

# Preparation and schedule for a new run for Photon Collection Efficiency measurement in Napoli

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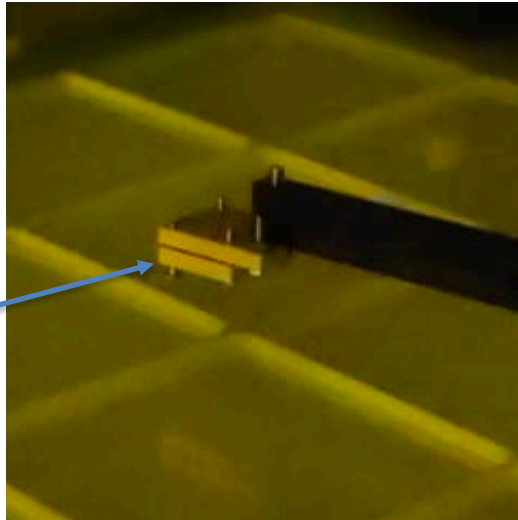
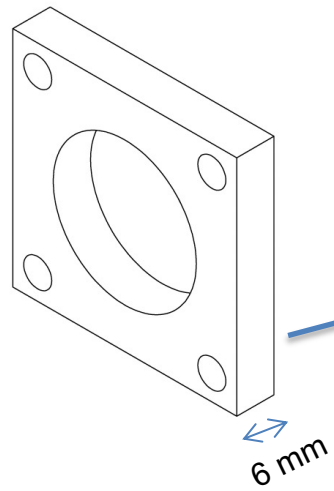


# Motivations

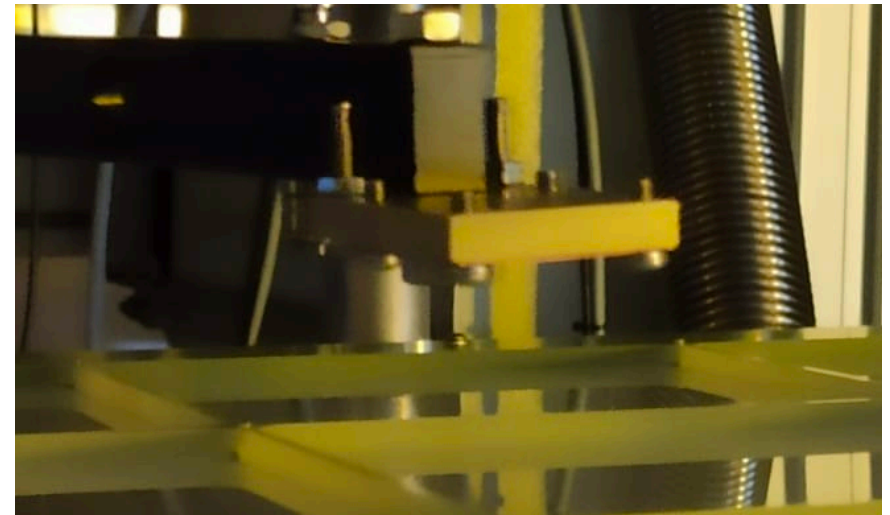
- Validate the first measurement performed in July 2023
- Modify the source holder to avoid alpha attenuation/shadowing
- Reduction of electronic noise to reduce systematics
- Collect larger data set in different conditions for comparison with MC simulation
- Improvement on investigation of efficiency behaviour with SiPMs overvoltage

