Update on Lab activities @ LNF

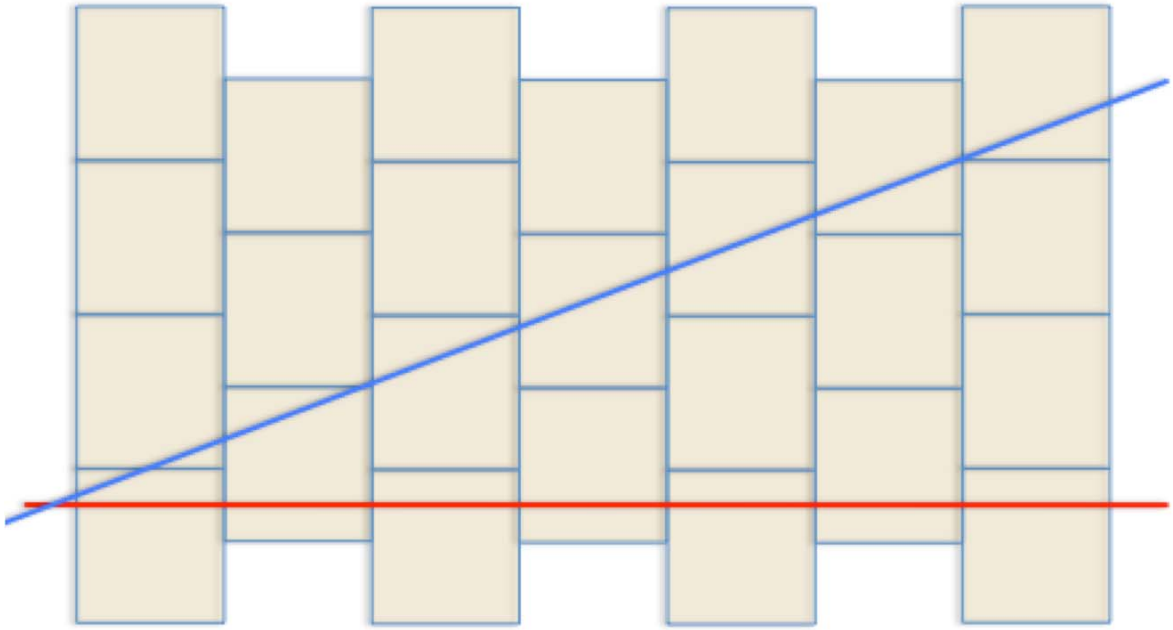
DCH-II parallel session

La Biodola, 31 May 2011

G. Finocchiaro

Prototype 2

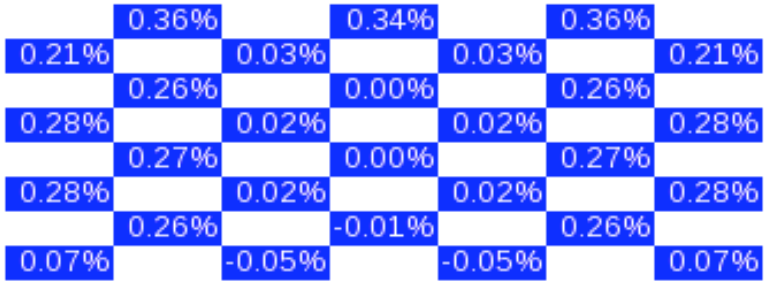
- *2.5m* long prototype to study DCH response from single clusters in a realistic environment, serve as a test bench for the final FEE, and for the DCH trigger
- Square drift cells - side=14mm, 3:1 field-to-sense ratio
- 28 sense wires arranged in 8 layers (3-4-3-4-3-4-3-4)
  - Tracks with $\vartheta \in [-20,+20]^{o}$ cross all layers



