Summary of WG1 session, 25 May 2010

Serge Duarte Pinto, Paul Colas

- Overview
- Timetable
- Registration
  - Registration Form
- List of registrants
- RD51 Collaboration page
- Paris RD51 meeting
- Crete RD51 meeting
- CERN RD51 meeting
- How to get to the meeting
- Conference Dinner
- Excursion
- Visitor's portable WiFi registration
- Hotel Information
- EVO Connections

Support

WG1: Technological Aspects and Development of New Detector Structures

Place: *Freiburg, Germany*
Weismann-Haus

Room: Lecture Room

Dates: Tuesday 25 May 2010 14:00

Conveners: Duarte Pinto, Serge
Colas, Paul
Colas, Paul

Contribution List **Time Table**

Tuesday, 25 May 2010

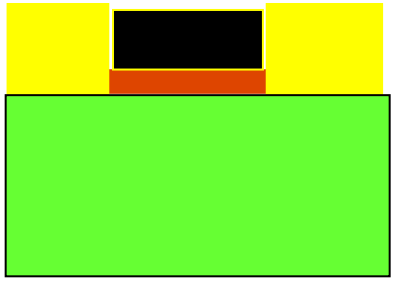
14:00	[30] MAMMA: spark-protected Micromegas by Rui DE OLIVEIRA (CERN) (Lecture Room: 14:00 - 14:20)	slides
	[4] Status update of the CMS-GEM feasibility study by Archana SHARMA (CERN) (Lecture Room: 14:20 - 14:40)	slides
	[3] Large GEMs for DHCal by Andrew WHITE (University of Texas at Arlington); Andrew WHITE (University of Texas at Arlington) (Lecture Room: 14:40 - 15:00)	slides
15:00	[45] First m^2 Micromegas chamber for DHCal by Maximilien CHEFDEVILLE (LAPP, Annecy); Maximilien CHEFDEVILLE (Lecture Room: 15:00 - 15:20)	slides
	[32] Results on a large area triple-GEM detector at LNF by Danilo DOMENICI (Laboratori Nazionali di Frascati (LNF)) (Lecture Room: 15:20 - 15:40)	slides
	[1] The PHENIX hadron blind detector by Dr. Craig WOODY (Brookhaven National Lab) (Lecture Room: 15:40 - 16:00)	slides
16:00	Coffee break (16:00 - 16:30)	
	[0] GEM foils made by laser micromachining by Vincenzo BERARDI (Politecnico di Bari) (Lecture Room: 16:30 - 16:50)	slides
	[2] The CBM-GEM project for FAIR by Schmidt HANS RUDOLF (Gesellschaft fuer Schwerionenforschung mbH (GSI)); Anand Kumar DUBEY (Institute of Physics) (Lecture Room: 16:50 - 17:10)	slides
17:00	[26] Development of MPGDs with resistive foils in Japan by Atsuhiko OCHI (Department of Physics) (Lecture Room: 17:10 - 17:30)	slides
	[6] New results of microbulk detectors by Francisco IGUAZ (CEA) (Lecture Room: 17:30 - 17:50)	slides

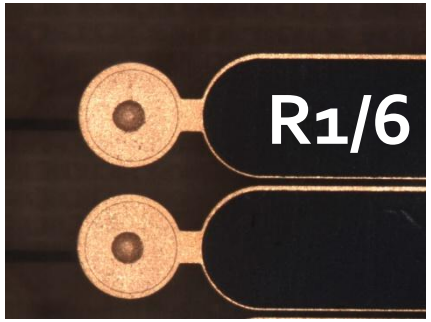
http://indico.cern.ch/event/89325
Last modified: 26 May 2010 07:28

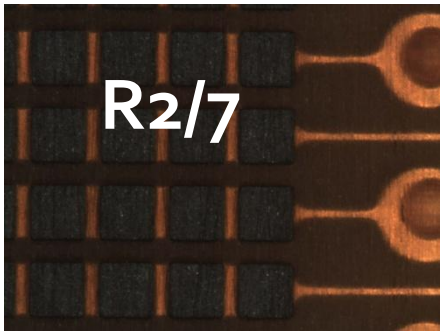
Powered by CDS Indico

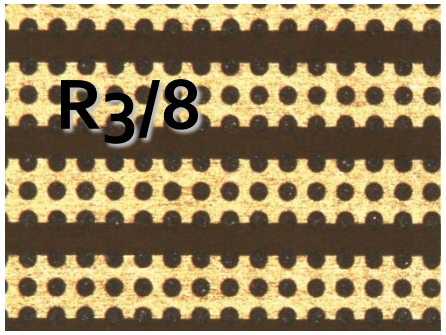
Various types of resistive readout boards

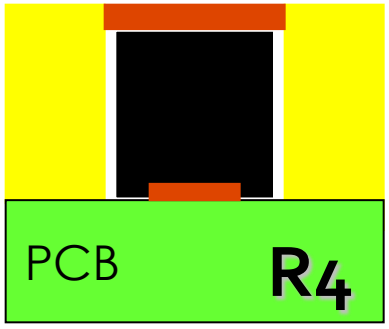
Rui de Oliveira

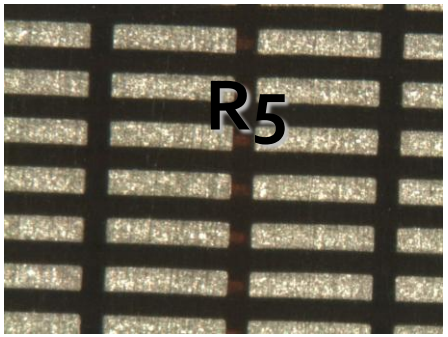


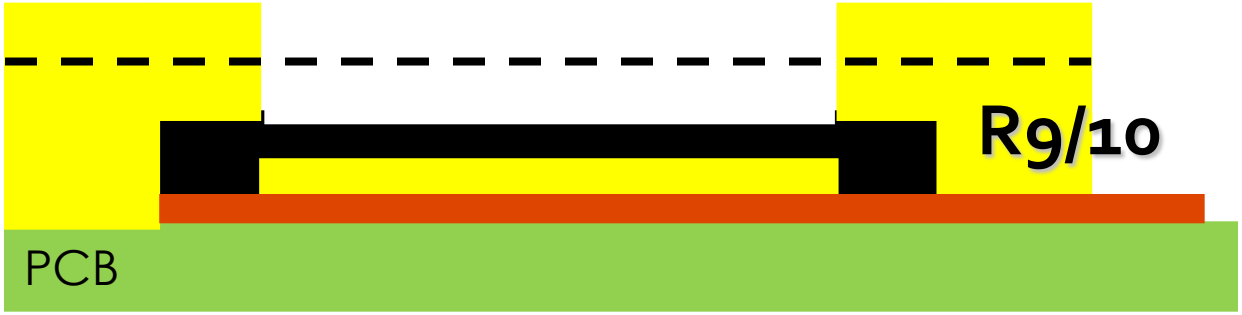








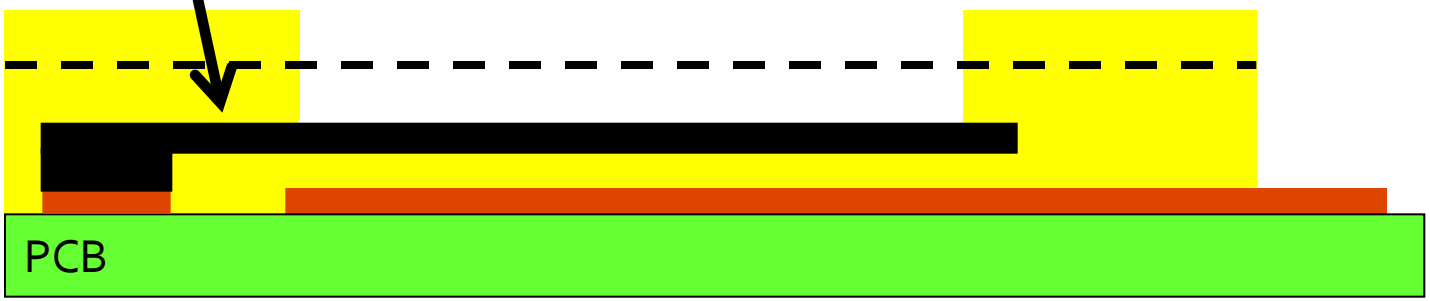


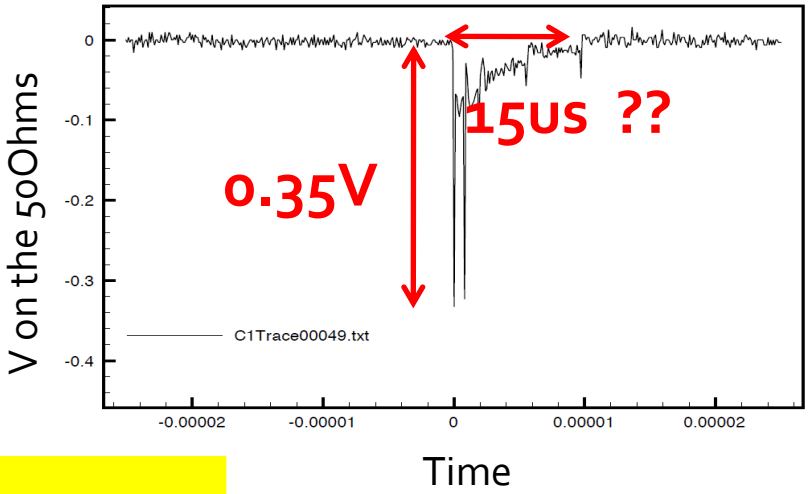


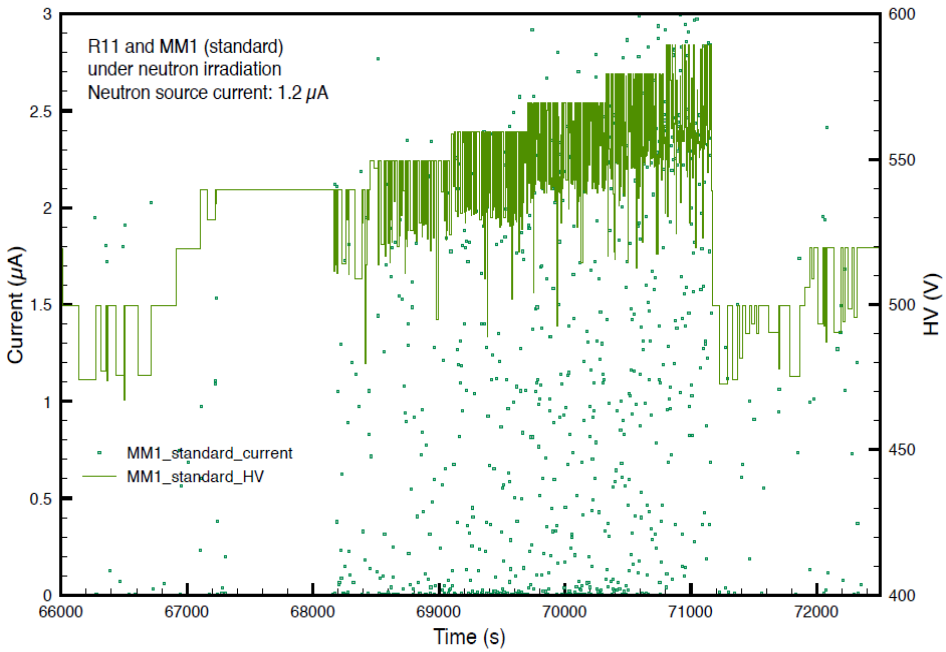
And the winner is…

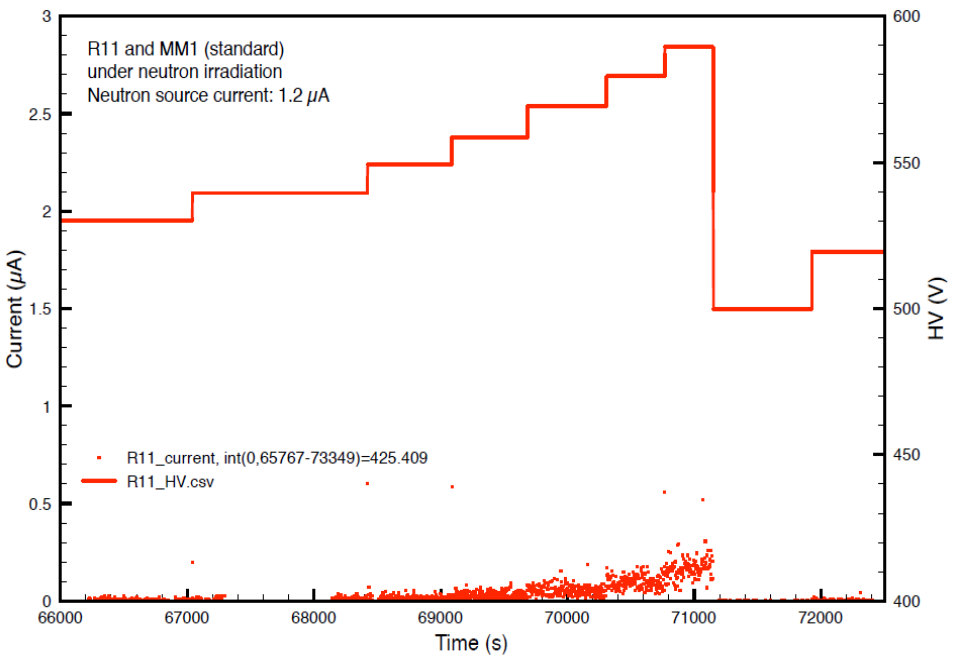
Embedded resistor
15 MOhms 5mm long

R11!



