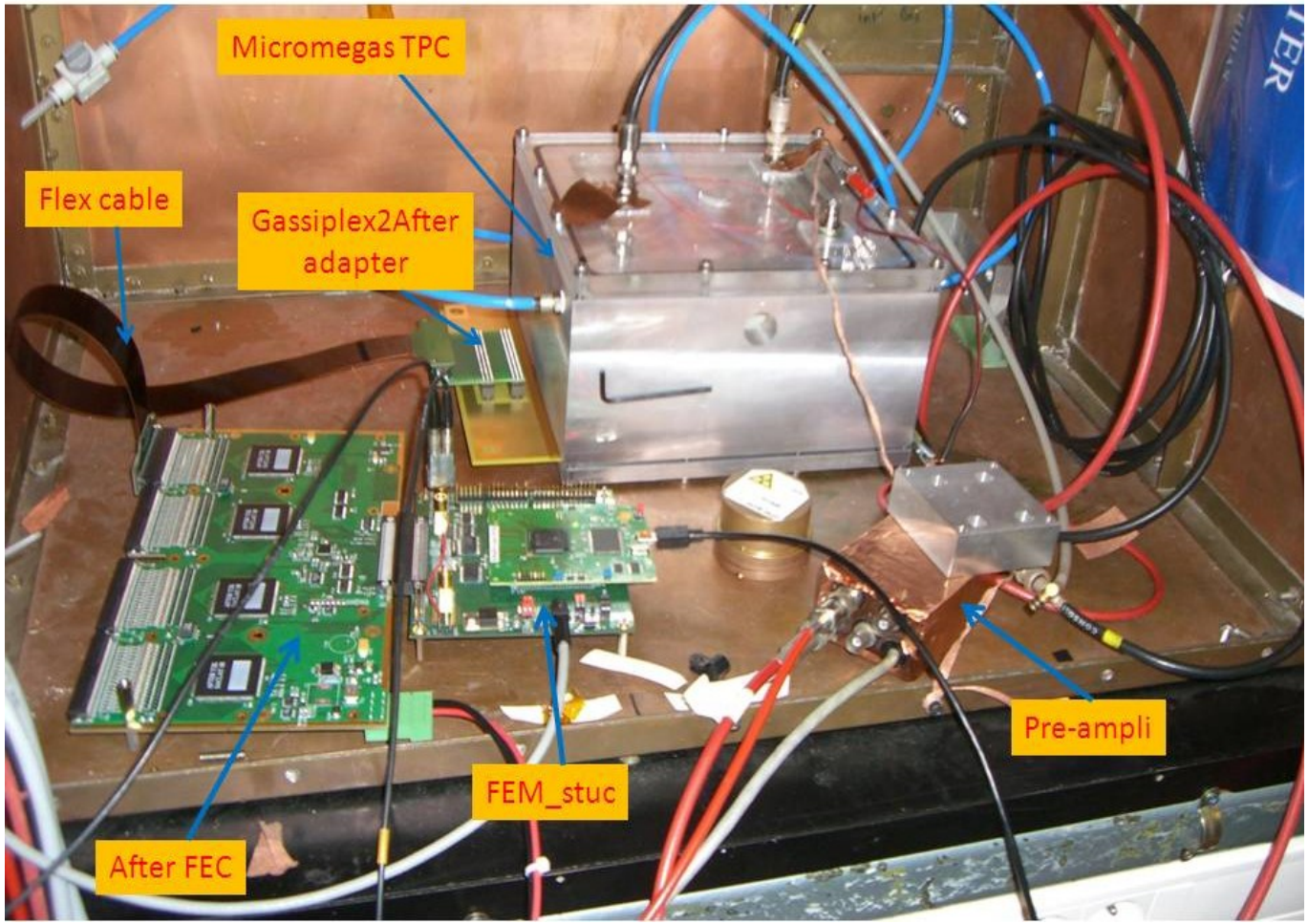
The FIDIAS Micromegas TPC in October RD51 tests