Guard Wires - Position and HV settings

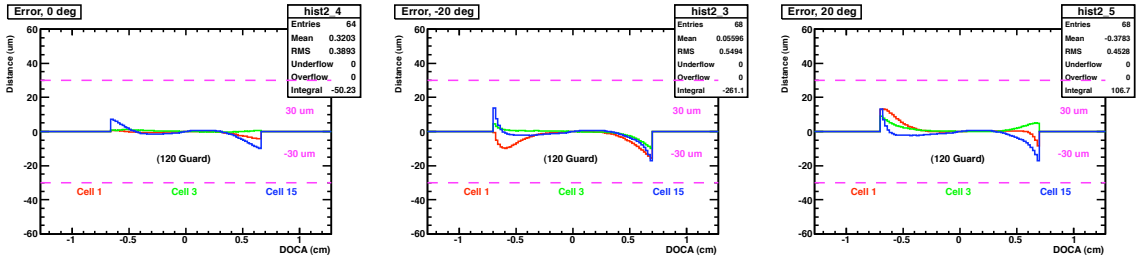
Philip Lu

Linear charge variation on all wires w.r.t. linear charge on central wires

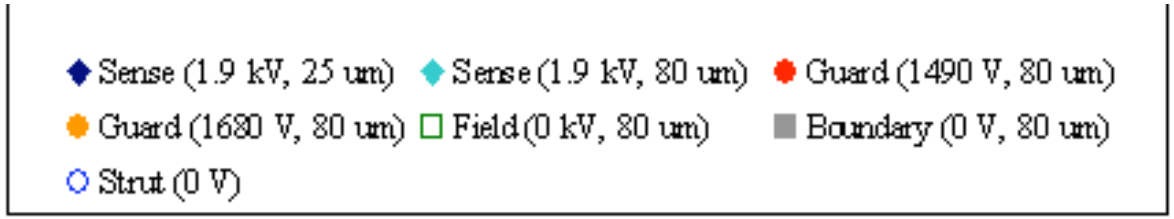


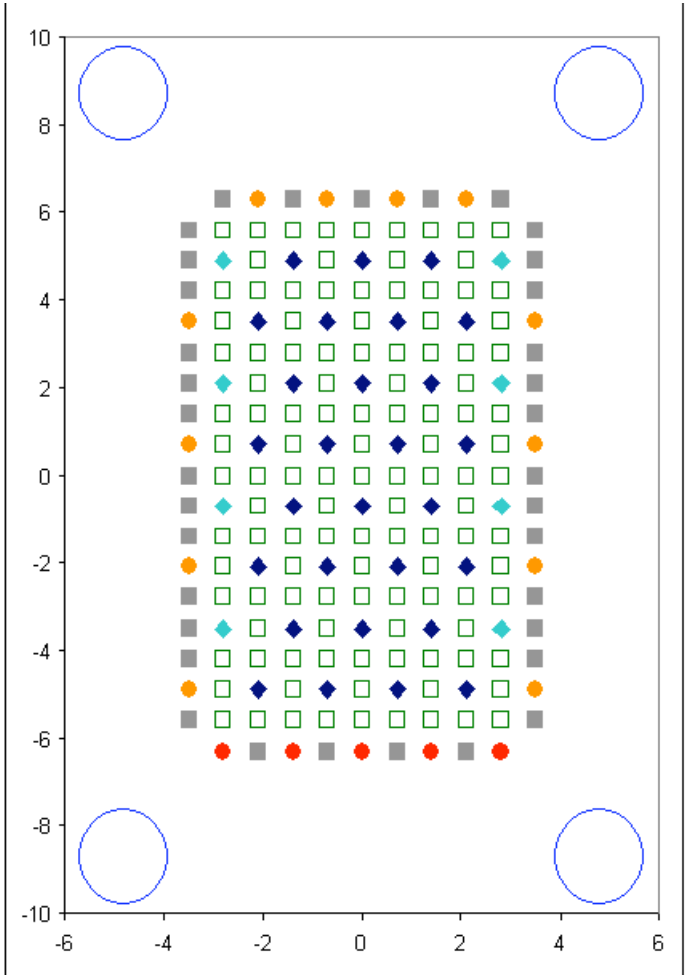
120 Boundary (Full)

Reconstruction error (μm) on selected wires when using the nominal t2d of the central wires



Using 120μm ⌀ wires for the external layer slightly improves linear charge and reconstruction homogeneity