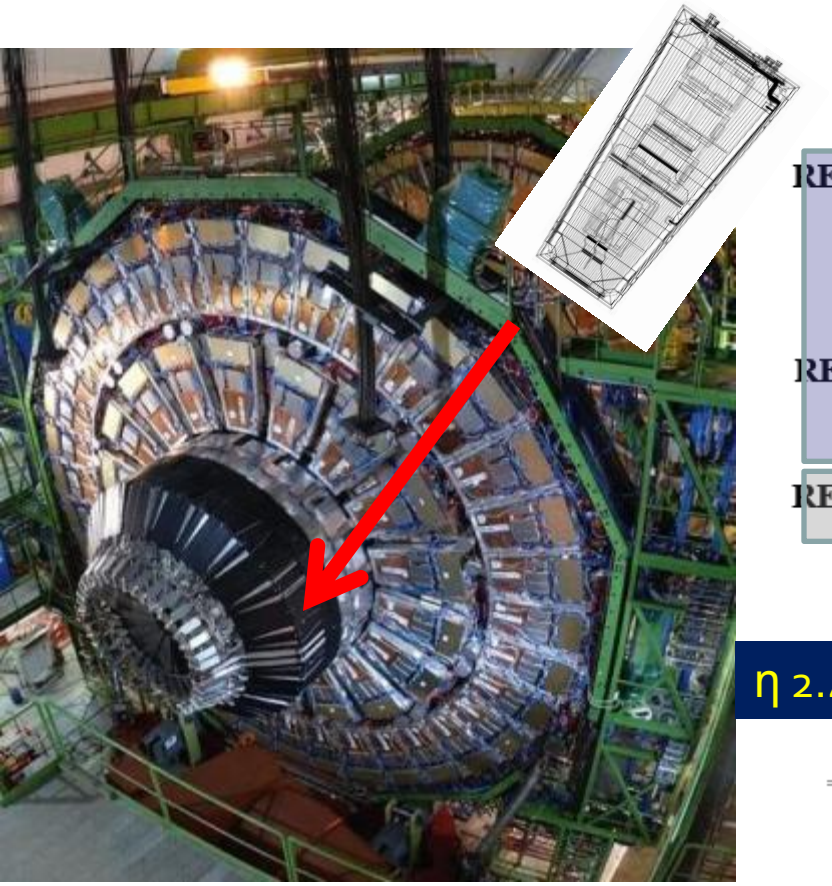


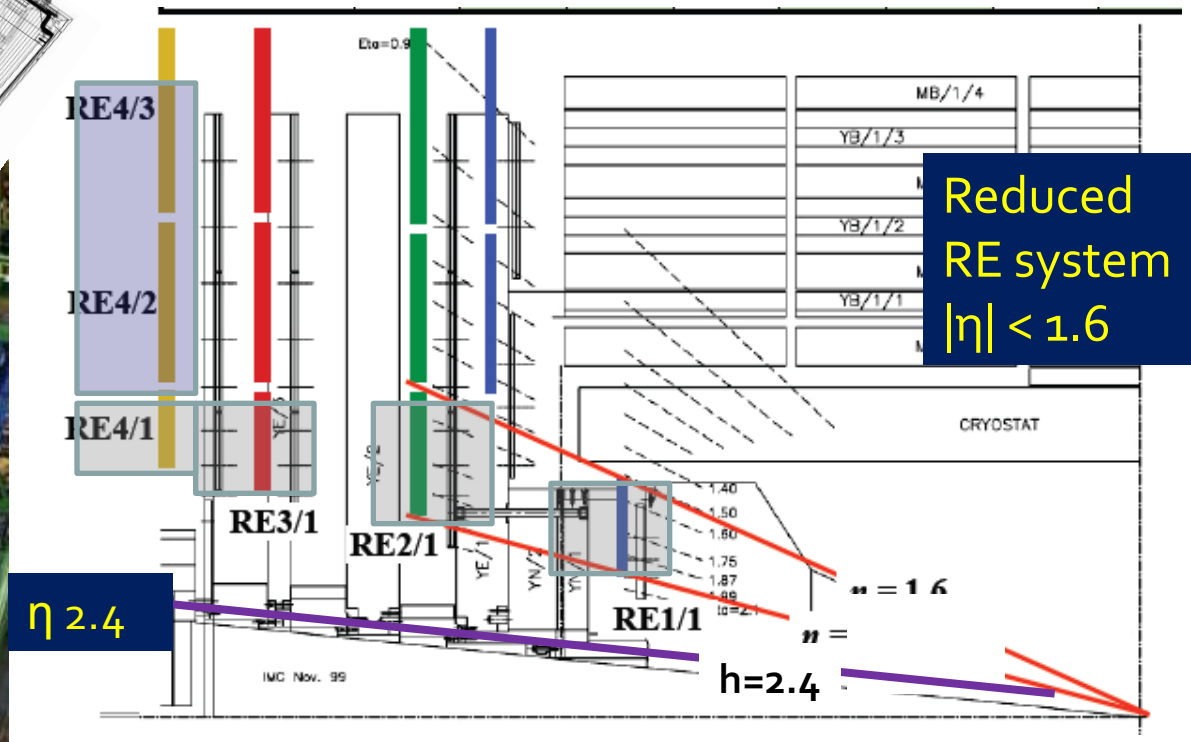




A high eta forward muon trigger and tracking detector for CMS

Archana Sharma



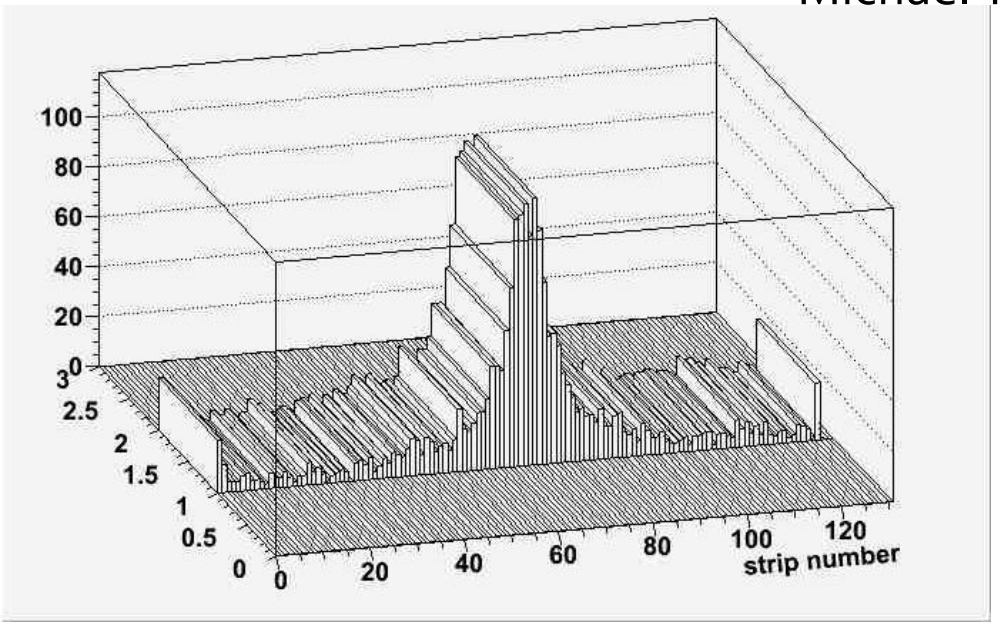


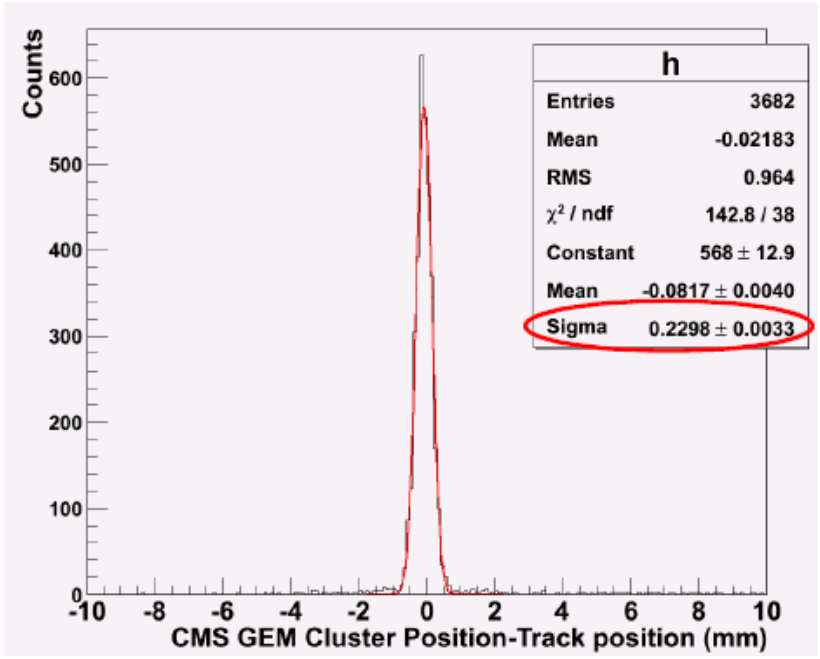
STAGED

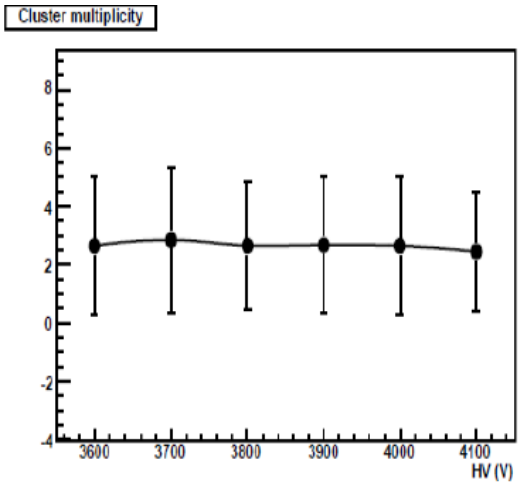
	RE 1/1	RE 1/2	RE 1/3	RE 2/1	RE 2/2	RE 2/3	RE 3/1	RE 3/2	RE 3/3	RE 4/1	RE 4/2	RE 4/3
No. of chambers	36*2	36*2	36*2	18*2	36*2	36*2	18*2	36*2	36*2	18*2	36*2	36*

