X-ARAPUCA PDE Measurements at CIEMAT

C. Palomares on behalf of the CIEMAT group

September 2023
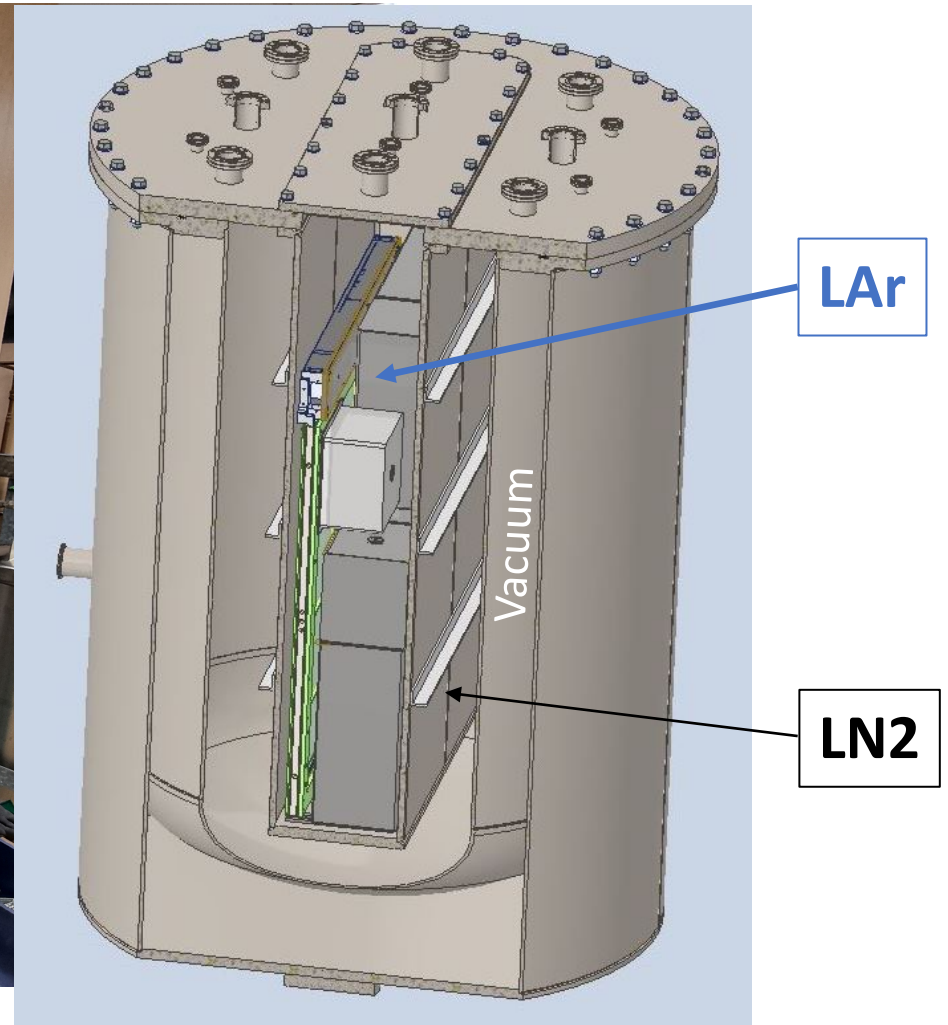
SETUP for the measurement of FD2 Mega-Cell PDE

