



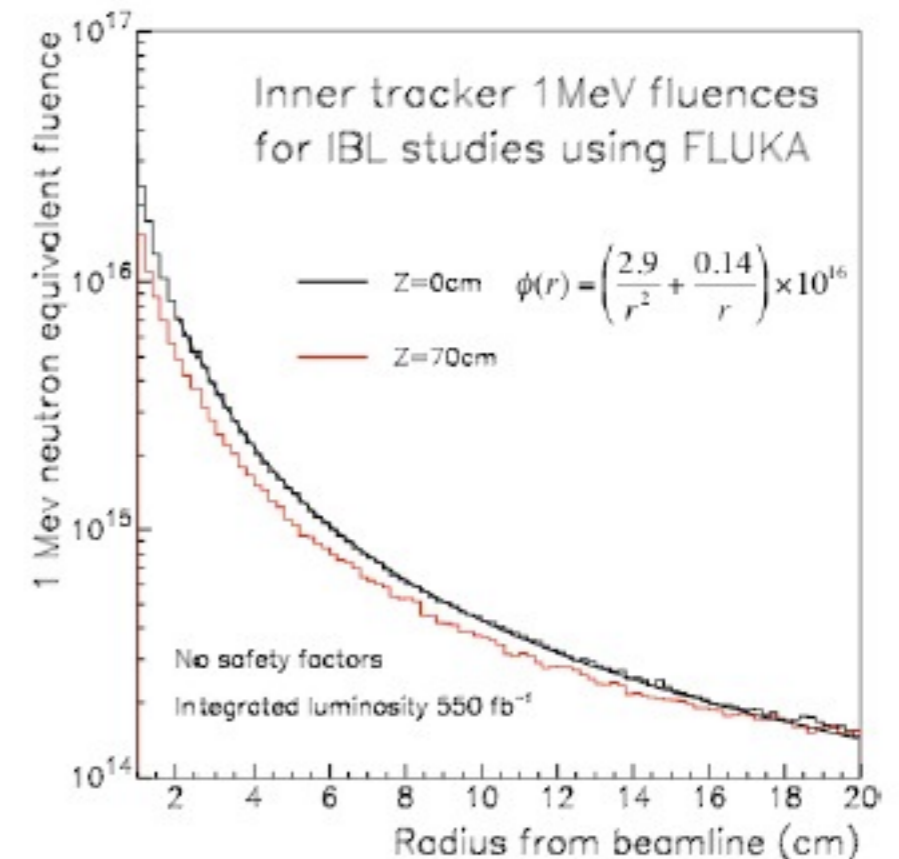
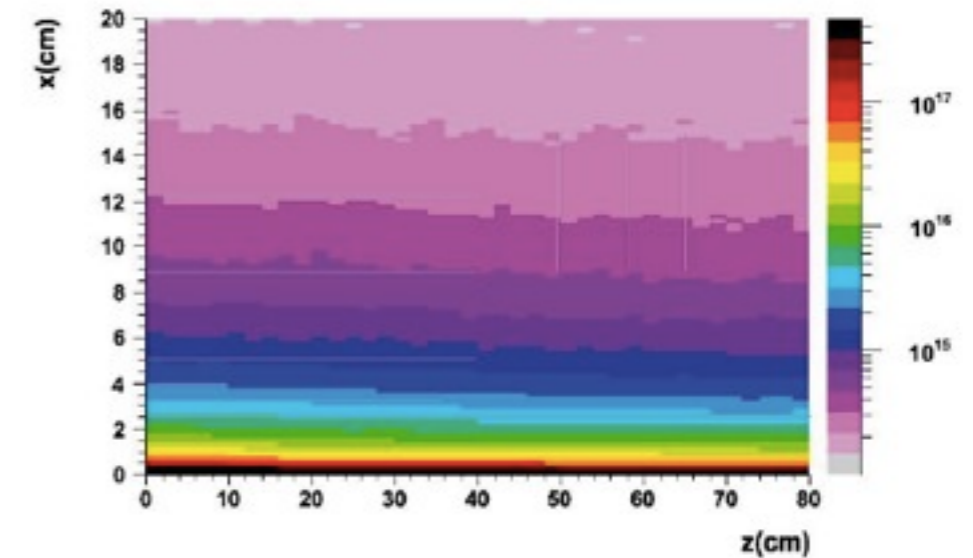
IBL construction

