

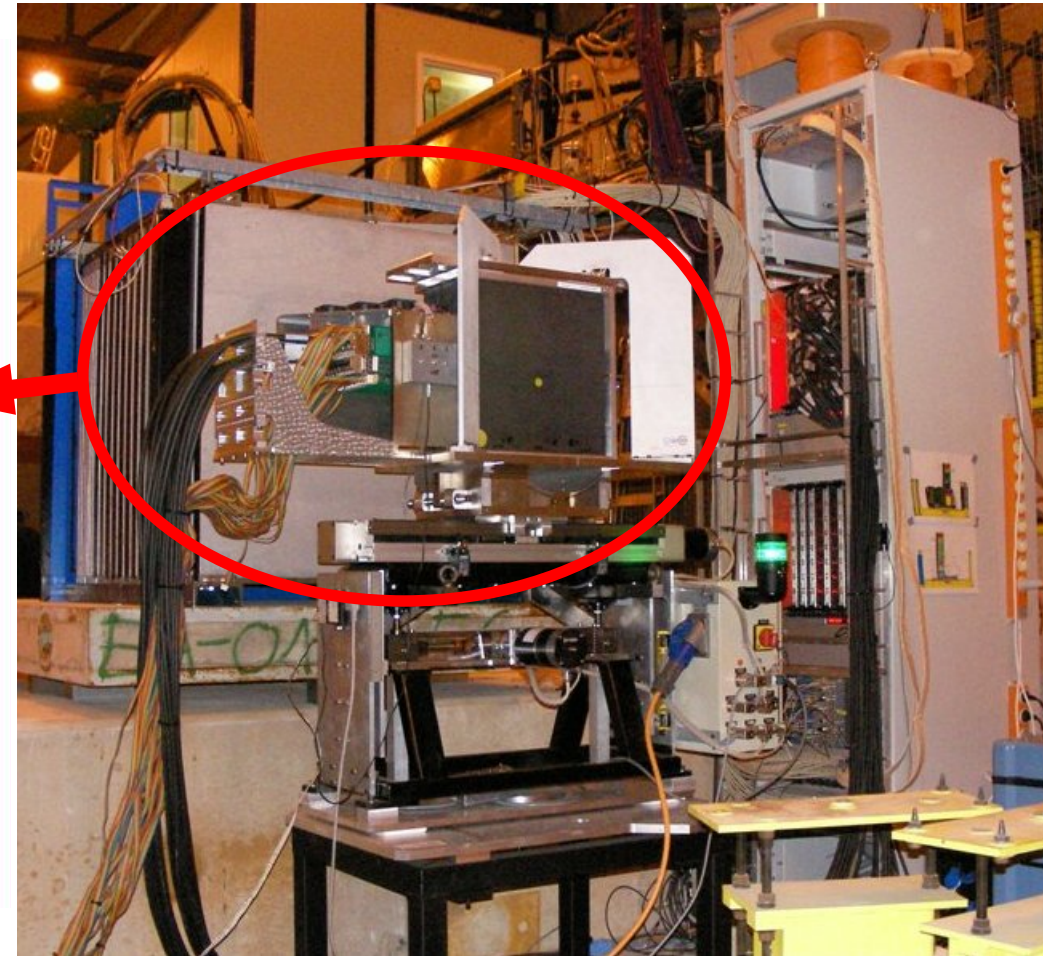
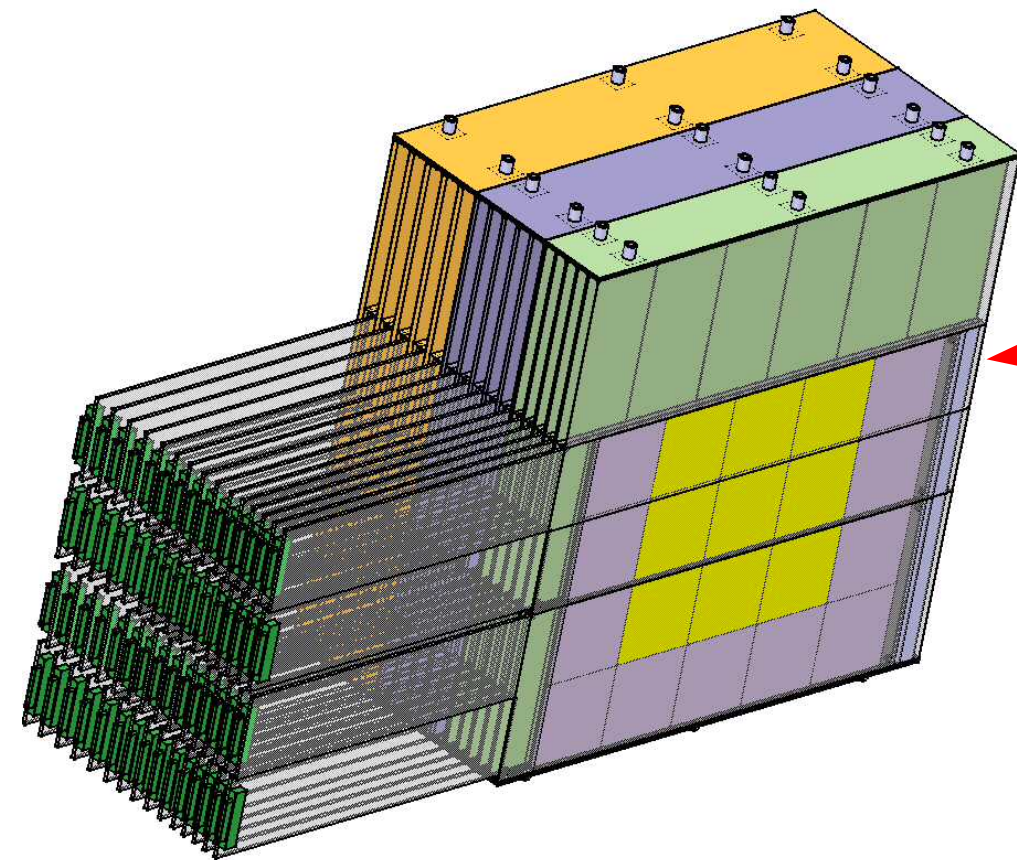
# Status of the Si-W ECAL Prototype Module