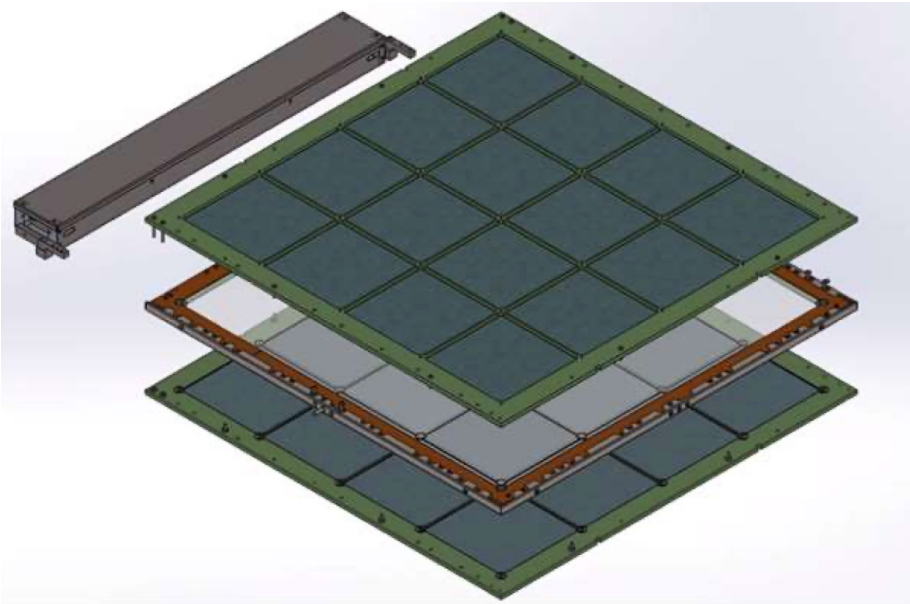# SETUP for the measurement of FD2 Mega-Cell PDE

Vessel 500 L

LAr

Vacuum

LN2

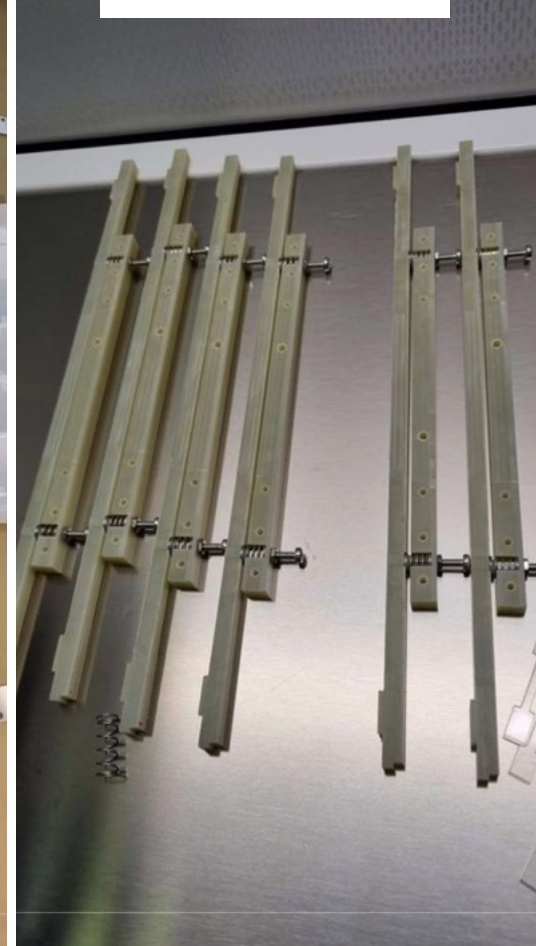# Mega-Cell assembly at CIEMAT

Following the procedure of document
V5 Module Assembly Procedures (Rev. 4-9 July)

Vikuiti is stuck on some pieces and SiPMs
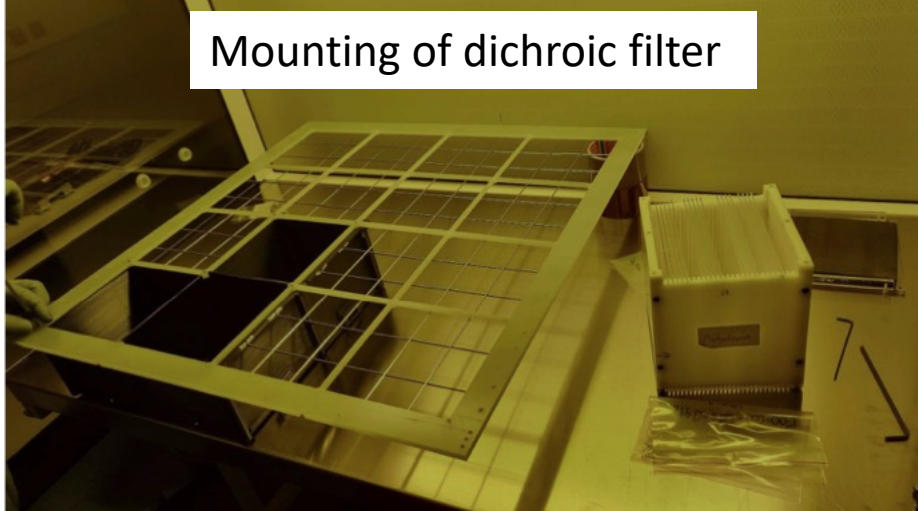

