

Gaseous detectors Task 13.4.7

MPGD detectors to industry

Preparation for large series production: standard production protocols of optimized MPPGD components to ease technology dissemination

(project leader : Fabien Jeanneau)

Gaseous detectors Task 13.4.2

Resistive anode Micromegas

Preparation for large series production: procedures and tools for large series resistive micromegas anodes

(project leader : Stephan Aune)

Reported at the 2nd annual meeting.

These two tasks are very interrelated.

Thanks to D. Attié, S. Aune, A. Delbart, E.Dumas, F.Jeanneau, M. Kebbiri, E. Mazzucato

S. Aune, M. Kebbiri

MIMOSA PROJECT:

RESISTIVE LAYER + BULK PROCESS = DETECTOR TEST

- SCREEN PRINTING OF RESISTIVE KAPTON (ACTIVE AREA 50x50 CM², 1024 STRIPS; 300 MM STRIP + 200 INTER)
- BASIC RESISTIVITY 100 KΩ/□ AND 1 MΩ/□ AND MIXED RESISTIVITY TEST FOR BETWEEN.
- FUTURE TEST AT 10 MΩ/□ AND 50 MΩ/□ WITH INSULATING PASTE MIXING
- USE AND TEST OF DLC-COATED KAPTON

R&D in progress at the Saclay MPGD lab

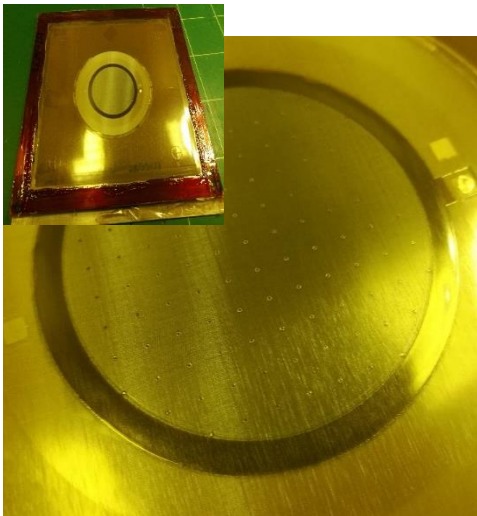


DLC (Diamond Like Carbon) with 80 MΩ/□

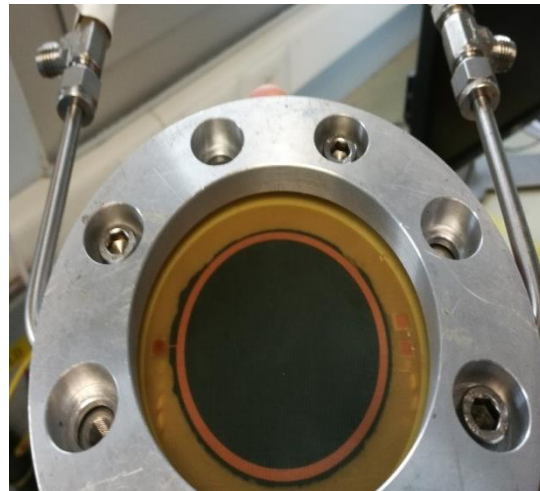
CALISTE PROJECT

S. Aune, M. Kebbiri

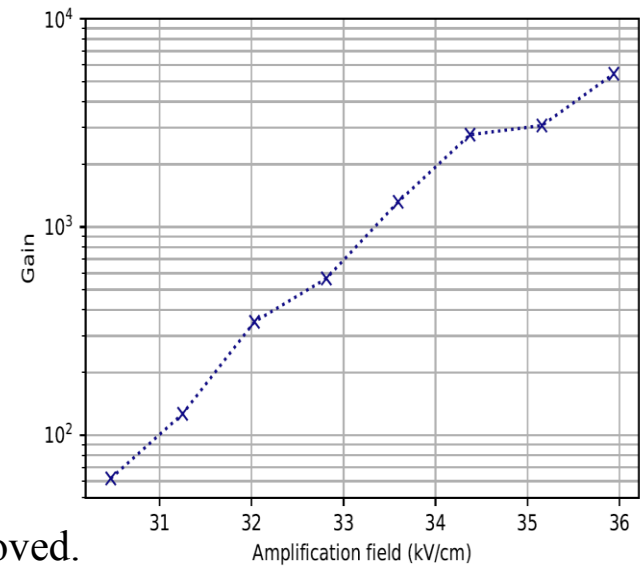
- RESISTIVE LAYER ON THIN FR4 IN PIGGYBACK MICROMEAS
pixel readout not on collection PCB = easy exchange of resistive layer with same readout
- RESISTIVE SCREEN PRINTING ON 200MM, 400 MM, 800 MM -THICK PCB WITH SEVERAL RESISTIVITIES. (TEST ON-GOING)



Bulk micromegas
(resist. layer under the mesh)



In setup, from below, readout removed.
(resistive layer visible through thin
PCB)



First gain curve

Large Micromegas produced for muon densitography. Screen-printing on kapton now used at CEA to improve the resolution by charge sharing.