# Source holder

Before

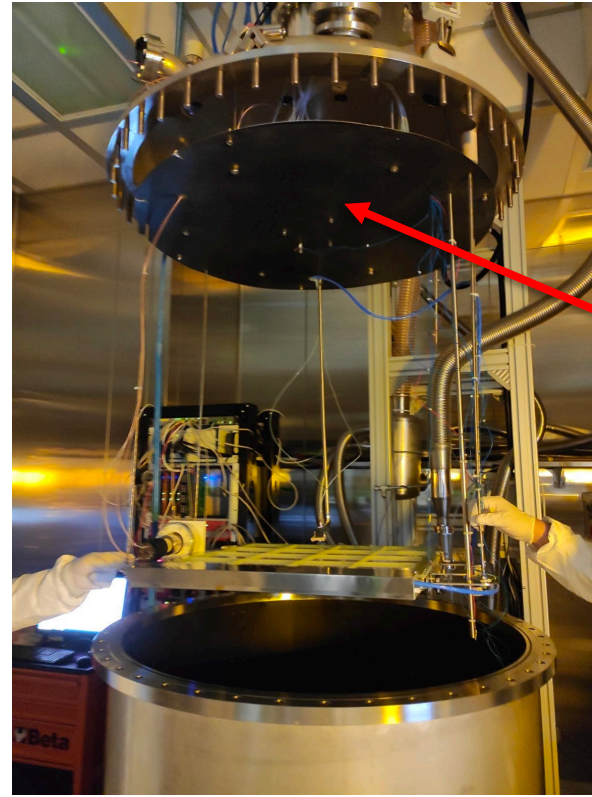
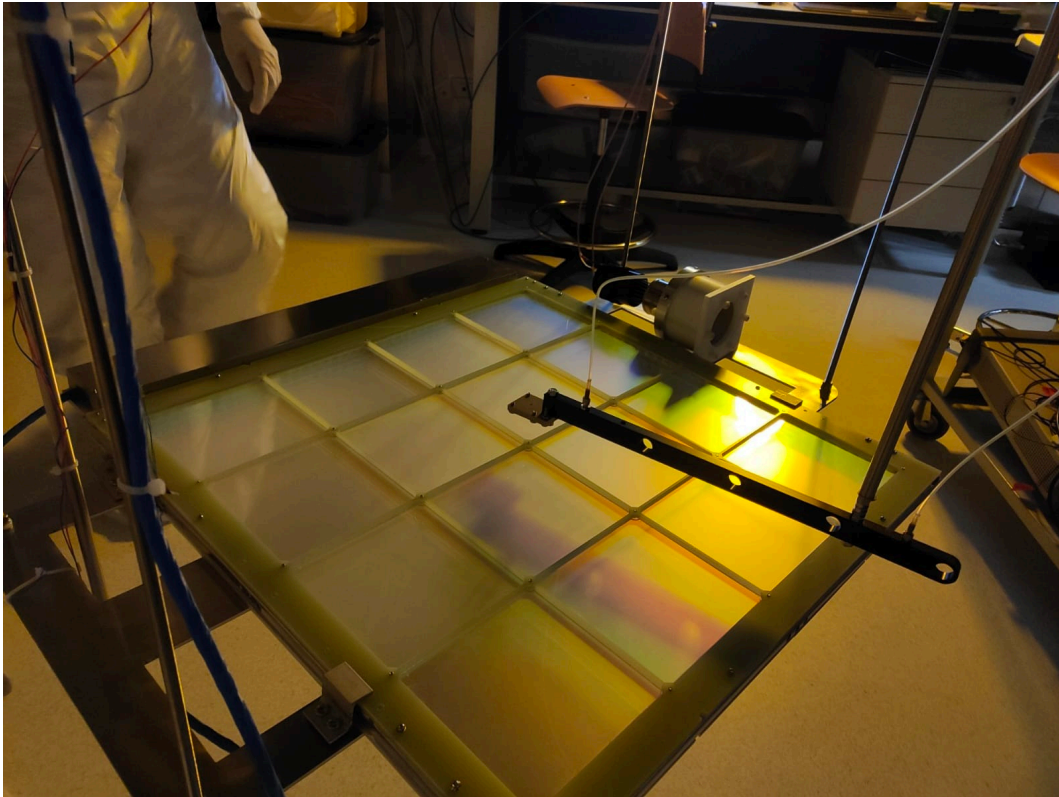