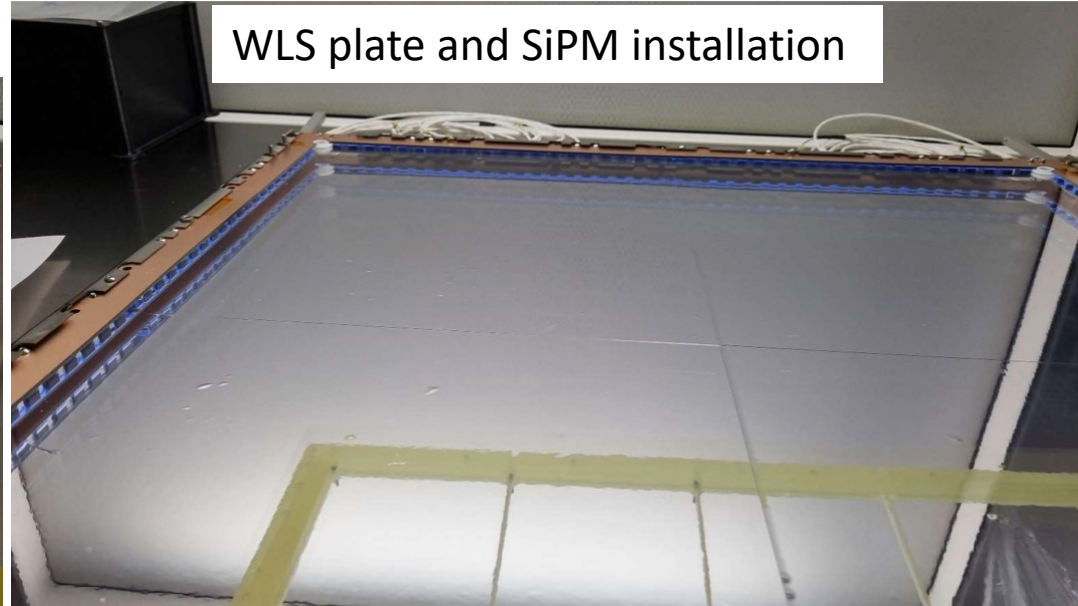Sub assemblies

Mega-Cell assembly at CIEMAT

Bottom frame assembly

WLS plate and SiPM installation
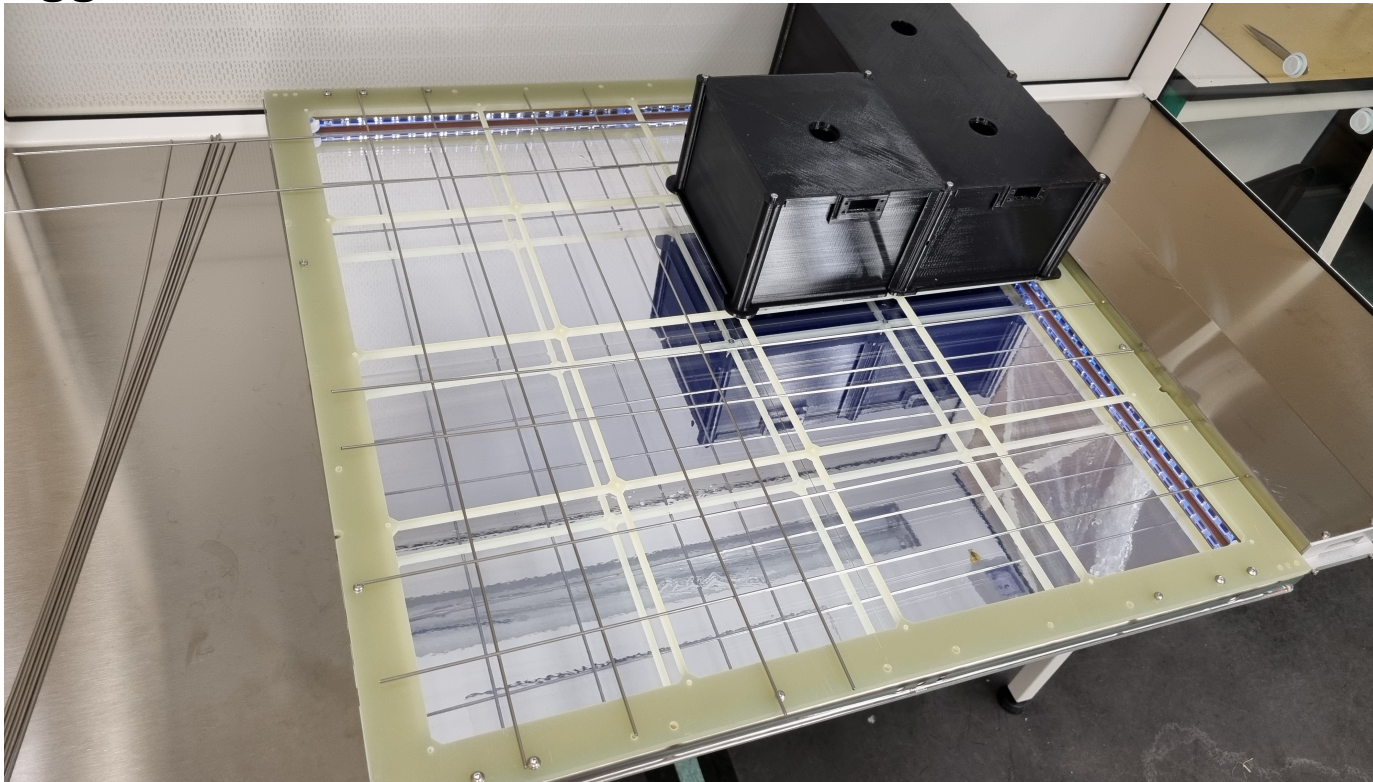
Mounting of dichroic filter

The Mega-Cell was assembled without major problems. We have gained the expertise to assemble M-C

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Centro de Investigaciones
