A Large Ion Collider Experiment

ALICE MFT activities @ T10

Stefano Panebianco – CEA/Irfu

PS/SPS User Meeting – 2018, July 5th

MFT layout

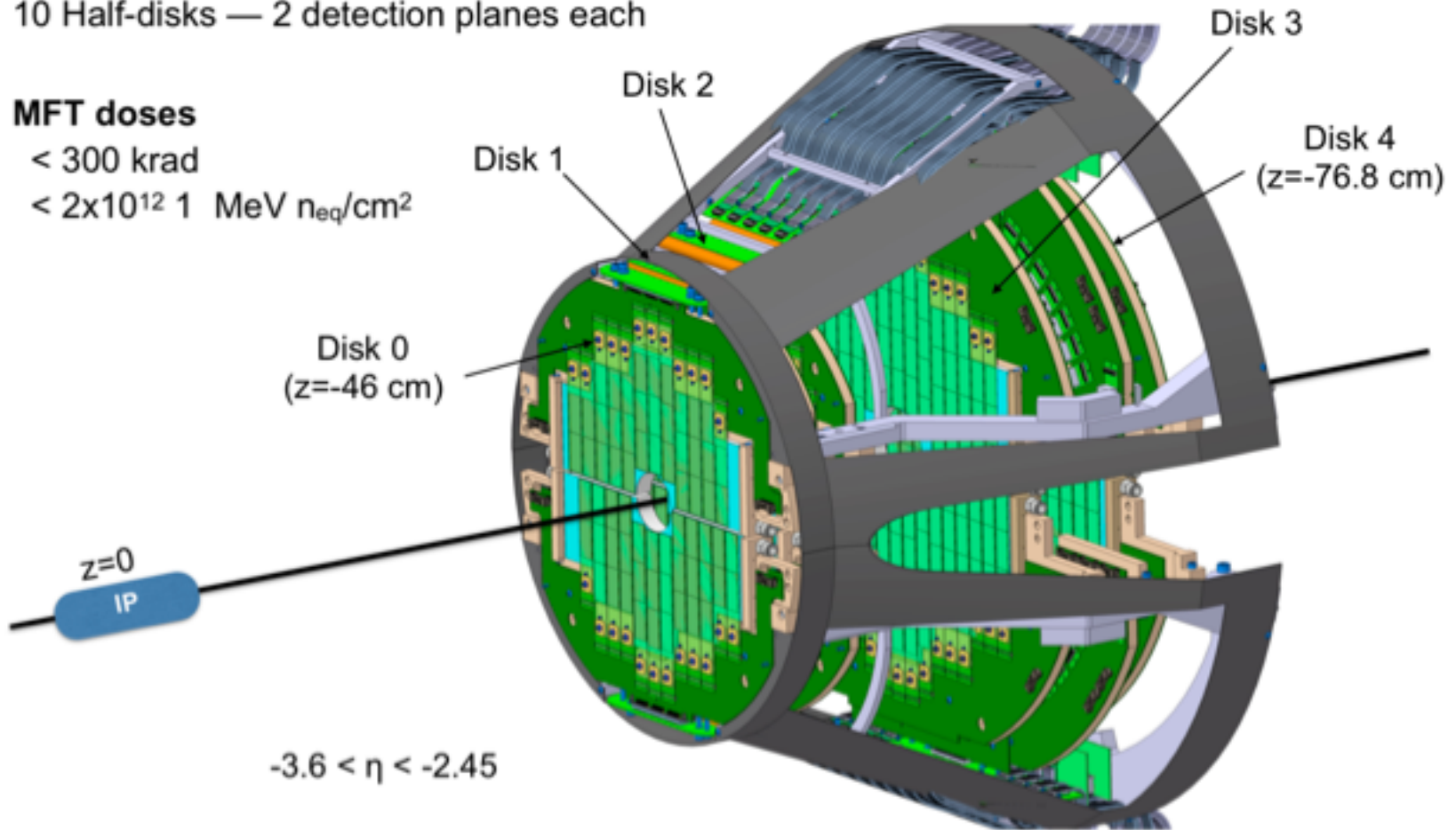**920 silicon pixel sensors (0.4 m²) on 280 ladders of 2 to 5 sensors each**