Allister Levi Sanchez (LLR)

(Thanks to Marcel Reinhard & Jean-Charles Vanel)

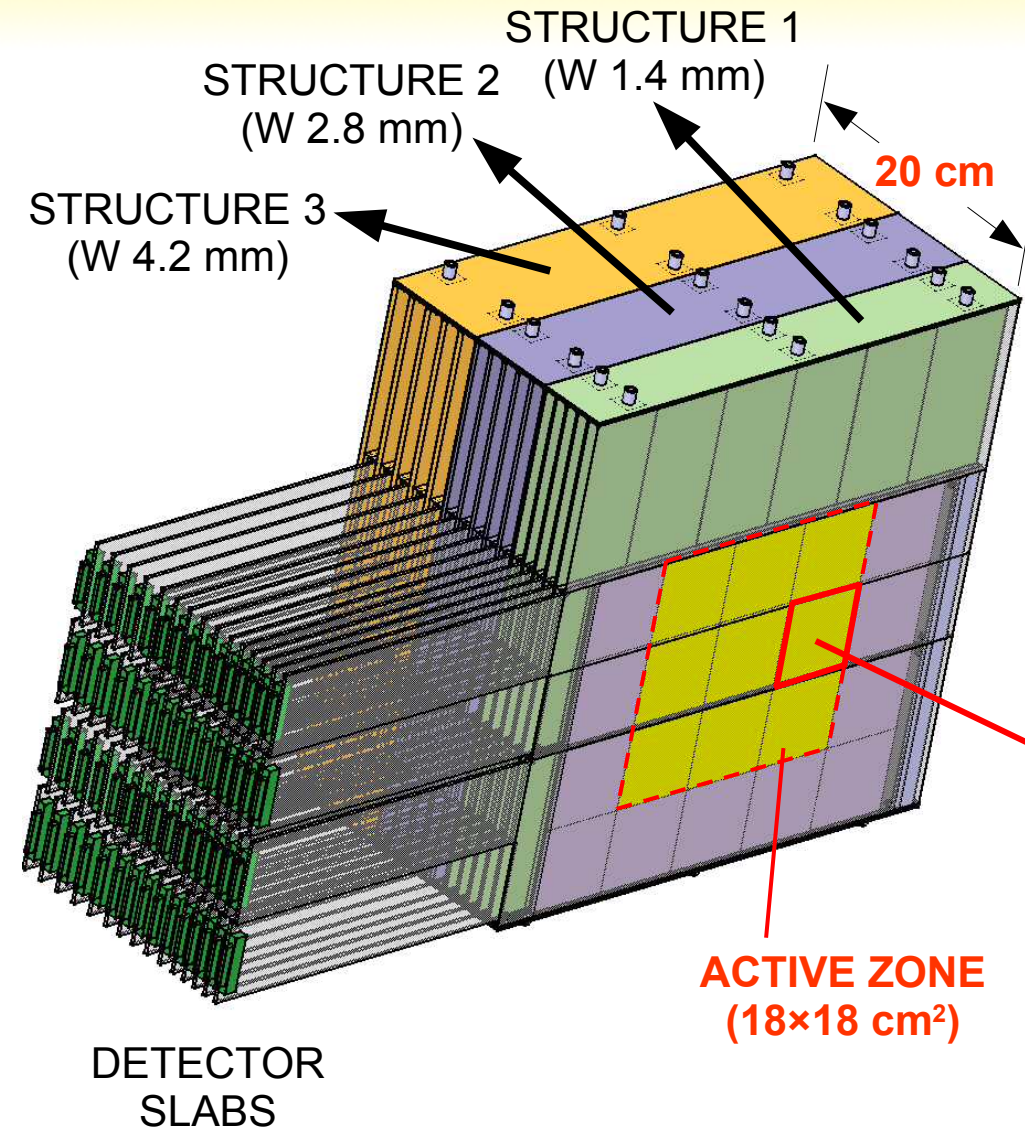
- Description of the Si-W ECAL Module
- Status in the previous test beam
- Some test beam results
- Current status

# Description of the Si-W ECAL Prototype Module

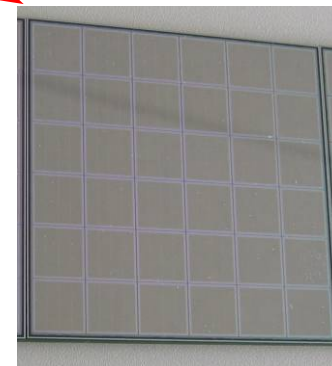




# Description of the Si-W ECAL Prototype Module



- 3 independent C-W alveolar structures (10 layers each) with different W thicknesses: 1.4, 2.8, and 4.2 mm
- 30 detector slabs are inserted into the central and bottom slots; 2 PCBs per slab
- Active zone: 6x6 pixels x 3x3 wafers x 30 layers = **9720 pixels**

