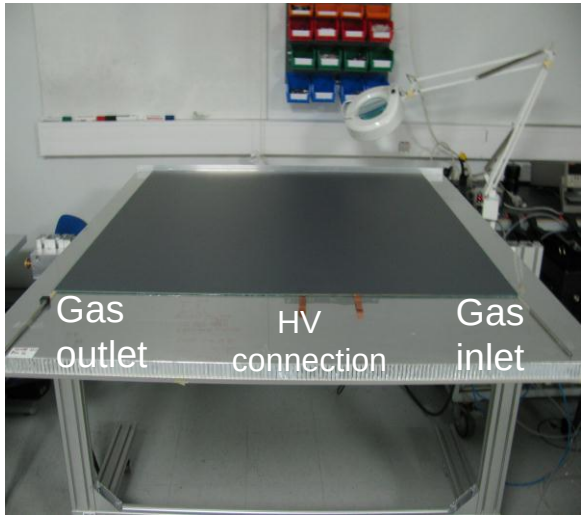
SDHCAL activity toward ILC : present and future

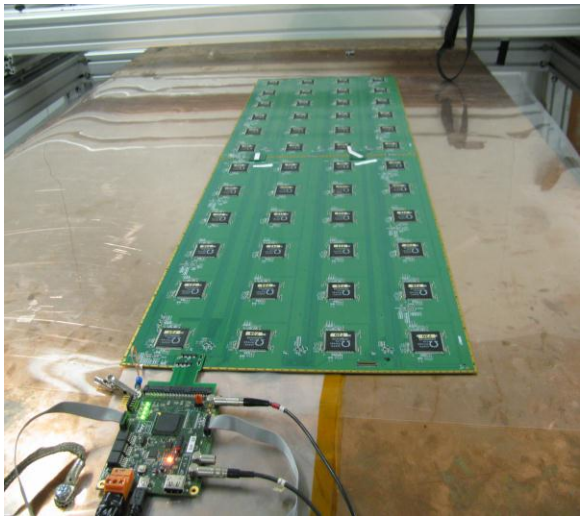
→What we have achieved up to now

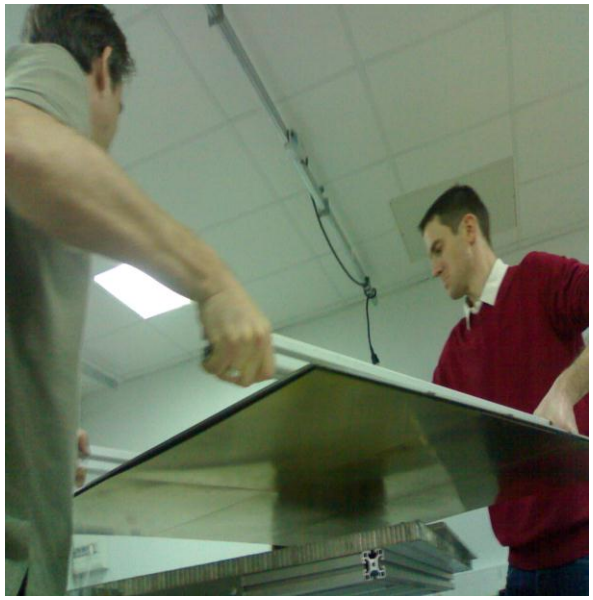
→ What we have to do until the DBD

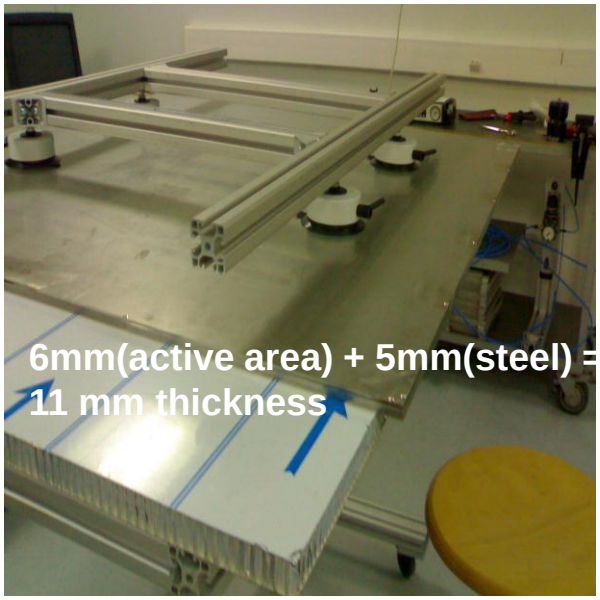
→ Post-DBD

Construction of one unit of the SDHCAL prototype

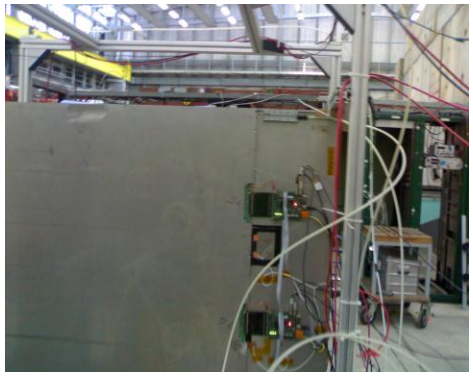