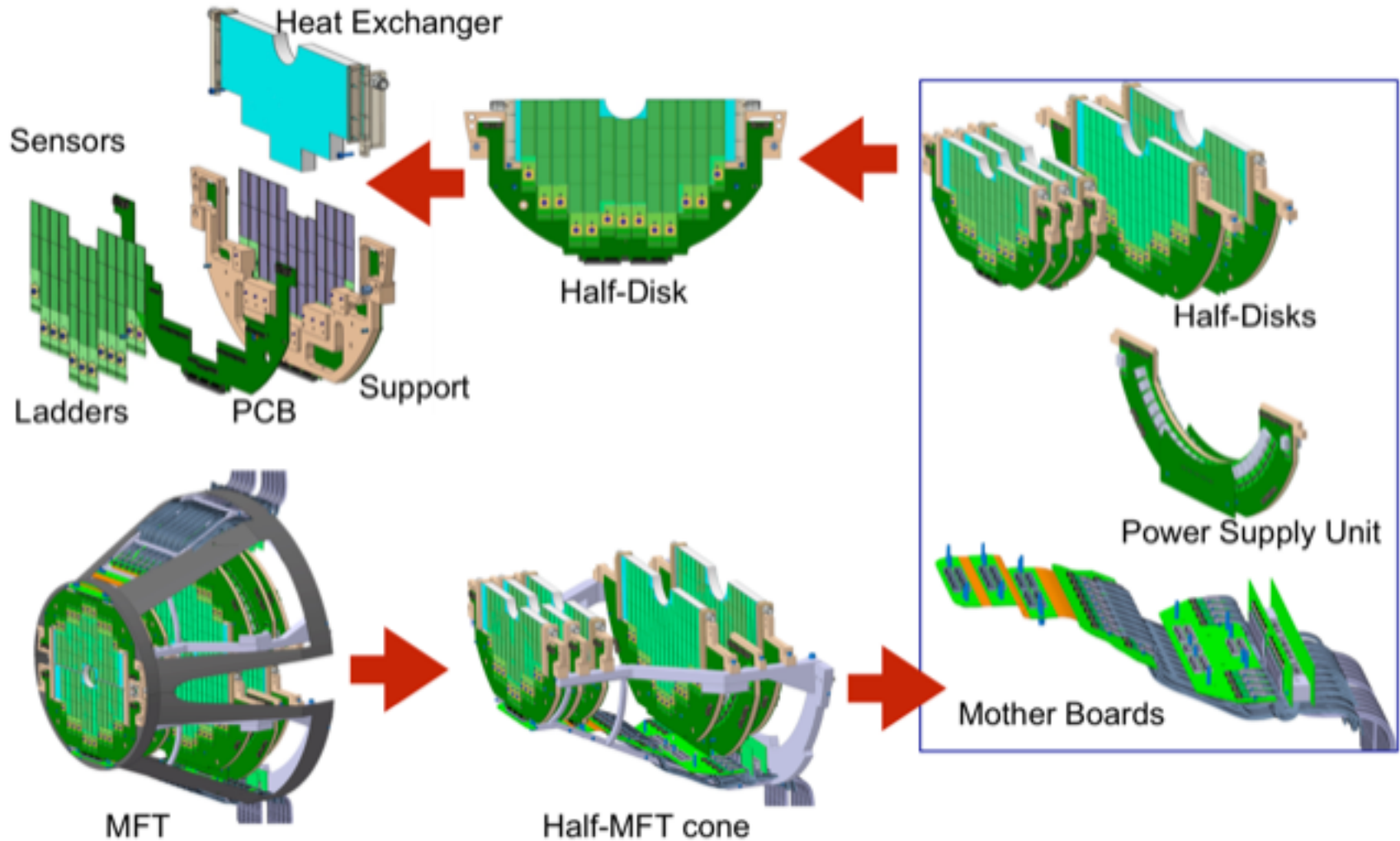
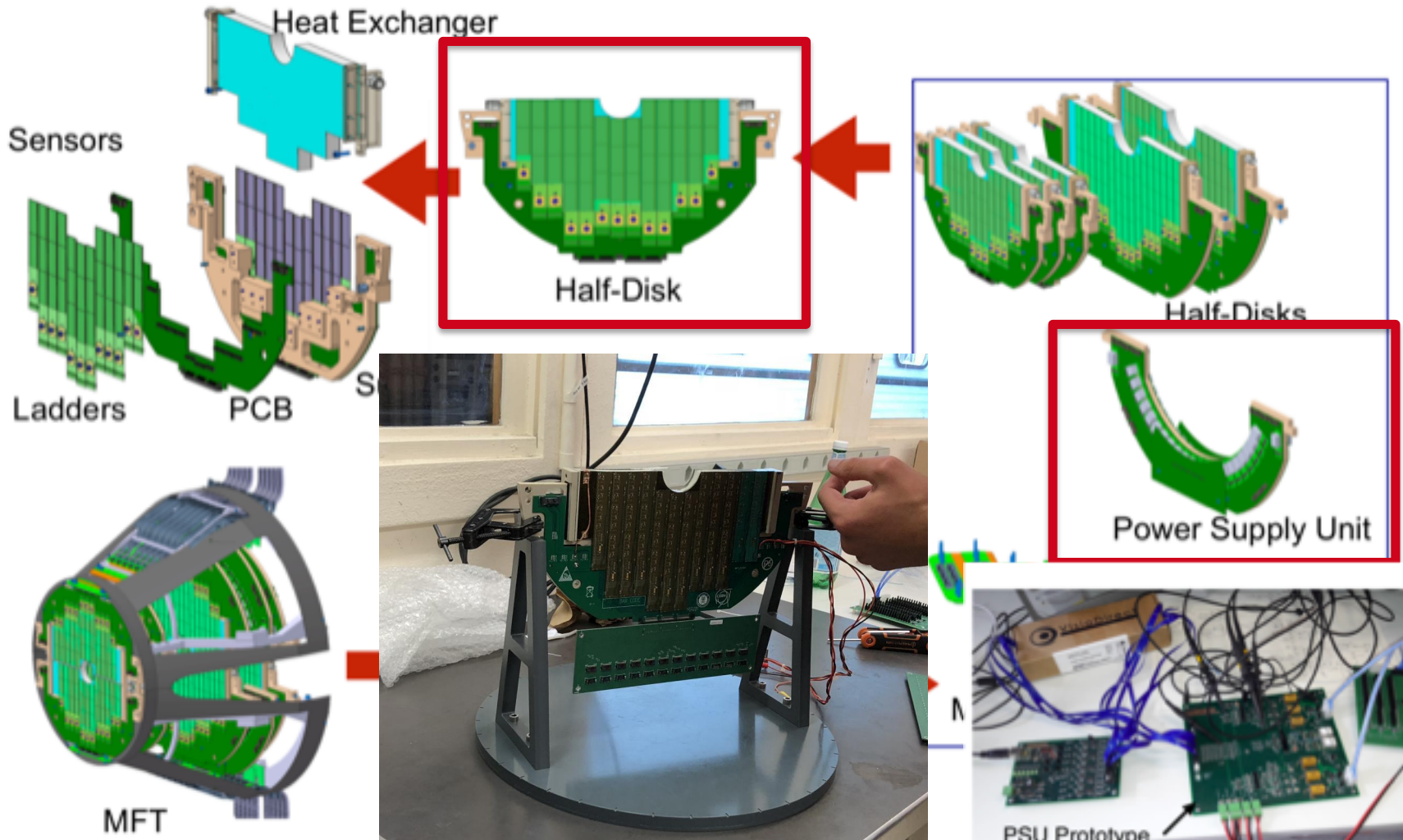10 Half-disks — 2 detection planes each