Now



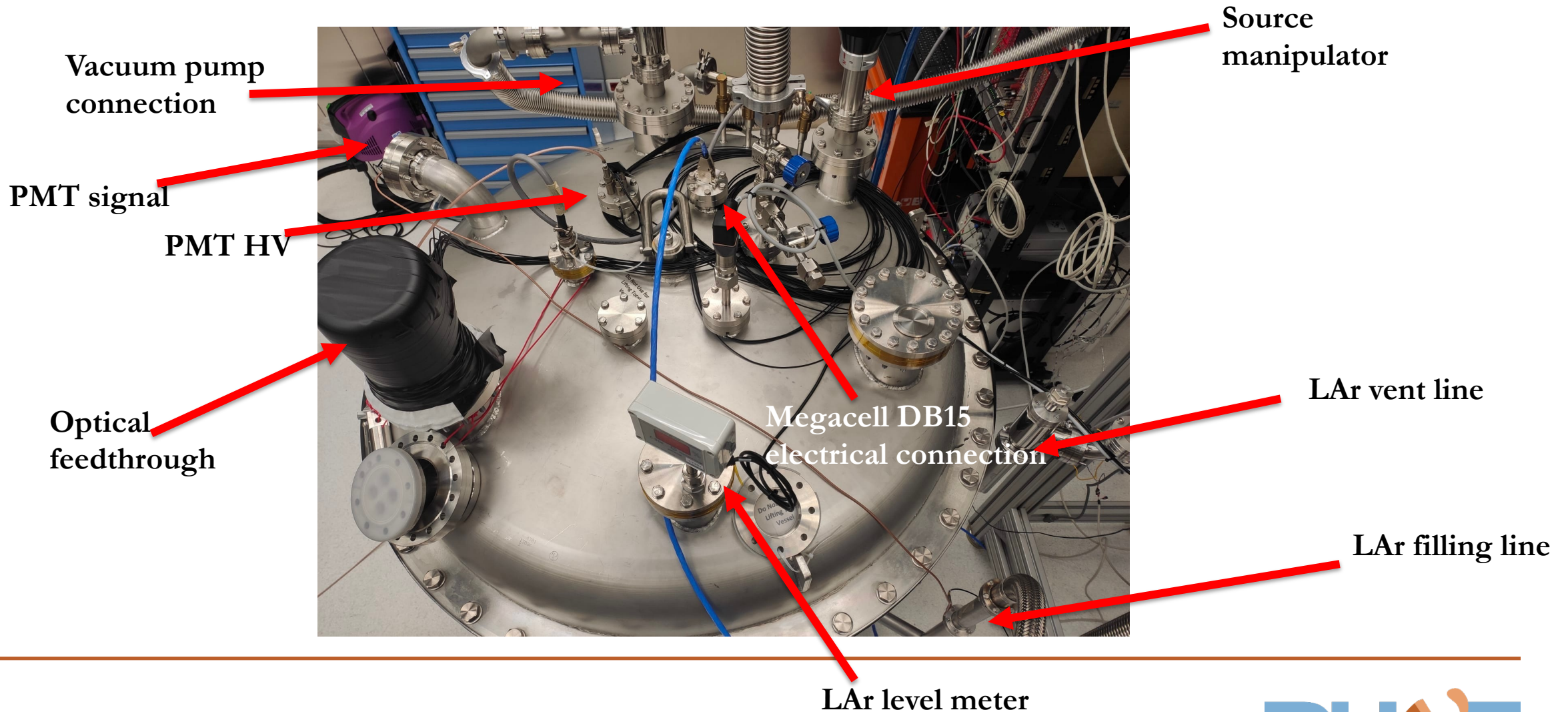
- The alpha source is now fixed by a 500 um copper foil instead of 6 mm peek cover

