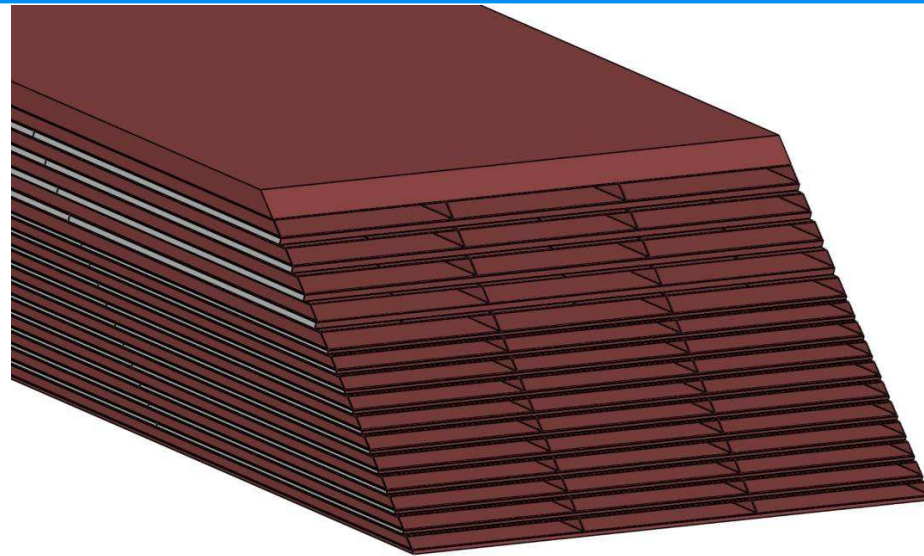


ECAL MECHANICAL R&D



LIR

26/01/2011

State of mechanical ECAL module.

- 1 Produced parts for ECAL Mould
- 2 Thermal studies
- 3 Study of behavior under pressure
- 4 Schedule

ECAL module – parts of Mould

- ⇒ Validation & Thermal tests : **Feb 2011**
- ⇒ Alveolar structure : **April 2011**

Alveolar layer production :

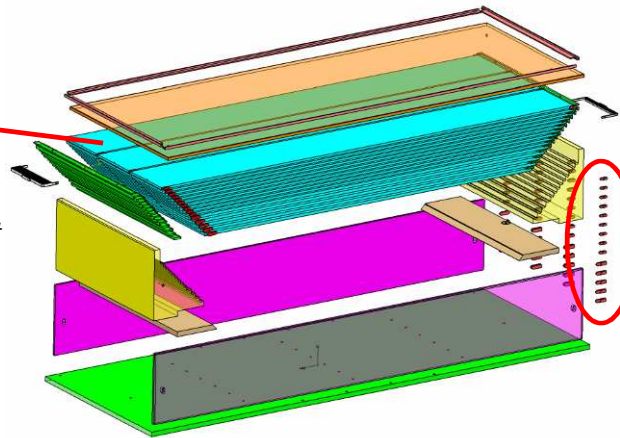
15/15 structures are been moulded

The production of one layer is now stopped because we waiting the FBG.

The reception of the FBG is expected within a week



All the cores and layers are assembled for the thermal test



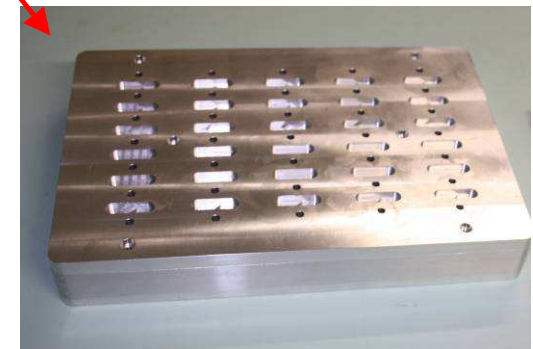
Joints production :