MFT doses
< 300 krad
< 2×10^{12} 1 MeV n_{eq}/cm^2

Disk 2

Disk 3

Disk 1

Disk 4
(z=-76.8 cm)

Disk 0
(z=-46 cm)

z=0
IP

$-3.6 < \eta < -2.45$

MFT layout

Heat Exchanger

Sensors

Ladders   PCB   Support

Half-Disk

Half-Disks

Power Supply Unit

MFT

Half-MFT cone

Mother Boards

MFT layout

Heat Exchanger
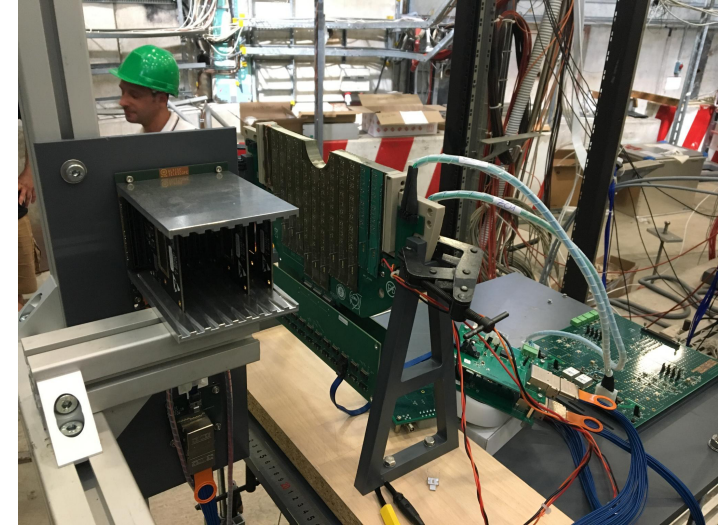
Sensors

