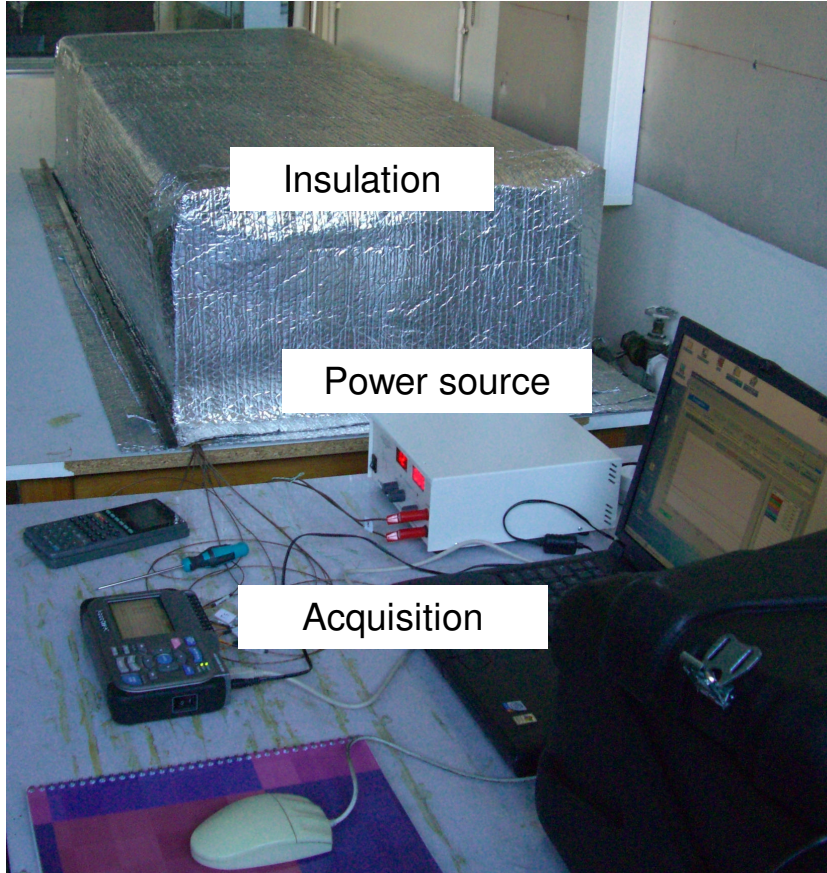


# LPSC summer thermal test

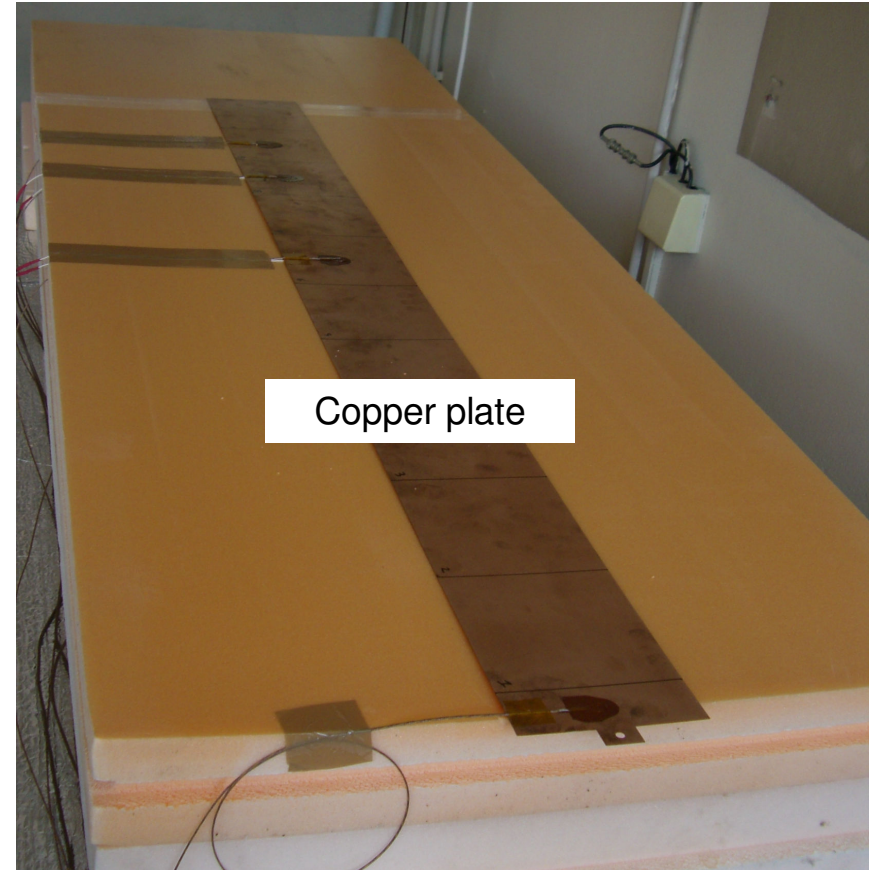
Julien Giraud ([giraud@lpsc.in2p3.fr](mailto:giraud@lpsc.in2p3.fr))



