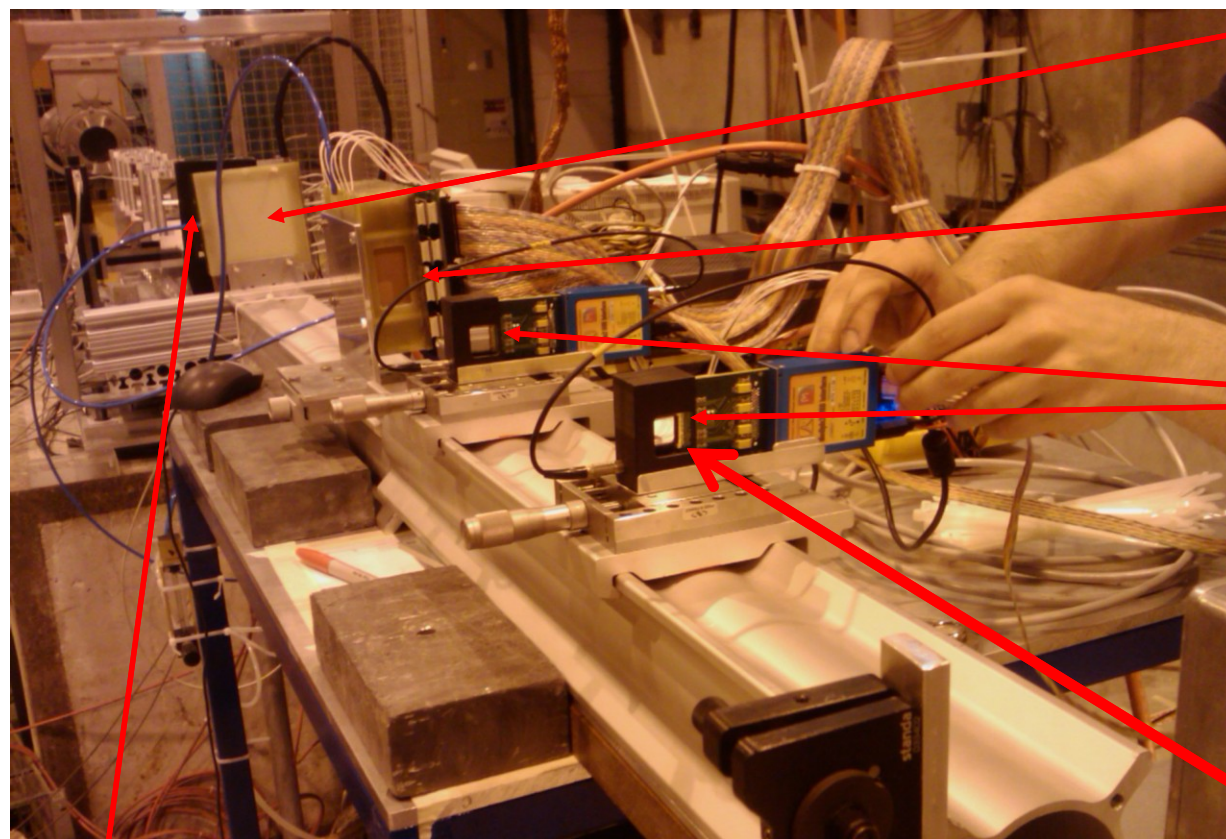


Instrumentation and Detectors in the CERN-H8 beam tests for heavy ion

- Test beam 2010
- TPC Gem detector
- TPG performance
- New DAQ Card
- Planar GEM

INFN detectors (Jun '10)