Ladders PCB

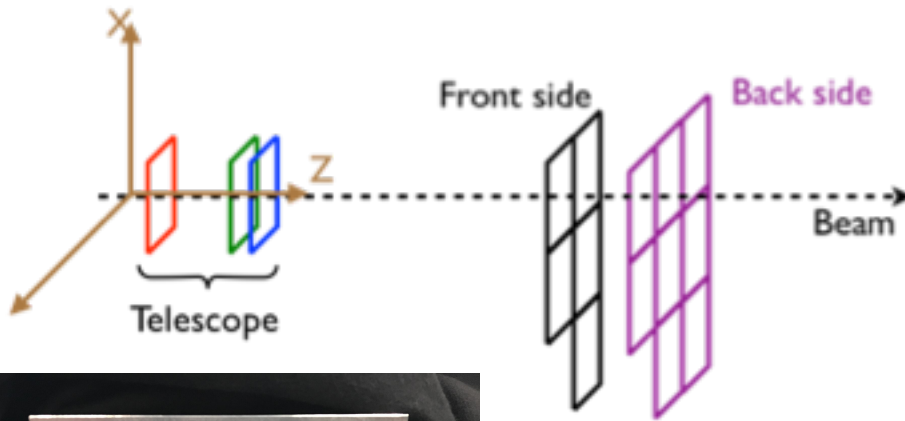Half-Disk

Half-Disks

Power Supply Unit

MFT

PSU Prototype
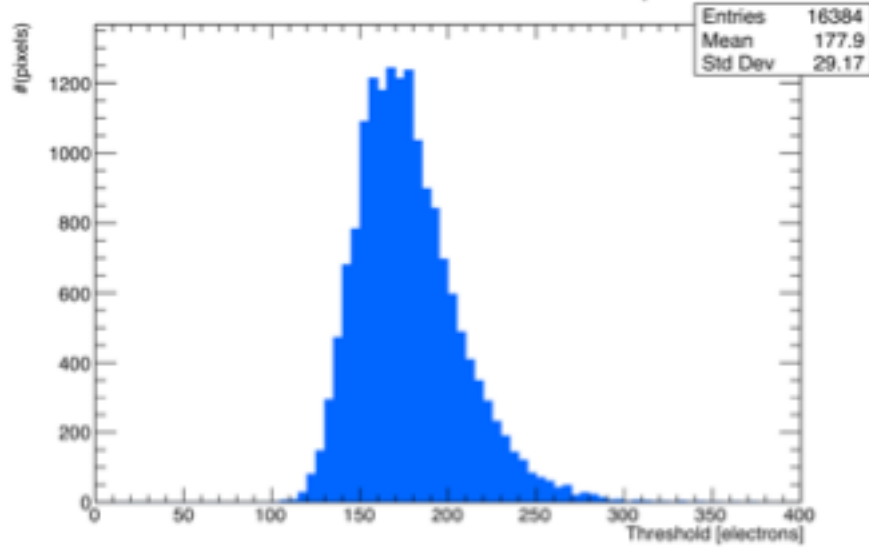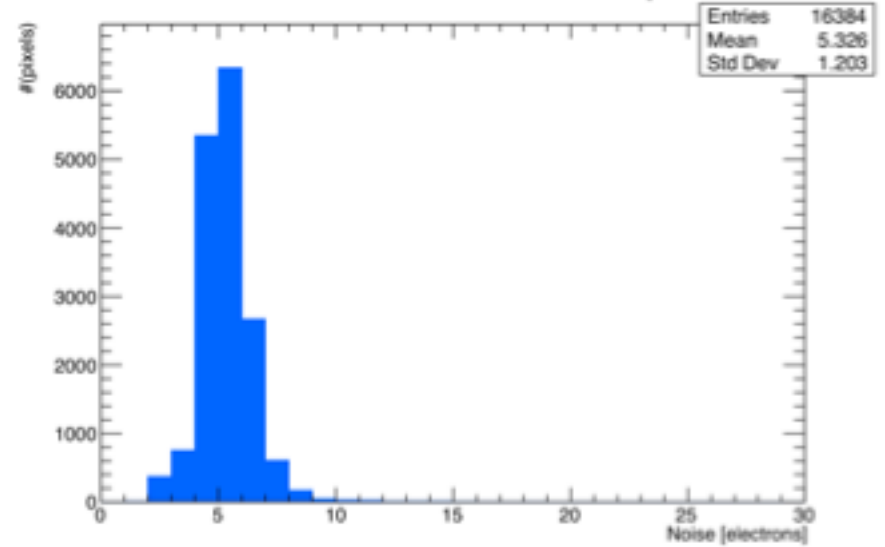
Test beam setup
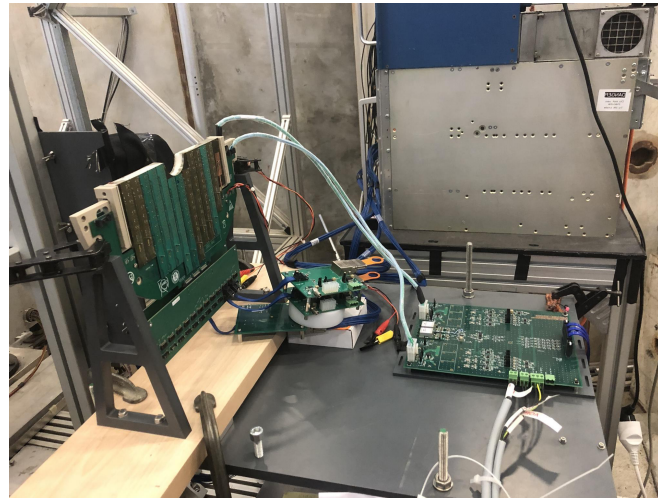
Beam conditions:
- 6 GeV π+
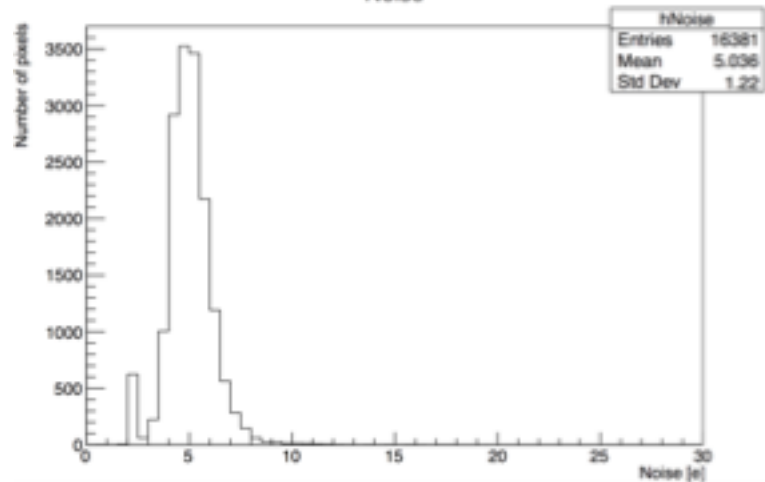- Trigger (mRPC-TOF):
  $\sim$2000 trig/spill