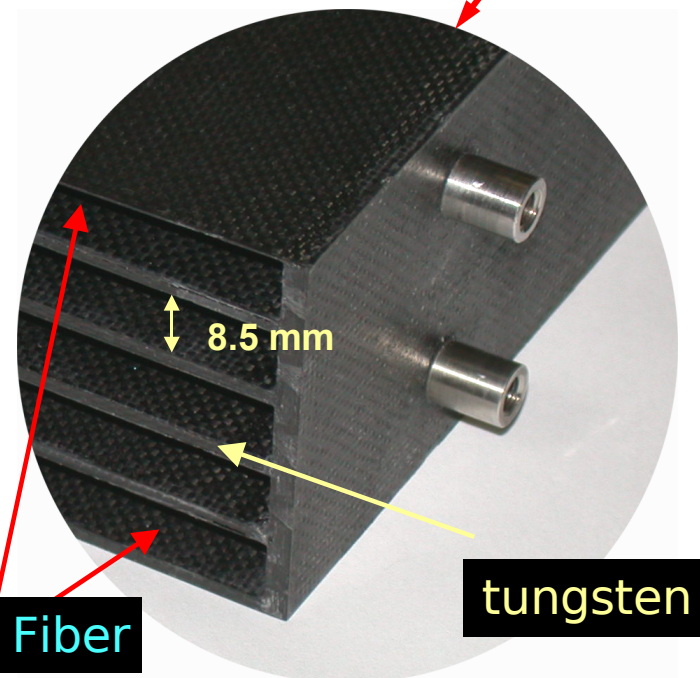
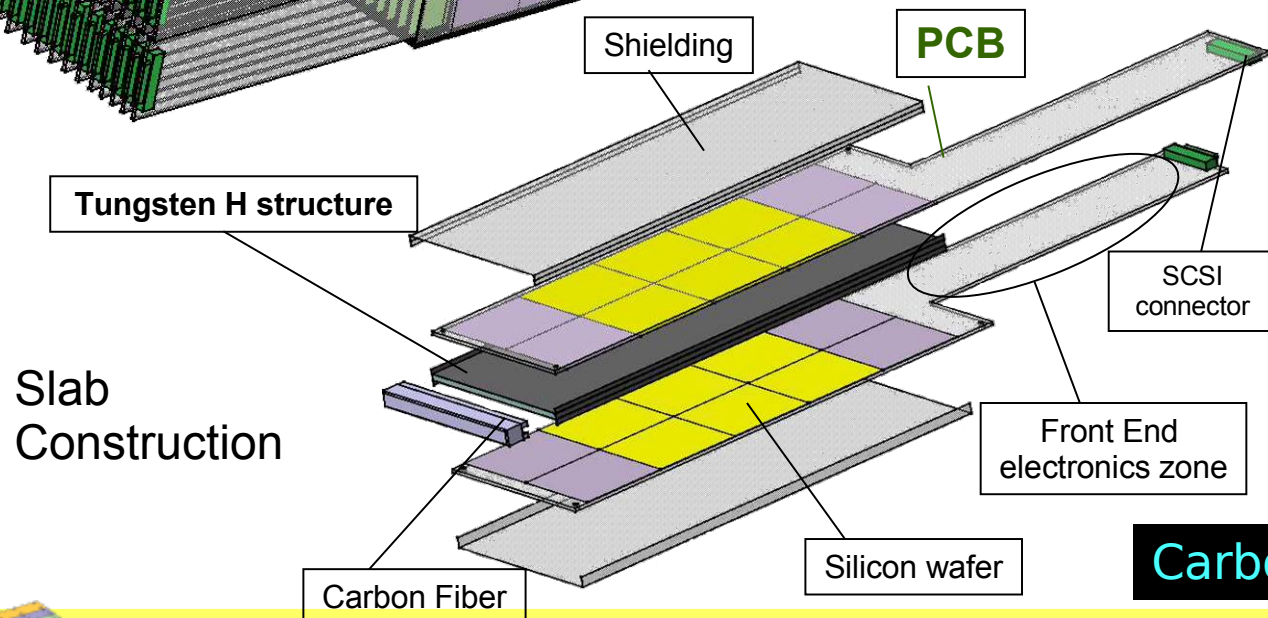
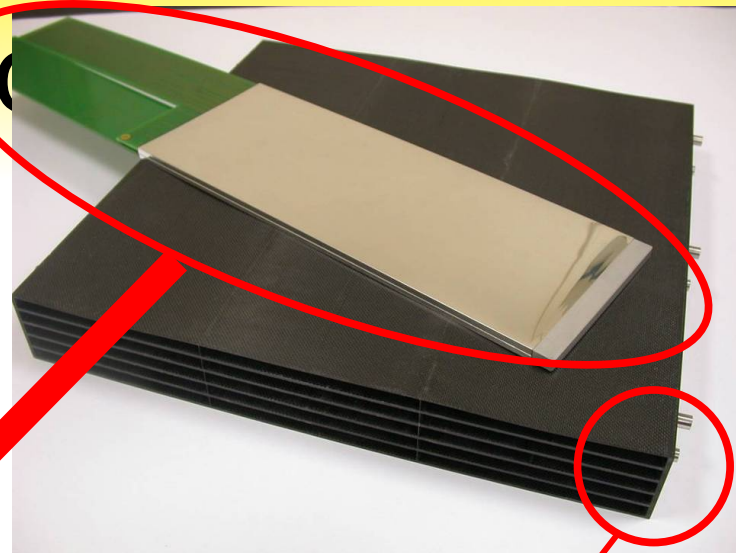
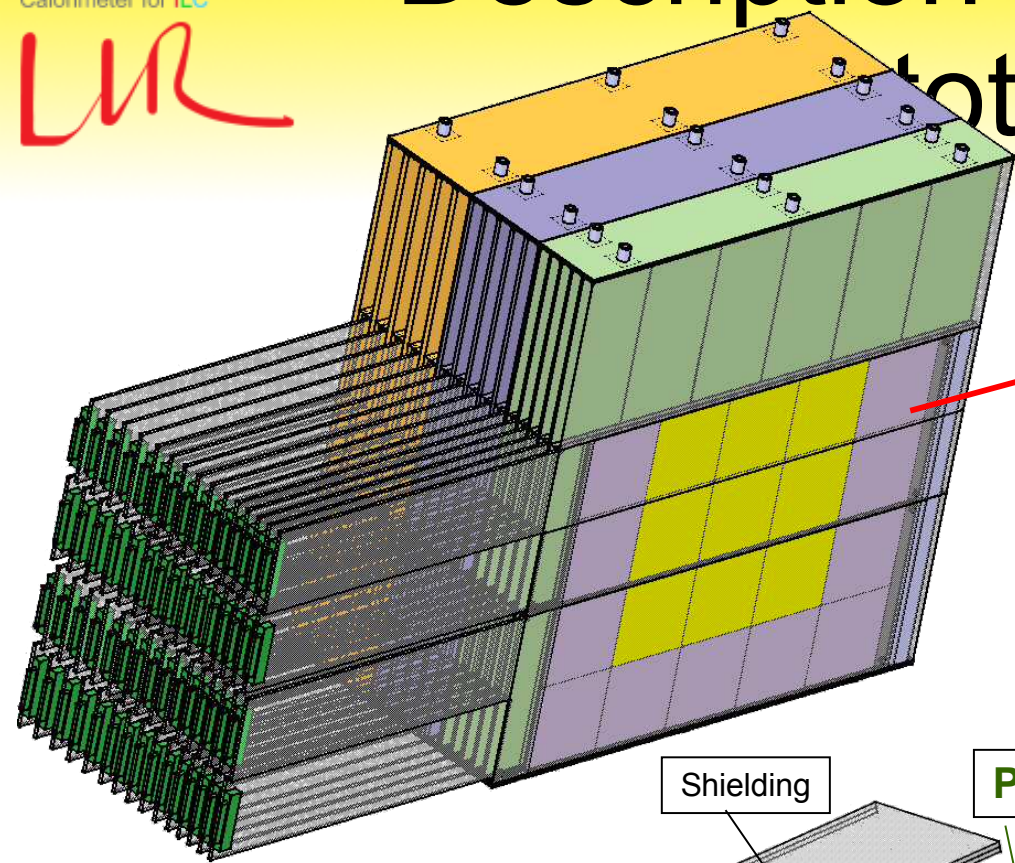