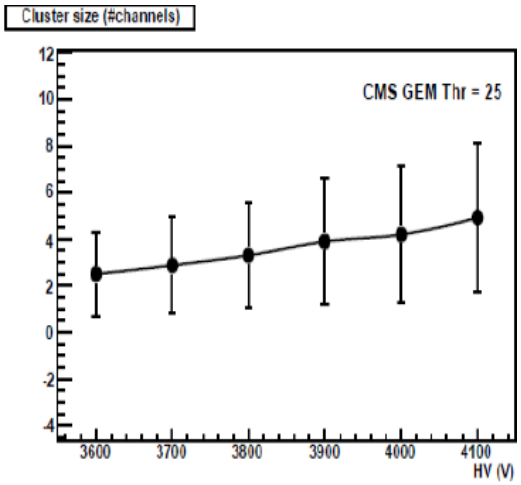
Testbeam 2009 – data analysis

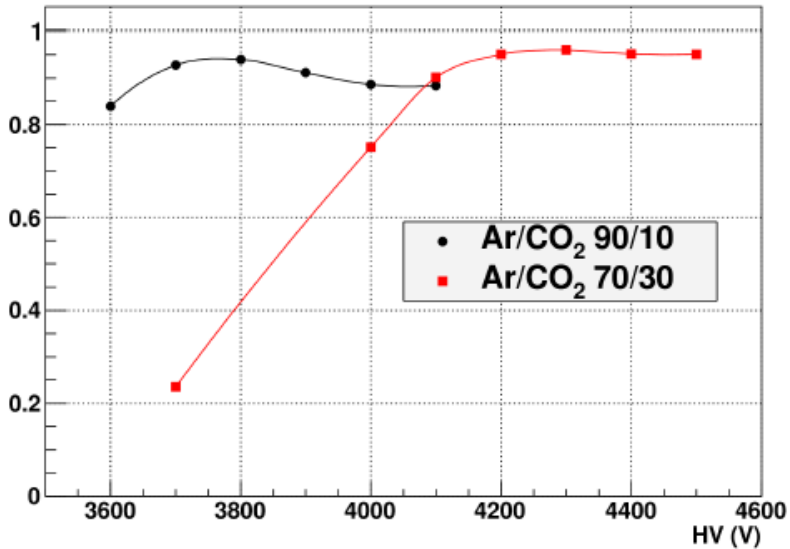
Michael Tytgat



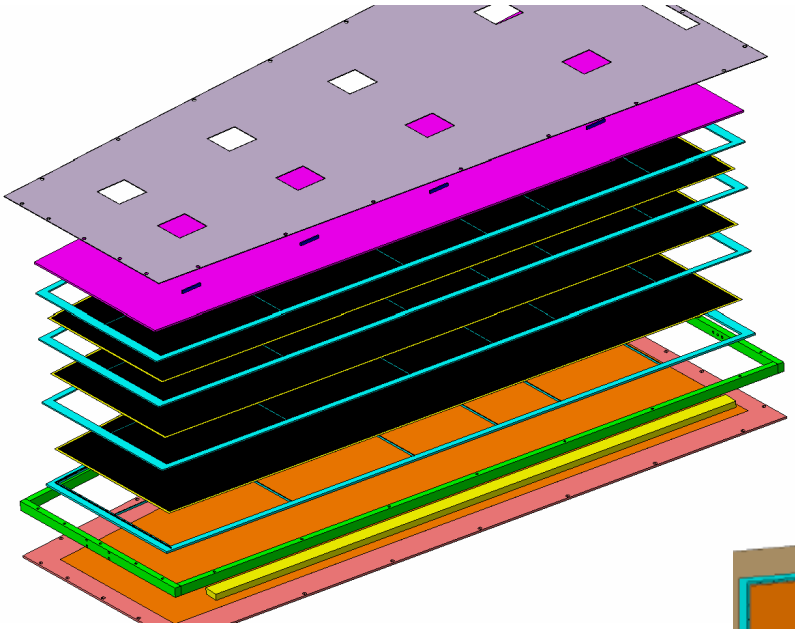


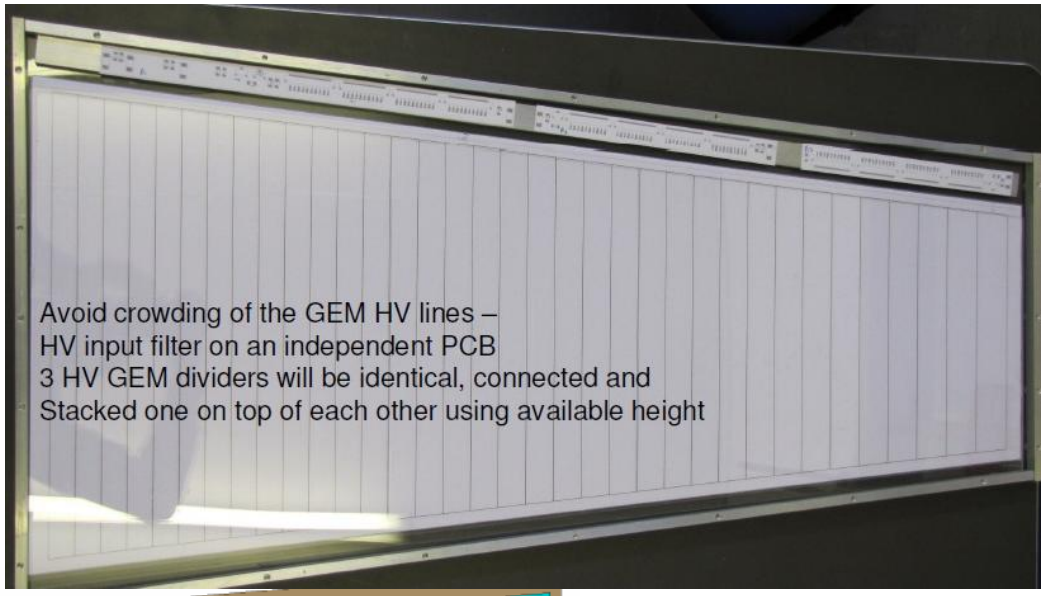


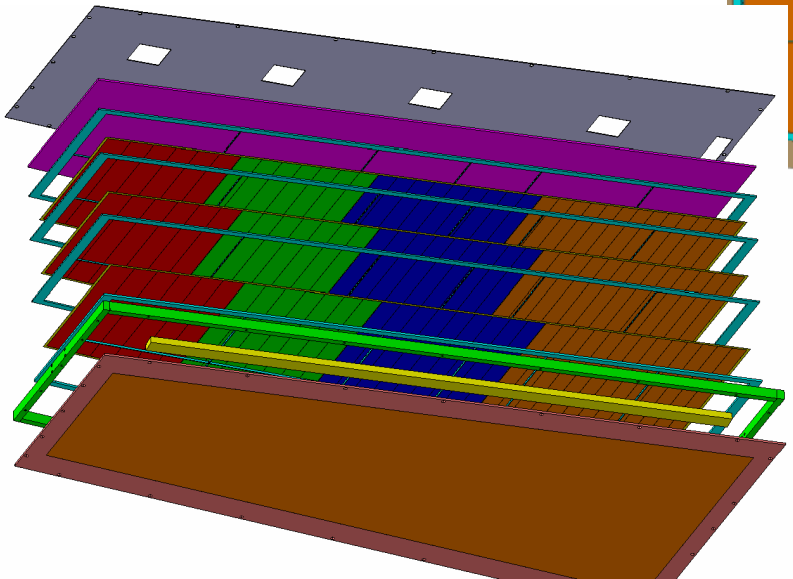


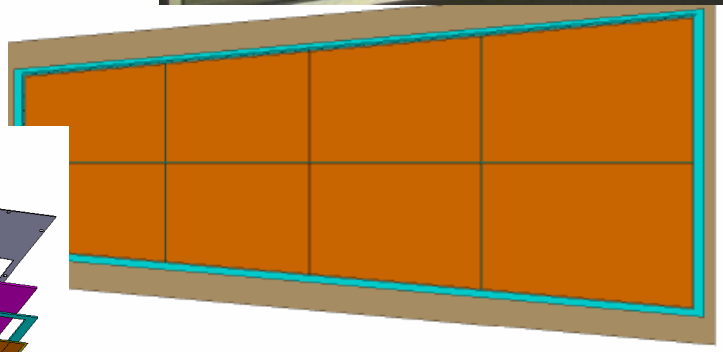


Prototype design

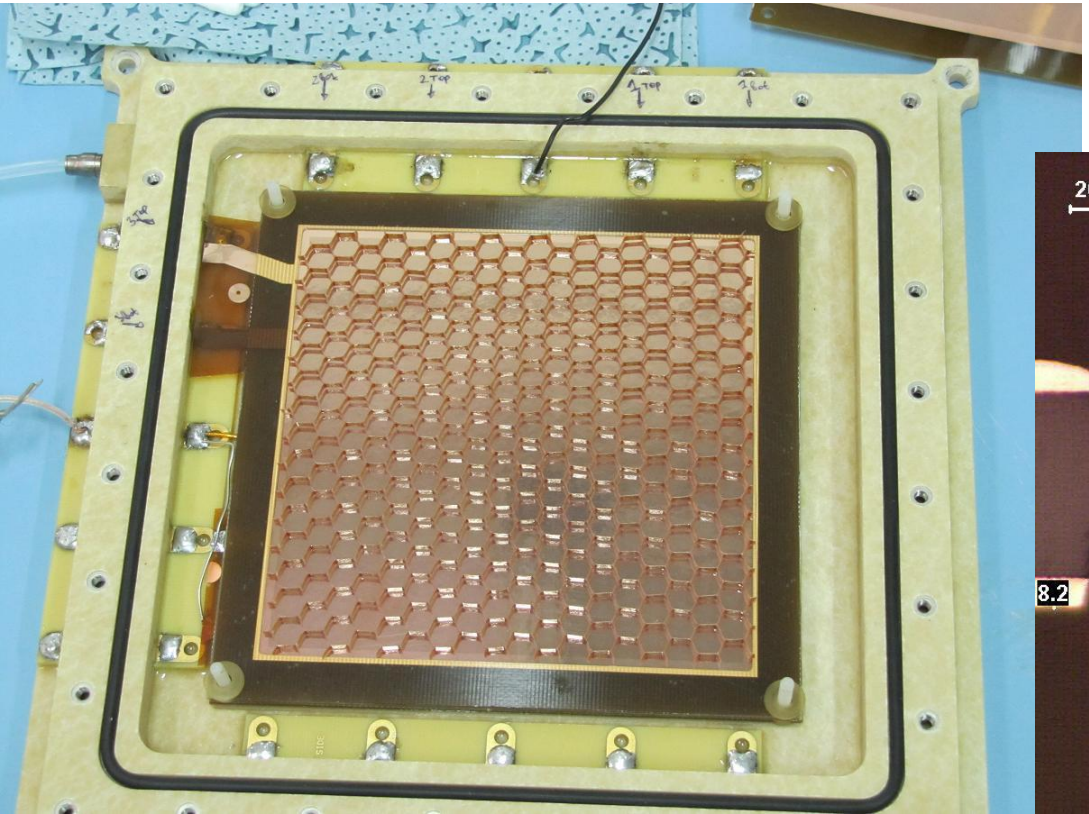


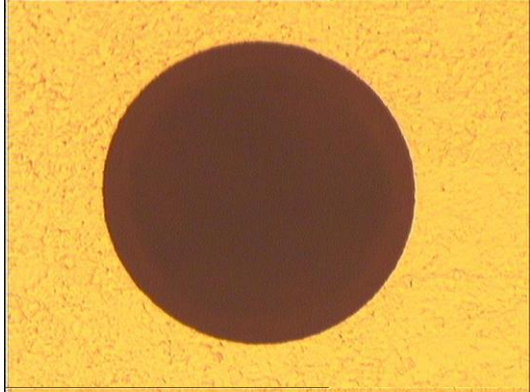


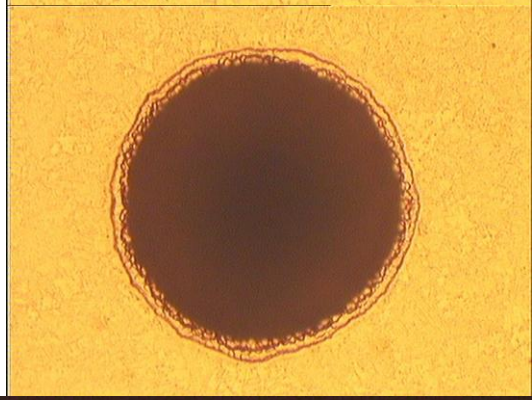


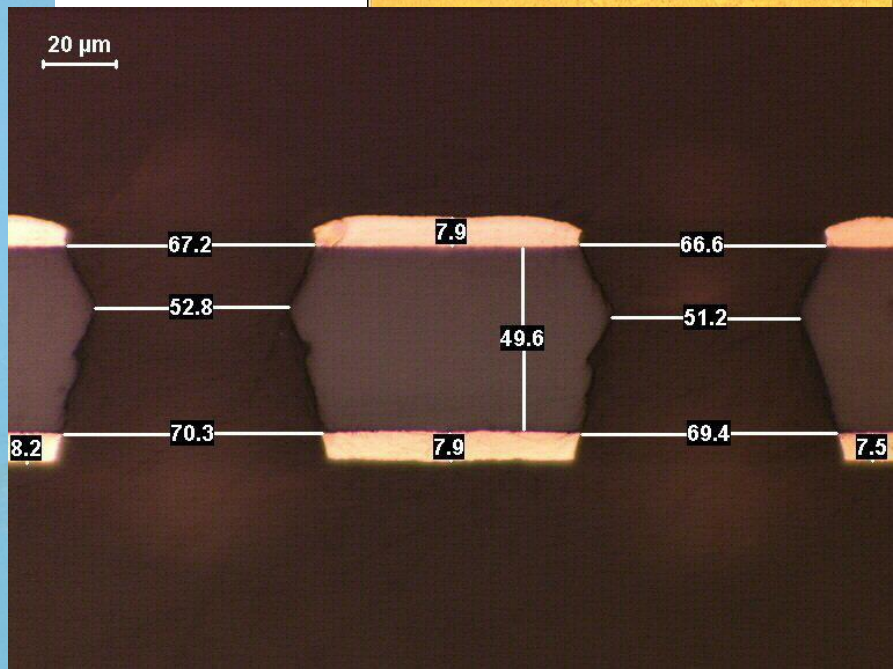


Honeycombs
& Single-mask GEMs



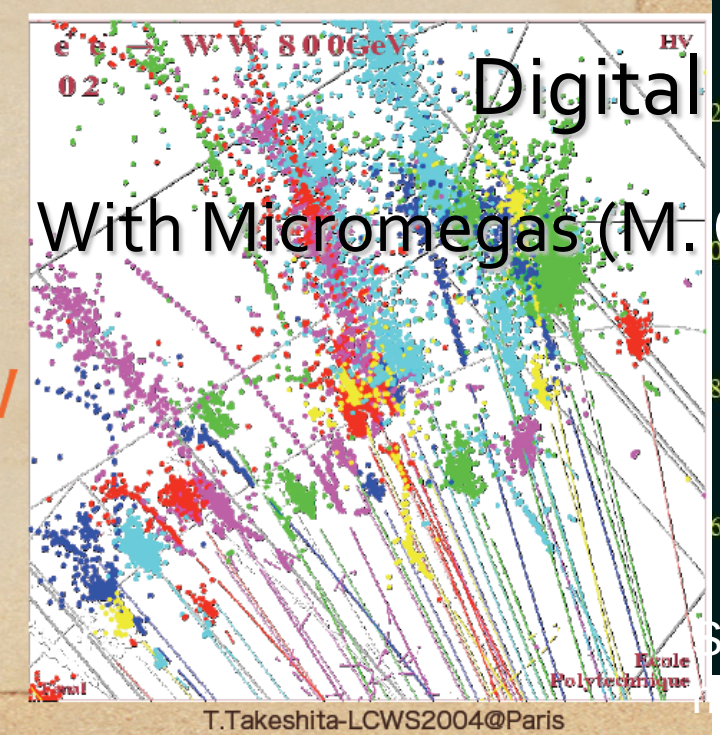


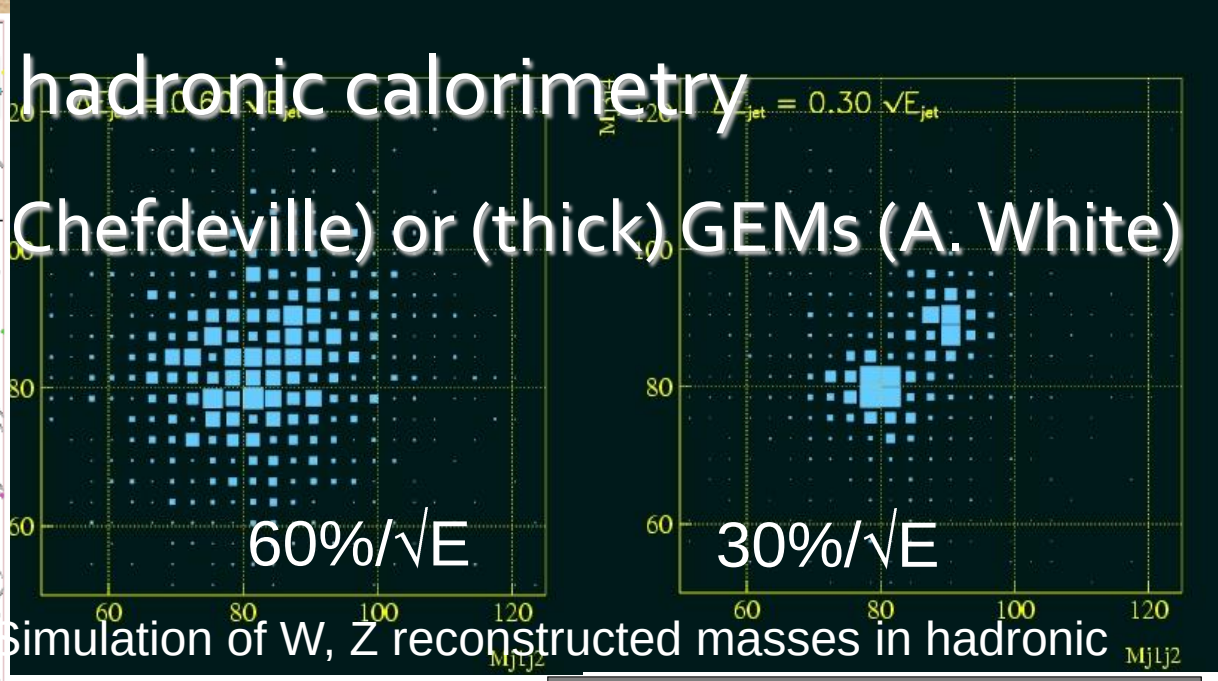




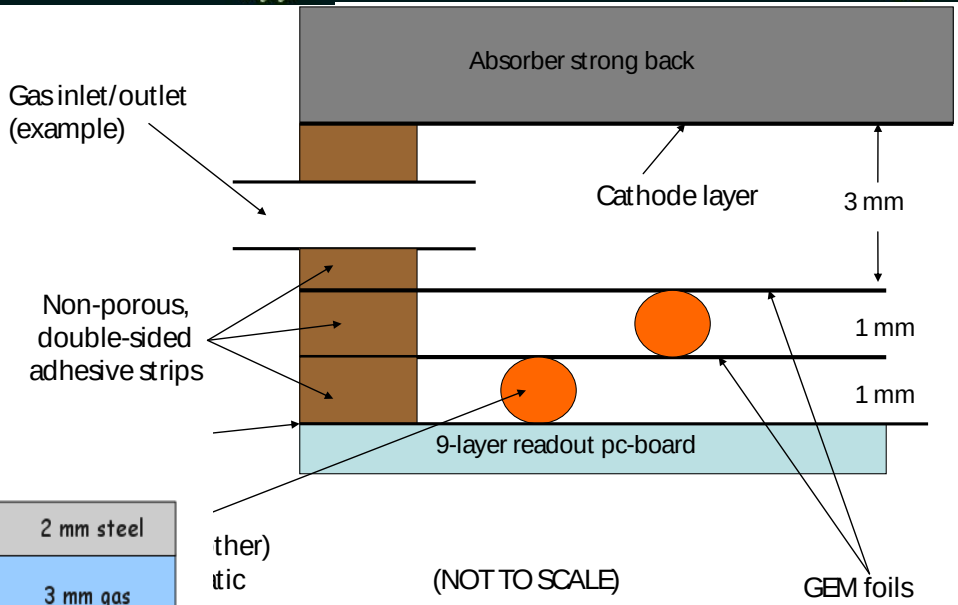
Digital hadronic calorimetry

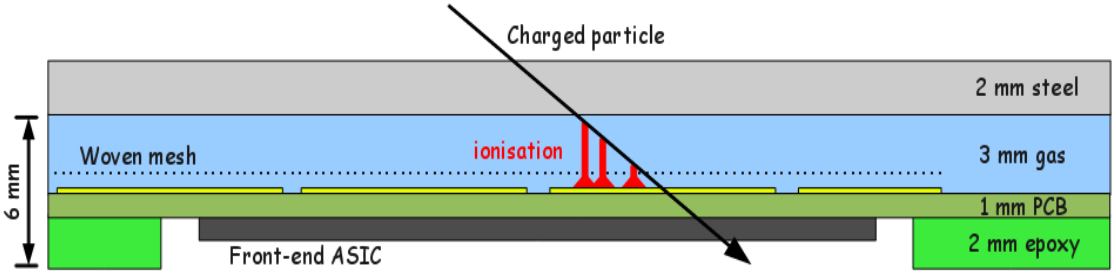
With Micromegas (M. Chefdeville) or (thick) GEMs (A. White)



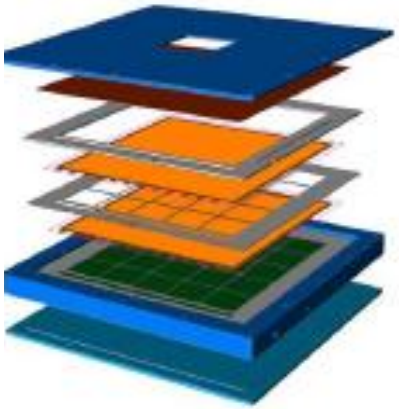


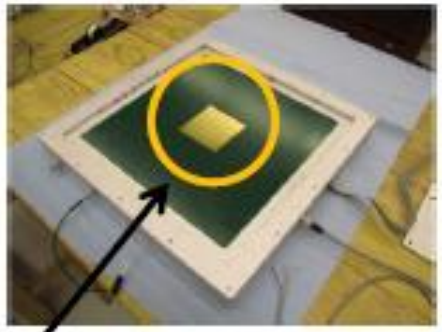
Simulation of W, Z reconstructed masses in hadronic



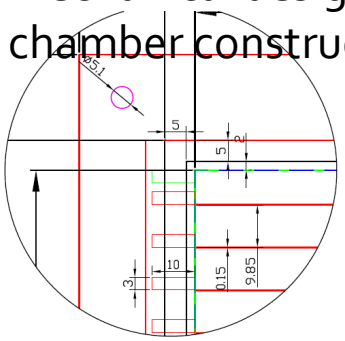


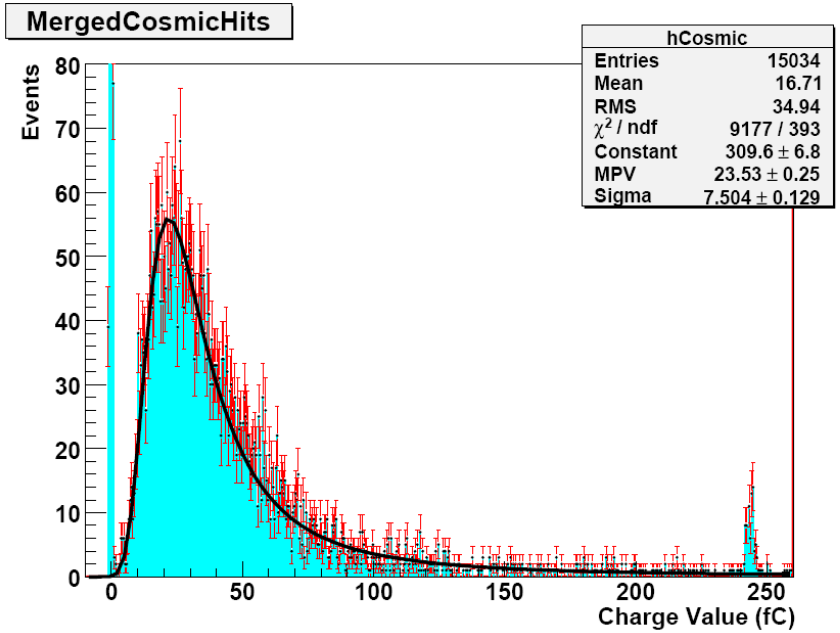
- 30cm x 30cm chamber read out with 64ch KPiX (8 x 8 pads of 1cm x 1cm).
- Few more 30 x 30 chambers made, also to be read out with DCAL electronics
- Completed the design of 30cm x 100cm GEM foil. Construction of first foils has begun.
- Mechanical design considerations for large chamber construction in progress.