Noise performances

Board 0 Ladder 3010 RCV 3 Chip 8

Board 0 Ladder 3010 RCV 3 Chip 8

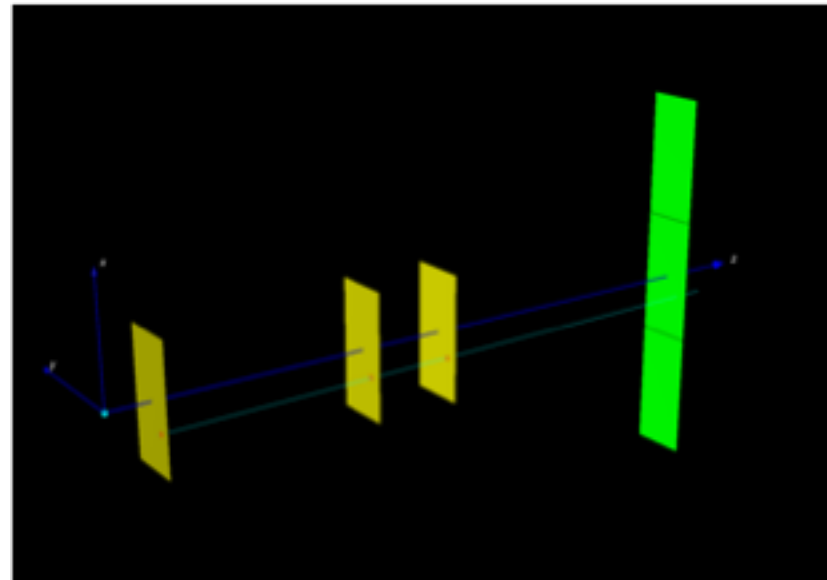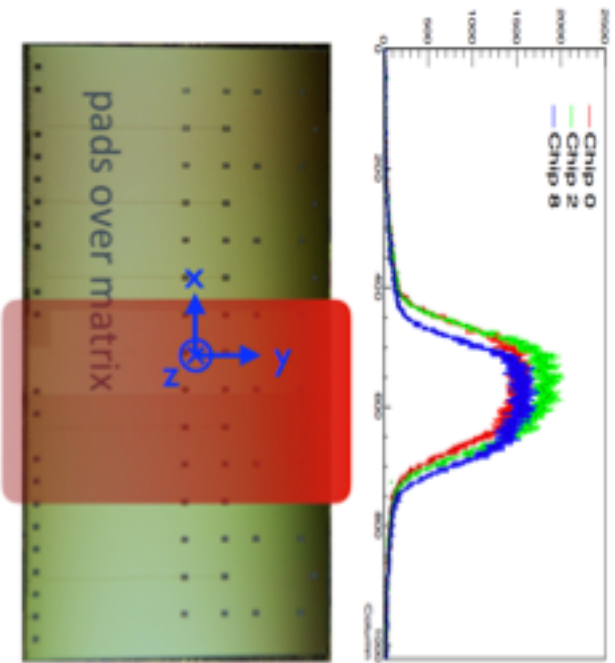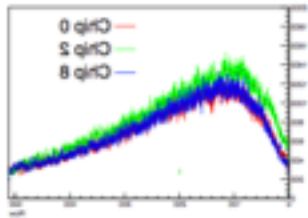| Entries | 16384 |
| Mean | 177.9 |
| Std Dev | 29.17 |

Entries	16384
Mean	5.326
Std Dev	1.203

Very good performances in
T10 environment
(as good as during in-lab tests)