# Megacell setup in cryostat



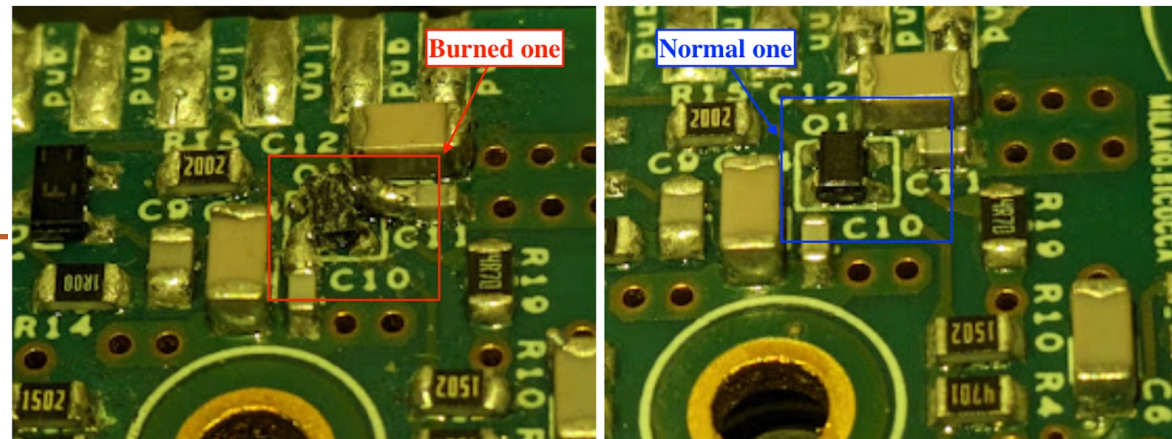
- Inner walls of the cryostat lined-up by black Delrin
- Heat shield covered by a Delrin disk inserted on the dome

# XA-VD measurement setup



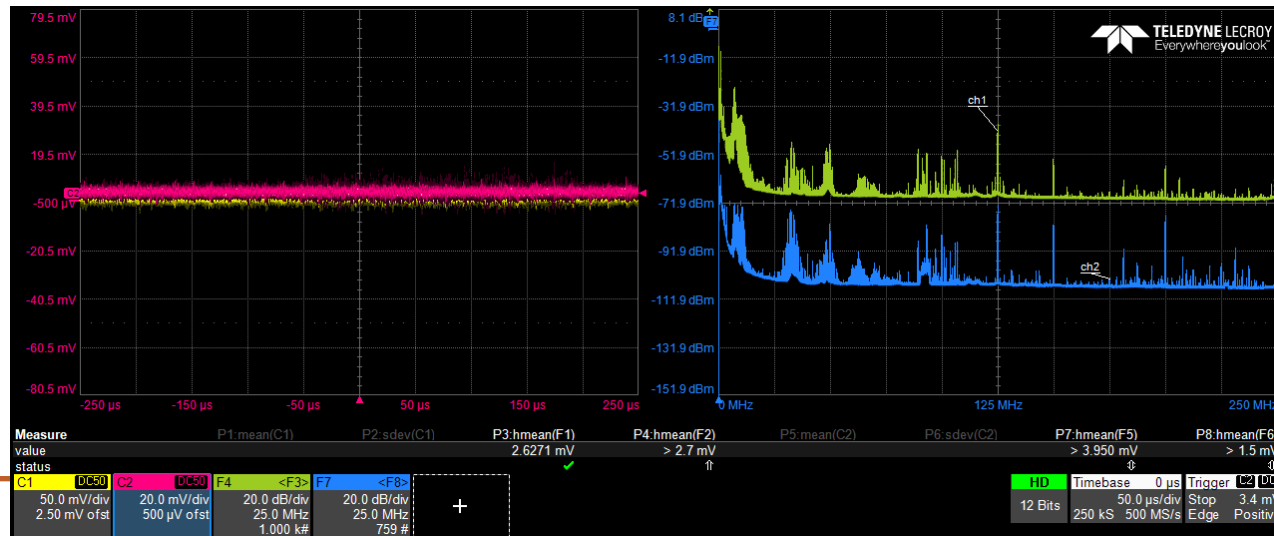
# Electronic test (1)

- Electronics due to several issues has been fully replaced
- In preliminary test we found one of two channels with offset of 1.7 V (solved by replacing warm second stage amplifier)
- After further test we found one of two channels dead, suspected burned of one component (transistor bfp640) of the cold amplifier
- The other channel is a bit noisy (10 mV std of baseline at warm)