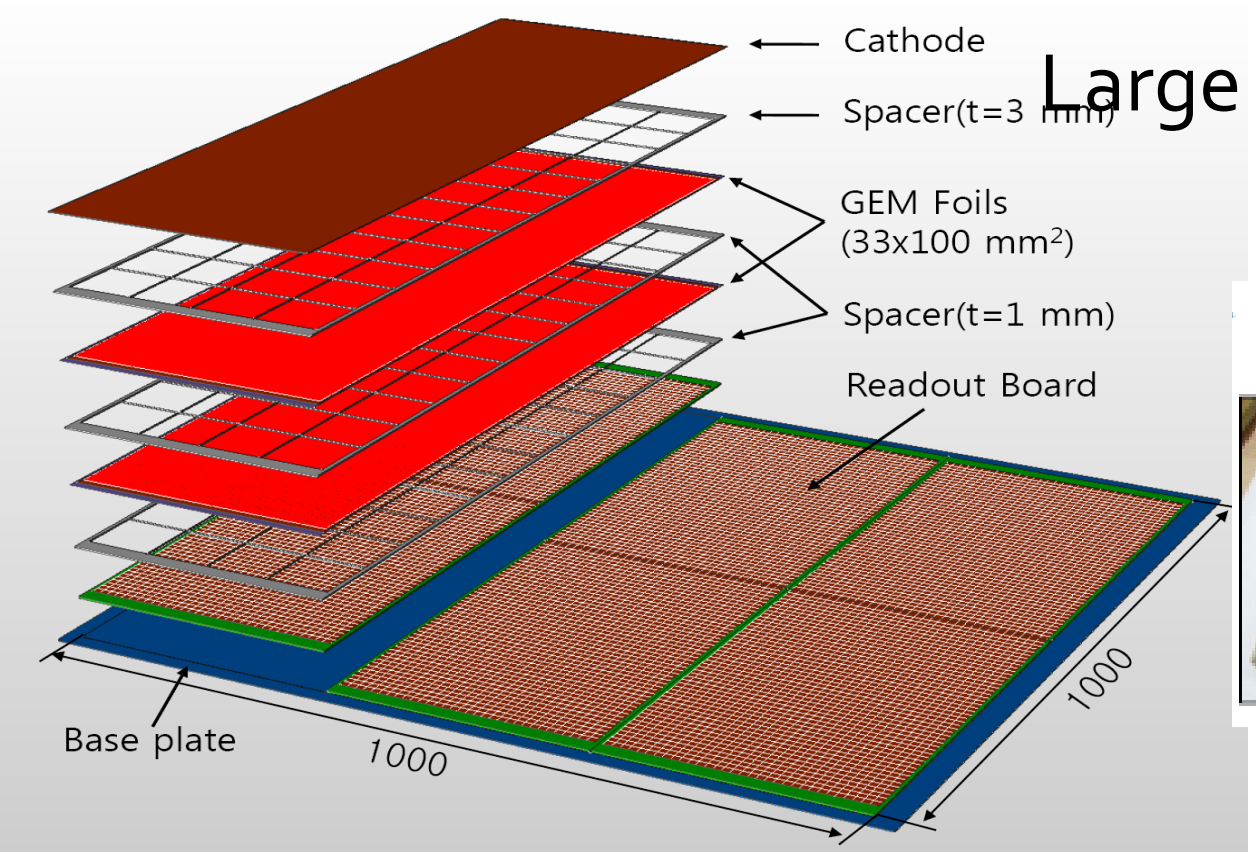


64-readout pads

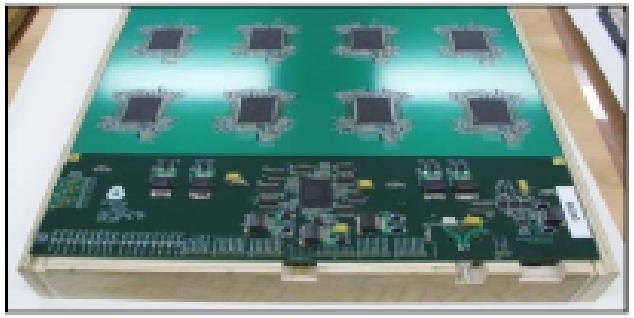




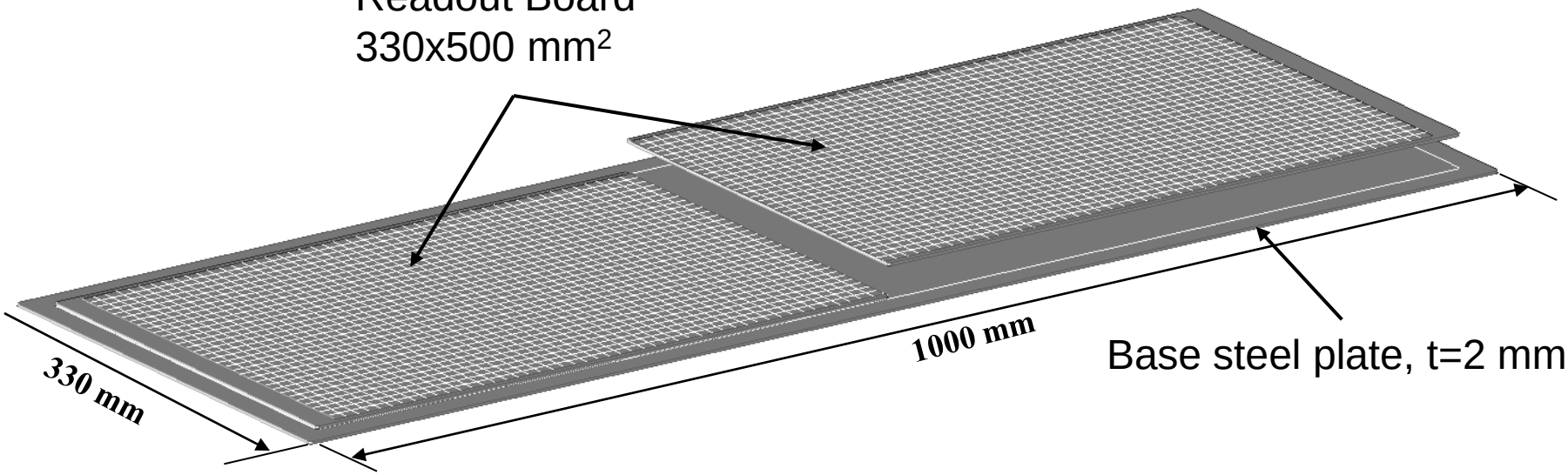
Large prototype design



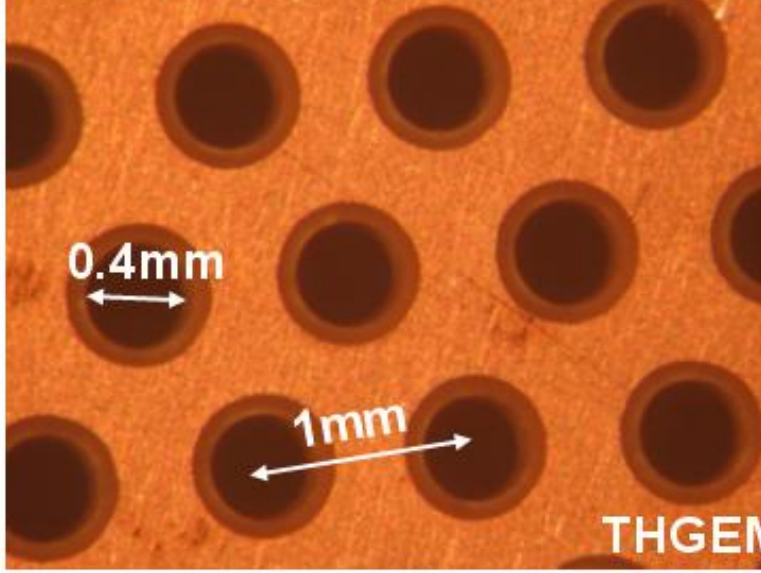
ANL DCAL board



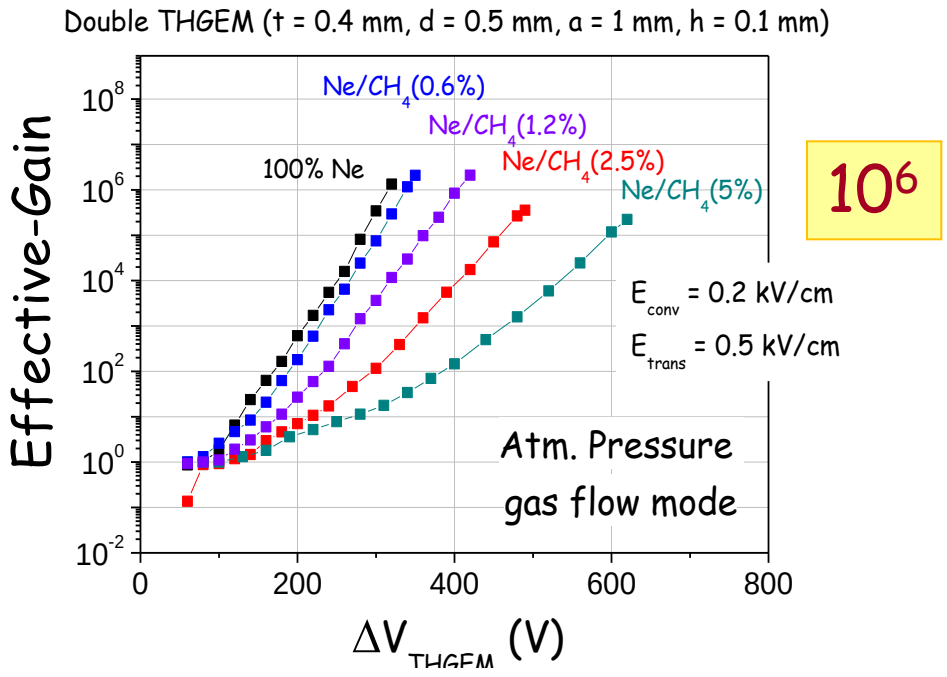
Readout Board
330x500 mm²



Thick GEMs for DHCal

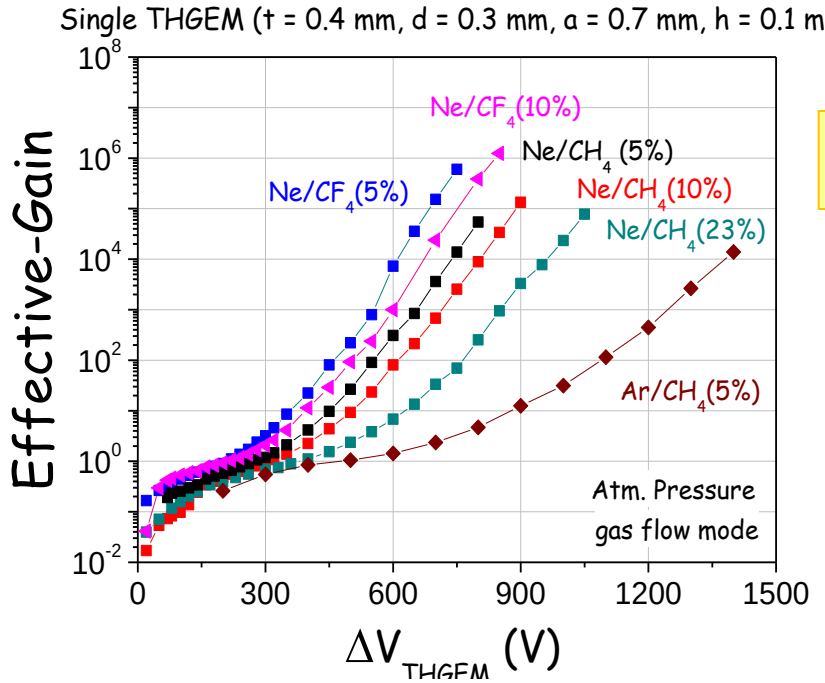


Double-THGEM
9 keV X-rays



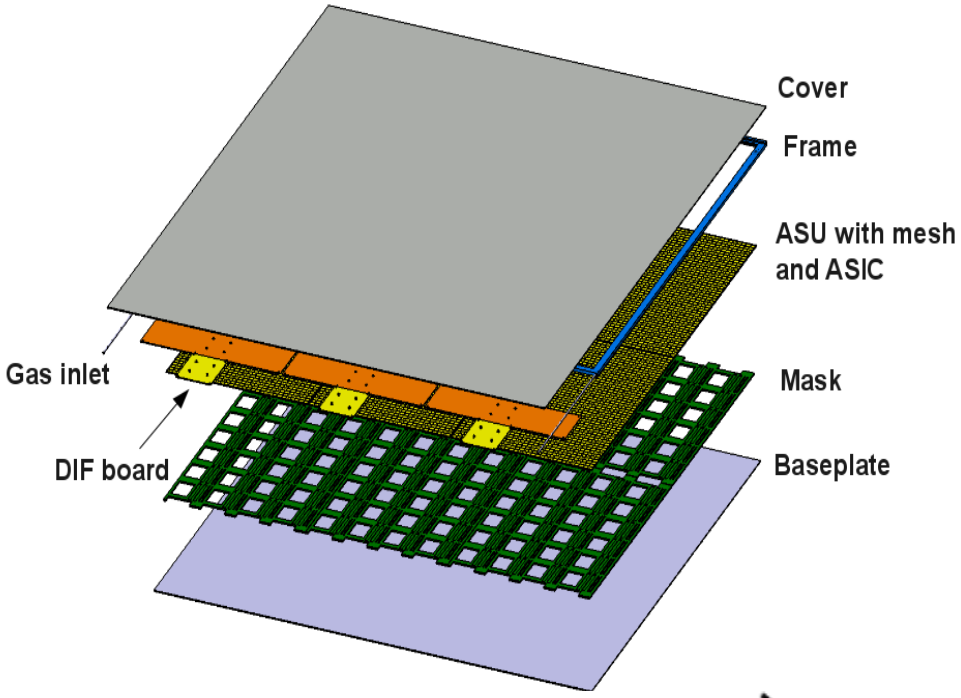
10^6

Single-THGEM
CsI PC + UV-light (180 nm)



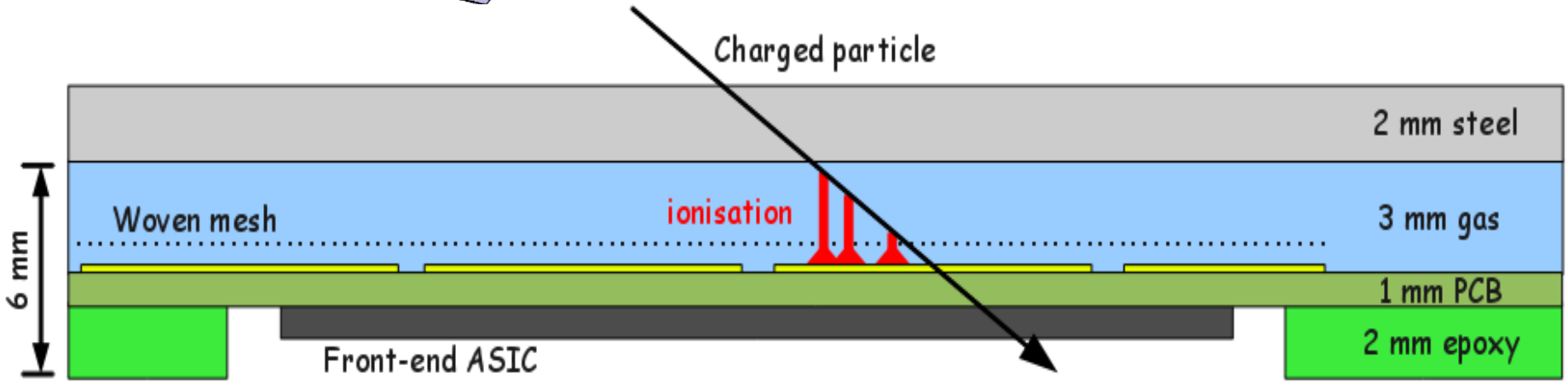
10^6

Micromegas for DHCal

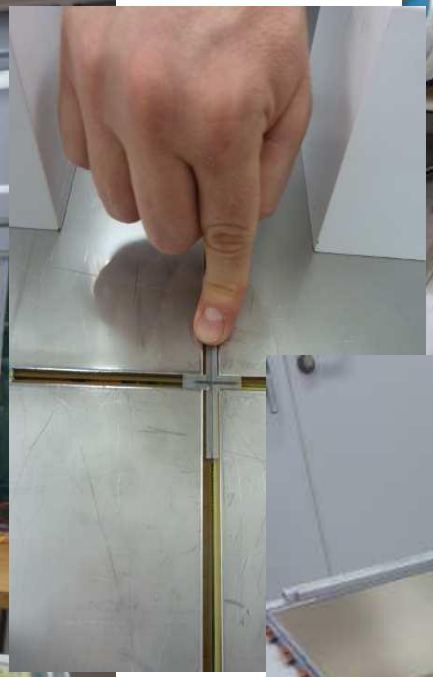


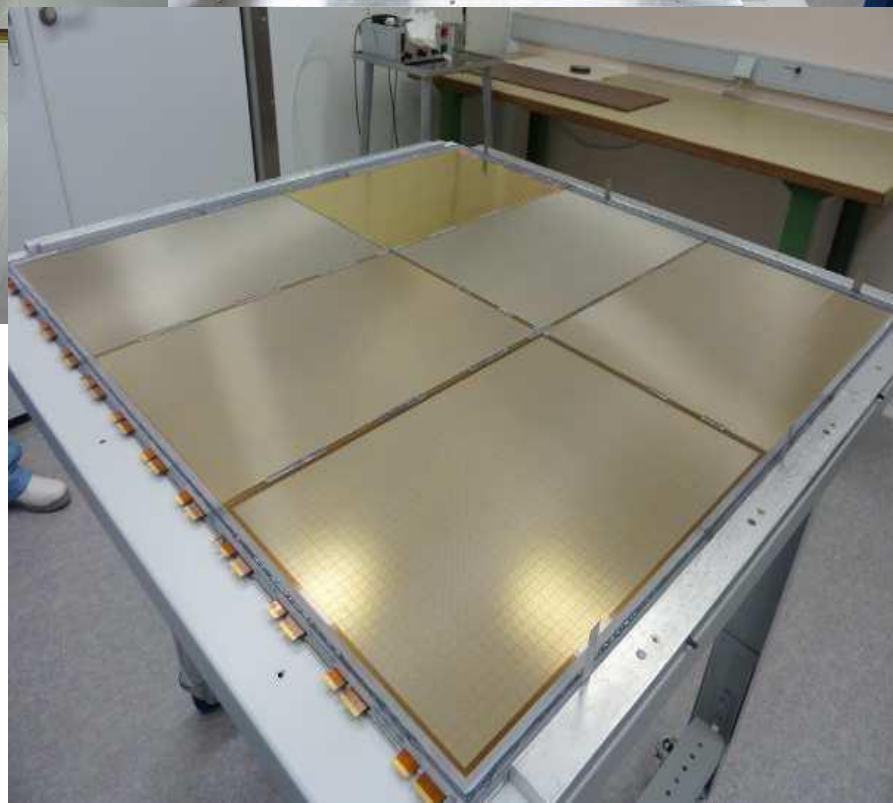
Towards the m²

- 6 Active Sensor Units (ASU) of 32×48 cm2
- 24 ASIC (HARDROC2) with 64 channels (per ASU)
- 12 mm thick including 4 mm stainless steel (covers)
- Assembly procedure validated with mechanical prototype