Planar GEM

TPC GEM

Medipix

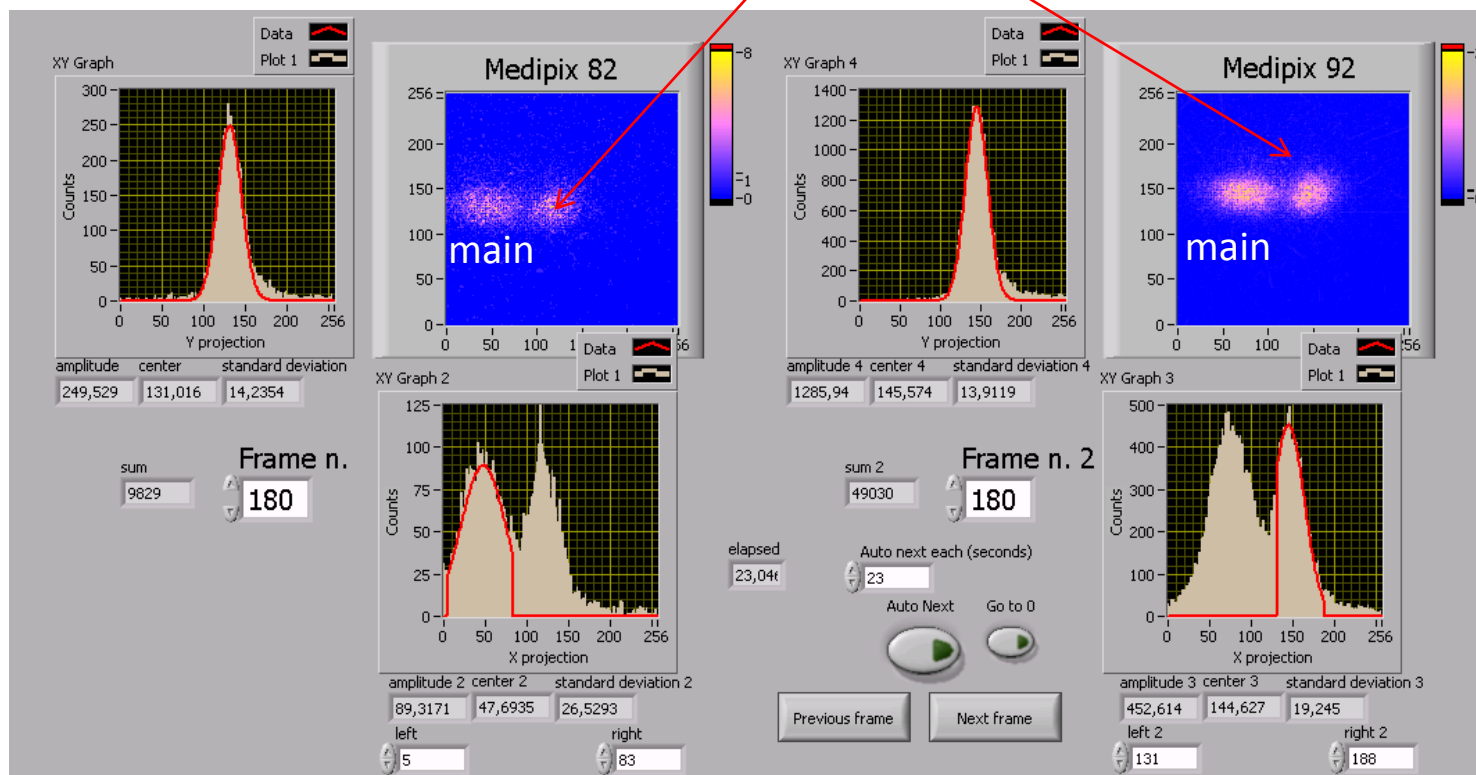
Proton Beam

Scintillators

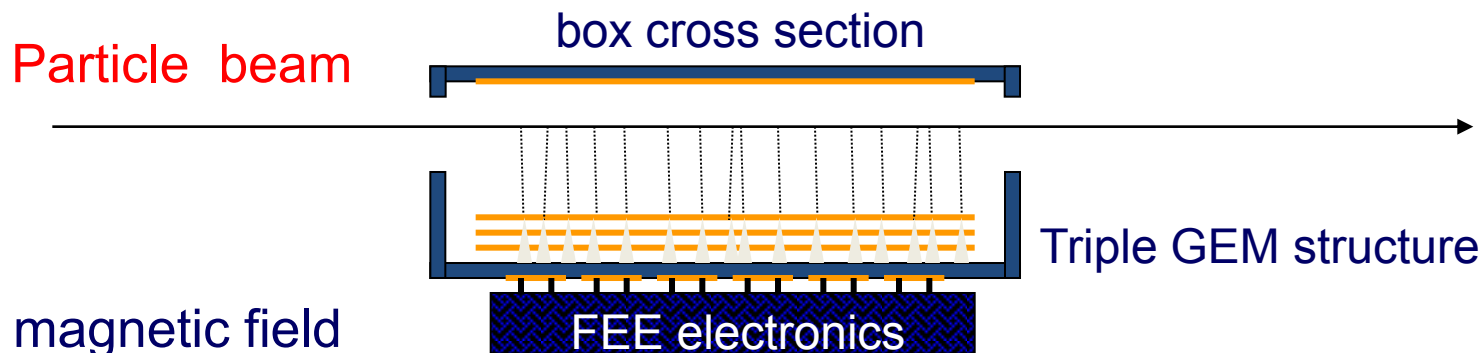
Fast angular scan with Medipix

- Use Medipix to image proton during one spill
- Fast procedure to find channeling (30 min)

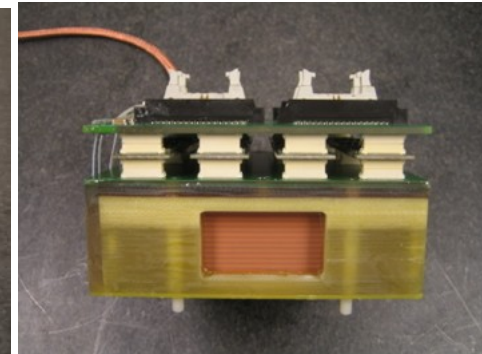
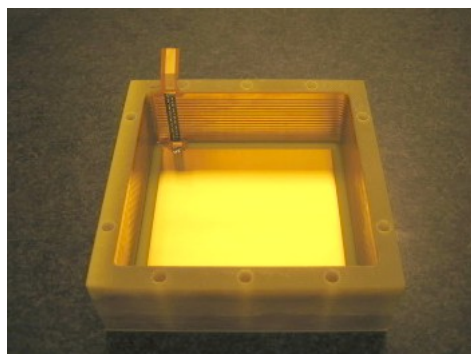
Channeled beam