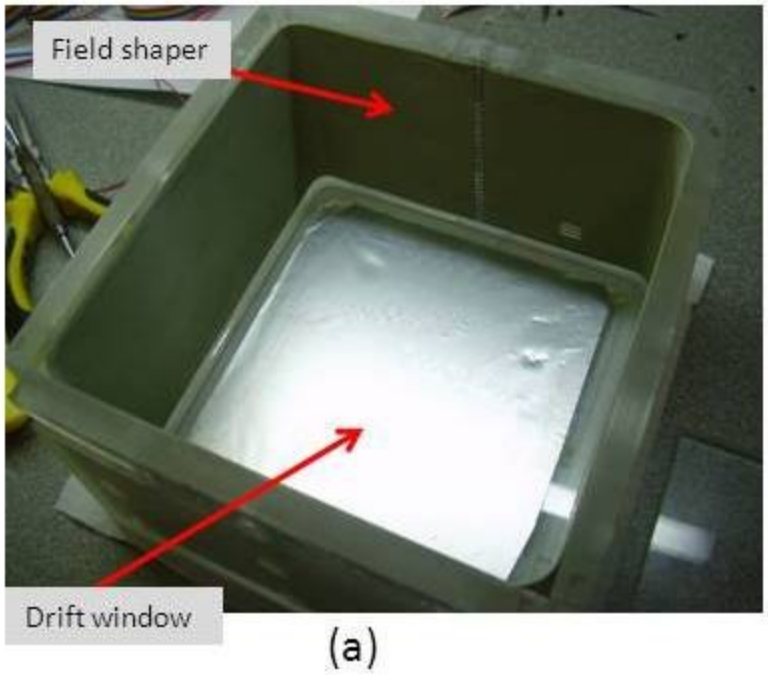
George Fanourakis[a], Stefano Panebianco[b], Michail Axiotis[a], Diane Doré[b], Frédéric Druillole[b], Theodoros Geralis[a], Ioannis Giomataris[b], Sotirios Harrisopoulos[a], Anastasios Lagoyannis[a], Thomas Papaevangelou[b]

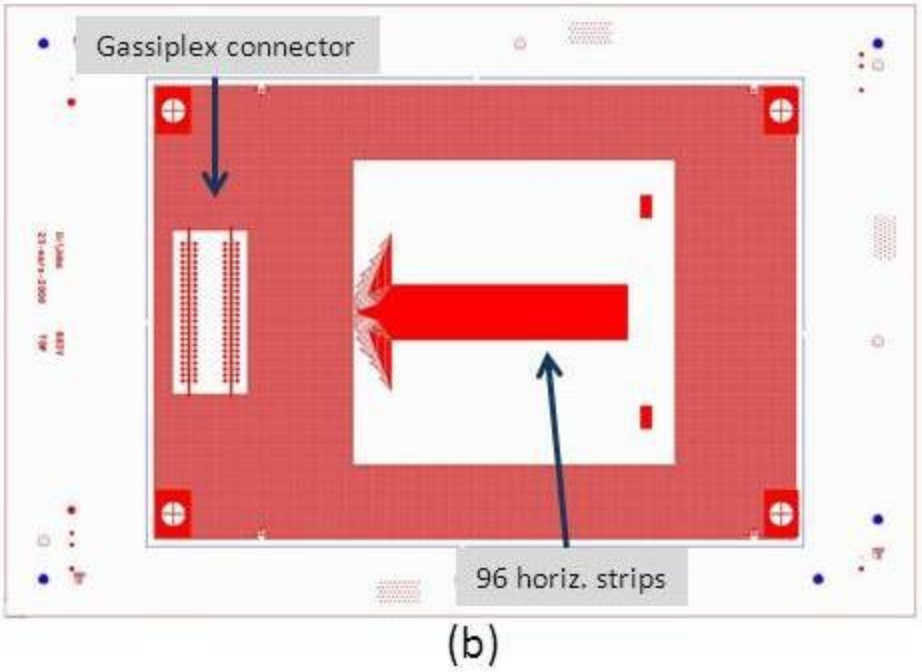
[a]Institute of Nuclear Physics, NCRS "Demokritos", 15310 Agia Paraskevi, Athens, Greece
[b]CEA, Centre de Saclay, Institut de Recherche sur les lois Fondamentales de l'Univers, 91191 Gif-sur-Yvette, France.