Noise

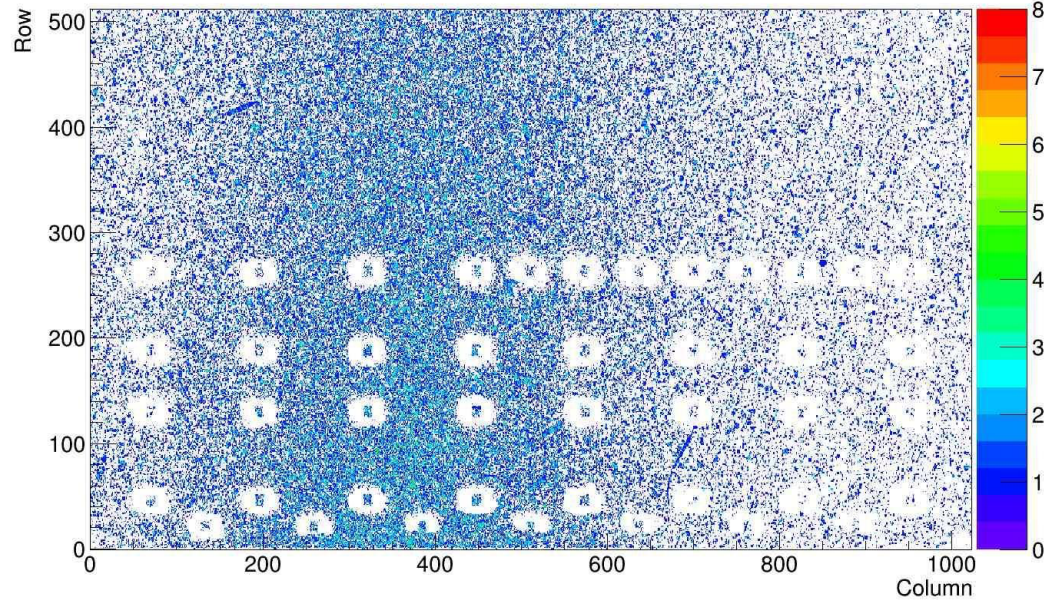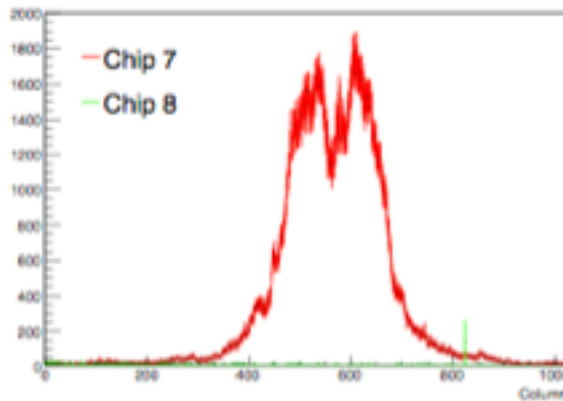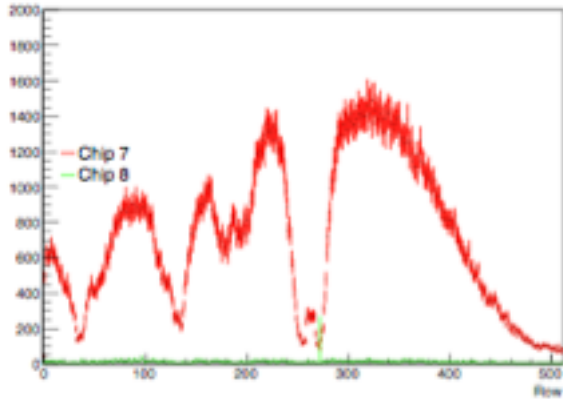| hNoise | |
Entries	16381
Mean	5.036
Std Dev	1.22