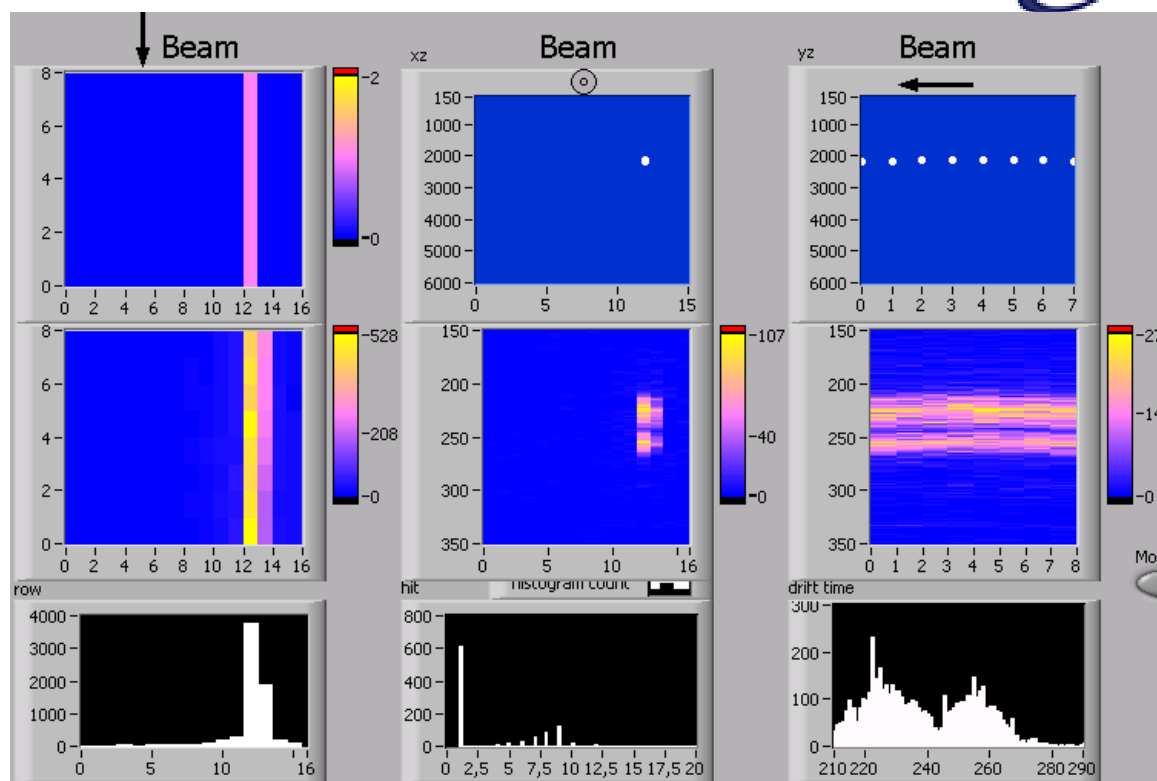
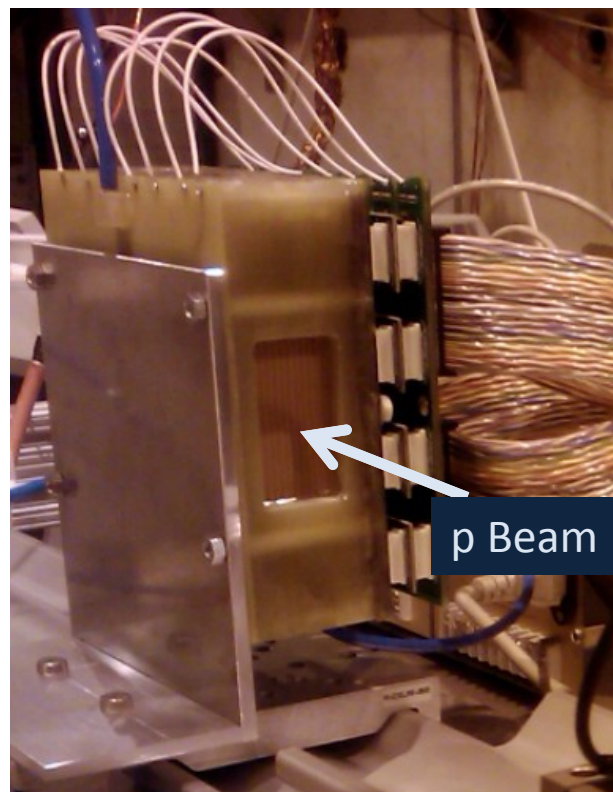
It's essentially a small TPC with a 4 cm drift and readout with triple GEM
In this way also high current beam can be monitored in position



The material budget crossed by a particle is only two kapton foils ($<0.2\%X_0$)
used for the field cage necessary for the drift field uniformity

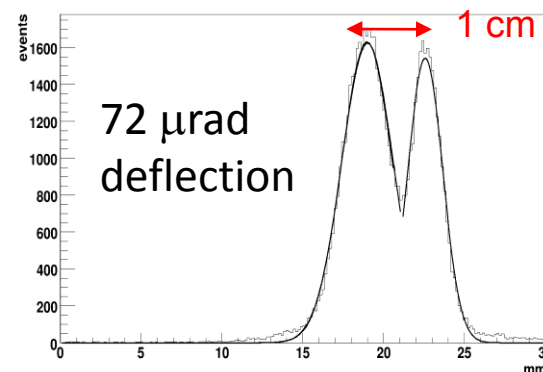


A TPC-GEM



Active area $5 \times 5 \times 3 \text{ cm}^3$
 16×8 pads, $3 \times 6 \text{ mm}^2$