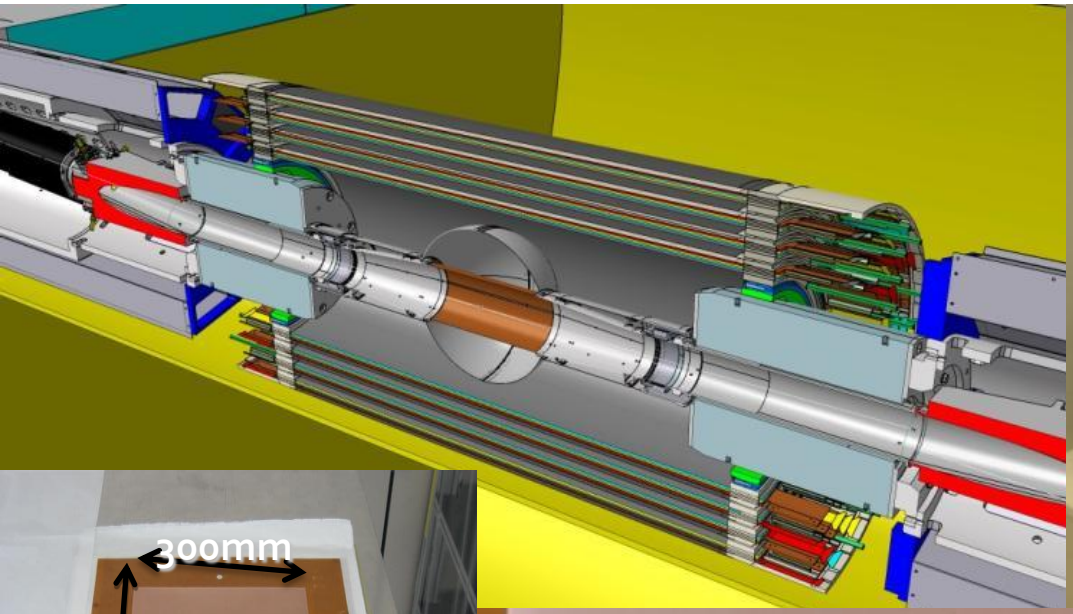
1m² prototype construction

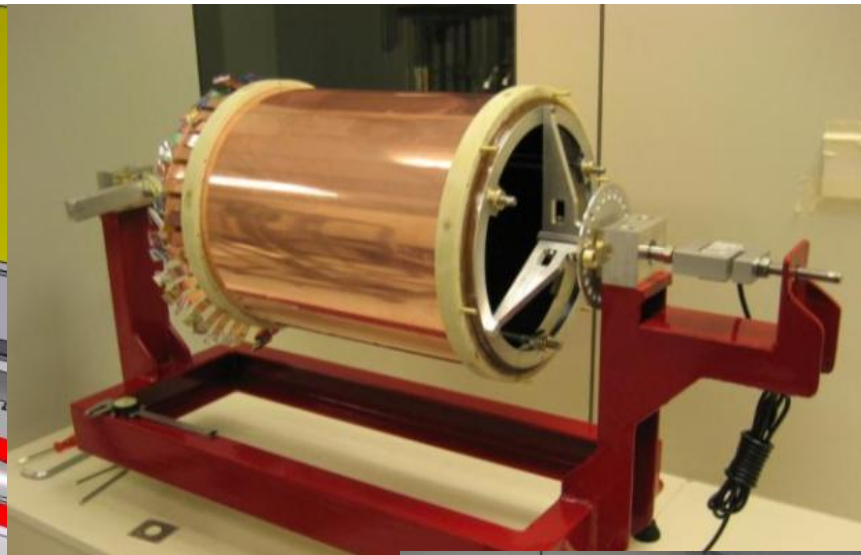


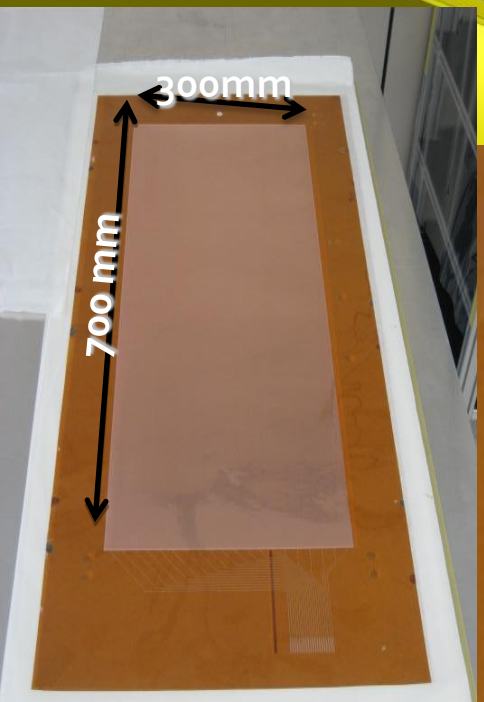


Large area GEMs for KLOE2

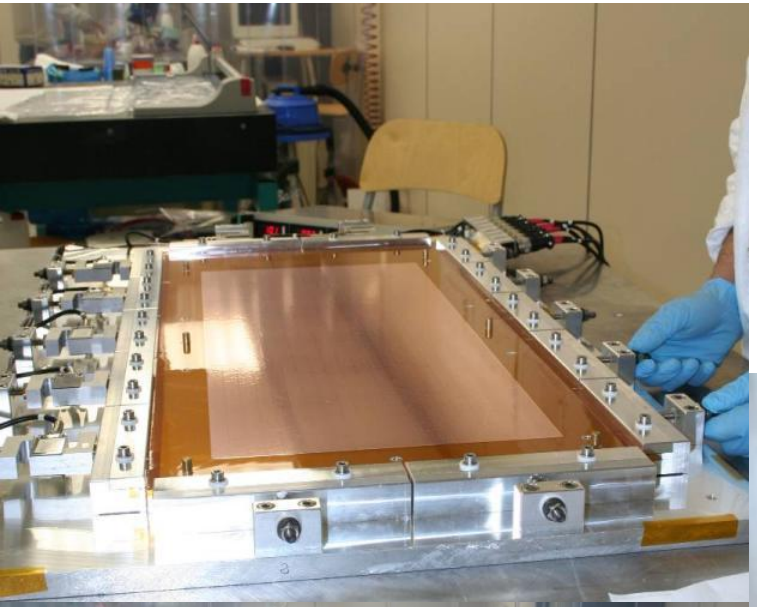
Danilo Domenici

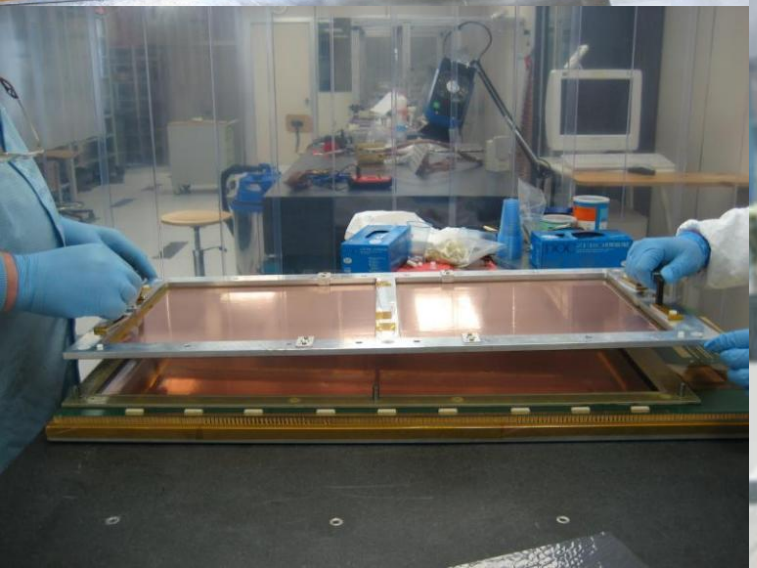


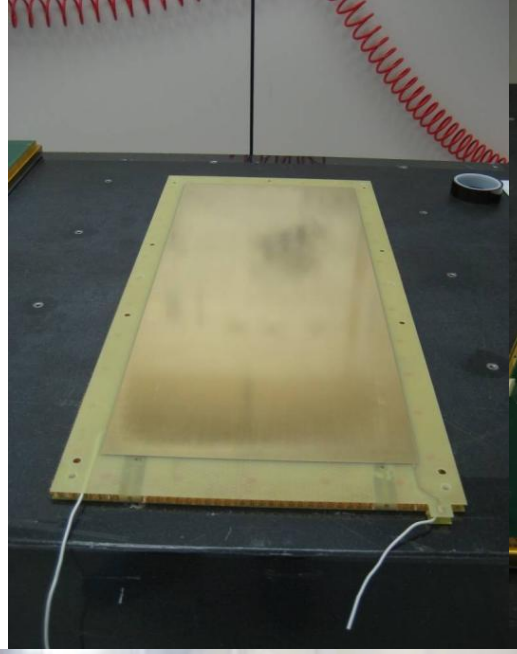




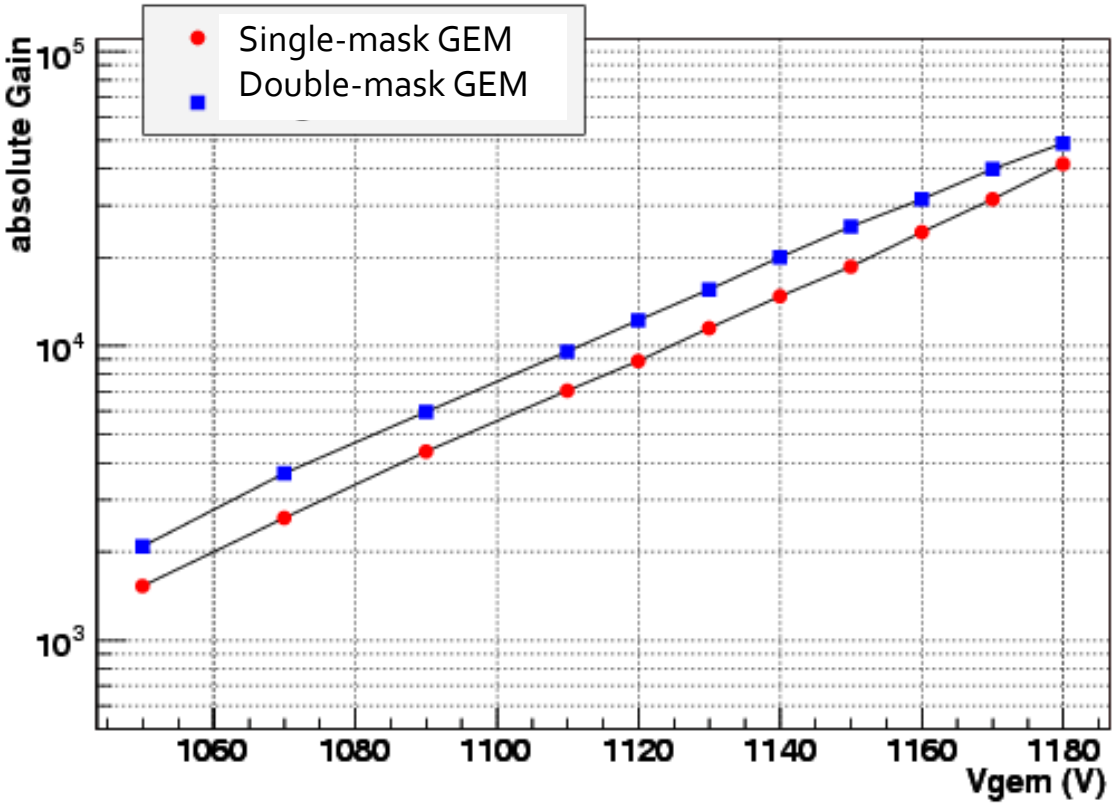
Prototype construction

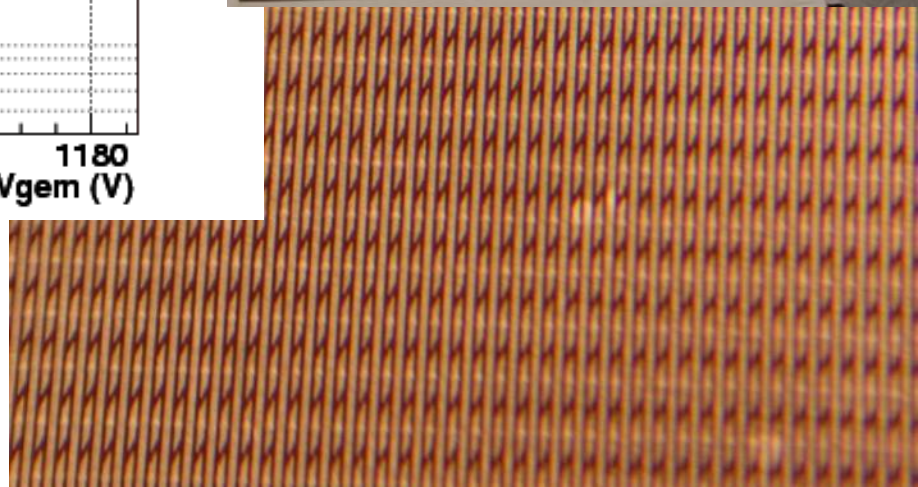






First tests and another proto



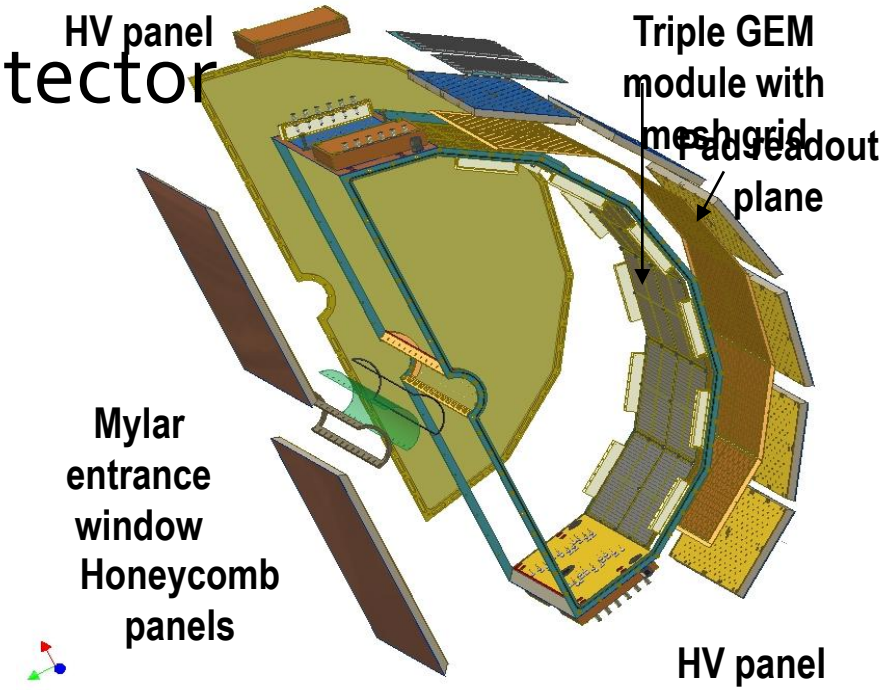


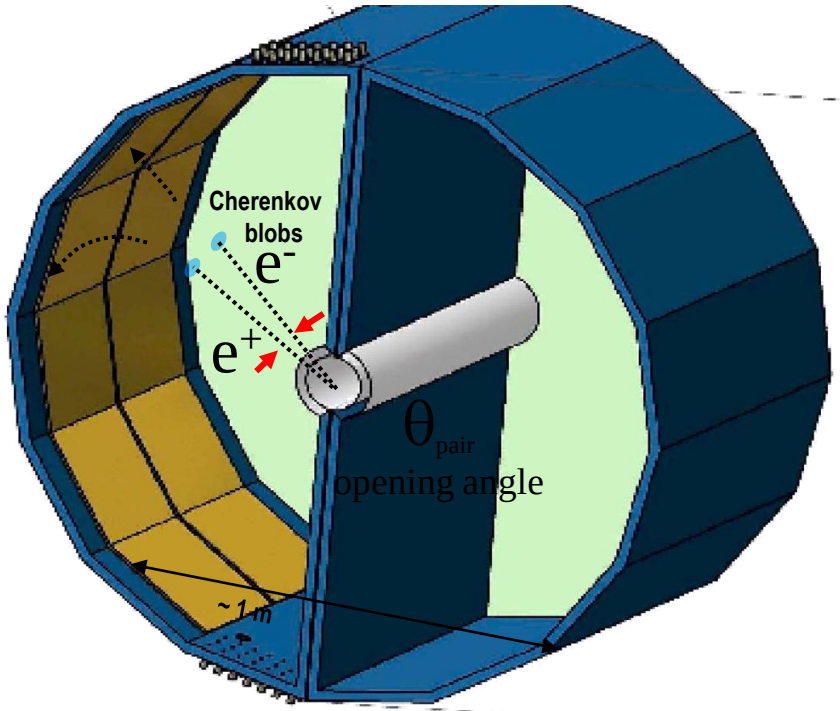
Same size, different readout board

The PHENIX hadron blind detector

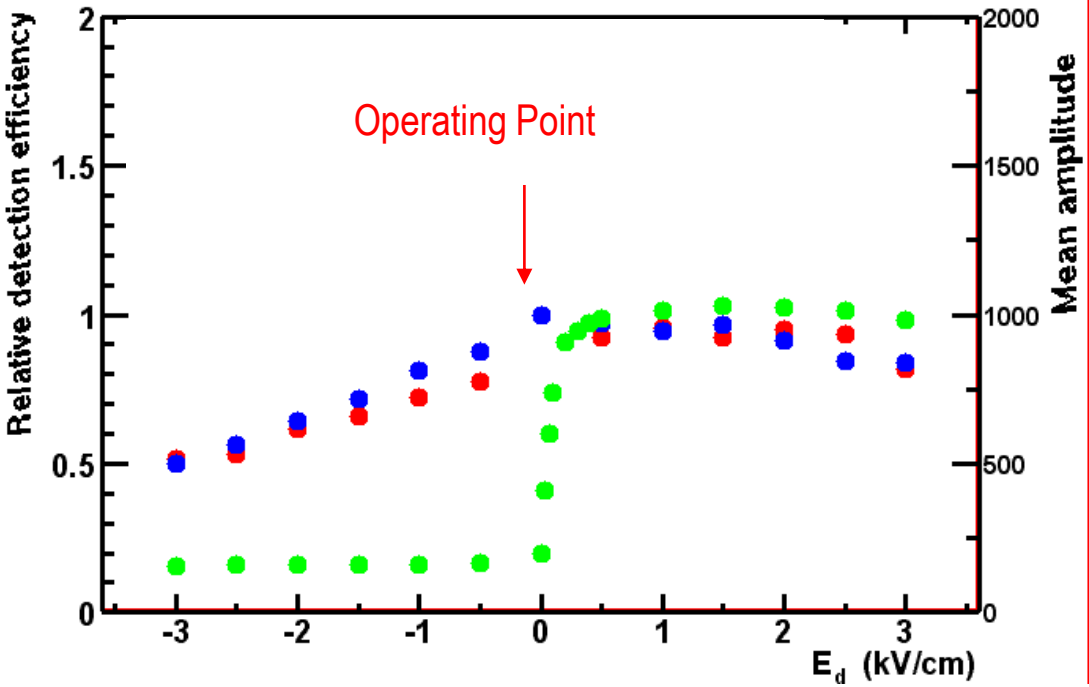
Craig Woody

- Triple GEMs made by Tech-Etch