A. Miucci



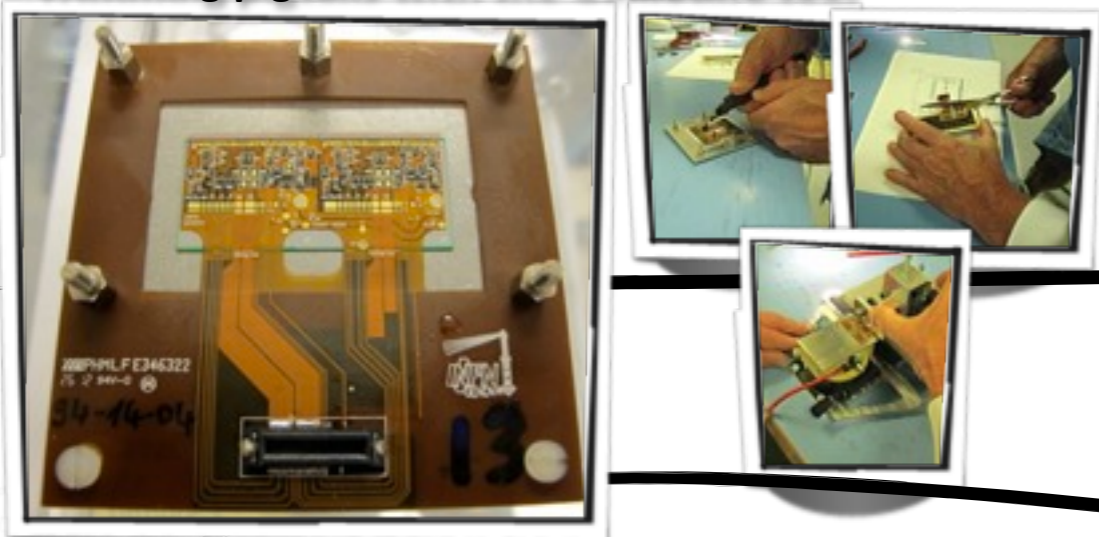
Introduction

- IBL is a 4th layer of Pixel detectors:
 - between a new beam pipe and the current B-layer.
 - $|\eta| < 2.5$
- Aims:
 - 1. Tracking robustness.
 - 2. Luminosity effects:
 - $2 \times \mathcal{L}(2012)$ is expected in Phase 1.
 - 3. Tracking precision.
 - 4. Beam pipe replacement.
 - 5. Large radiation doses:
 - 1. Smaller radius of the IBL requires a more radiation hard technology.
 - 2. Because of the small radius between the new beam pipe and the existing Pixel detector sensors needs active edges or a slim guard rings.
 - 3. Minimizing material is very important in the optimization of tracking and vertexing performance.



IBL staves construction: procedure

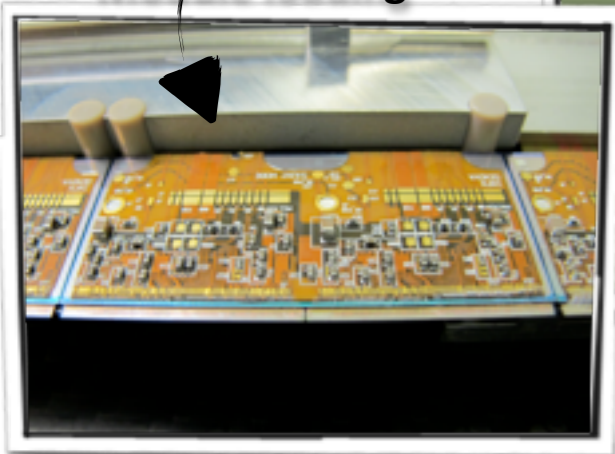
Trimming pigtails with the Guillotine tool