*Our only device to study ion channeling
 (when they come...)*



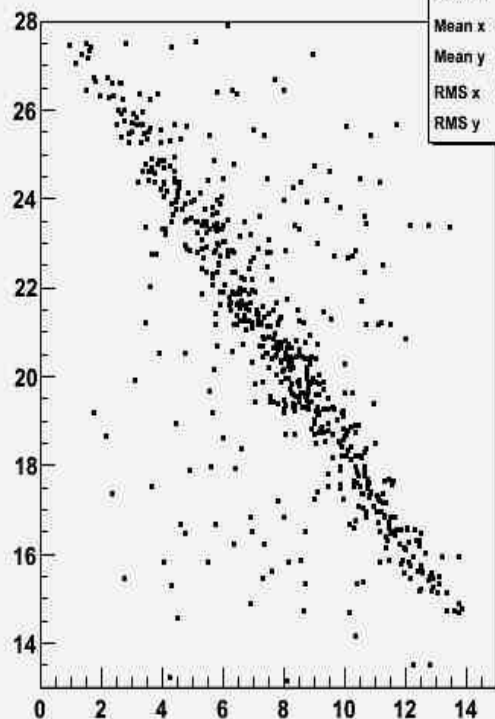
Track reconstruction

medipix

TPG

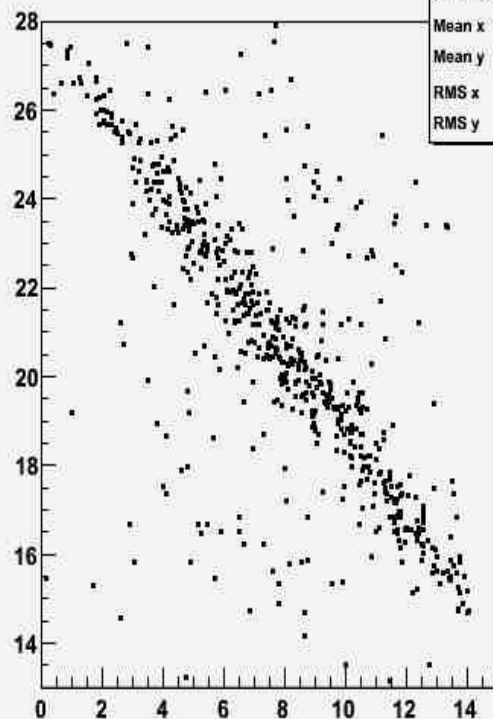
medipix

Ztrace vs X_M82 (+ offsets)



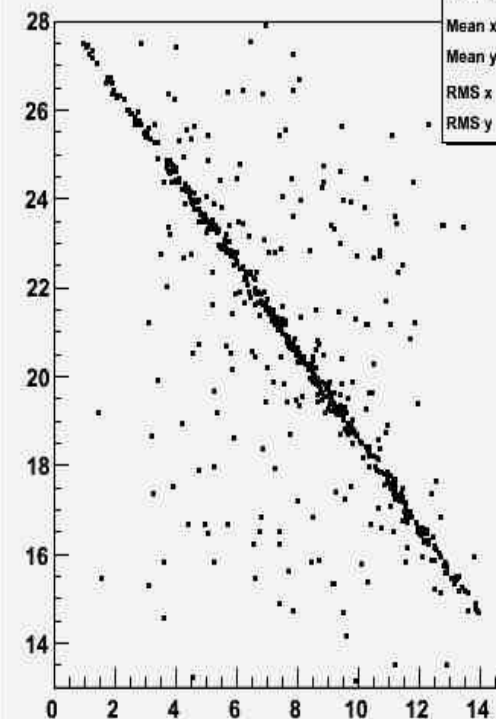
hXImageXY	
Entries	828
Mean x	7.723
Mean y	20.71
RMS x	2.851
RMS y	3.24

Ztrace vs X_M92 (+ offsets)



hXImageXY	
Entries	828
Mean x	7.79
Mean y	20.71
RMS x	3.241
RMS y	3.24

Ztrace vs Media_X_Medipix (+ offsets)