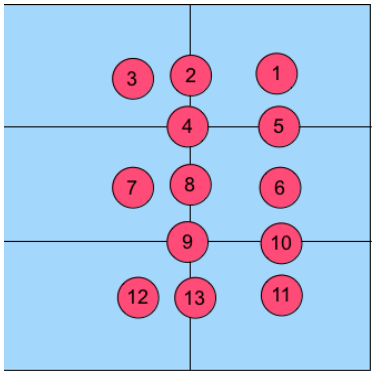




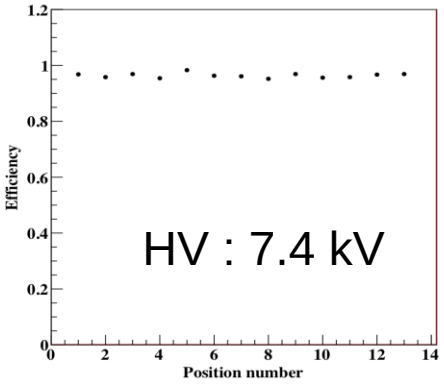


The homogeneity of the detector and its readout electronics were studied

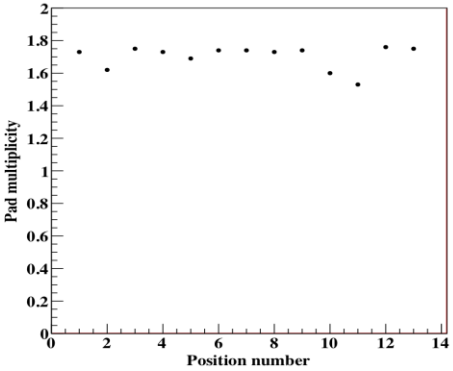




Beam spot position



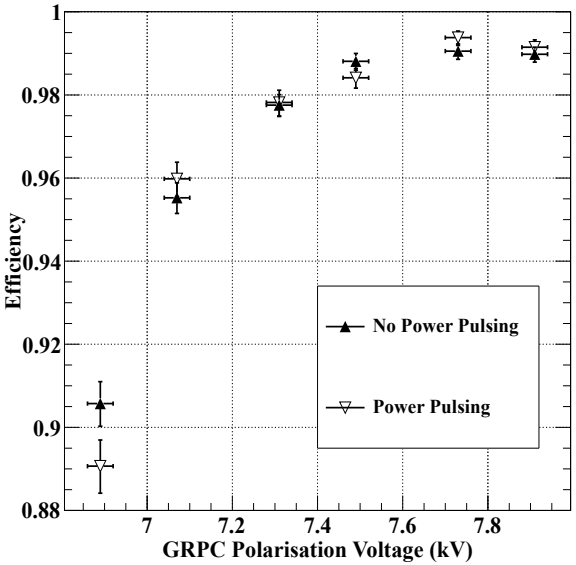
Efficiency

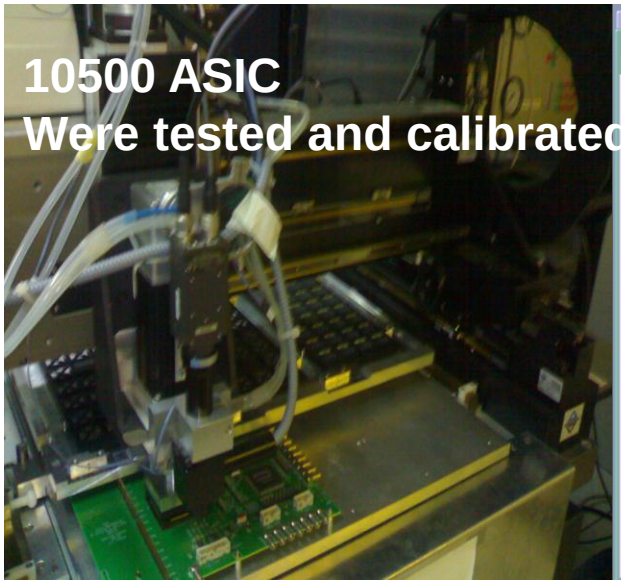


Multiplicity

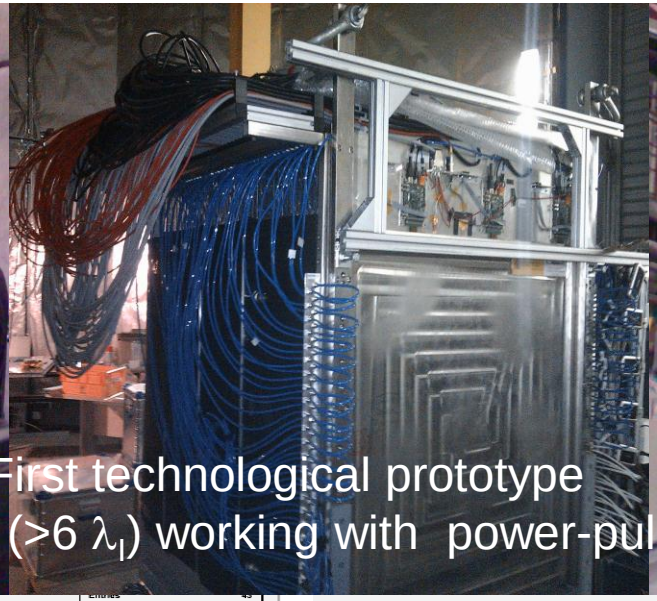