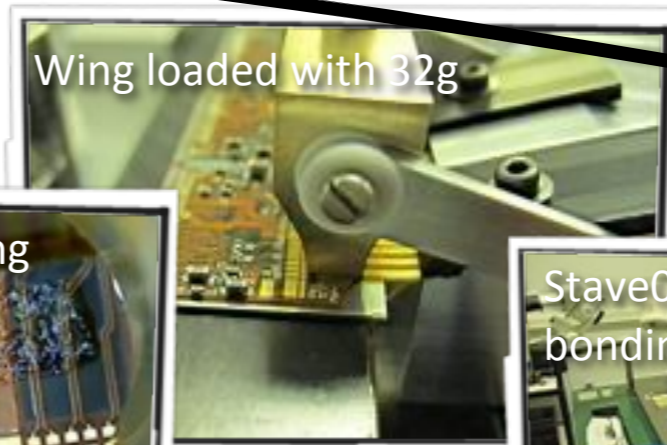
Grease mask working steps



Module loading



Wing loaded with 32g



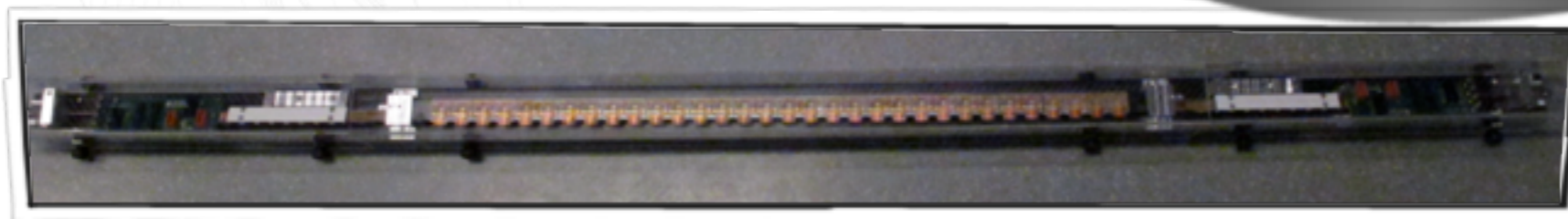
Glue stamping



Stave0 on pull tester

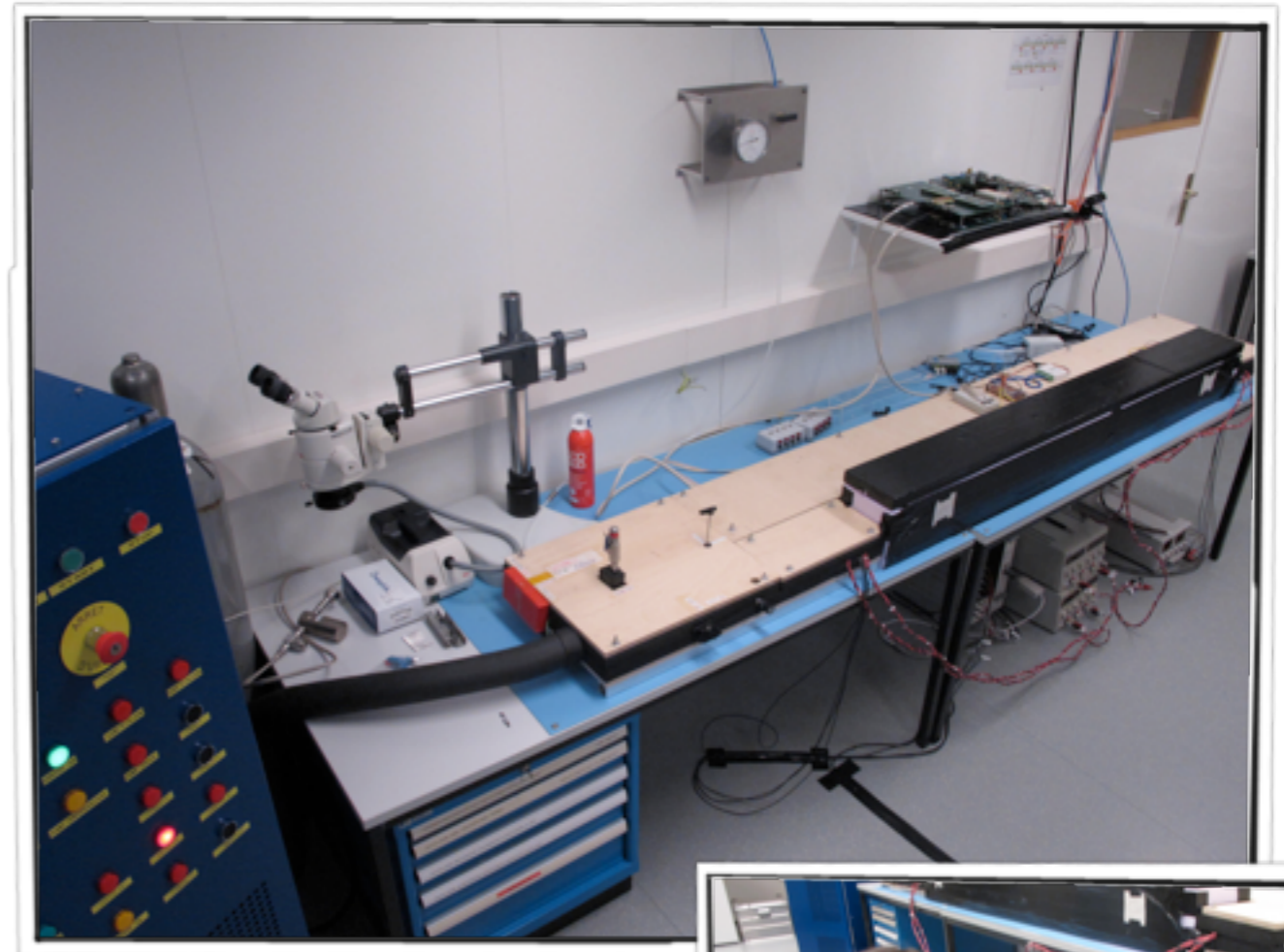


Stave0 on the wire bonding machine



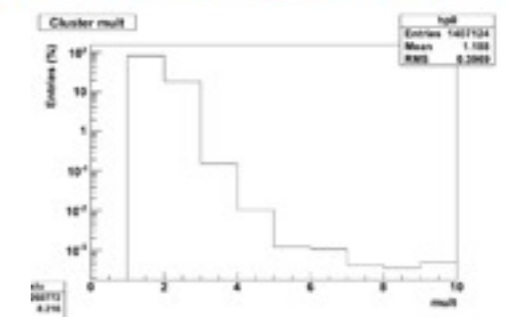
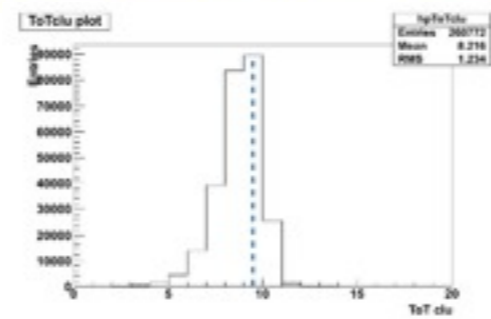
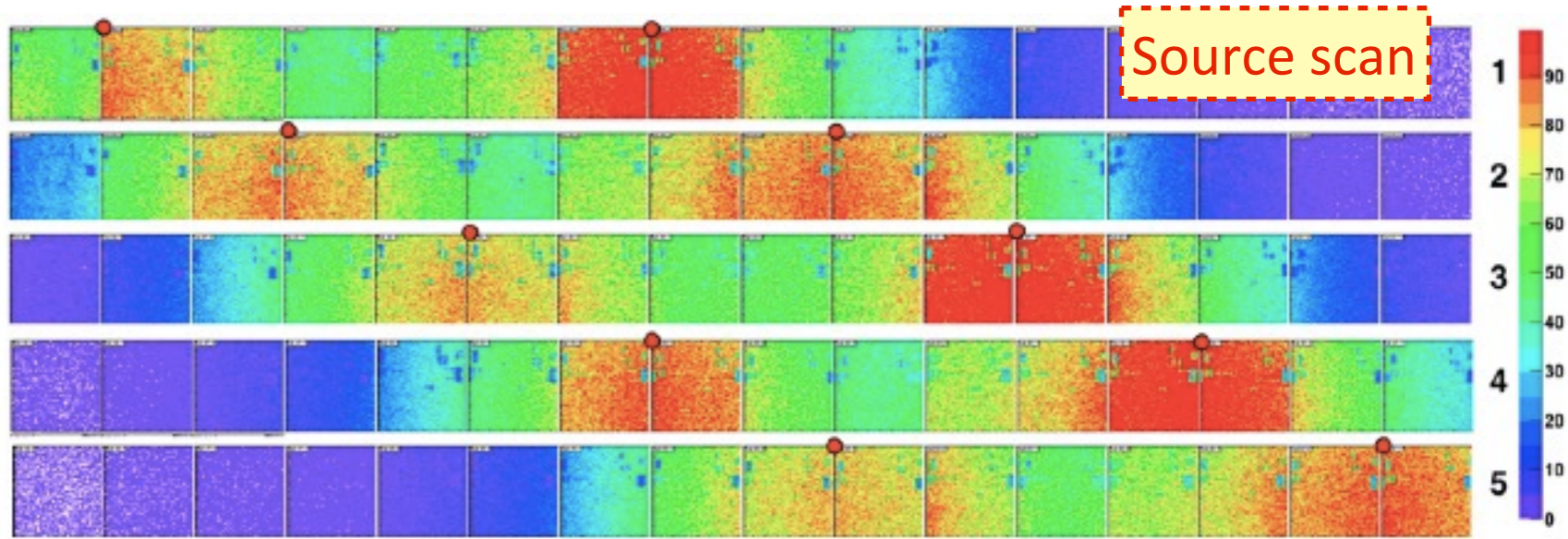