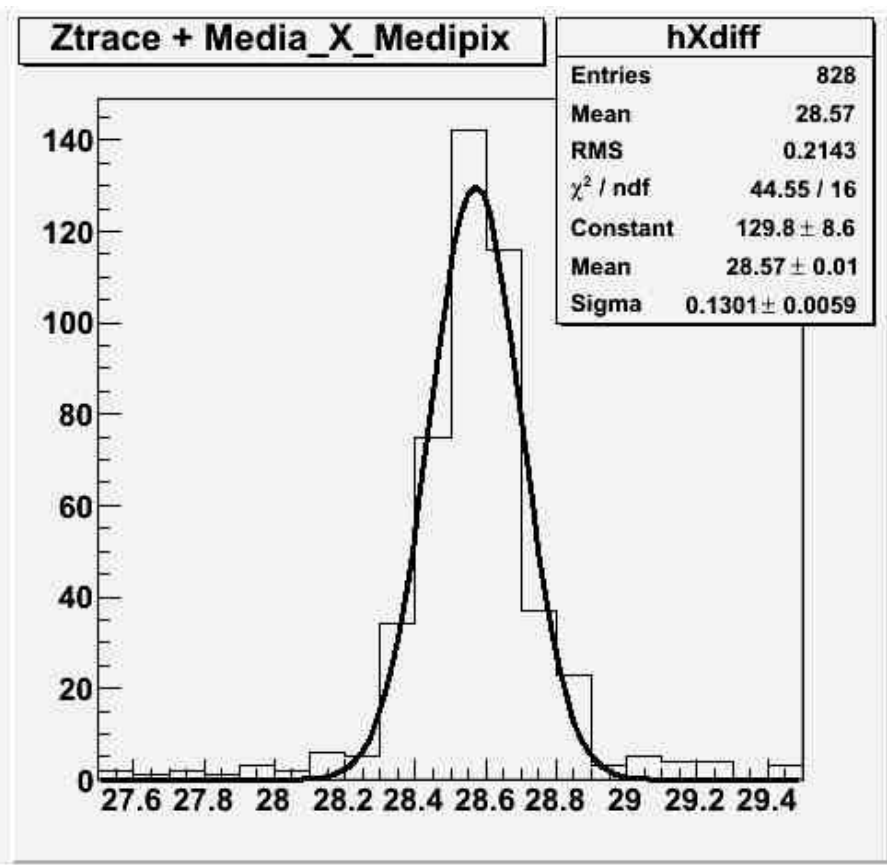
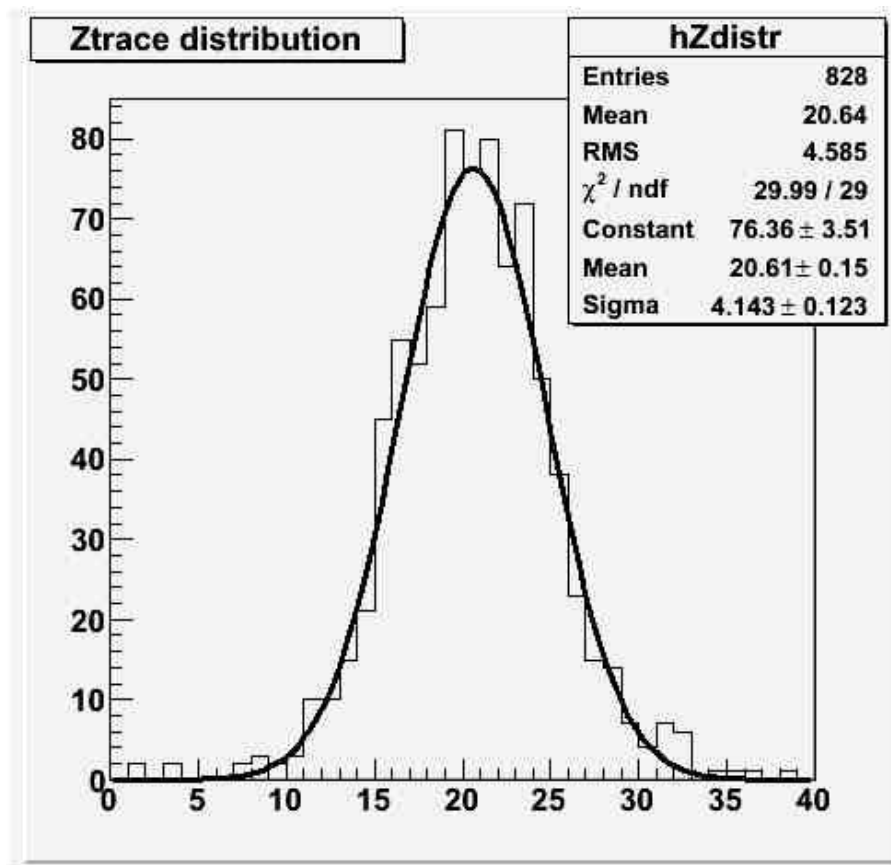