## First part : thermal comportement along the slab



Global installation



Sensor on copper plate

# LPSC Summer Thermal Tests

## Parameters of the test:

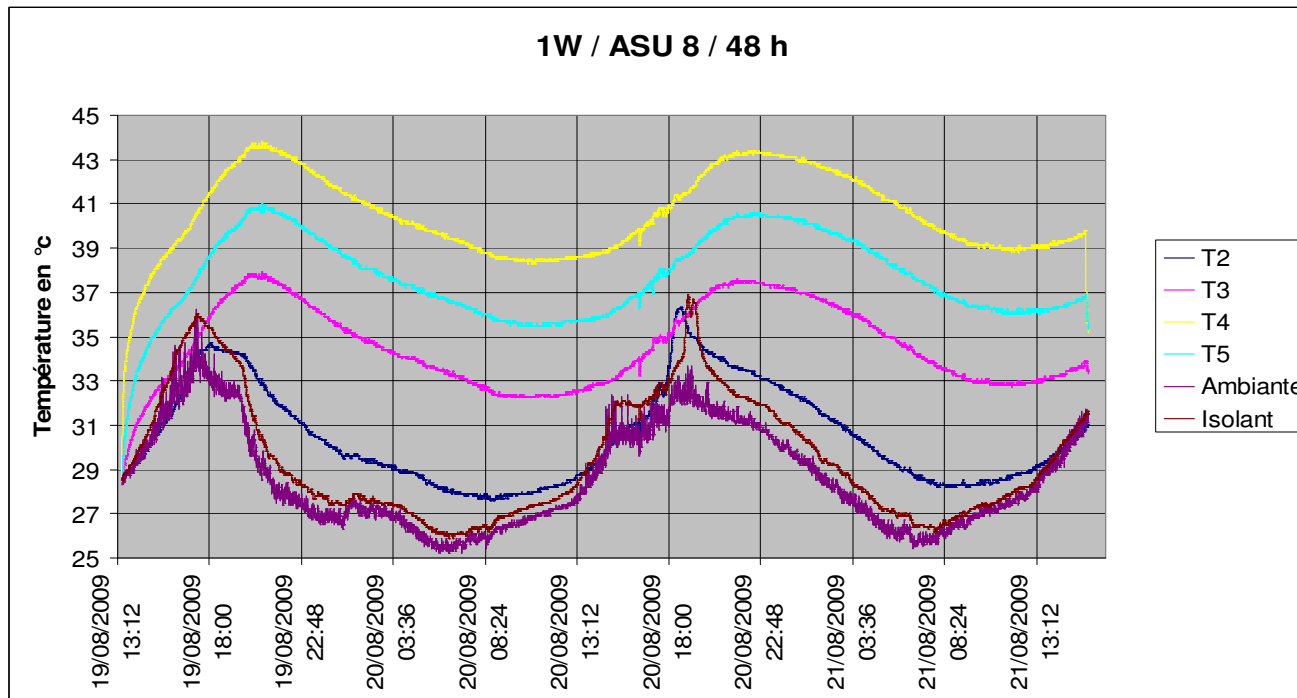
Huge insulation / No cooling / 1 W on ASU number 8 directly stick on the copper plate (0.5 mm) / 5 sensor temp / 48 h of test