IBL: Stave QA

- Goal of Stave QA:
 - Check of the electrical behaviour of IBL modules before loading to make a selection
 - IV of the sensor
 - Communication with FE
 - Connection between FE and Sensor
 - Optical Inspection
 - Check for mechanical defects
 - FE properties
 - Check the electrical behaviour after the loading to be sure to not introduce any damages
 - Do source and cosmic scan
- My role:
 - QA assurance of Staves at University of Geneva and CERN
 - Data analysis and interpretation



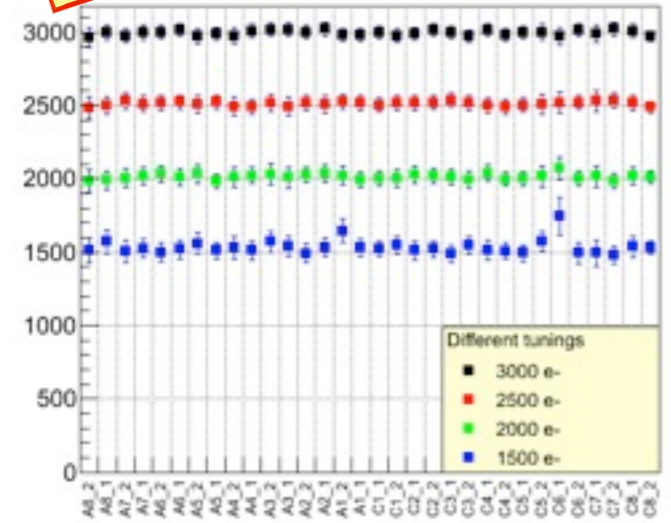
IBL results

- 2 prototypes staves ready and tested
 - no issues about loading procedure
 - some issues in Module production site, now solved
 - Disconnected Bumps and Polimerization of the Flux