Stringing is complete

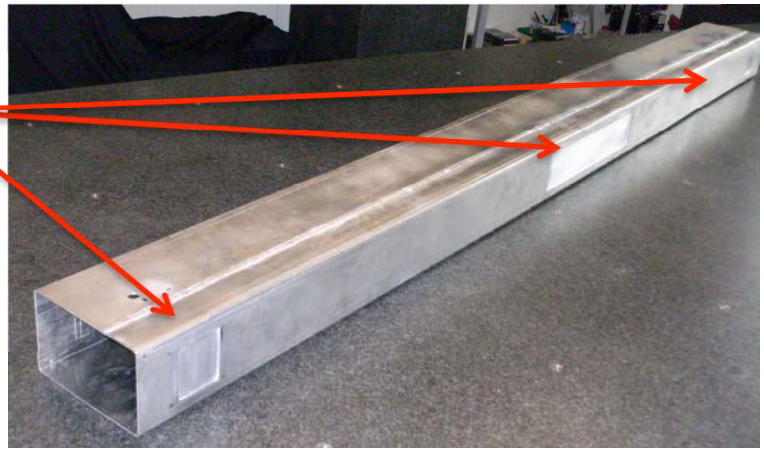
- 28 sense wires, 25μm ∅
  - 21 wires (6 rows) are Au-plated Mo(*)
  - 7 wires (2 rows) well-known Au-plated W-Rh for comparison

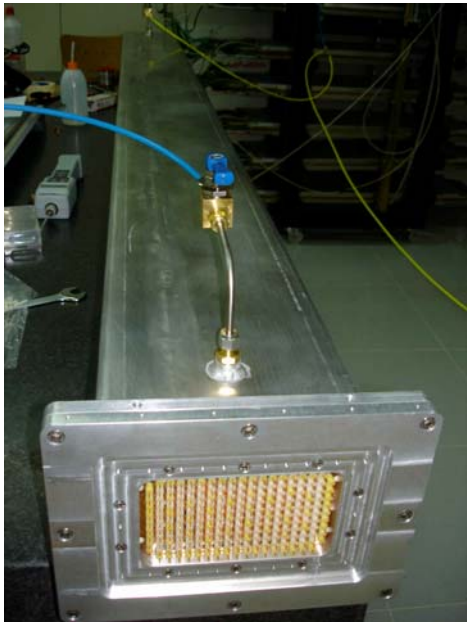
  (*) Molybdenum wire has lower resistivity (less signal distortion for C.C.) and lower density (effective X_0(gas+wires) 12% bigger)
- 127 field wires
  - 80μm ∅ bare Al wire (120μm ∅ on the external frame)
- 17 guard wires (3 different HV's)

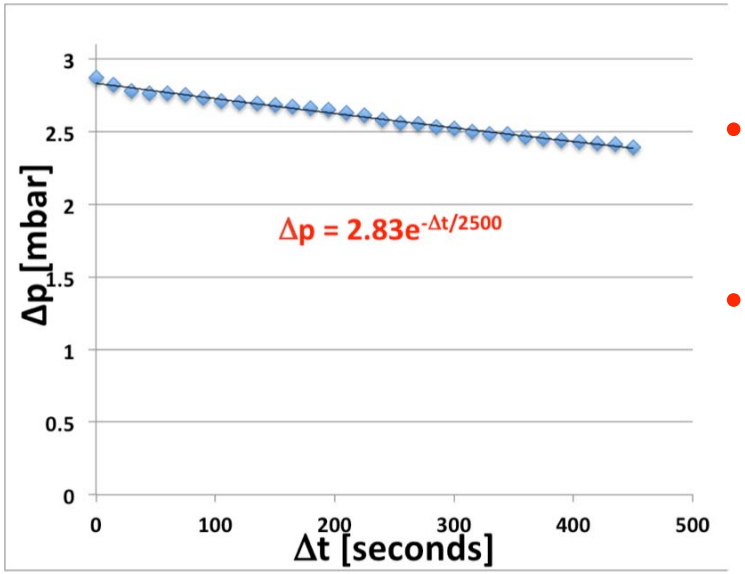
Tensions adjusted to obtain a gravitational sag of 200μm at the center of prototype

Gas Tightness, e.m Shield

- External tube
  - 3mm thick Al, 3 pairs of 0.3mm thick windows to minimize material are milled at mid length, close to, and far from the RO electronics
- Al flanges
  - With grooving and O-rings to ensure gas tightness