Power-Pulsing mode was tested in a magnetic field of 3 Tesla

The Power-Pulsing mode was applied on a GRPC in a 3 Tesla field at H2-CERN
(2ms every 10ms)
No effect on the detector performance



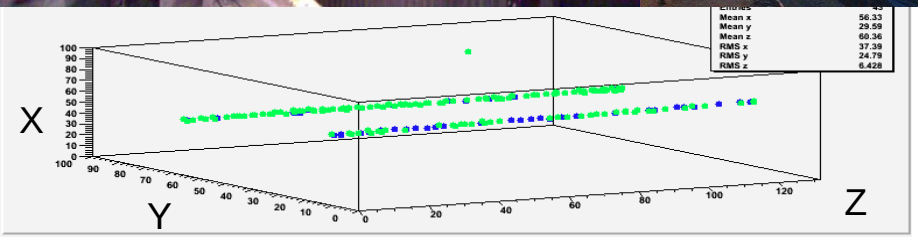


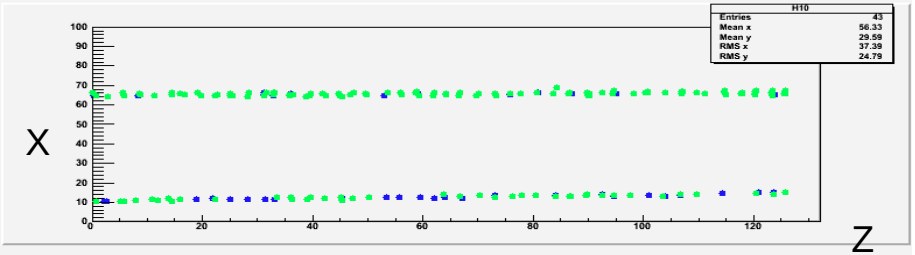
Construction of the SDHCAL prototype
460800 electronic channels
and self-supporting mechanical structure
with planarity requirements fulfilled