- CsI covered top electrode for detection of Cherenkov photons
- Cherenkov radiator is also multiplication gas (CF_4)
- Reversed drift field makes it insensitive to primary clusters ('hadron blind')

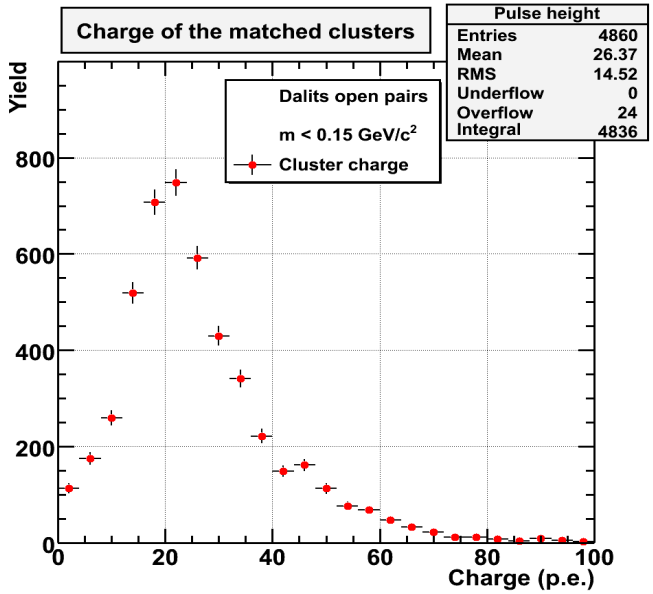




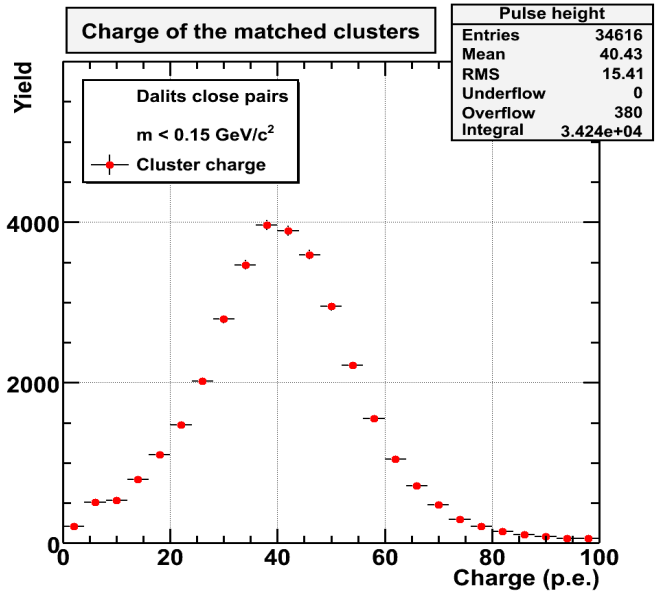
Performance



Single electron



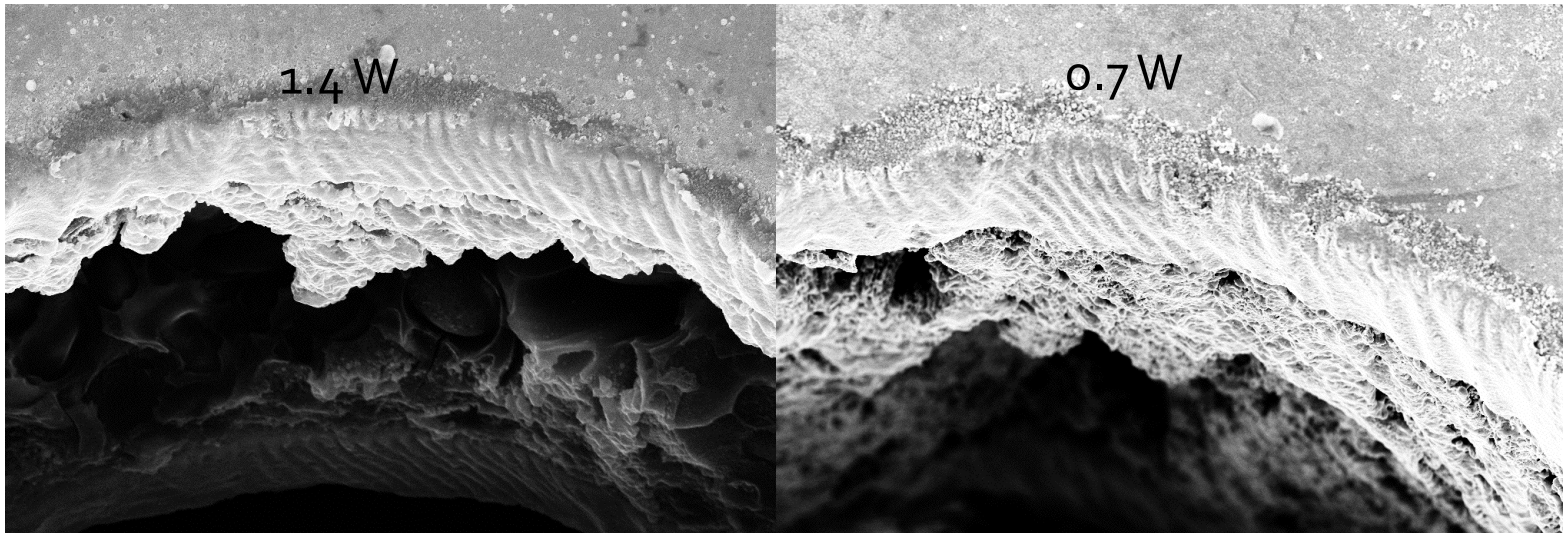
Double electron



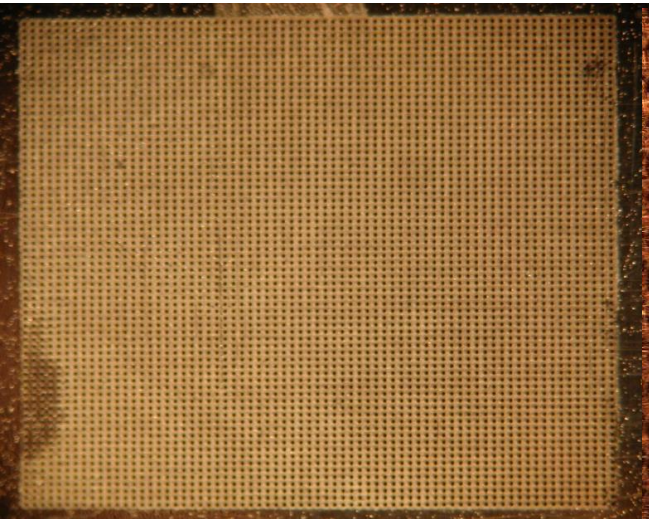
2009-07-14

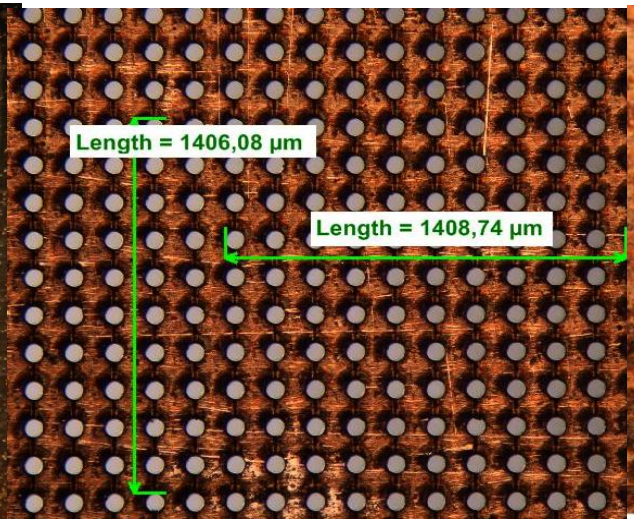
GEMs made by laser micromachining

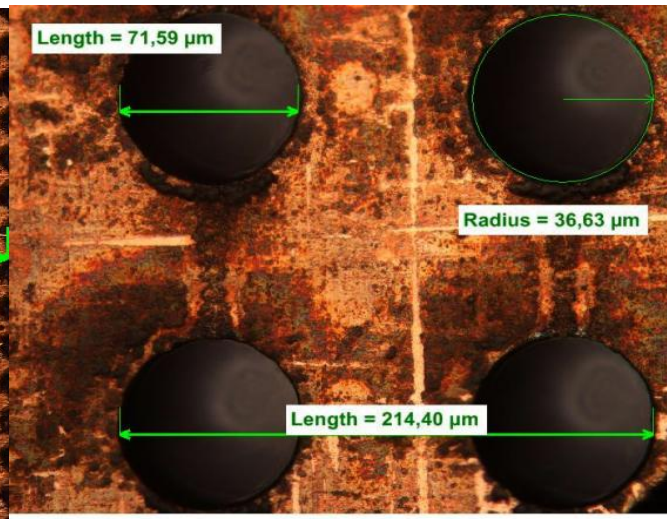
Vincenzo Berardi

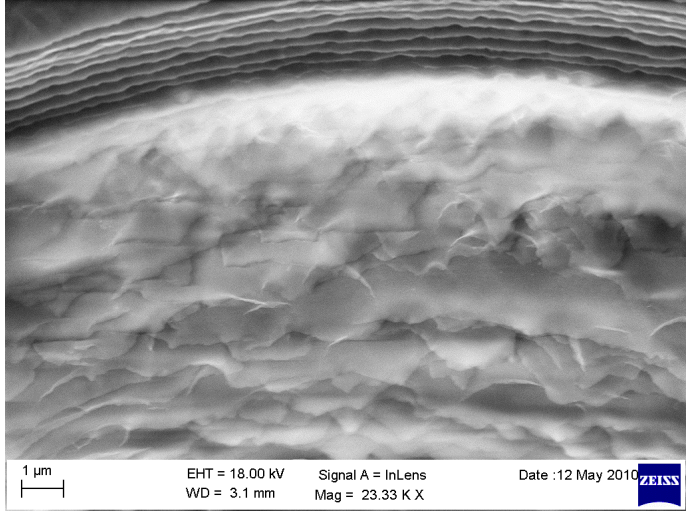


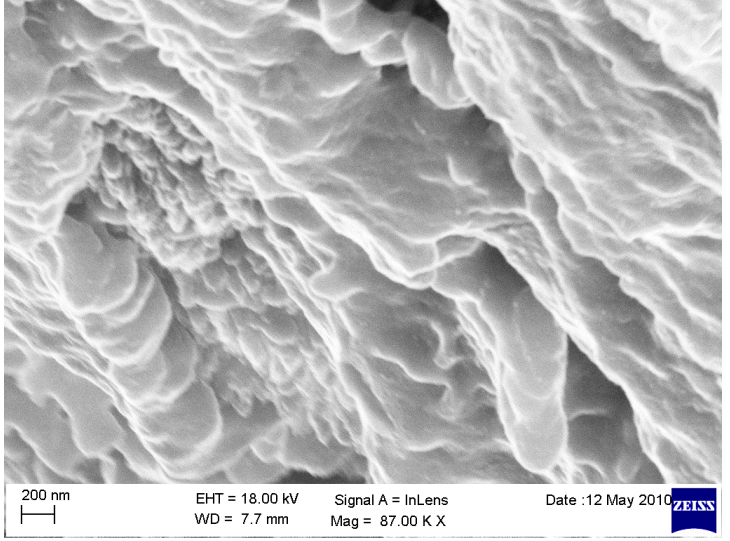
Various techniques exist, mechanical trepanning appears most controlled.
100 ps pulses at 100 kHz frequency.