pixel size:  
1 x 1 mm<sup>2</sup>

wafer size:  
6.2 x 6.2 mm<sup>2</sup>



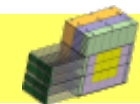
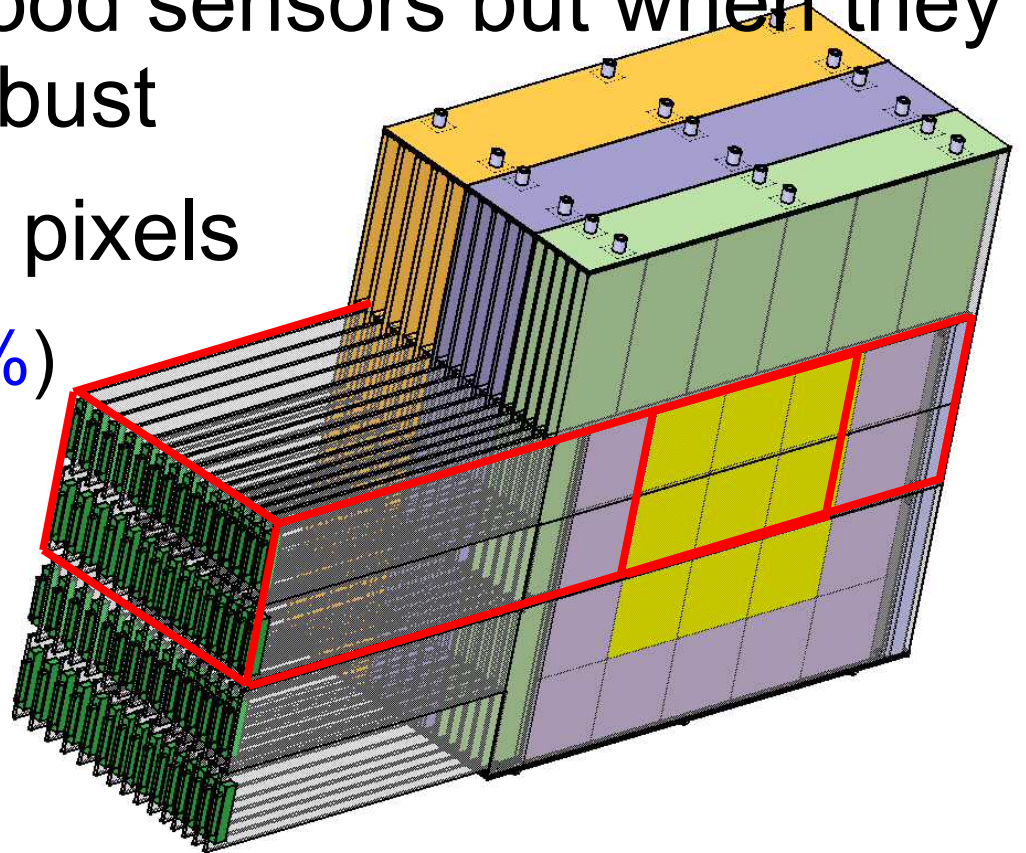
# Description of the Si-W ECAL prototype Module



