Steps toward mass slab assembly

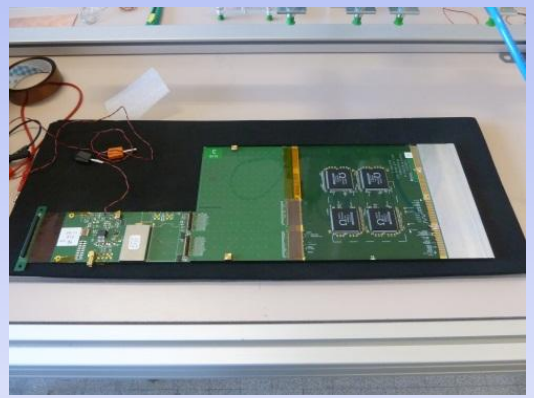
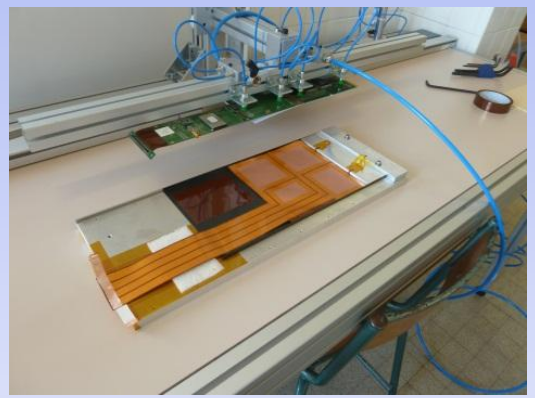
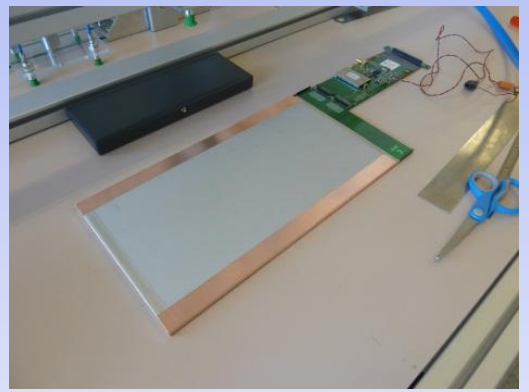
Julien Bonis

P. Cornebise, C. Bourgeois, A. Gonnin, A. Thiebault, S. Pavy (until 3/2013)

Julien Bonis
bonis@lal.in2p3.fr

Background

- ASU interconnection study => A rapid and reliable method (lead by P. Cornebise).
- Test beam slab development and assembly knowledge.

Think up mass slab assembly methods and needs

(Production rate, controls, strorage, quality system….)

Steps toward slab mass assembly :

- **Step 1 : Coarse procedure for slab mass assembly**
  - Reception Controls, tests and storage.
  - Pre-assembly and upstream preparation.
  - Assembly : Separate in several stations for simple and available tools in steady work.
  - Packaging and storage.

- **Step 2 : Test and development of mass assembly methods (in progress).**
  Detection of possible difficulties before validation.
  Under procedures redaction.

- **Step 3 : Complete procedure for mass slab assembly.**

- **Step 4 : Initial study of industrial tools and organisation.**

Step 1 : Coarse procedure for mass slab assembly

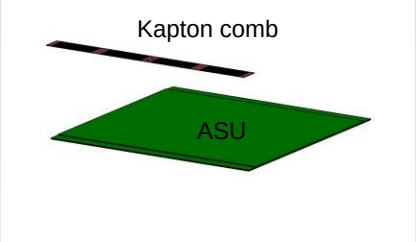
➢ **Reception Controls, tests and storage.**

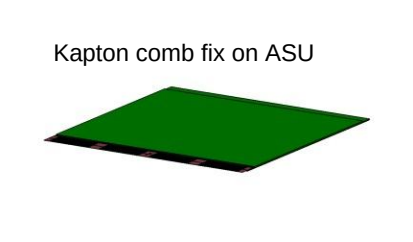
Reception controls and tests of ASU, adapt board, structure dimension….
Dry storage for sensible parts.

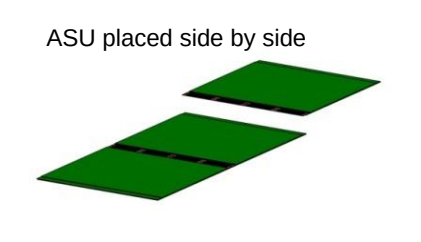
➢ **Pre-assembly and upstream preparation**

=> Final assembly simplification.
=> Less time constraint.

- Interconnection Kapton glue on ASU. ⇨ Less parts to place precisely during assembly.







- Kapton HV glue in structure.
- Adapt board fixed in slab.
- Structure placed in half return tool with core below.

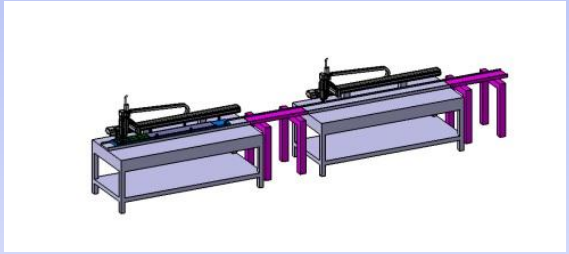
➢ Assembly line.

Separate in several stations for simple and available standard tools in steady work.

- *St1 : Electrically conductive glue put on HV Kapton.*
- *St2 : ASU setting out in slab.*
- *St3 : Interconnection.*
- *St4 : Controls of interconnection, wafer leakage current measure and functional test.*
- *St5 : Put on board and ASU fixing glue.*
- *St6 : Copper drain setting out in slab.*
- *St7 : Heat cure in damper.*

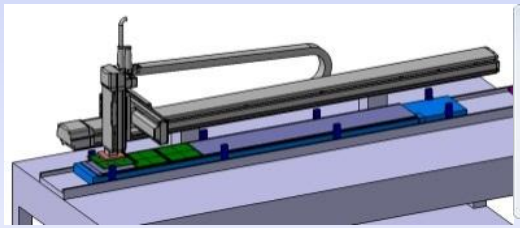
- *Slab Reversal*

- *…*
- *…*
- *Slab clamping.*



Stations of assembly line

Standard robots



➢Packaging and storage.

Dry conditions.

….

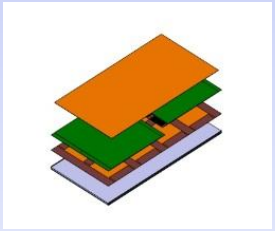
Step 2: Test and development of mass assembly methods.

- **R and D assembly**

  Dummy slab make up with inactive board and glass wafer (in progress).

  - Interconnection with 4 wafer inside ASU.
  - Kapton comb Pre-assembly efficiency.
  - Efficiency of ASU fixing in slab by electrically conductive glue before heat cure.
  - Disassembled option.
  - Repairable possibility.

Dummy short slab



Interest for wafer gluing training

- **Automatic interconnection control.**

  Lead by. P. Cornebise (See also talk).

- **Tools for interconnection Kapton brazing (=> automated process).** *Cf.*

  Lead by P. Cornebise.