hXImageCorr	
Entries	828
Mean x	7.828
Mean y	20.71
RMS x	3.002
RMS y	3.24

Test Beam at BTF

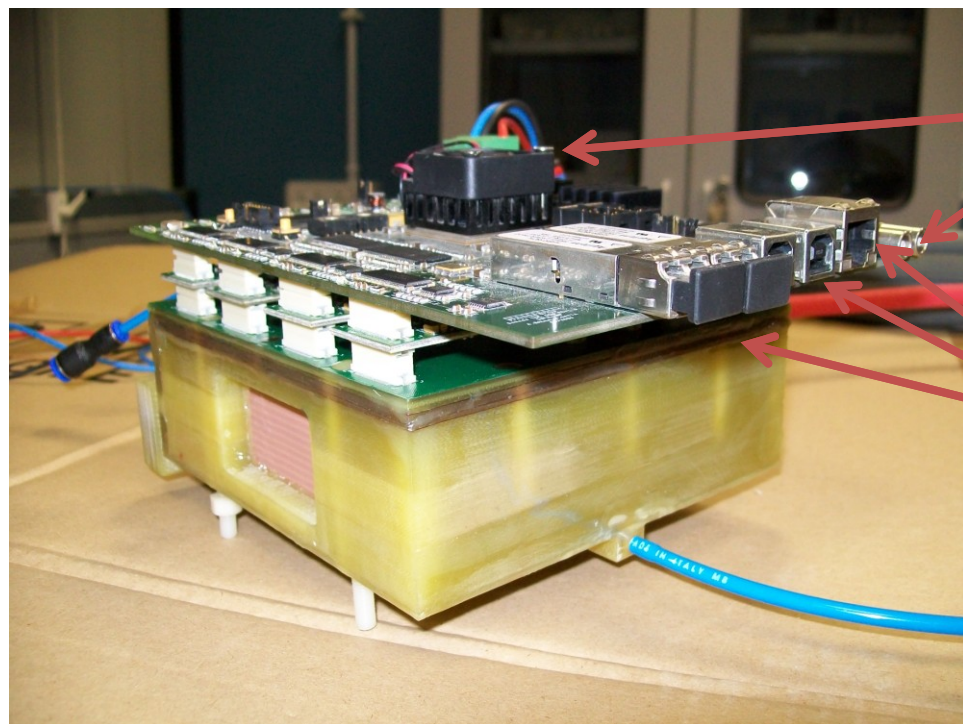
BTF Beam profile

Residual Z_{medipix} Z_{TPC}



New readout card

A new mother board based on FPGA has been made for a compact DAQ system



Input :