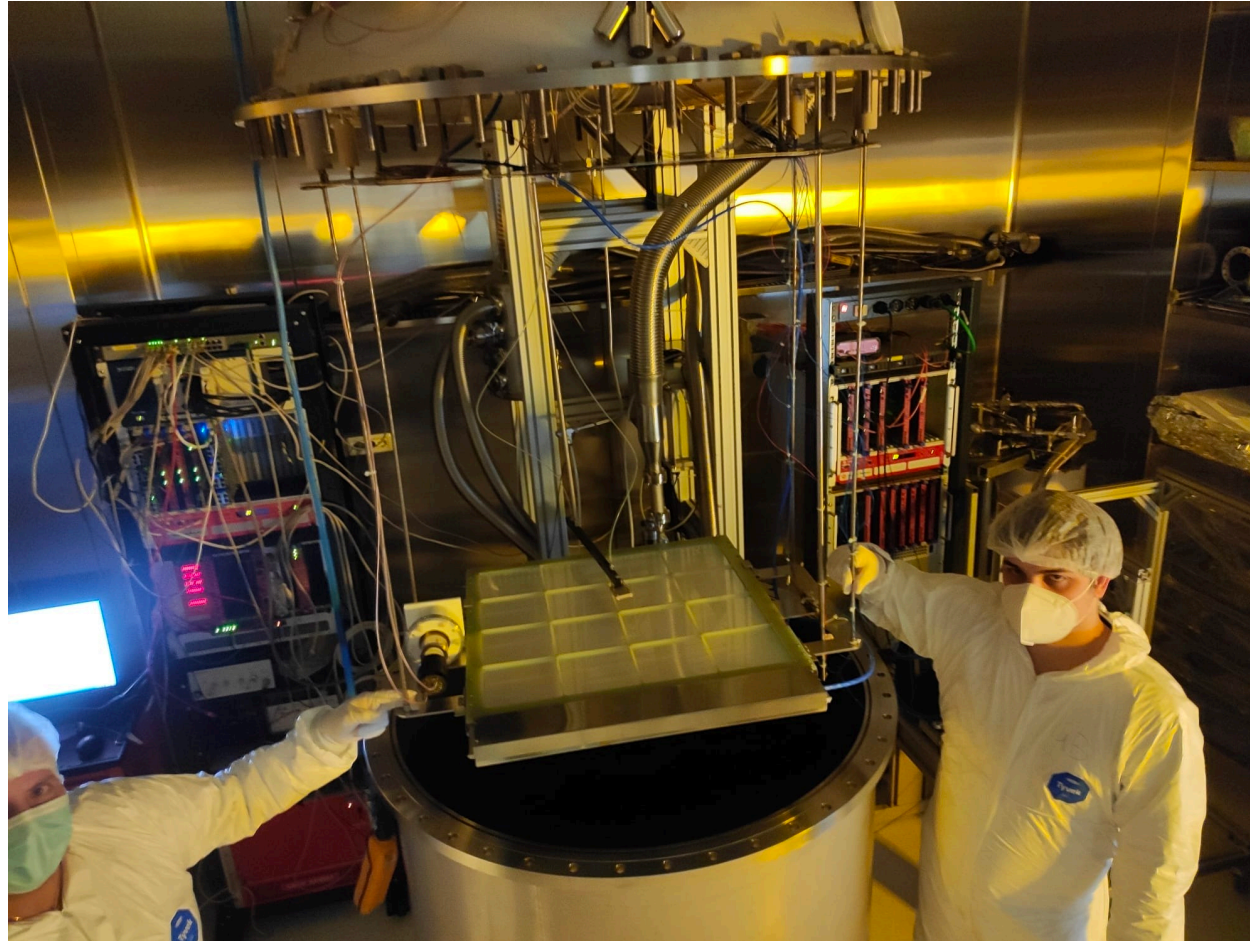


# Electronic test (2)

- Last week we received two new cold amplifiers from MiB
- We also replaced the bfp640 in the old one with new part and the channel is working again
- We selected 2 cold amplifiers (out of 4) with the best noise performances
- 3-4 mV std of the baseline at warm temperature (low gain and no transformer )



