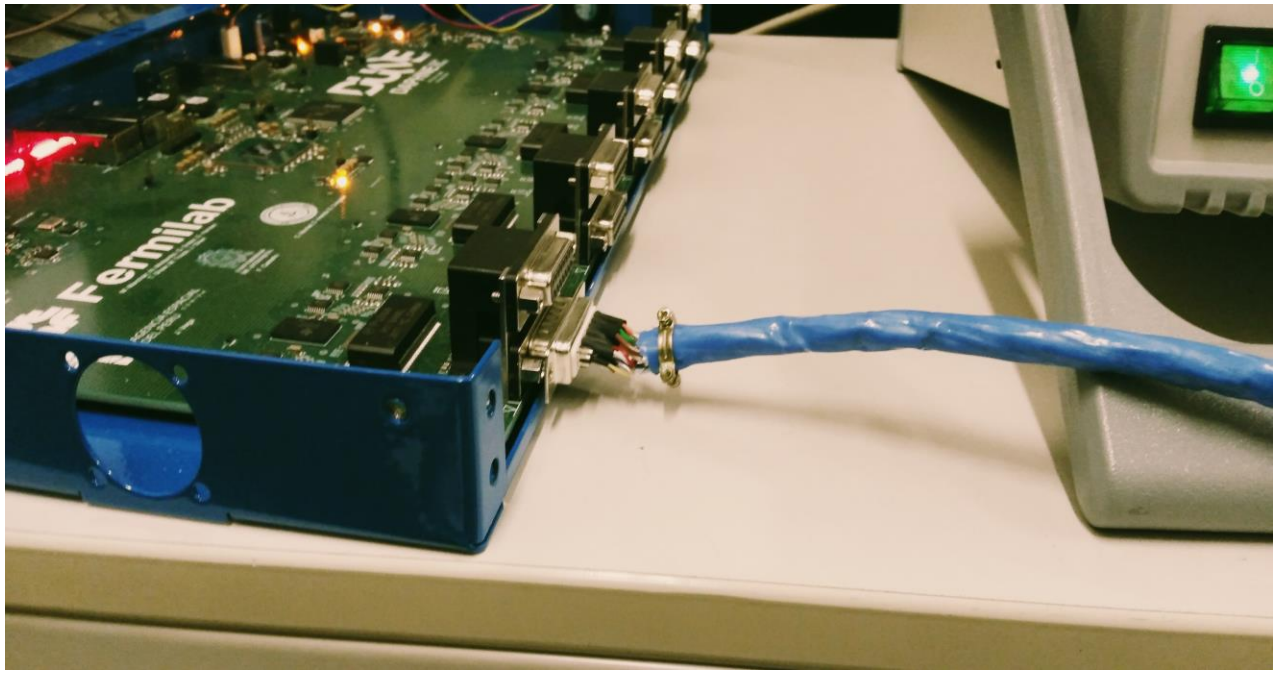




*David Christian,January 4, 2022

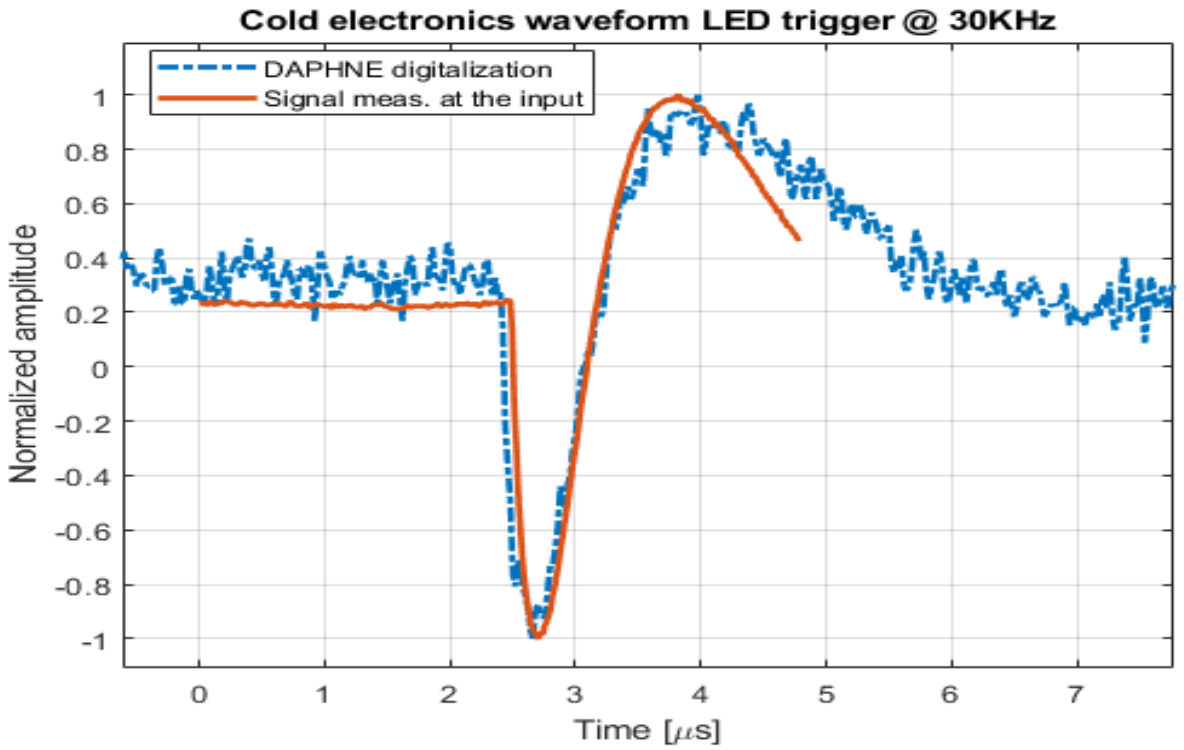
3. Test pulse cold amplifier

- Now the channel (0) is the same for the cold amplifier and Daphne



3. Test pulse cold amplifier

- Digitalized Channel 0 AFE 0
- LED pulse on 48 SiPMs (FBK) in liquid nitrogen, 31.6V (+4.5V overvoltage), readout with cold amplifier
- 150mV amplitude (300 mV differential) corresponds to roughly 750 photons (1 p.e. = 400 uV peak differential)



Currently:

- Esteban is doing some tests at CERN with DAPHNE related to the electrical integration between DAPHNE and the optical receiver of the Arapucas in the VD .

Next Steps

- Calibrate the gain and the offset per channel with the cold amplifier.
- Determine the signal to noise ratio.
- Will start the external trigger test.