6

Beam profile on telescope

Occupancy on telescope

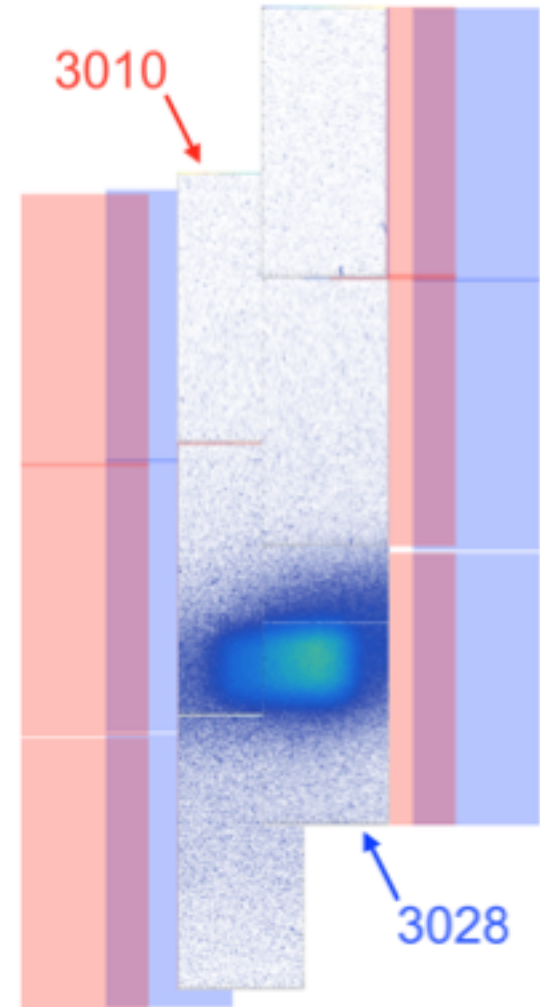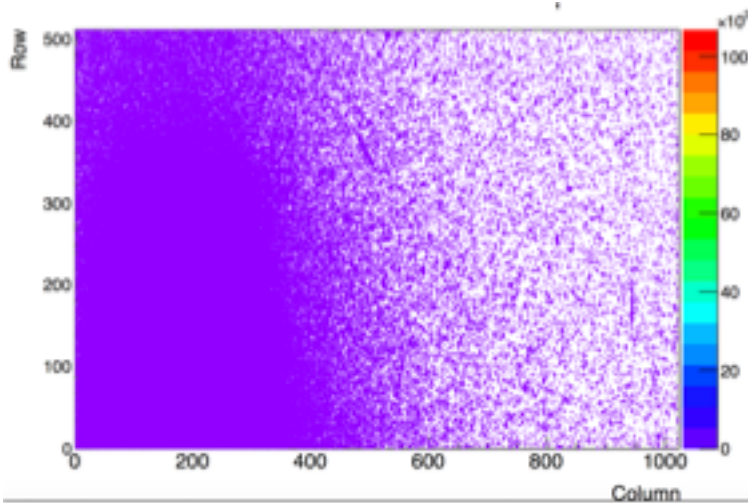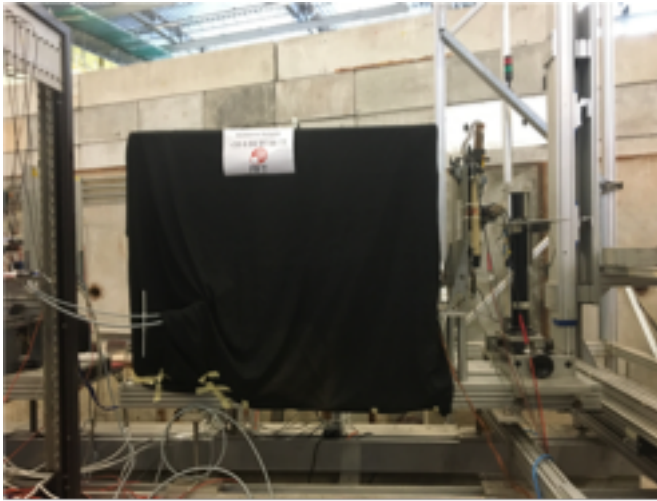# Beam profile on ladder

Occupancy on disk

High sensitivity to ambient light

Fast construction of a black box

Beam profile on ladder

3010

3028

Conclusions and plans

- Very positive test beam with MANY lessons learnt
  - New readout system to distribute trigger and synchronize several devices
  - Low noise with PSU power system
  - Ladder response as expected
  - Sensitivity to light
  - Mechanical instability of some readout connections

- Continue to take data until Monday the 9th
- Fine analysis of data (tracking performances, efficiency and space resolution) ongoing but very promising so far
- Remove the setup by the 16th

- **Big thanks to**:
  - Lau Gatignon for the excellent beam configuration
  - PS operators for the very stable beam
  - Crispin Williams and Zheng Liou for providing a nice trigger
  - Paolo Martinengo for his very useful advices
  - All my team for their outstanding work!