# Test is starting





# Test Schedule

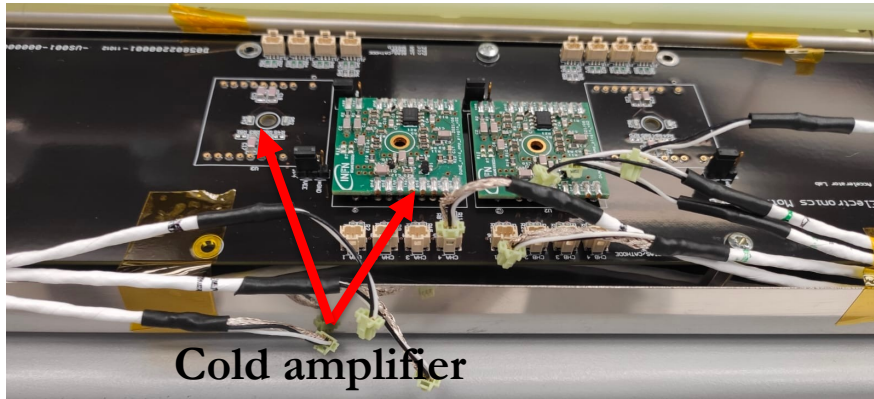
LAr Filling operations are ongoing right in this moment:

- Pump and purge operations (yesterday)
- Pumping in progress
- LAr filling it was foreseen to start tomorrow
- Accident occurred on LAr tanks (rupture disks broken, loss of pressure and most probably LAr contaminated)
- We will reschedule the test as soon we have news from LAr company



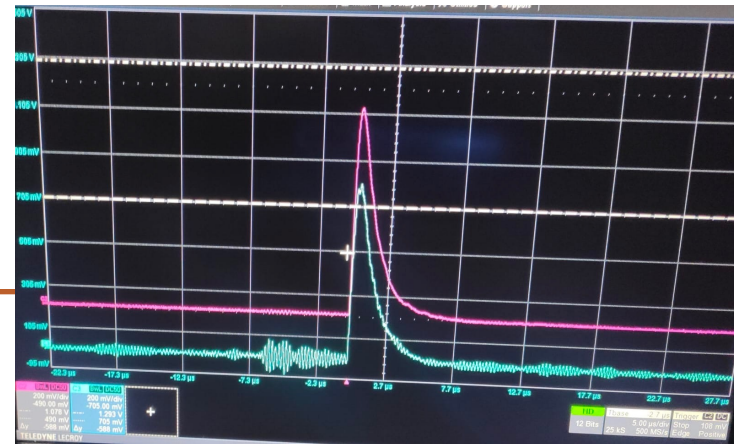
# Back-up slides

# Electrical connection and DAQ

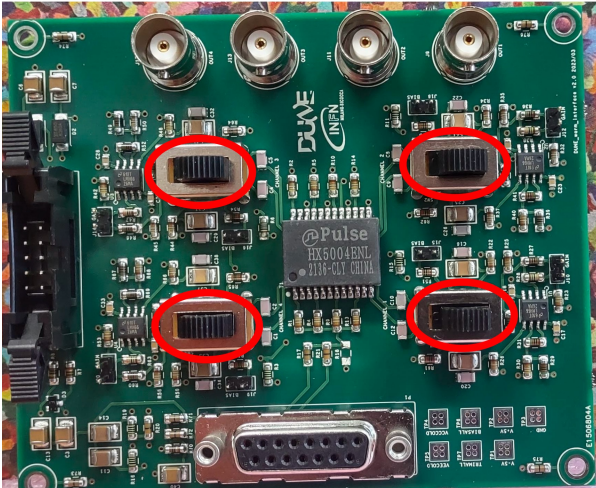


- DMEM with two cold amplifier: preliminary tested in LN<sub>2</sub> : both channels working
- just before to close the cryostat one of two signal is not present: we changed position of one cold amplifier
- After LAr filling discovered that one channel is very noisy
- Output signals from second stage amplifier sent to CAEN V1725B digitizer