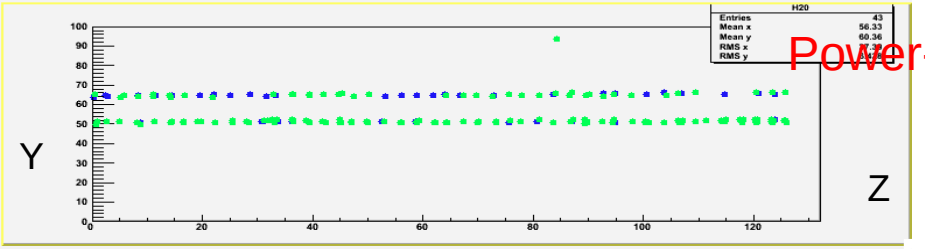


First technological prototype
50 units (>6 λ_I) working with power-pulsing

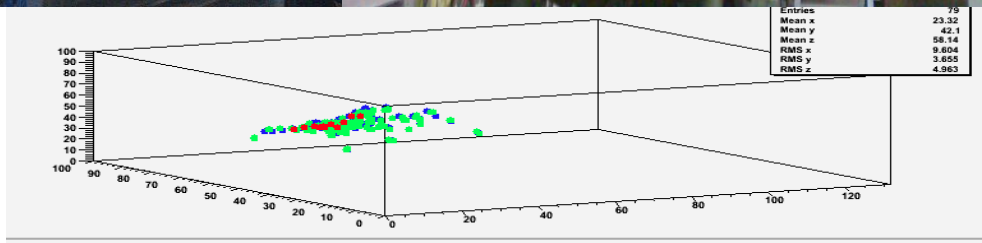
Currently in TB

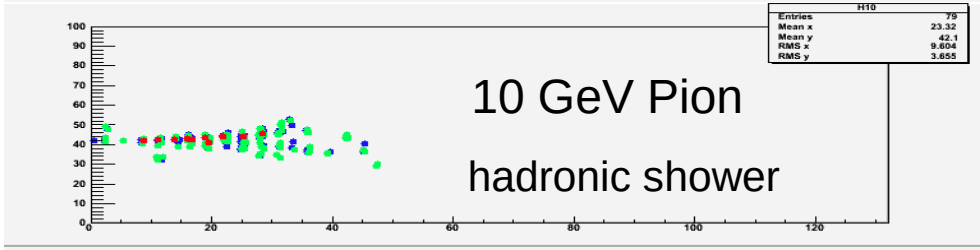






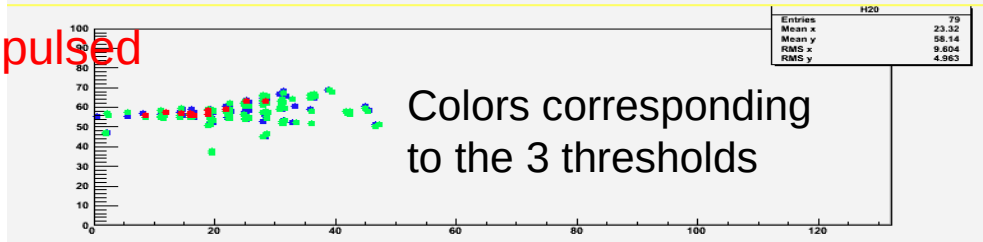
Power-pulsed





10 GeV Pion

hadronic shower



Colors corresponding to the 3 thresholds

What we need to do until the DBD :

1- Analyze the data collected this last days

2- a) study the detector behavior in details
b) Compare data with the simulation
c) develop tracking and pattern recognition algorithms
d) study the energy resolution

3-Prepare the fall TB in order to improve on energy resolution
(gain correction was prepared but used for instance)

In parallel, improve on the simulation in order to come as close as possible to DATA.

What we want to do after the DBD :

1- Build few very large GRPC detectors (2-3 m2) : Gas circulation system, thickness…
2- Improve on the readout electronics (I2C, circular memory..)
3- Design a new ASU capable to read the large GRPC
4- Develop a new DIF (low consumption, reduced size, new functionalities)
5- Build a small mechanical prototype to host the few large chambers