- 12 Volt for FEE power supply
- Trigger

Output

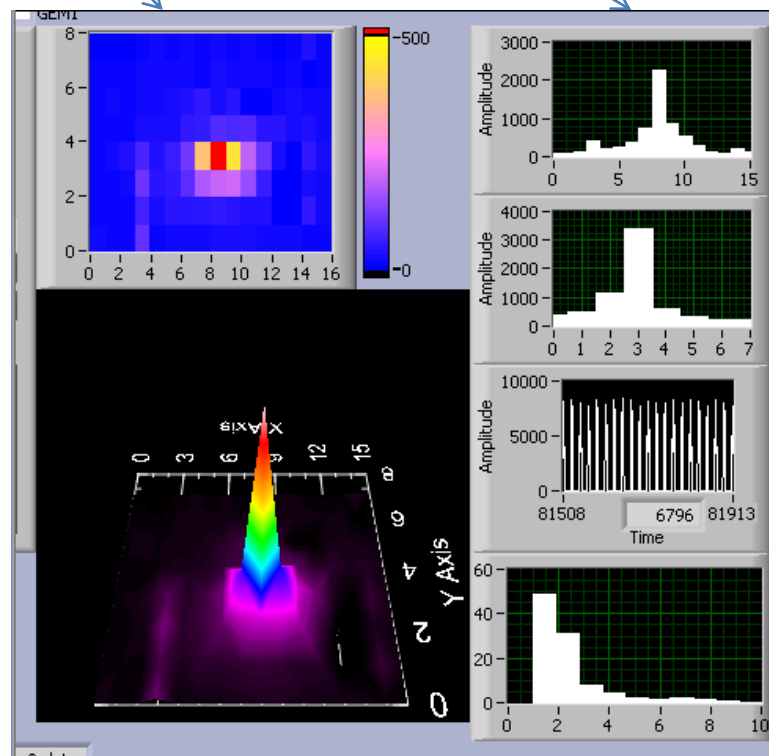
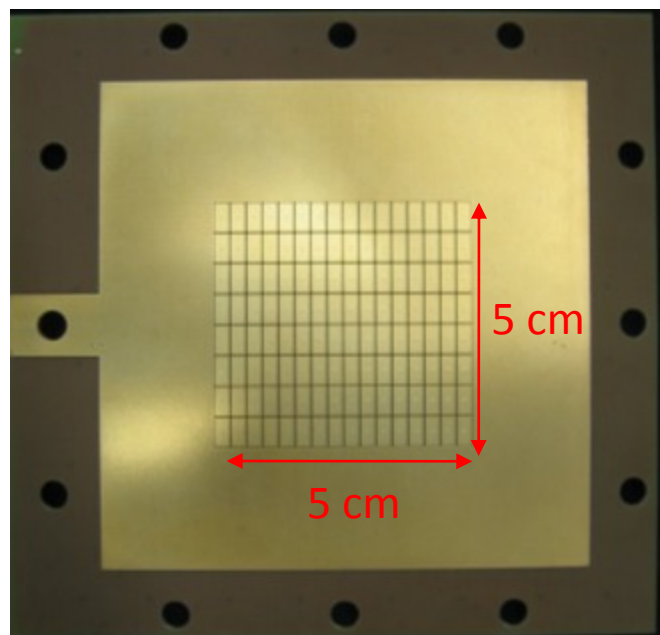
- Ethernet
- USB
- Optical link

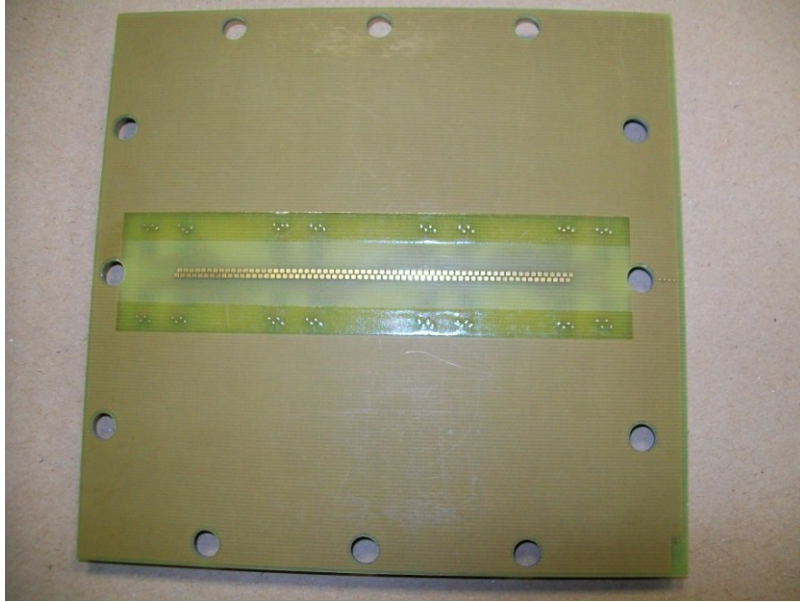
This board can be used also for other triple GEM detector in UA9

Planar GEM

A new planar GEM was placed downstream the proton beam for large angle measurements : beam spot and beam profile can be easily shown online in an active area of $5 \times 5 \text{ cm}^2$

In future detector of $10 \times 10 \text{ cm}^2$ and $20 \times 20 \text{ cm}^2$ can be put on beam test





If you don't have a beam trigger just counting the hits in a second a beam profile can be obtained