In 2016-2017, 40 large bulk Micromegas have been built: 20 at CERN and 20 at ELVIA. Steady improvement of ELVIA quality, however not reaching yet the CERN quality.

In 2017-2018, 40 more resistive bulks will be produced at ELVIA (4 already so far): 20 with screen printing and 20 with DLC.

NSW (ATLAS muon chambers) →

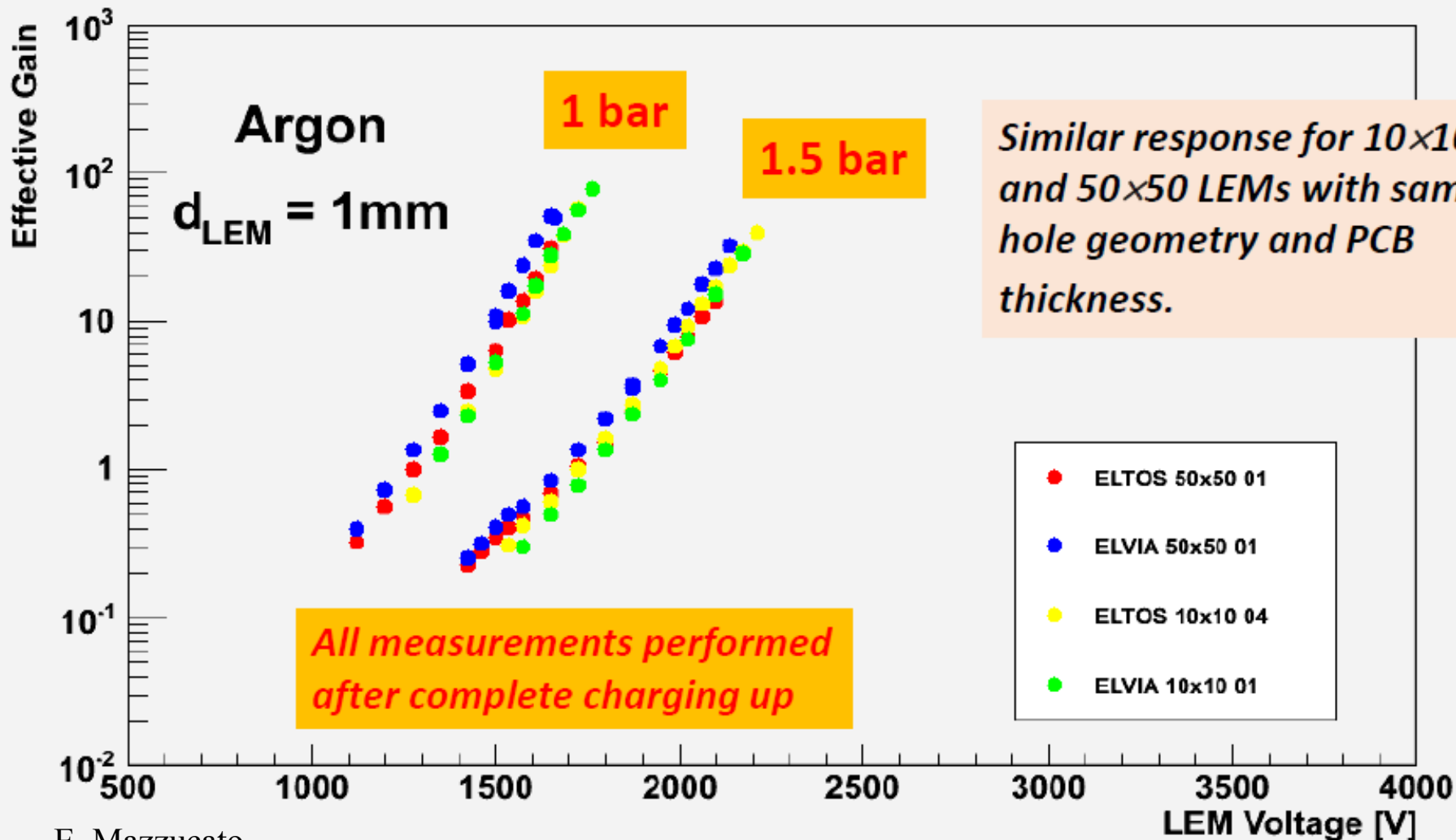
- production at ELTOS and ELVIA and QC at CERN
- Module 0 completed at Saclay this summer

80 50x50 cm² LEMs are to be produced for the demonstrator for DUNE (neutrino long baseline experiment) and tested at Saclay under pressure

- CEA-IRFU responsible for the procurement of 1/2 of the 144 LEMs + anodes for the 6x6x6 + their validation.
- Irfu has contributed to the current LEM design, LAS assembly and to detector simulation.
- All the infrastructures necessary for the preparation and tests of the LEMs available at Saclay (cleaning, baking, polymerization, metrology, etc...).
- A High Pressure chamber has been built in order to perform LEM tests in argon at same gas density as in DLAr conditions ($P \sim 3.3$ bar at room temperature).
- LEM production started last July and is progressing well (contract with ELTOS for 78 LEMs). All LEMs for 1st CRP (36) expected to be available by mid-October.



(Spring 2017)



E. Mazzucato