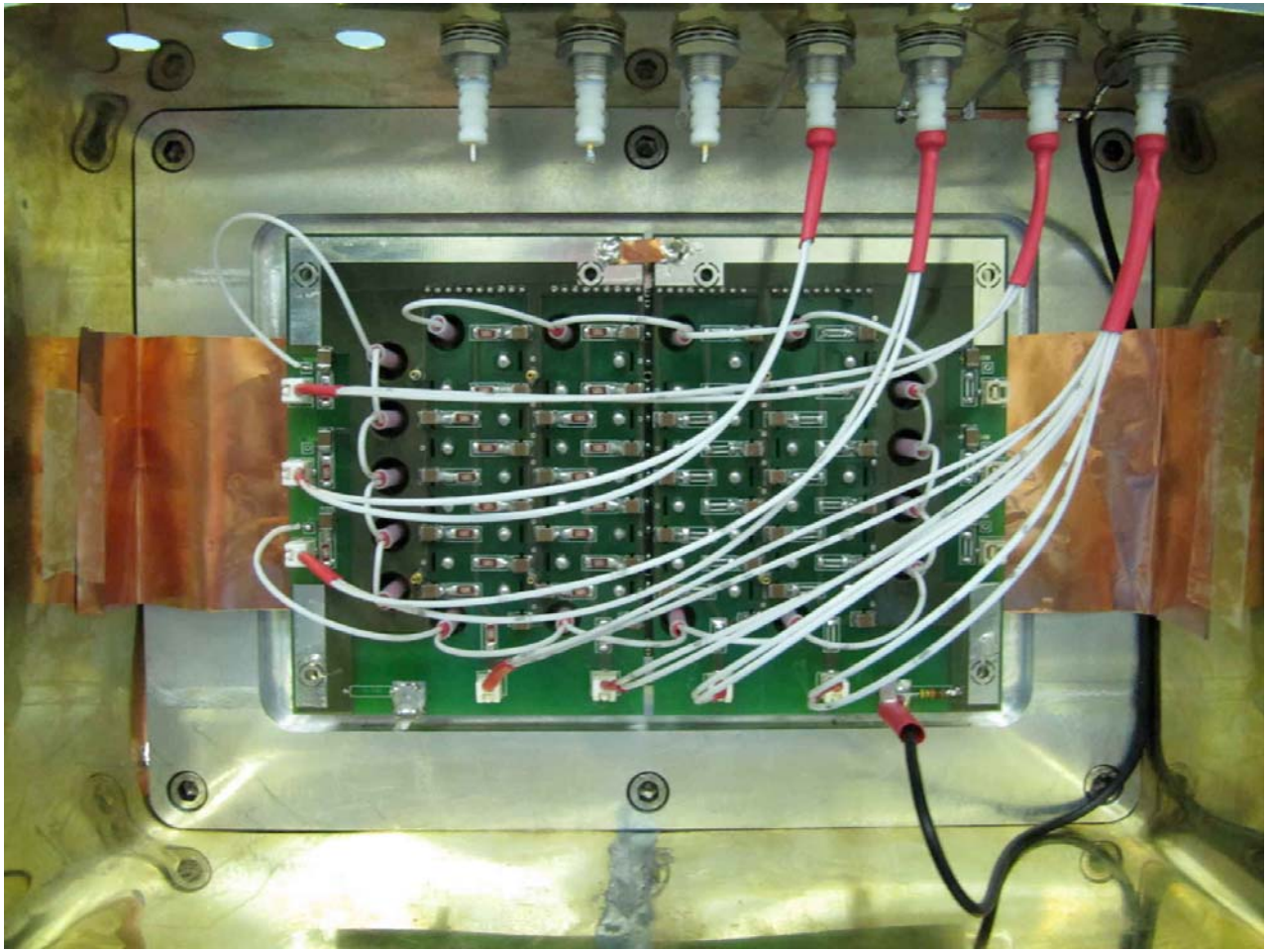






- Gas tightness test shows leak rate of <3cc/min (*in He*)
- He concentration on the endplates much less than in clean-room atmosphere (after proper sealing of the feed-throughs)

Electronics



See next talk!

Summary

- Construction of Prototype 2 is complete
  - Details on commissioning of HV and read-out electronics in Giulietto's talk
- 10-days beam-test period booked next October at BTF
  - System to support and rotate the prototype at fixed angle respect to the beam axis to be prepared in July-September
- Progress in cluster counting studies in Marcello's and Jean-Francois' talks