The Micromegas TPC prototype test setup at Saclay



The TPC field shaper and Micromegas readout board



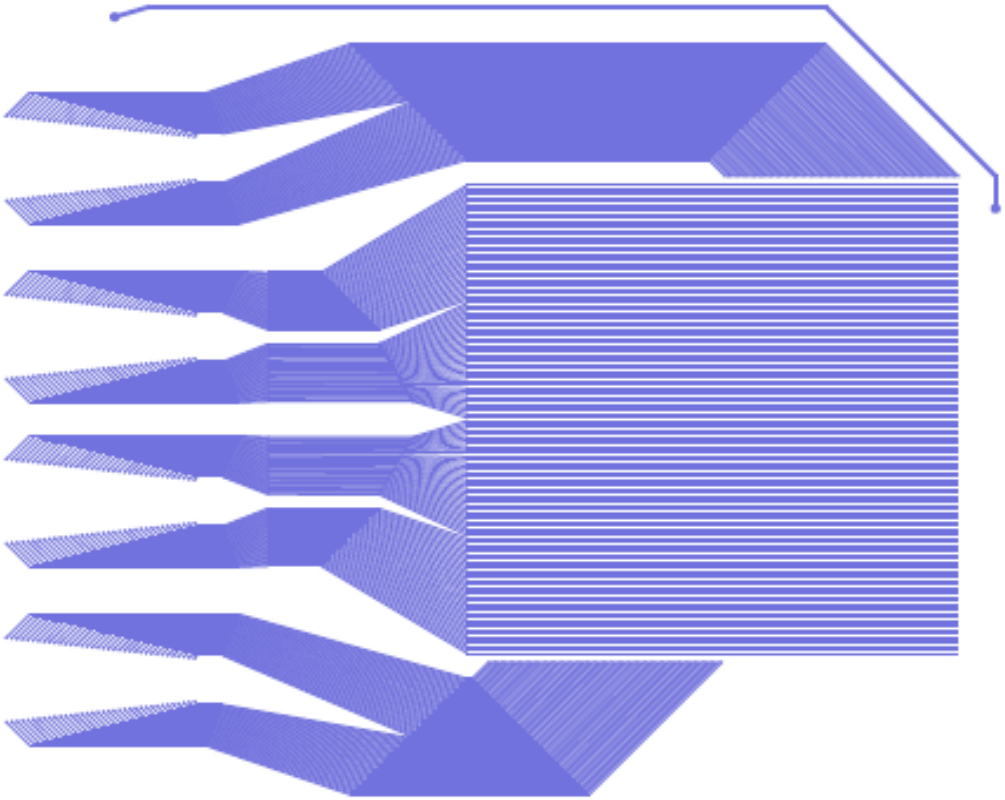


Drift field shaping cage

MM-TPC only X strips readout board used for initial test and proof of principle

in ~20x20x10 cm^3, 1cm thick aluminum box, 10 cm in drift direction

The new X-Y Micromegas readout board design



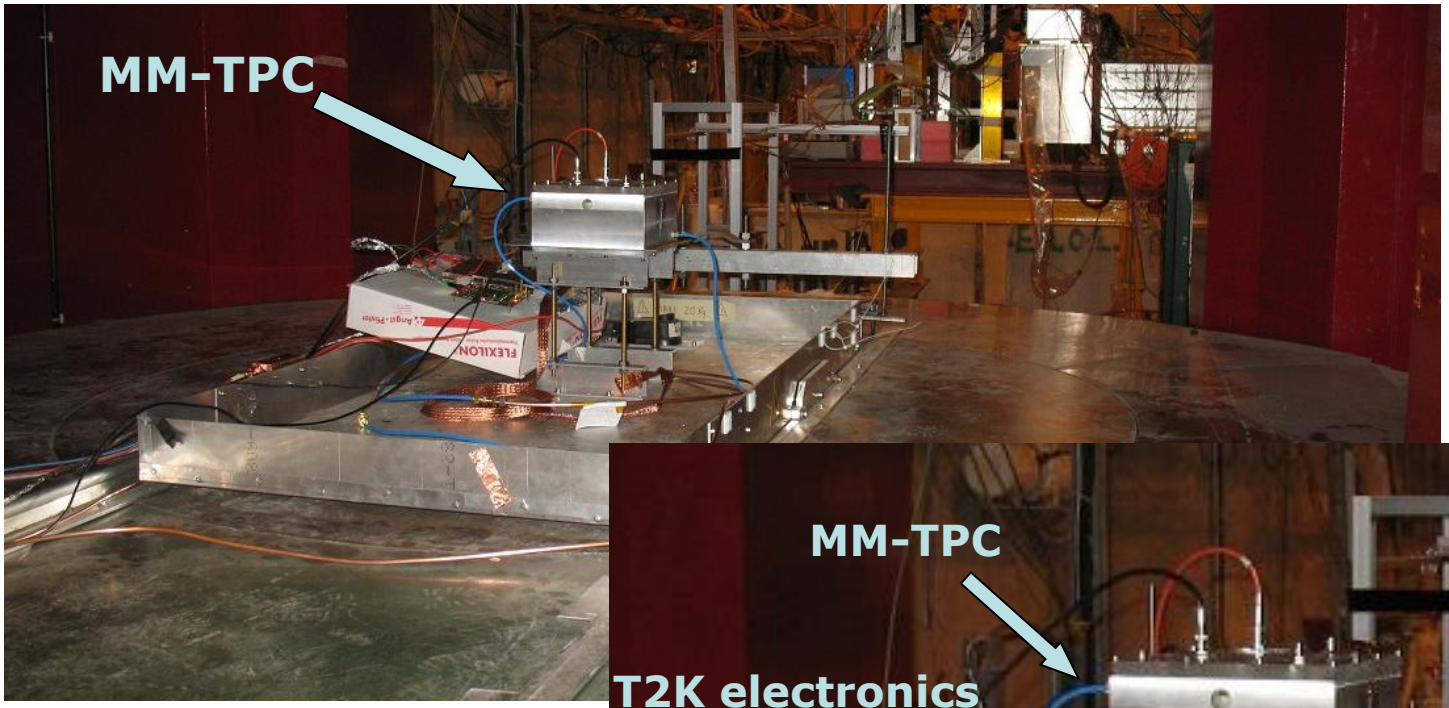
Based on MIMAC's Saclay design modified and constructed by Rui's lab at CERN