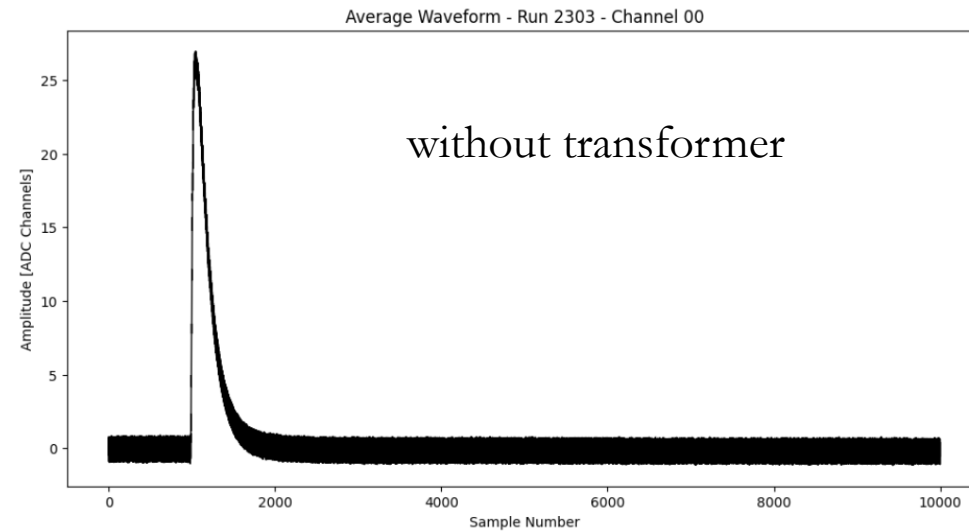
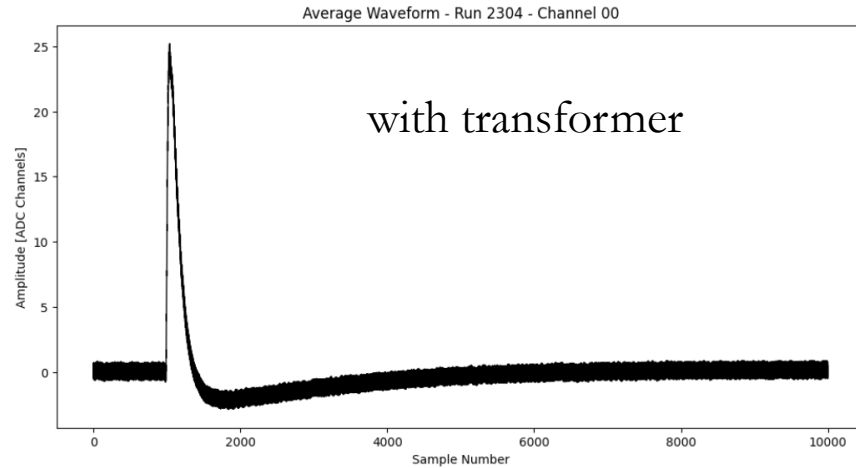
Warm second stage amplifier