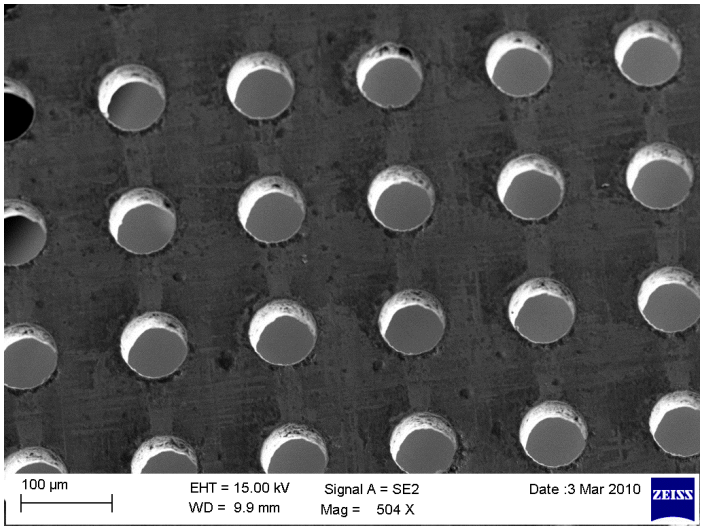


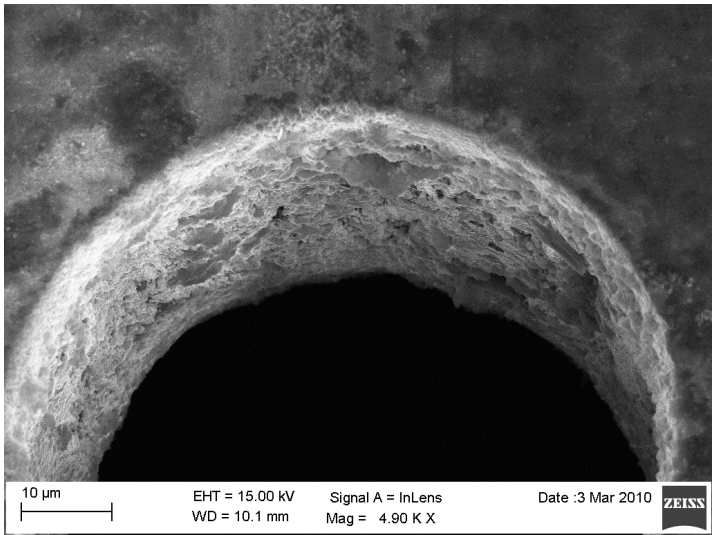






- Leakage currents high, chemical cleaning needed
- GEM performance not yet verified
- Other geometries like deeper or fine-pitch holes possible
- Other materials (than polyimide) could open the way to ceramic, UHV clean, GEMs.

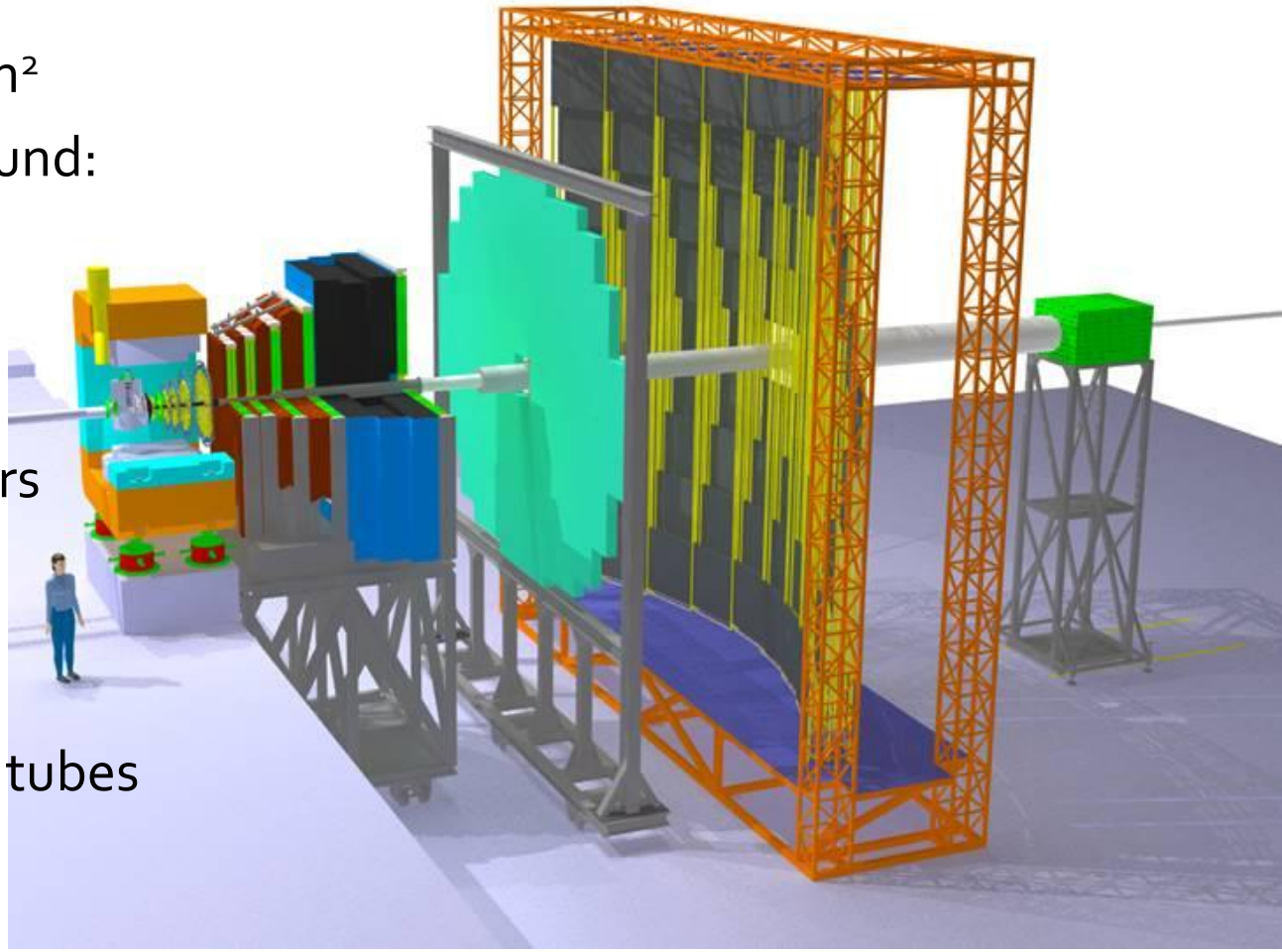




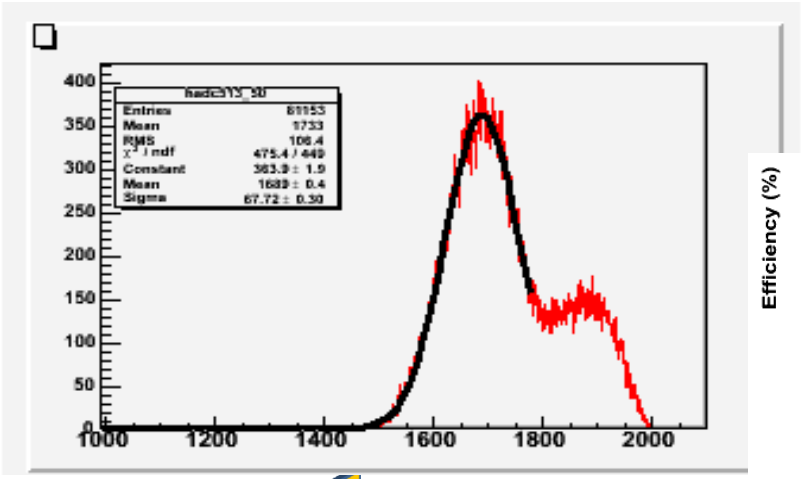
The CBM project for FAIR

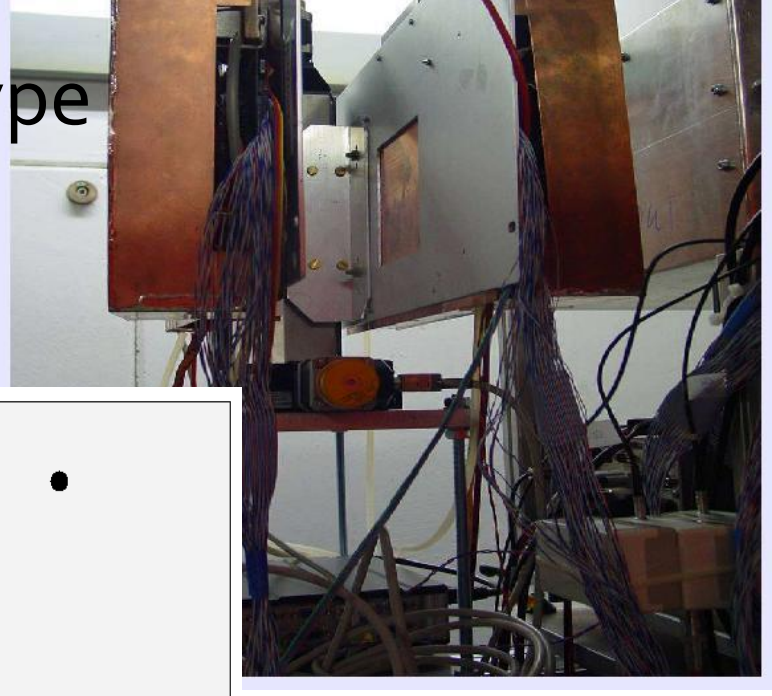
Anand Dubey, presented by *Hans Rudolf Schmidt*

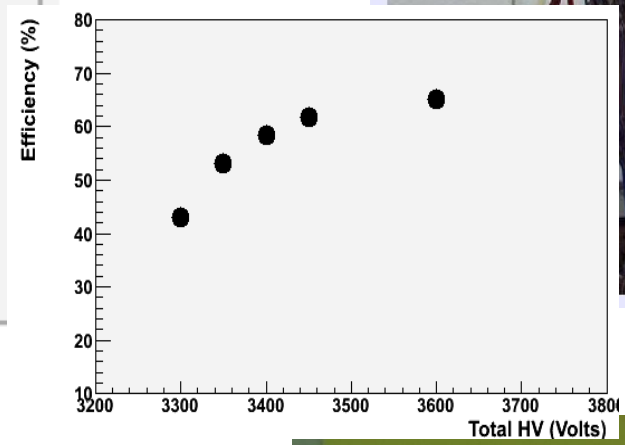
- CBM muon chambers
- High rate: 100 kHz/mm^2
- High neutron background: 100 kHz/mm^2
- 30cm x 30cm area
- Resolution: ~.5mm
- 6 stations of 3 detectors each
- GEMs, thick GEMs, Micromegas/GEM combination, or straw tubes are considered