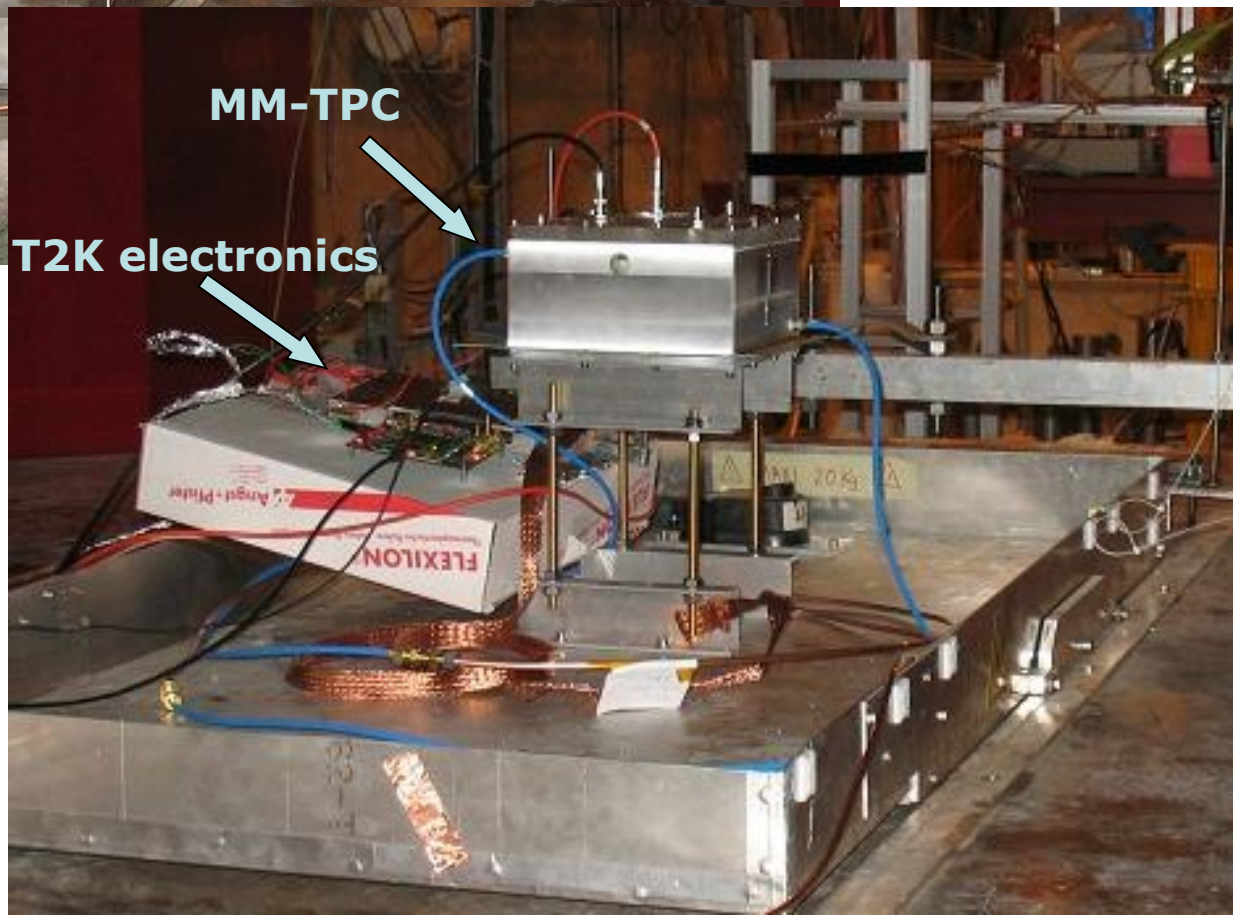
Installation

- The MM-TPC was installed inside the Goliath magnet of H4 beam line
- Leszek's team helped a lot on the setup and support inside the magnet
- Fellow team from Saclay (Stefan Aune et al.) helped on gas connections, Argon/Isobutane gas and signal cables.