What we expected:

⇒ Temperature of the copper plate should increase dangerously

What we found:

⇒ Temperature of the copper plate increase of a maximum of 14.5°C



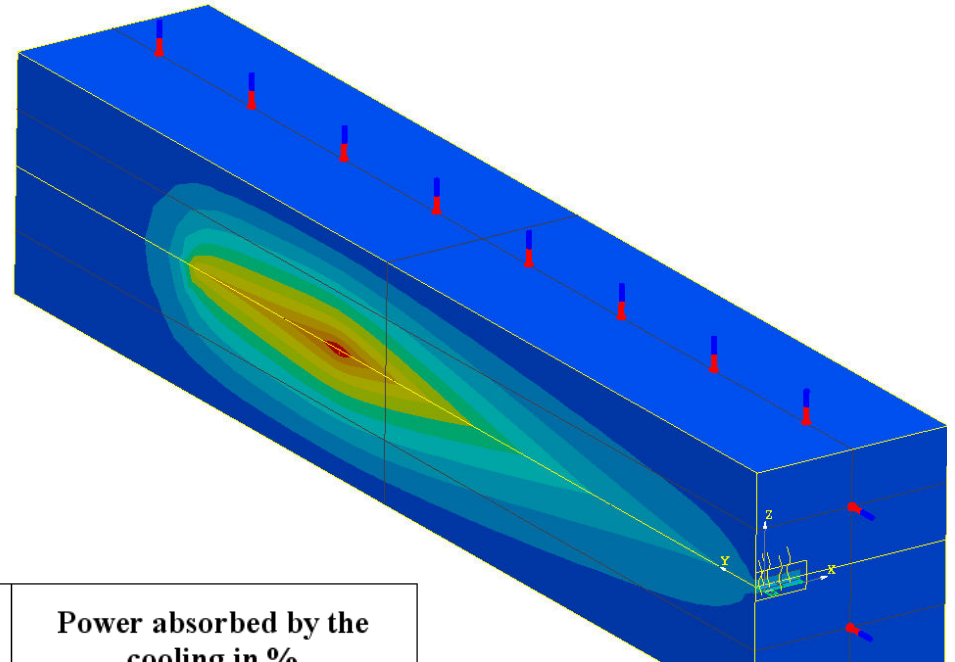
## Conclusion of this test:

The thermal slab compartment can't be based to the compartment of the copper plate with conduction only.

⇒ We need to take into account the rest of the structure (W, composite material...)