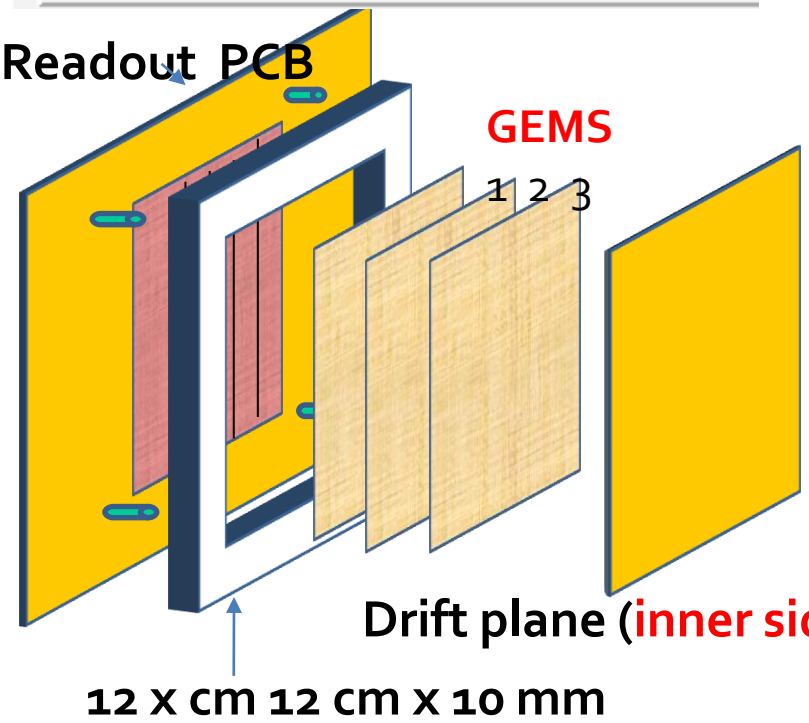


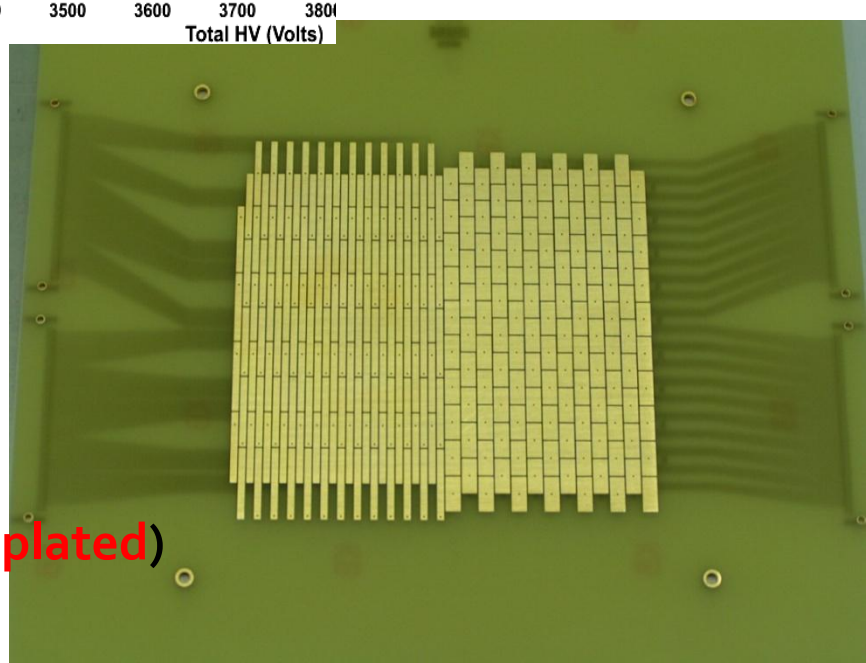
First 10cm x 10cm GEM prototype



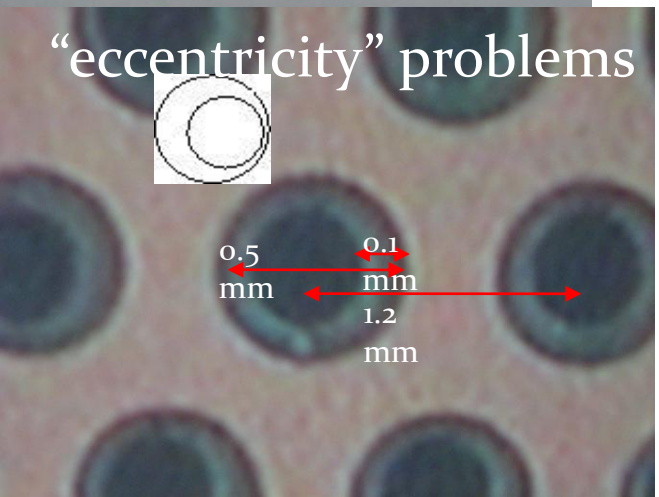


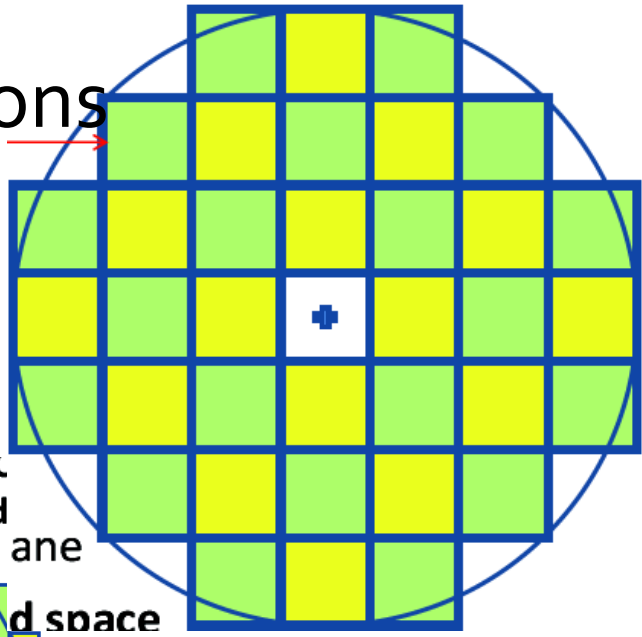


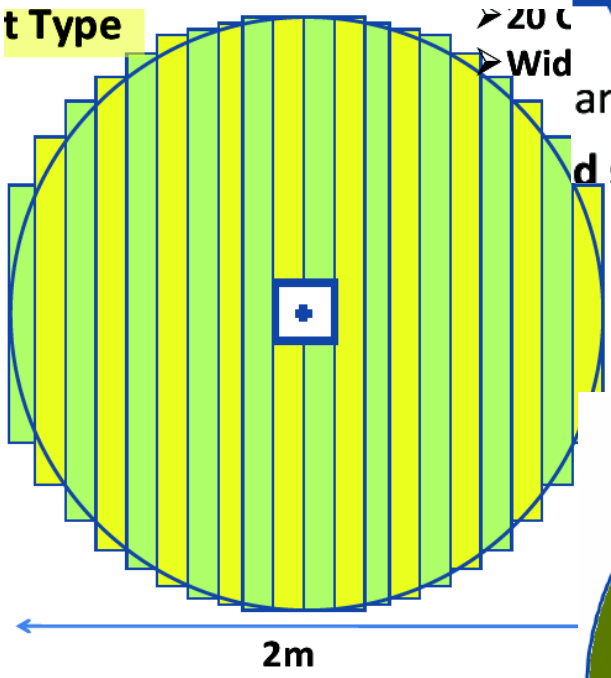


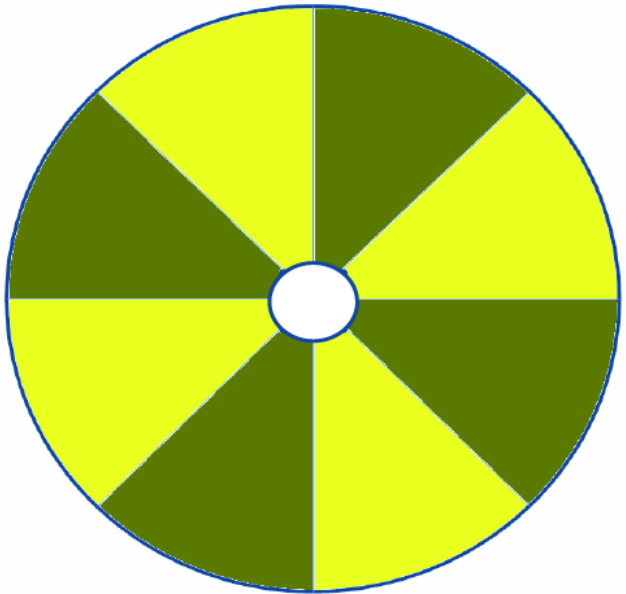


Thick GEMs, layout of detector stations









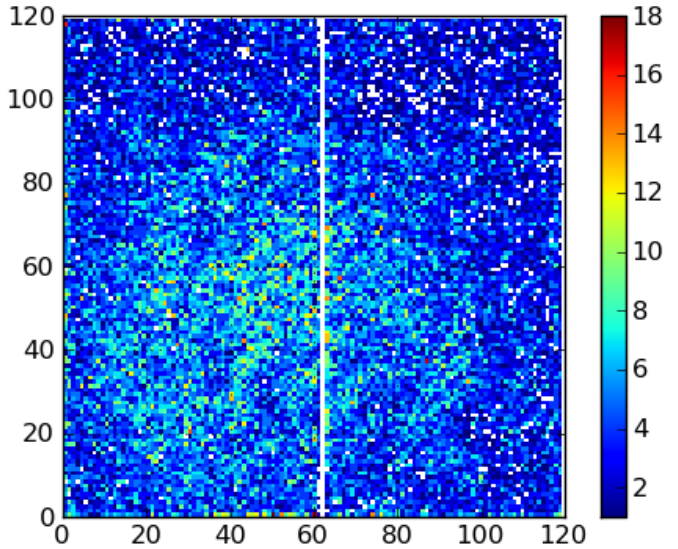
Development of MPGDs with resistive foils

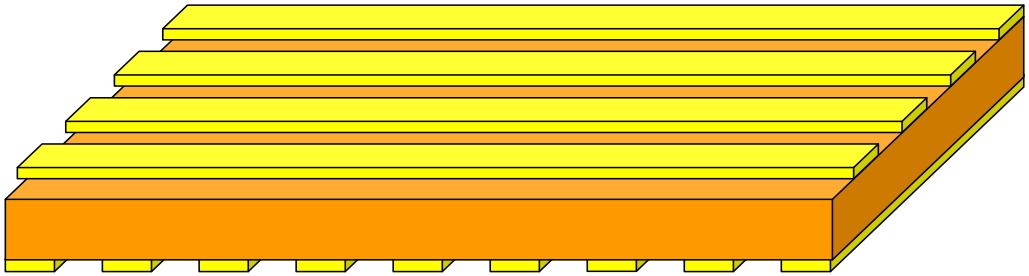
Atsuhiko Ochi

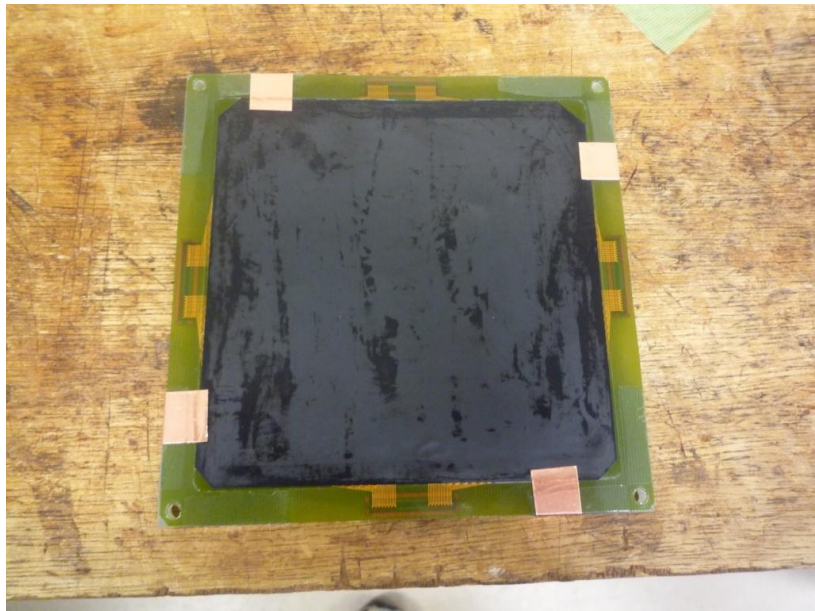
DuPont carbonloaded Kapton used for

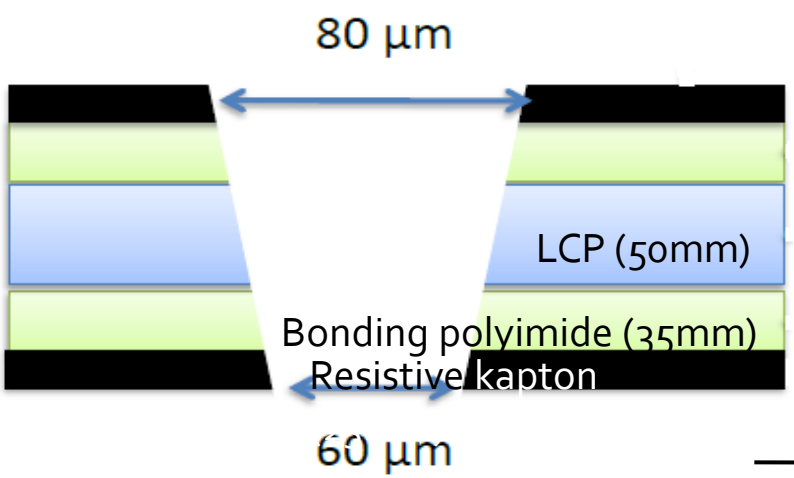
- GEM readout with resistive foil
- GEM with resistive foil electrodes
- μ-PIC with resistive foil to protect cathodes

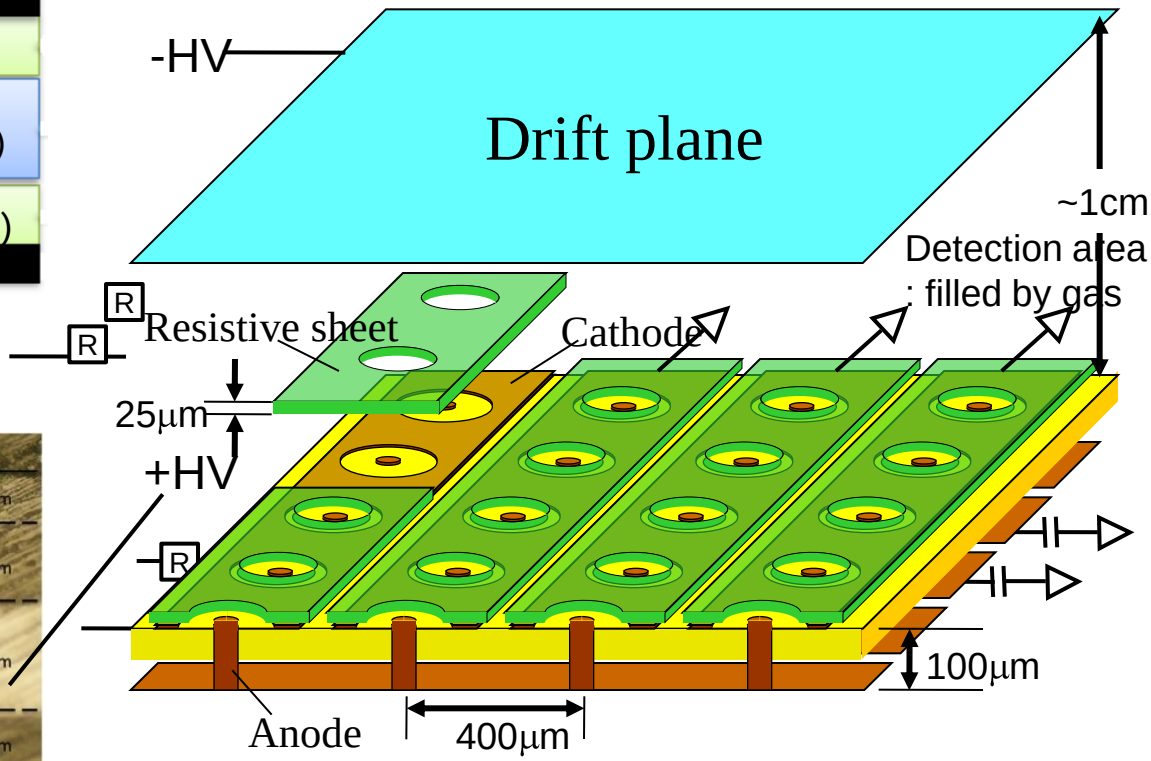
These films have better uniformity than most sprays, inks and pastes on the market.

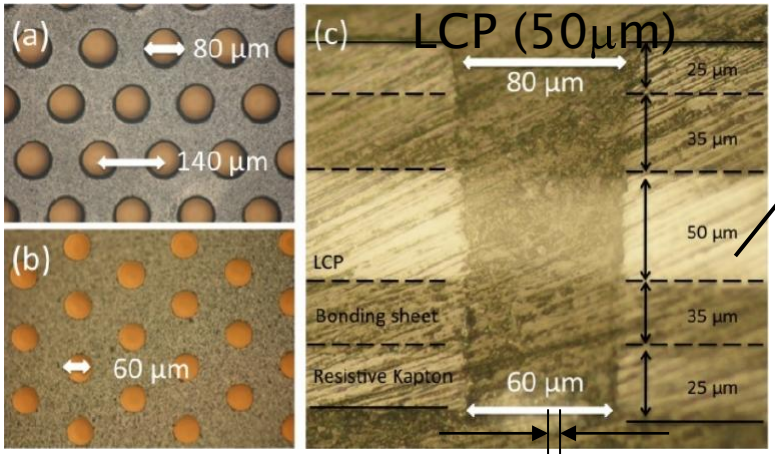


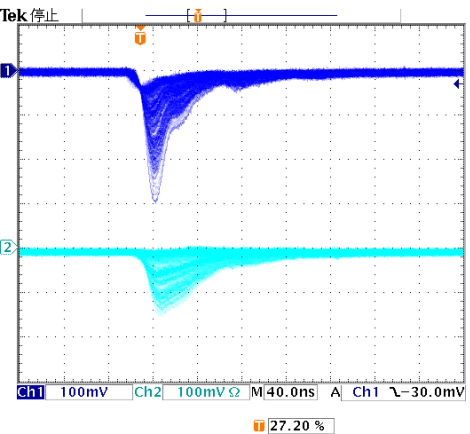


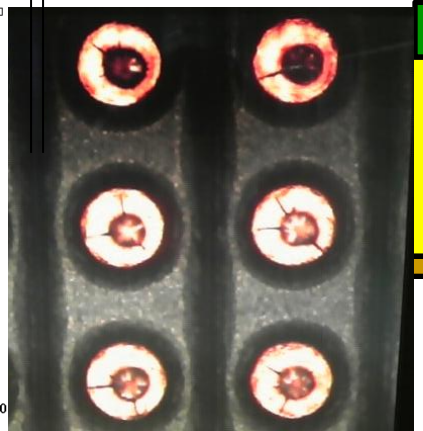


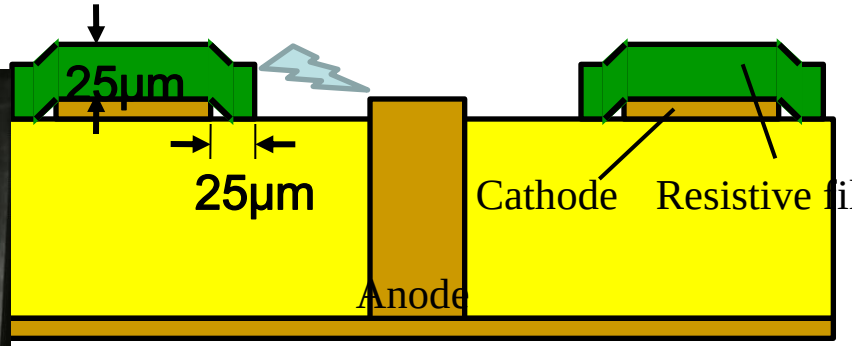

80 μm
LCP (50mm)
Bonding polyimide (35mm)
Resistive kapton
60 μm


-HV
Drift plane
~1cm
Detection area
: filled by gas
R
R
Resistive sheet
Cathode
25μm
+HV
R
100μm
Anode
400μm


(a)
80 μm
140 μm
(b)
60 μm
(c)
LCP (50μm)
80 μm
25 μm
35 μm
50 μm
LCP
Bonding sheet
35 μm
Resistive Kapton
60 μm
25 μm

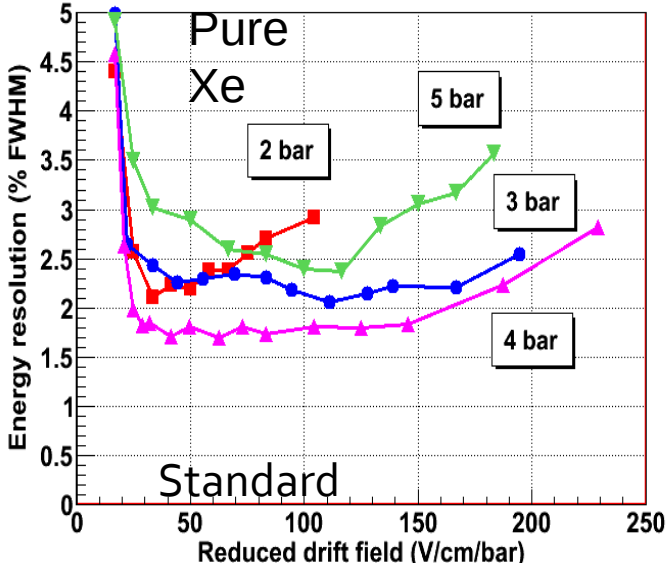

Tek 停止
Ch1 100mV
Ch2 100mV Ω
M 40.0ns
A Ch1 ∖ -30.0mV
27.20 %
10 May 2010
19:51:01




25μm
25μm
Cathode
Resistive film
Anode

Stabilization times and operation in pure gases for various Microbulk readouts

F.J. Iguaz



With pillars