Energéticas, Medioambientales
y Tecnológicas

DUNE

SETUP for the measurement of FD2 Mega-Cell PDE

- The alpha particle deposits its energy inside a **black box** facing the M-C

- **VUV sensitive SiPMs** with known PDE are used as reference and for providing the trigger
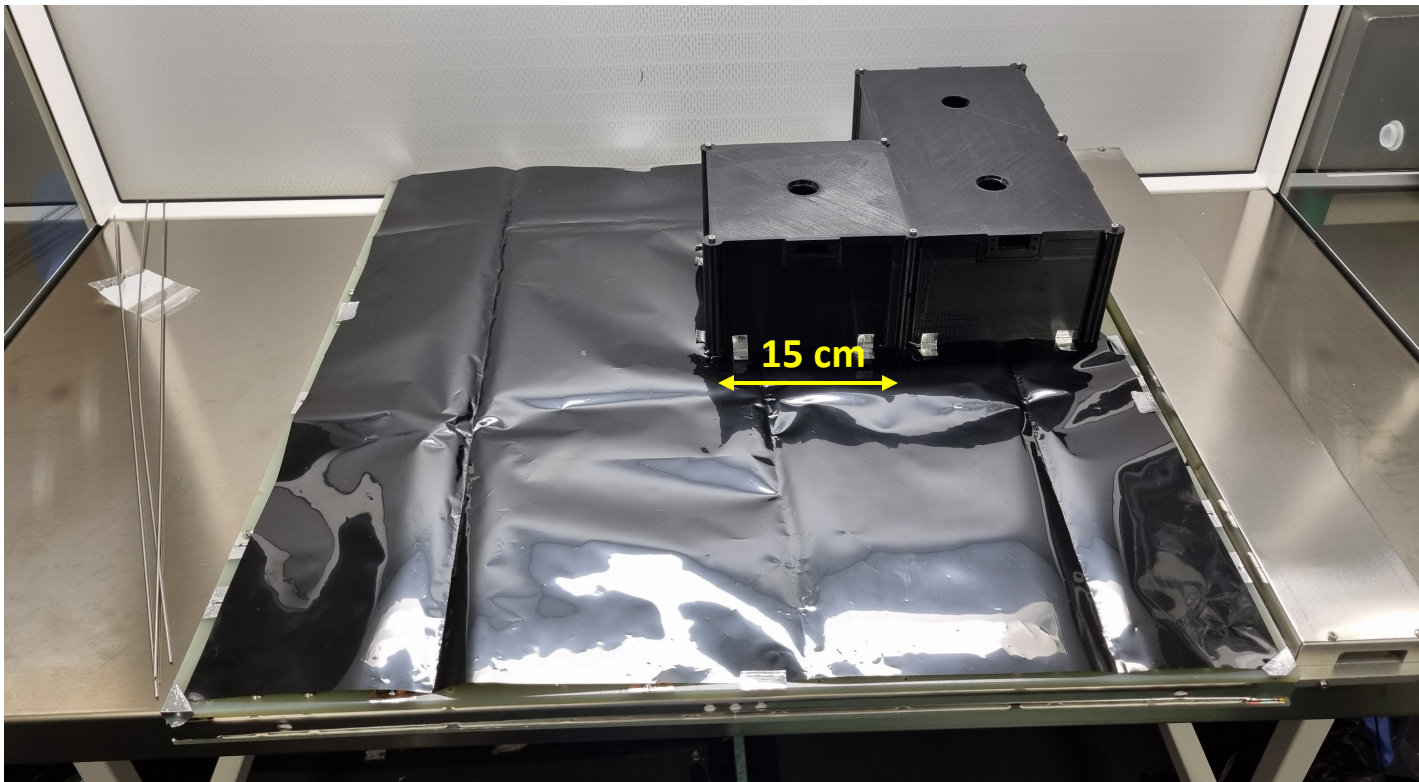