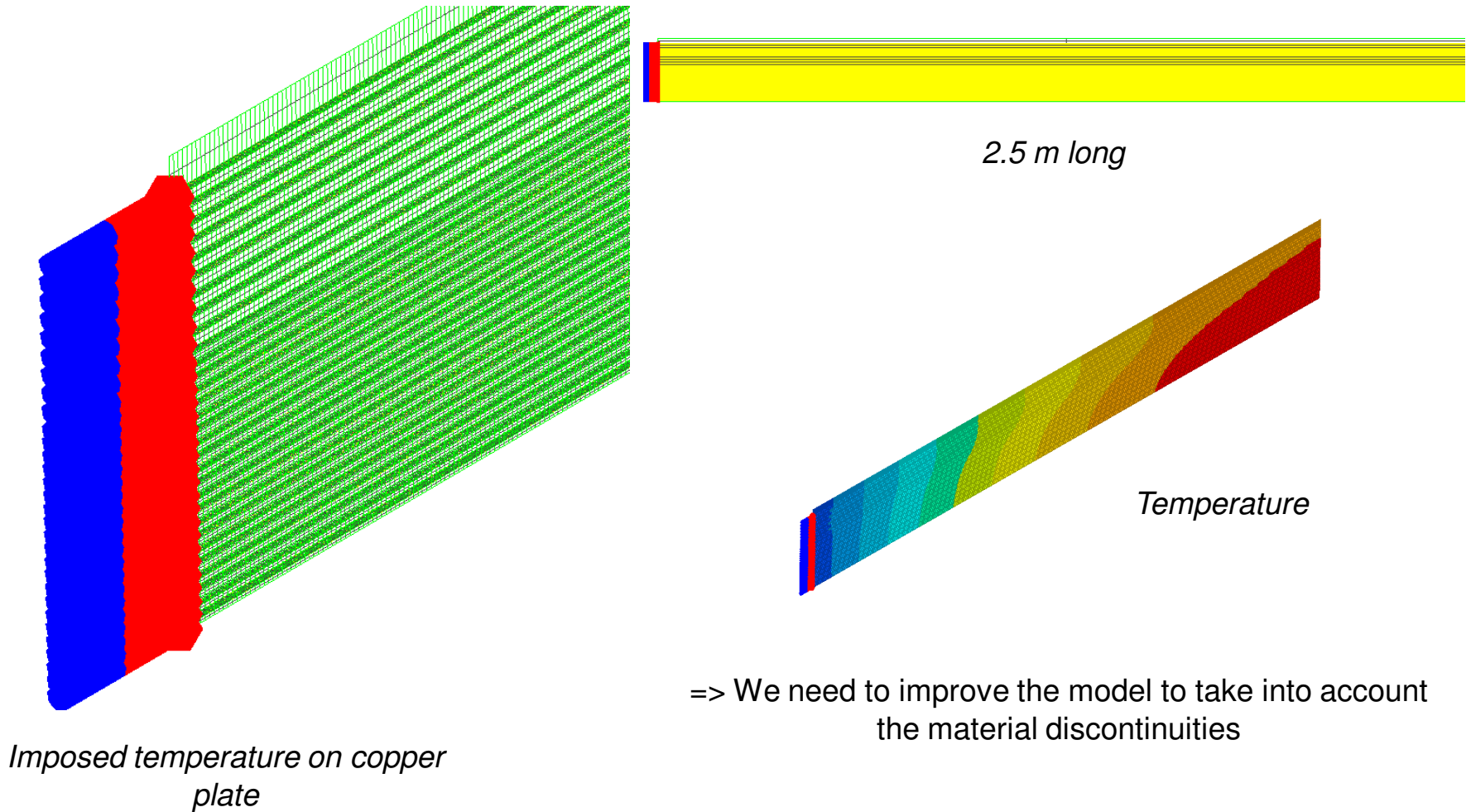
Simulation fit with tests

⇒ We can extrapolate the power absorbed by the cooling

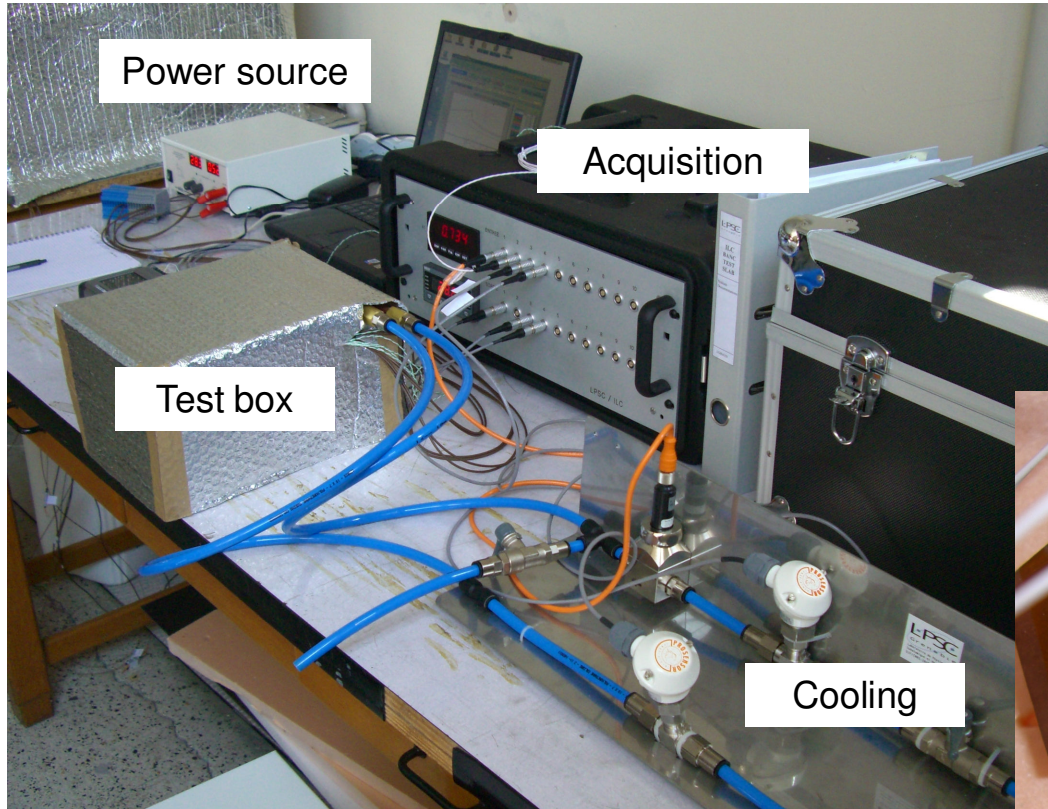


<u>Exterior insulation temp (°c)</u>	<u>Cooling temp (°c)</u>	$\Delta$ (°c)	Power absorbed by the cooling (W)	Power absorbed by the cooling in %
28.3	28.3	0	0.12	12
28.3	27.5	0.8	0.16	16
28.3	24.5	3.8	0.34	34