## Warm amplifier

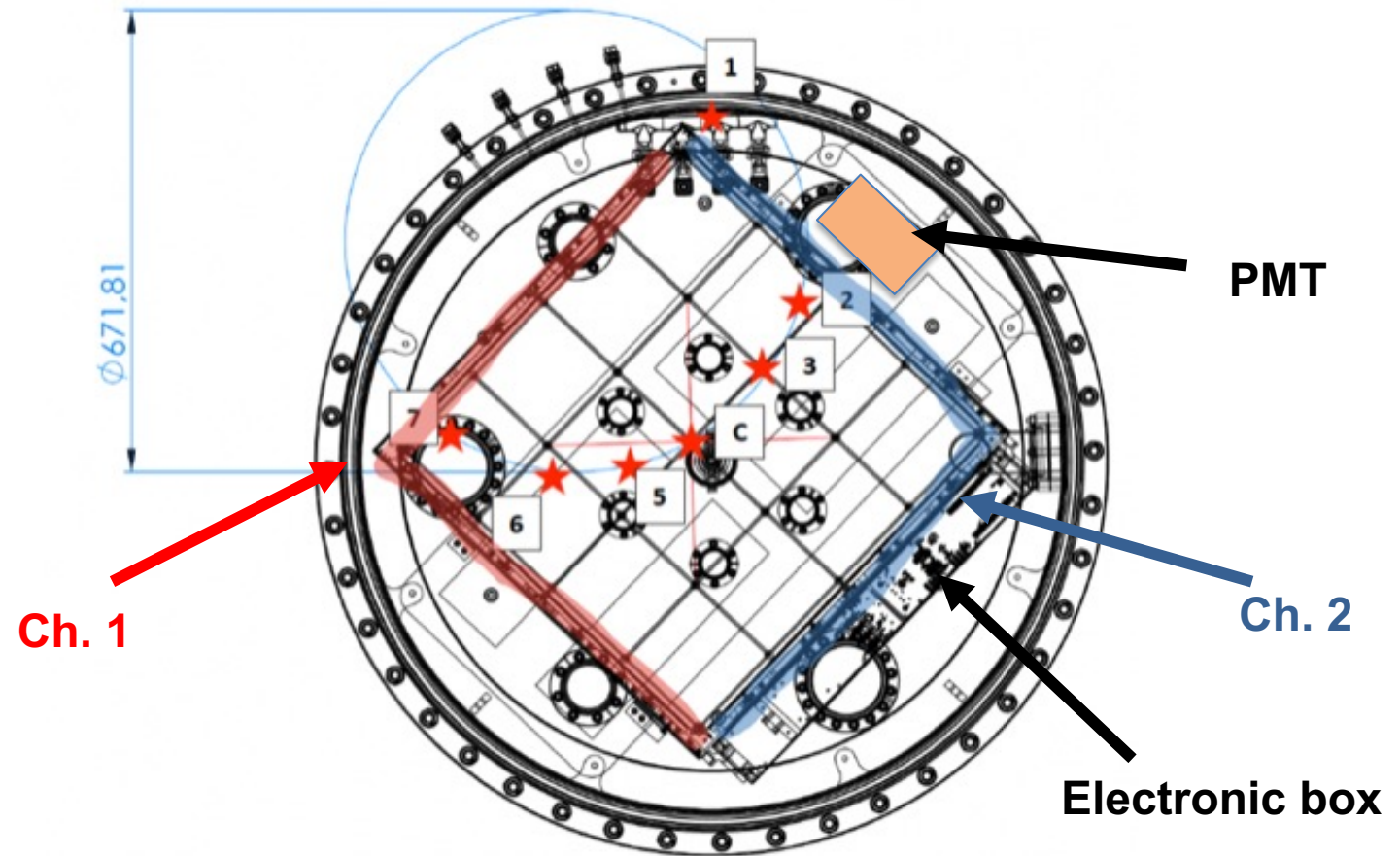


- Switches to choose differential to single-ended conversion circuit
- Switch towards the center of the board = With transformer
- Switch towards the edge of the board = No transformer
- Low/High gain mode through lateral jumpers
- Our preferred conditions was low gain without transformer



# Measurement positions

- Ch1: square dimples
- Ch2: cylindrical dimples
- PMT for purity monitoring



# Preliminary results for PCE

	PCE(%) @ OV=4.5V	PCE(%) @ OV=7.0V
Position	5 cm	5 cm
P2	$2.71 \pm 0.41$	$3.45 \pm 0.52$
P3	$2.16 \pm 0.32$	$2.75 \pm 0.41$
C	$2.09 \pm 0.31$	$2.67 \pm 0.40$
P5	$2.19 \pm 0.33$	$2.80 \pm 0.42$
P6	$2.35 \pm 0.35$	$3.01 \pm 0.45$