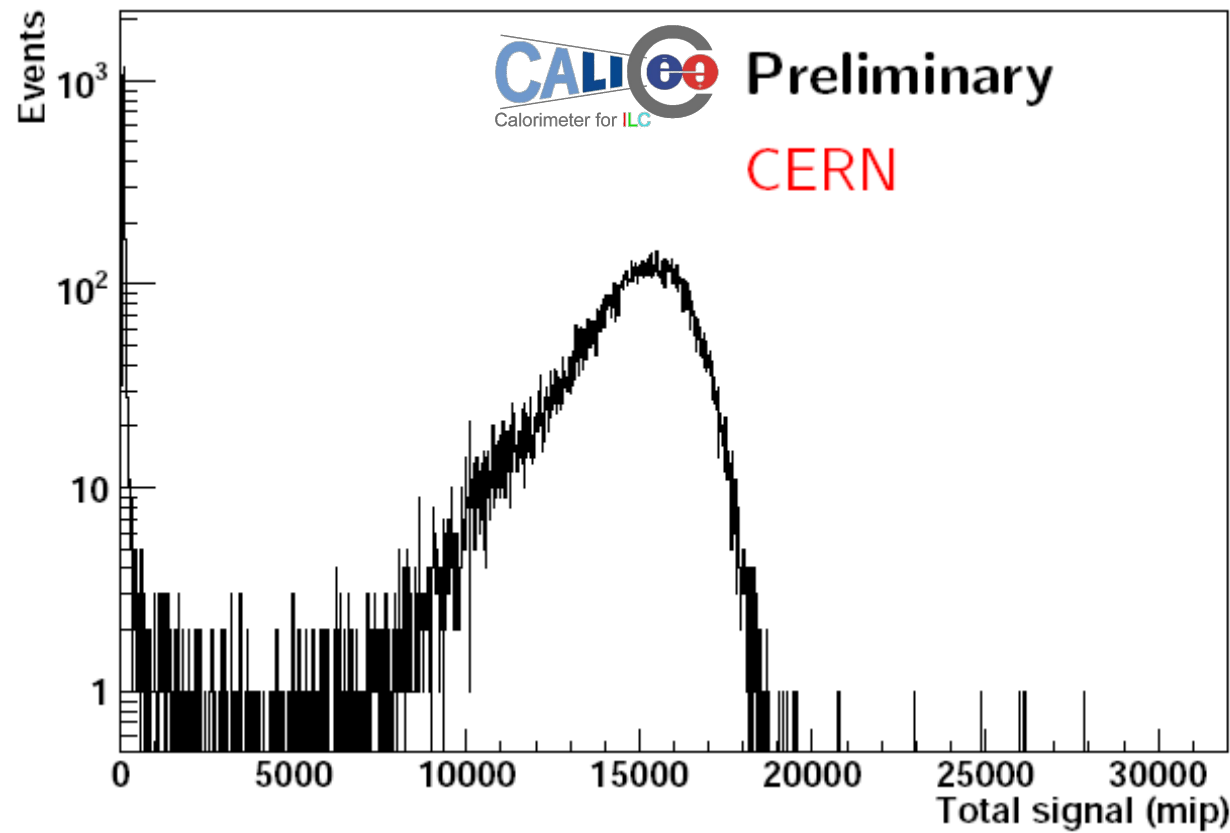


# Status in the previous test beam

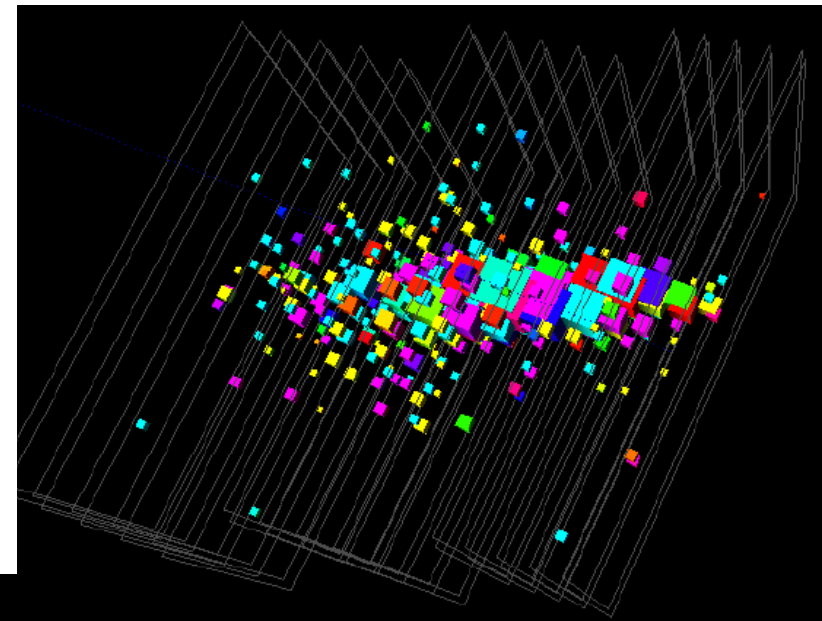
- Due to lack of good wafers, only 15 slabs were used (two upper rows)
- Difficult to produce good sensors but when they are good, they are robust
- Only few problematic pixels
  - 9 of 6480 pixels (0.1%)



# Some test beam results



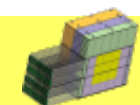
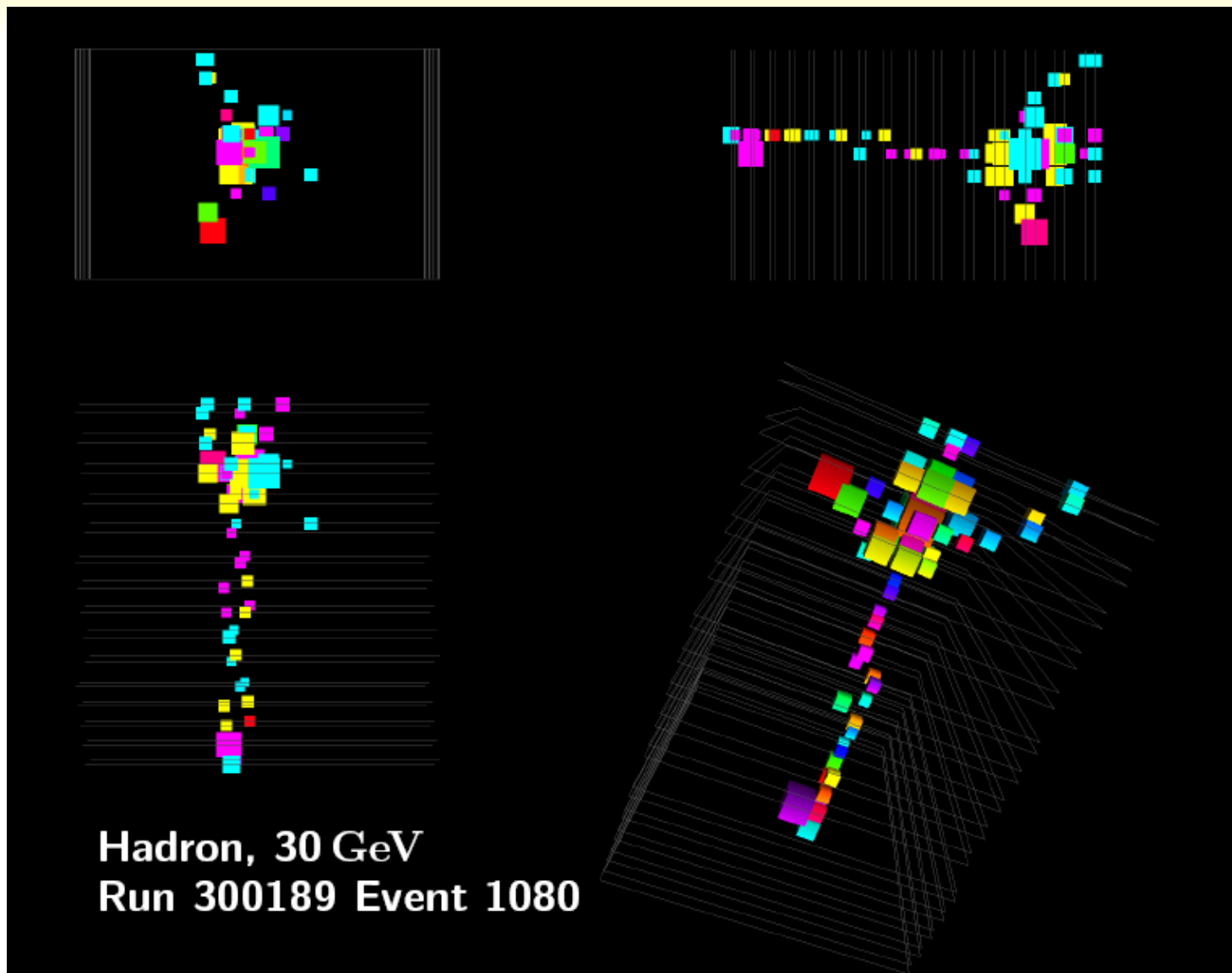
G. Gaycken  
45 GeV electron