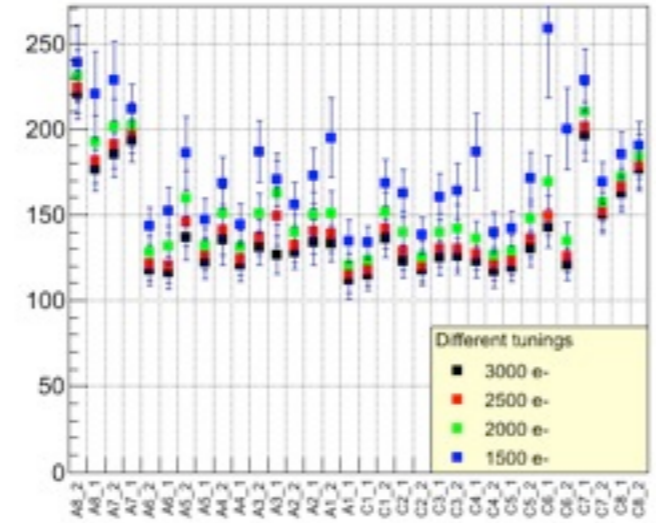


Stave ob

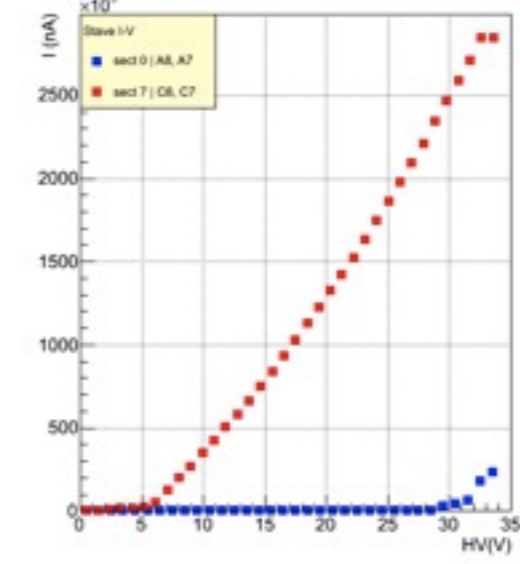
Thres. Distr.



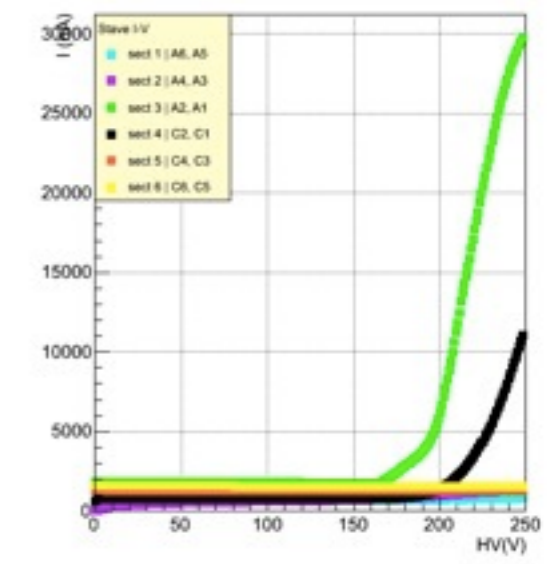
Noise Distr.



IV_3D



IV_planar



HV-CMOS with strip readout

- Silicon sensors with a first amplification stage implemented in the bulk
 - CMOS technology
- Tunable output from different pixel
 - Different pulse heights in pixels
 - Trying to use a strip readout for a pixel information
- Each pixel has half of the current FEI4 pixel dimension
- Aim:
 - Radiation Hard Technology