180/180 joints ready

Design and construction of 2 moulds according to lower and upper parts



All PVC parts for pre-compacting are completed



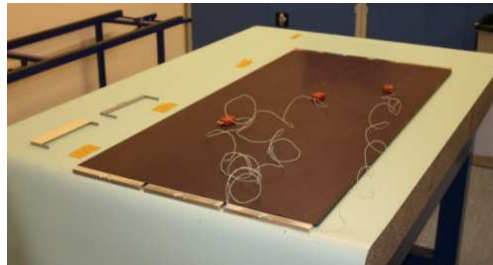
ECAL module – Thermal test

⇒ Beginning of Assembly tests : **15 dec 2010**

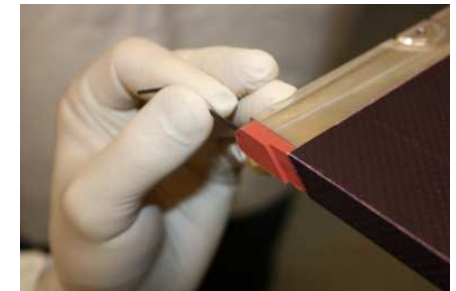
⇒ End of assembly: **Janv 2011**



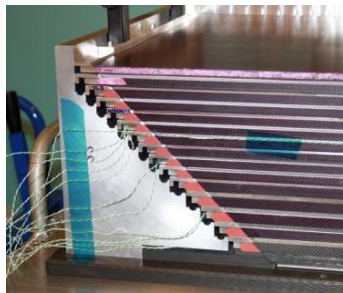
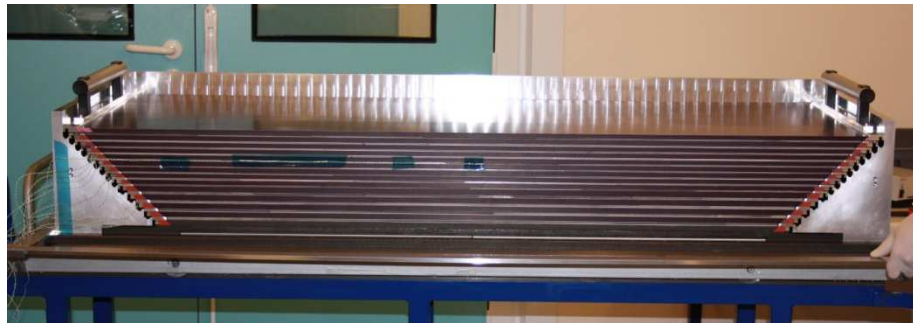
First assembly



The temperature sensor are stuck to the core



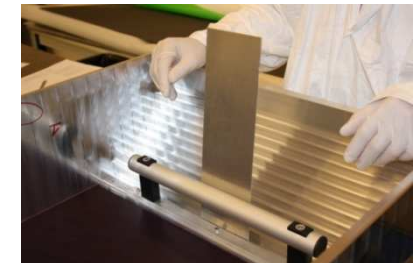
The joints are inserted between the alveolar and cores