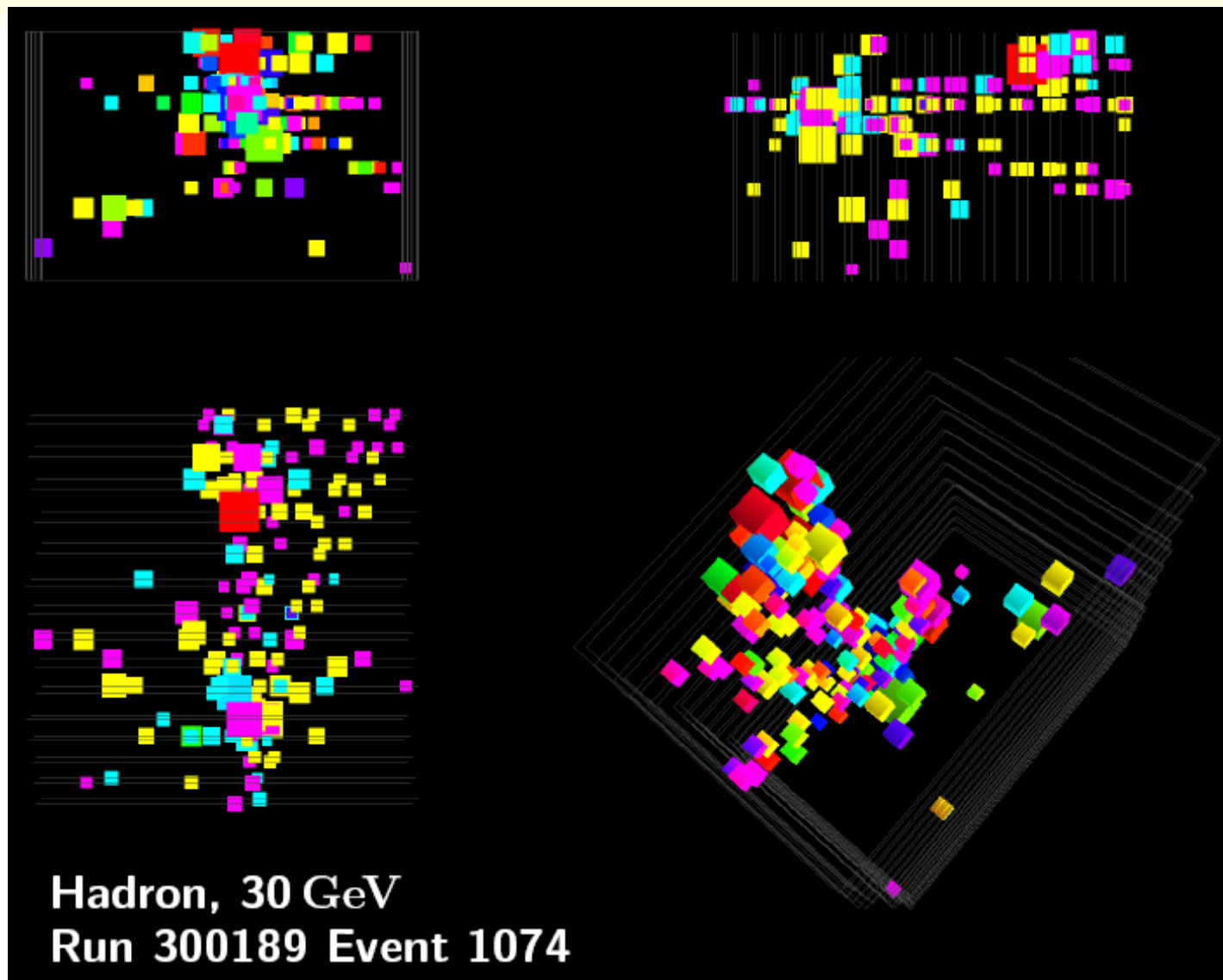
Electron 45 GeV, 20°  
Run 300364 Event 19205