Performance

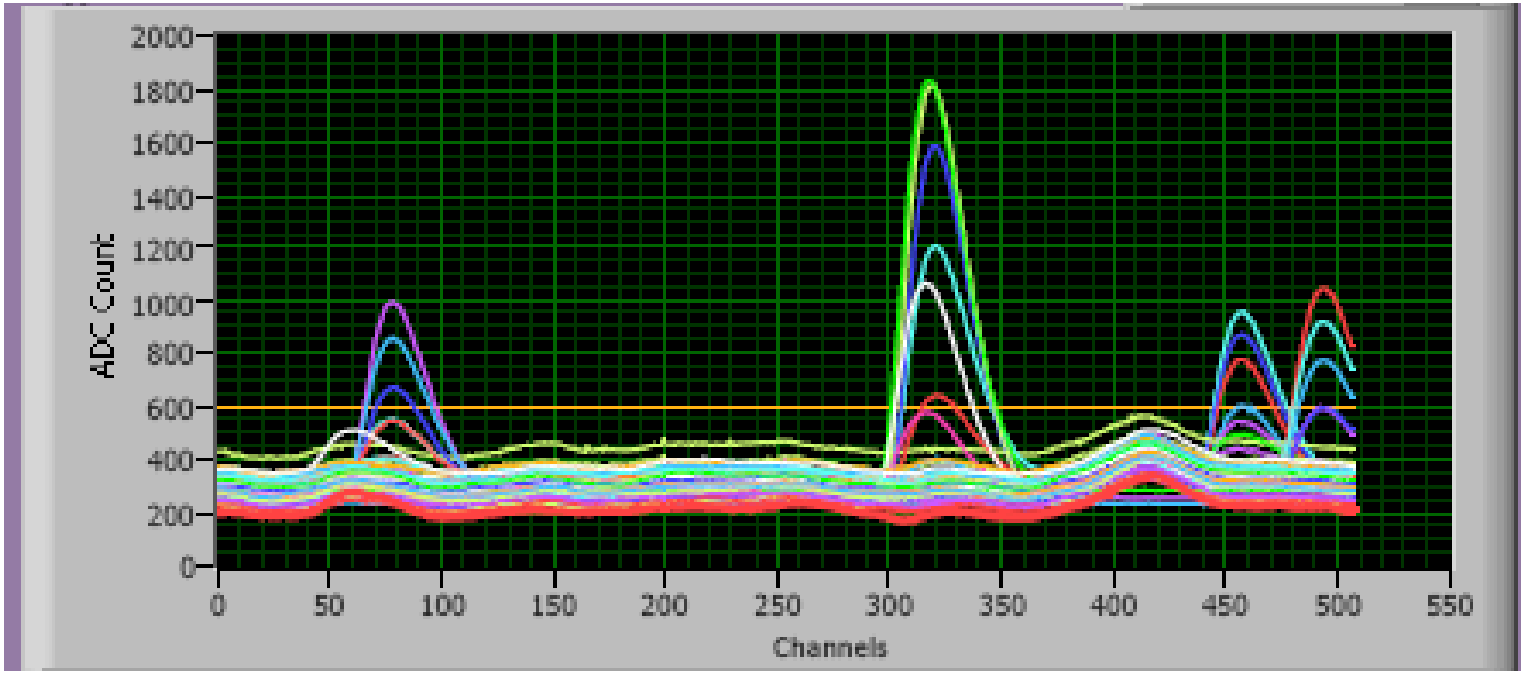
- Huge noise – partially dealt by extra grounding and higher gain.
- Enough cables available to read ¾ of the detector (All X+1/2 Y)
- Used two different data acquisition systems: one used for tests at Saclay (reading ¼ of the detector at a time) and the T2K DAQ reading all channels (all X and half Y)
- Both DAQ systems would crash after a certain (not fixed) number of events.
- Managed to take data in these conditions
- …Still… in the process of evaluating the data





Inside Goliath

pions seen by the MM-TPC during October 2011 RD51 test beam



Conclusions

- **The MM-TPC can function in muon beams and low intensity hadron beams**
- **Noise should be further educed to be able to self trigger on pure events**
- **Intense tests of the different available data acquisition system are needed before we go back for further and more detailed beam tests.**
- **A very useful proof of principle has beam accomplished in last years October RD51 test.**