For the Mega-Cell **3 boxes** with
- 3 alpha-sources
- 2 x 3 VUV SiPMs

SETUP for the measurement of FD2 Mega-Cell PDE

- The alpha particle deposits its energy inside a **black box** facing the X-A

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For the Mega-Cell **3 boxes** with
- 3 alpha-sources
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Commissioning of Setup for Mega-cell PDE measurement

Data-taking 8 – 9 August

Mega-Cell configuration:
- 160 FBK-TT SiPMs
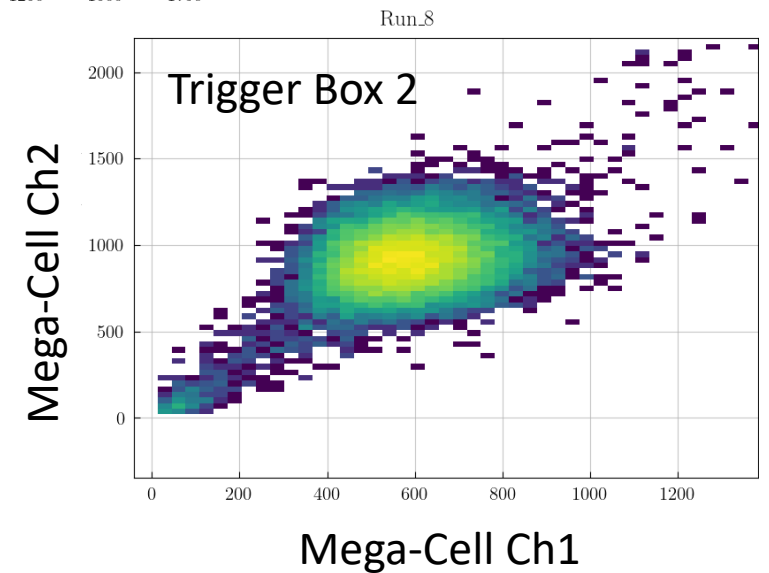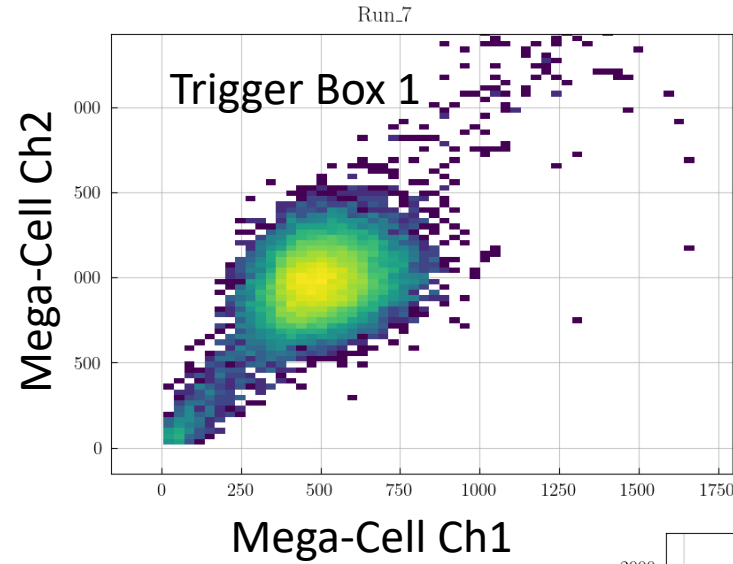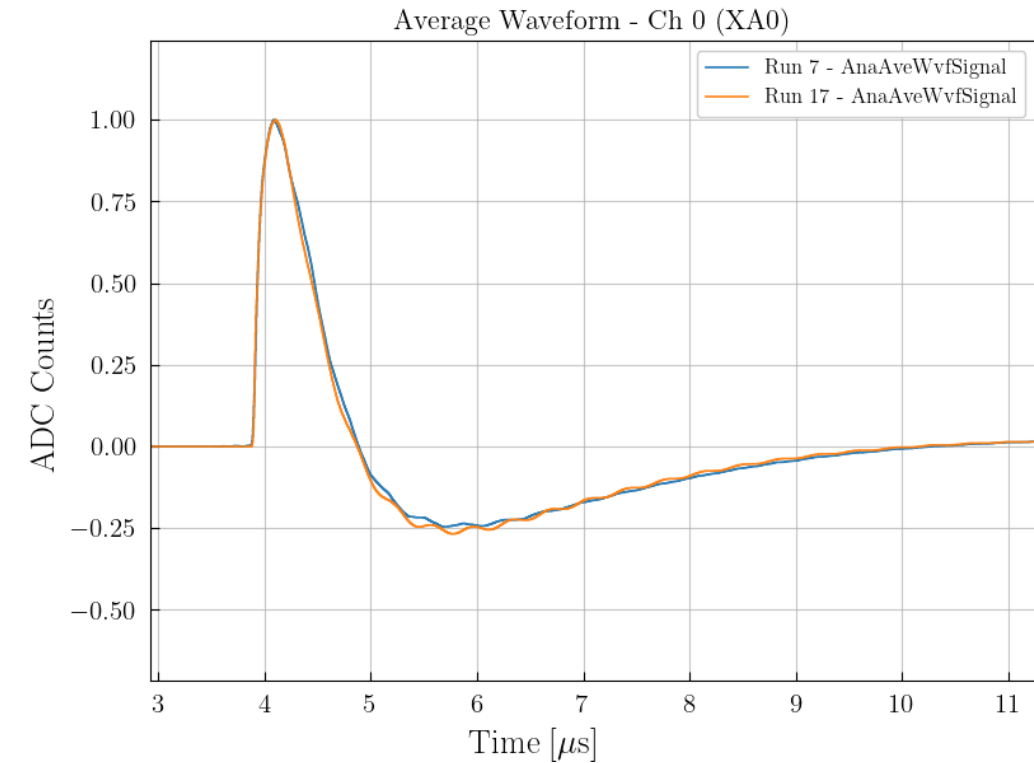- G2P 60x60 cm bar w/o dimples
- ZAOT filters

Issues:
- Failure of the ref. SiPMs of central box
- No good purity
- Noisy Mega-Cell channels

The analysis is on-going:
Tow boxes have been operated independently without xtalk

Commissioning of Setup for Mega-cell PDE measurement

NEXT Steps

- The Mega-Cell (w/o filters) will be tested in LN2 in the following month to fully characterize the M-C and to test and fix noise and other issues. We plan to use the new electronics (no overshooting)

- The design of the black box will be improve.

- The setup will be ready in October for the PDE measurement of different Mega-Cell configurations