The temperature sensor wires are fixed precisely



The tungsten plates are positioned precisely under the mould

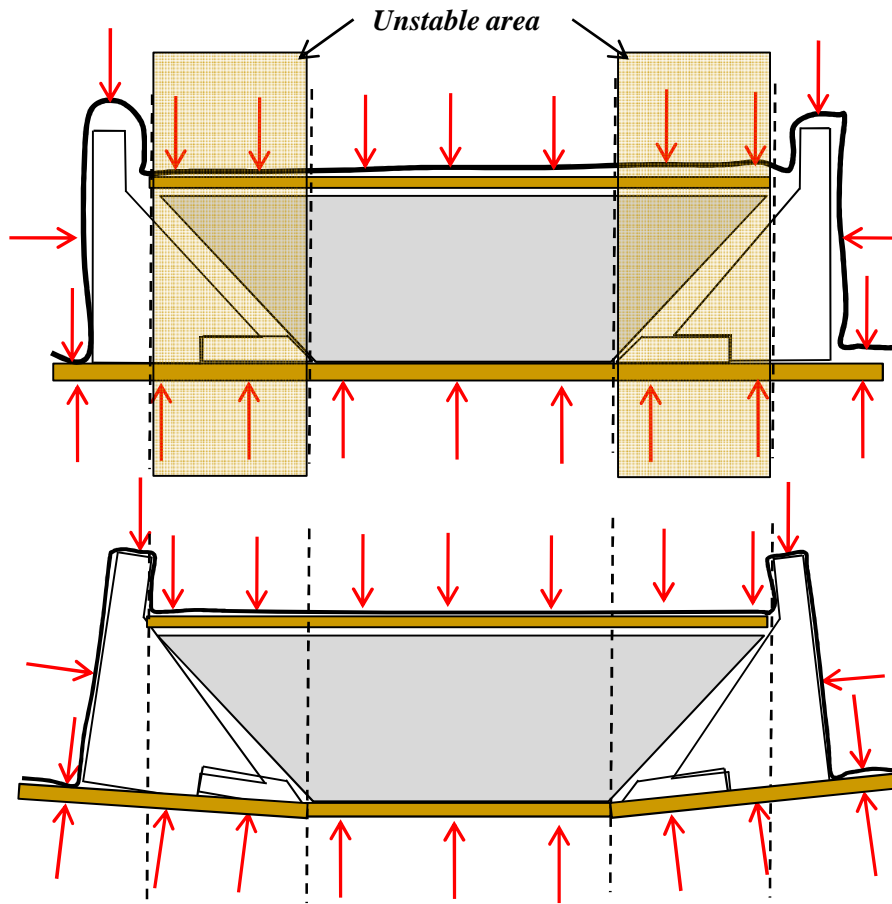


An alveolar layer is inserted in the mould with calibration foils

ECAL module – Studies

When mounting and assembly of the mold we saw a problem. There was an area at the ends of the structure that were not balanced.

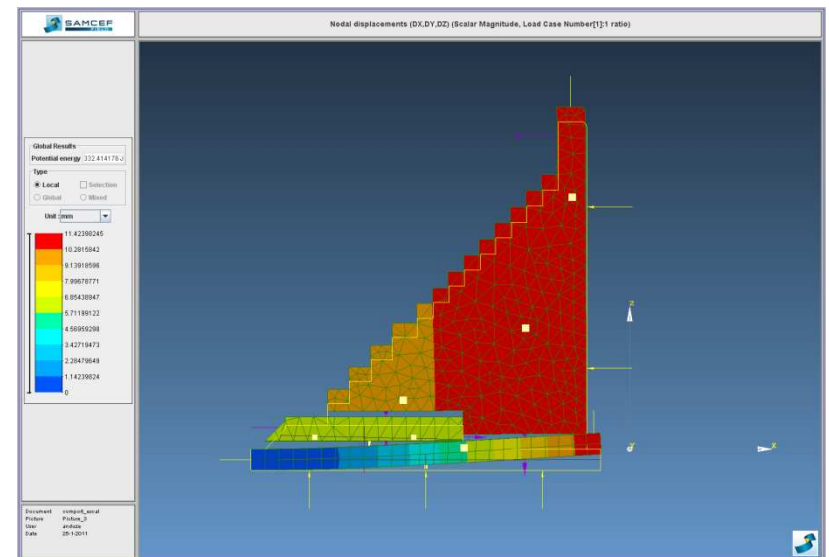
After several simulations, it appears that this area would have distorted our carbon plan and moved our staircase.



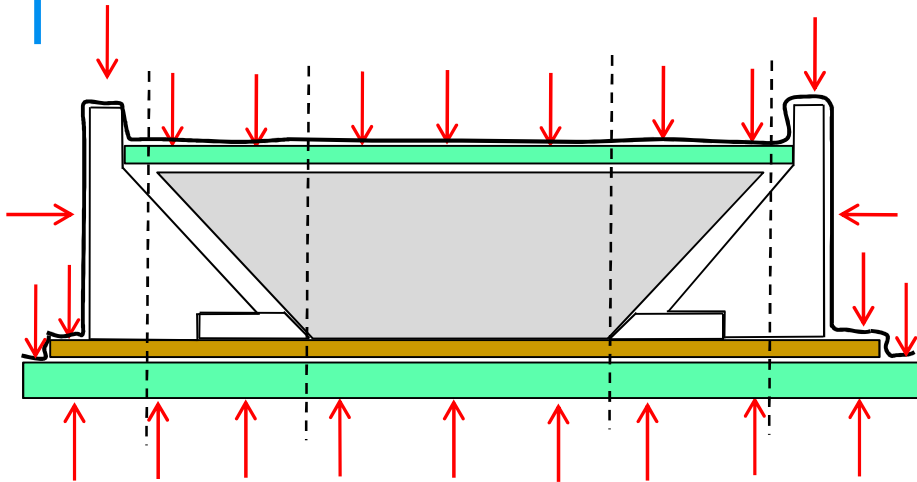
After analysis, we made a first design in which all parts of the mold came in contact. Eliminating any risk of possible deformation.

However, after several iterations and unwilling to constrain the volume of the structure, we decided to increase the space between the structure and the staircase.

It was during this last change that we have forgotten the role of balance of forces that played the structure.