# Some test beam results



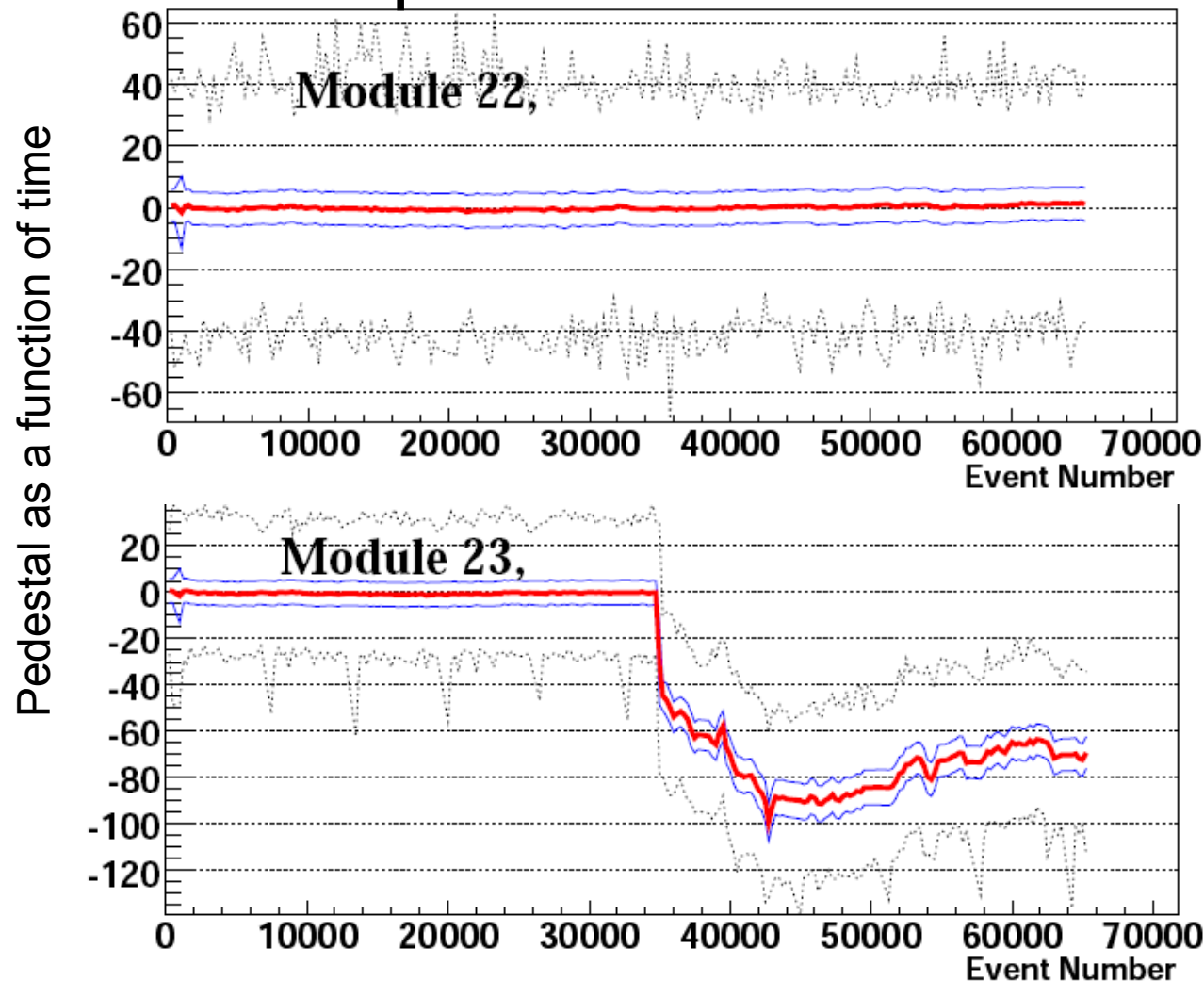
# Some test beam results





# Some test beam results

- Global pedestal shift



Good PCB

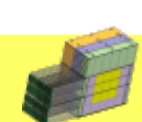
PCB with unstable pedestals

(from G. Gaycken)



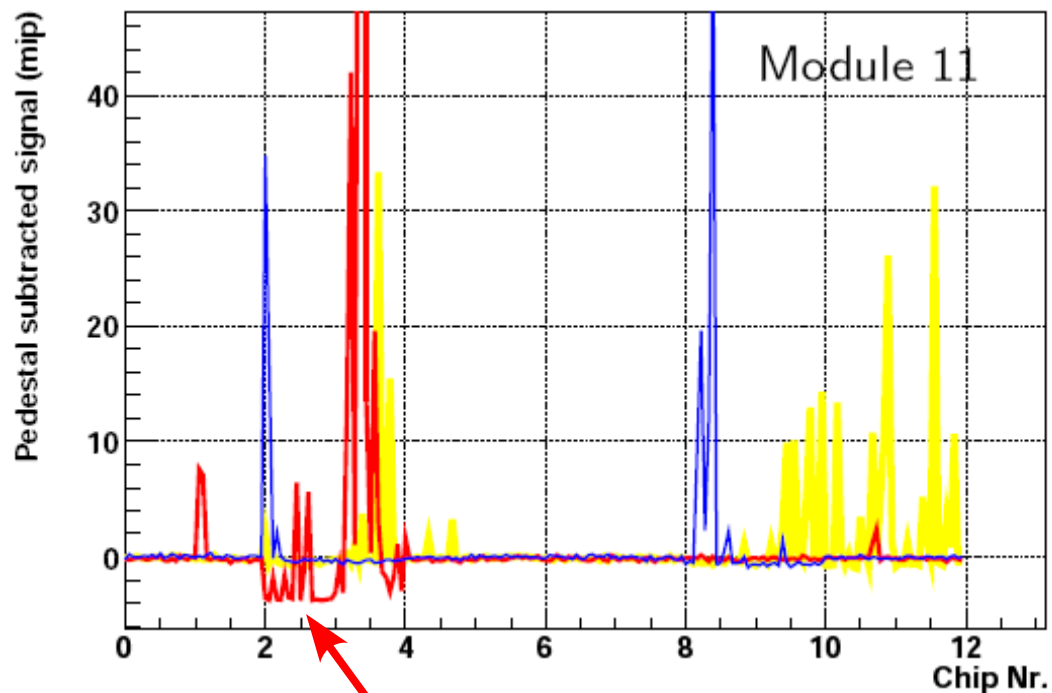
# Some test beam results

- Global pedestal shift
  - Software correction works well
  - Hardware problem understood: fake differential in the chip
  - SKIROC chips, with real differential, will be used in EUDET module, but not in the coming July test beam

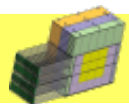


# Some test beam results

- Signal-induced pedestal shift
  - A large energy deposit on a pixel can cause a drop in the pedestals of other pixels in the same wafer



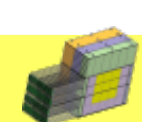
Large impact on 2<sup>nd</sup> wafer (350 mip)