28.3	20.5	7.8	0.56	56
28.3	15.5	12.8	0.83	83

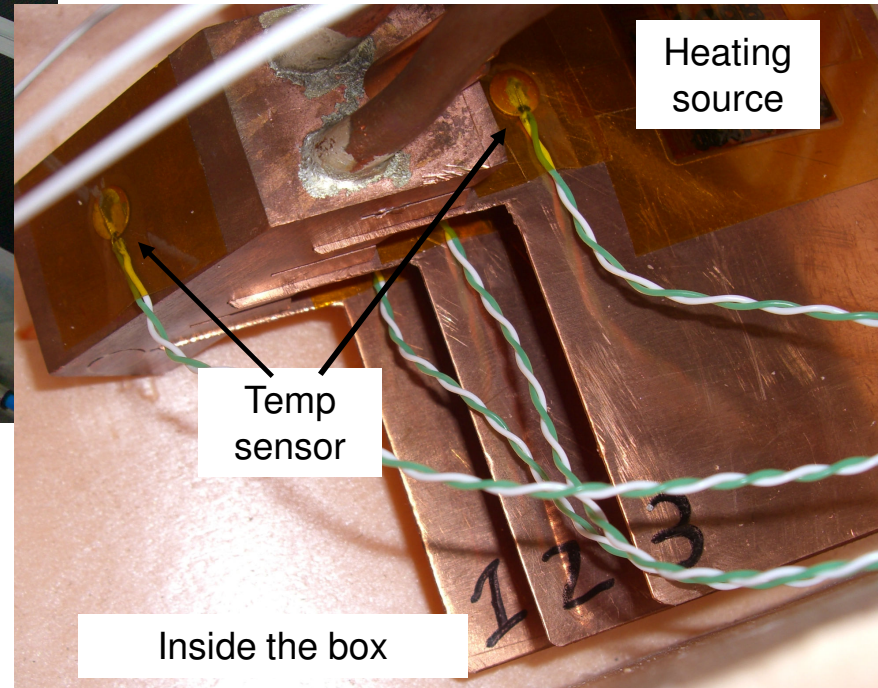
On going : global simulation on slab section



## Second part : Thermal contact resistance characterization



Global installation



Inside the box

## Conclusion of the thermal contact resistance test :

Dry contact : 3.9 K / W

Contact with thermal paste (0.4 W/m/K) : 3.1 K / W