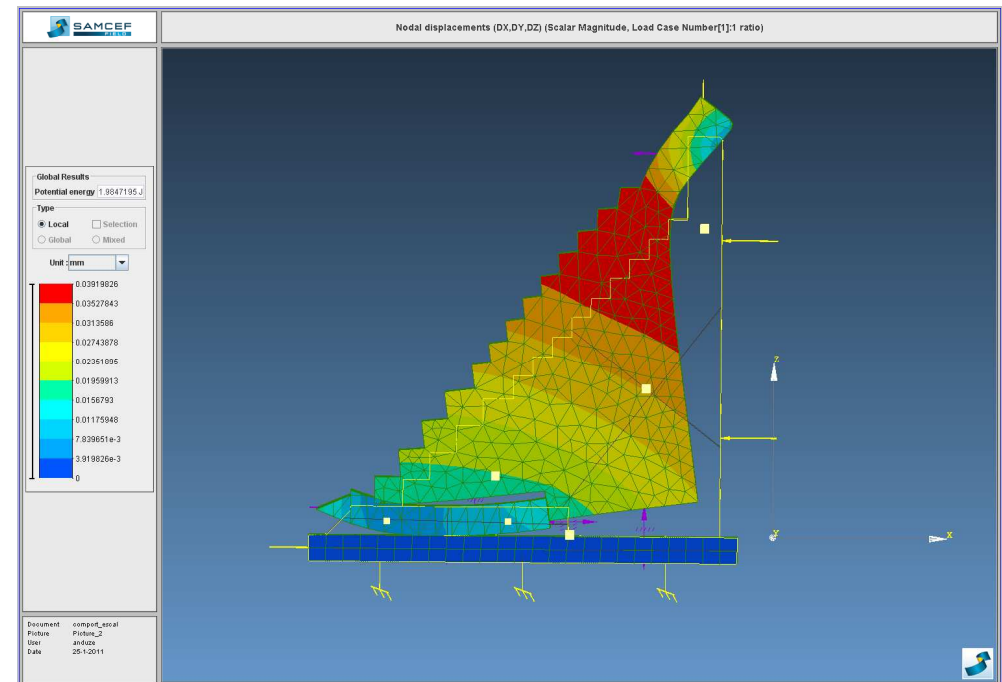
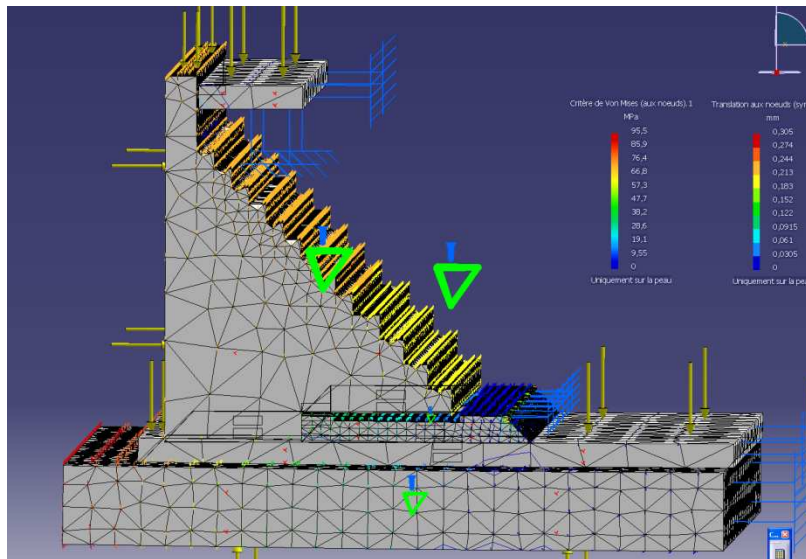
ECAL module – Studies



To solve the rotation of the staircase, we add a carbon plate on top to block his move.

To solve the deformation of the carbon plan, we added an aluminum plate thicker to withstand the stresses.

After some simulations, we have a mold perfectly balanced within 7 bars as shown in the result below.



The schedule:

- ECAL module :
 - Reception of complete Assembly mould **Done**
 - The end of the alveolar layer production **February 2011**
 - Optical integration Studies **On going**
 - Thermal tests and Validation of the mould **On going**
 - **ECAL module construction** **March 2011**
 - Modifications of H mould **May 2011**
 - **14 short H-shaped + 1 long** **May 2011**
 - Mechanical demonstrator tests (+destructive) **February 2011**
 - **TestBeam preparation** (interfaces, tools...) **First half-year 2011**