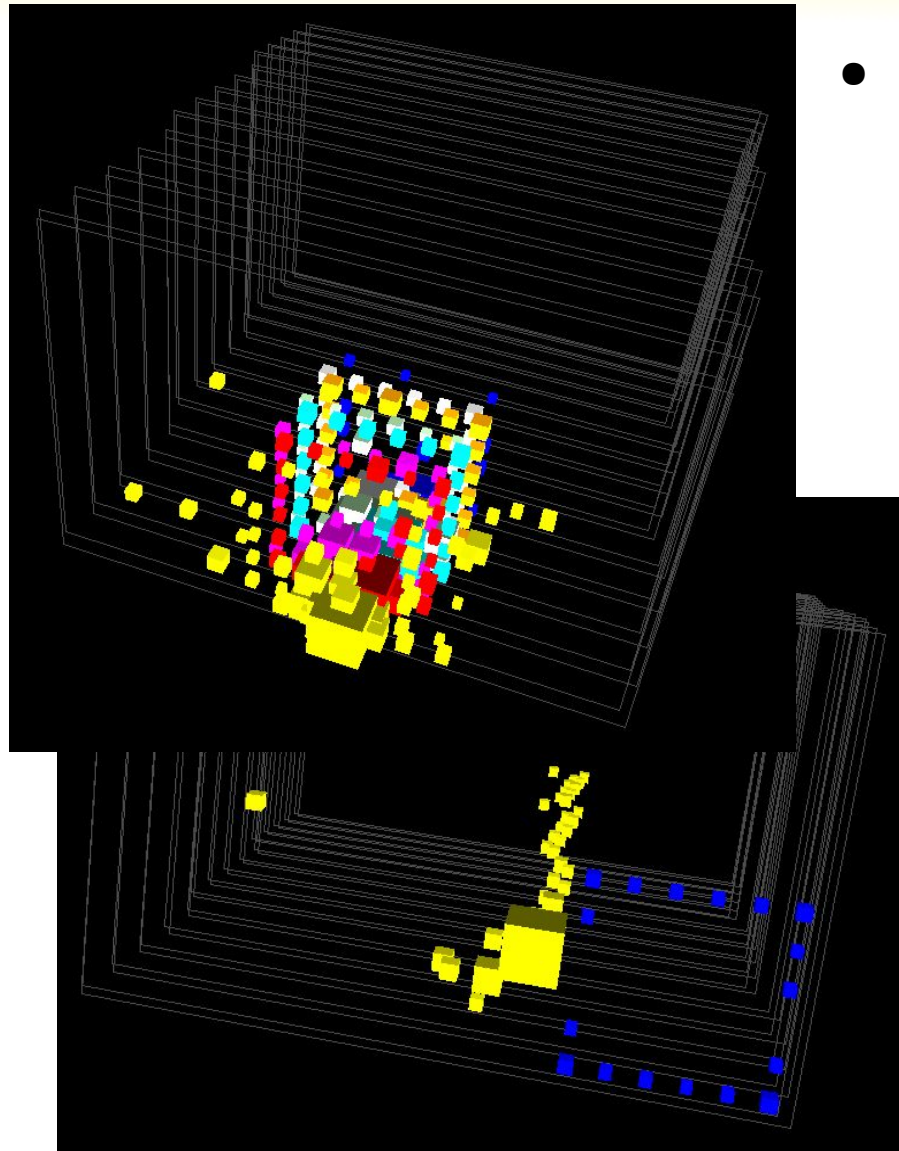


# Some test beam results

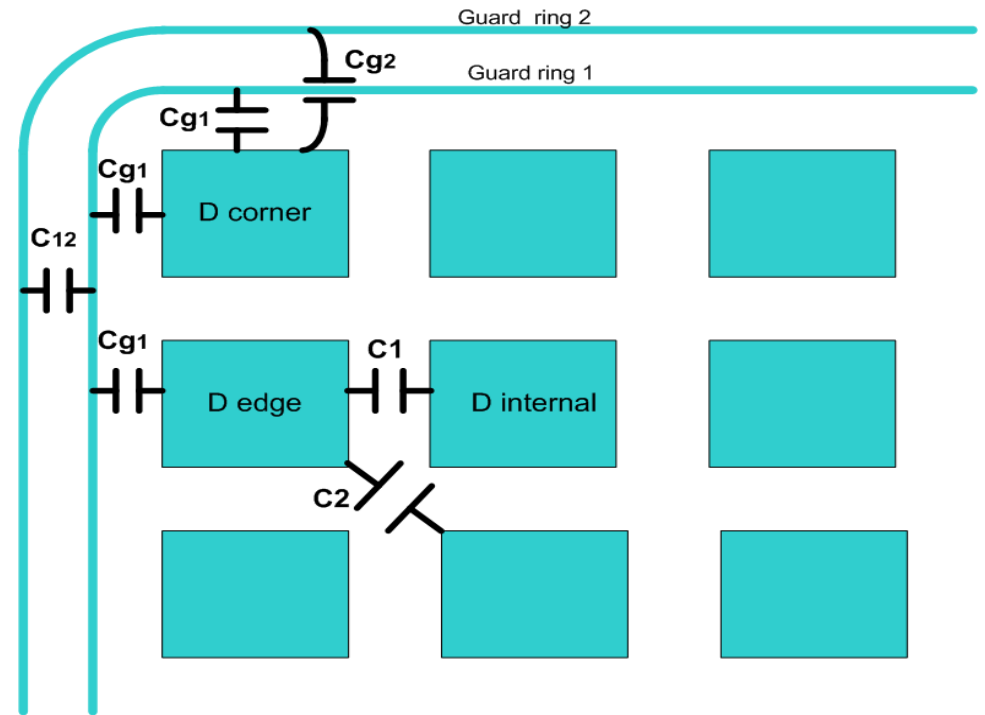
- Signal-induced pedestal shift
  - Software correction works (M. Reinhard)
  - The cause is not yet well understood



# Some test beam results



- “Square events”
  - cross talk between guard rings and pixels (Akli Karar)



# Current Status

- Lower part still lacks wafers ( $30 \times 3 = 90$  wafers)
- Czech production of 100 wafers (done)
  - Good for 7 slabs
  - For status of silicon production, see V. Vrba's talk
- Production of 125 more wafers beginning May
  - There's (a bit of) hope to finally be completed for CERN test beam this year! (44 wafers more to go)
- Guard ring study is under way for “square events”

