Laboratoire d'Annecy de Physique des Particules

Cooling system for Reception Tests

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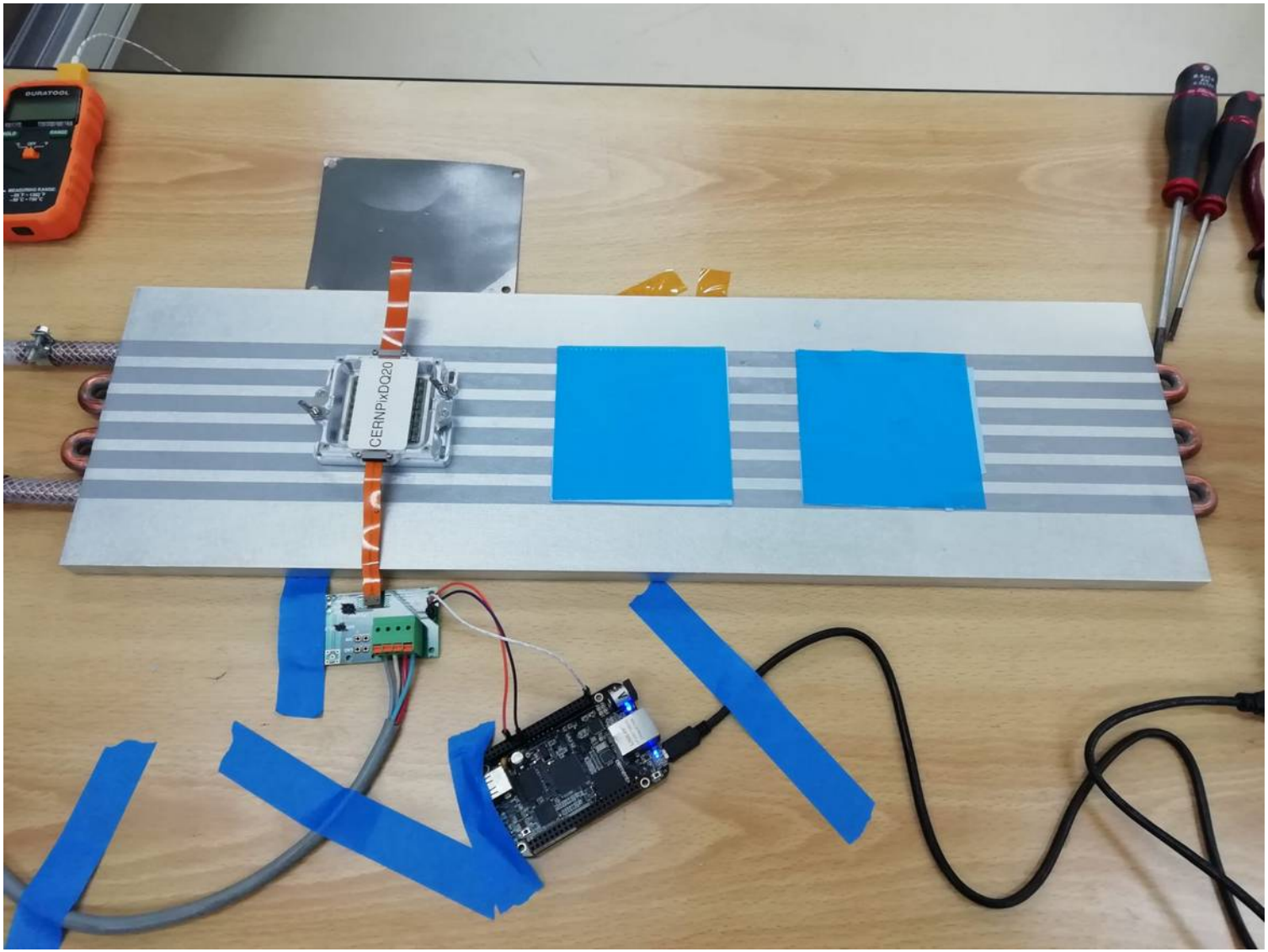
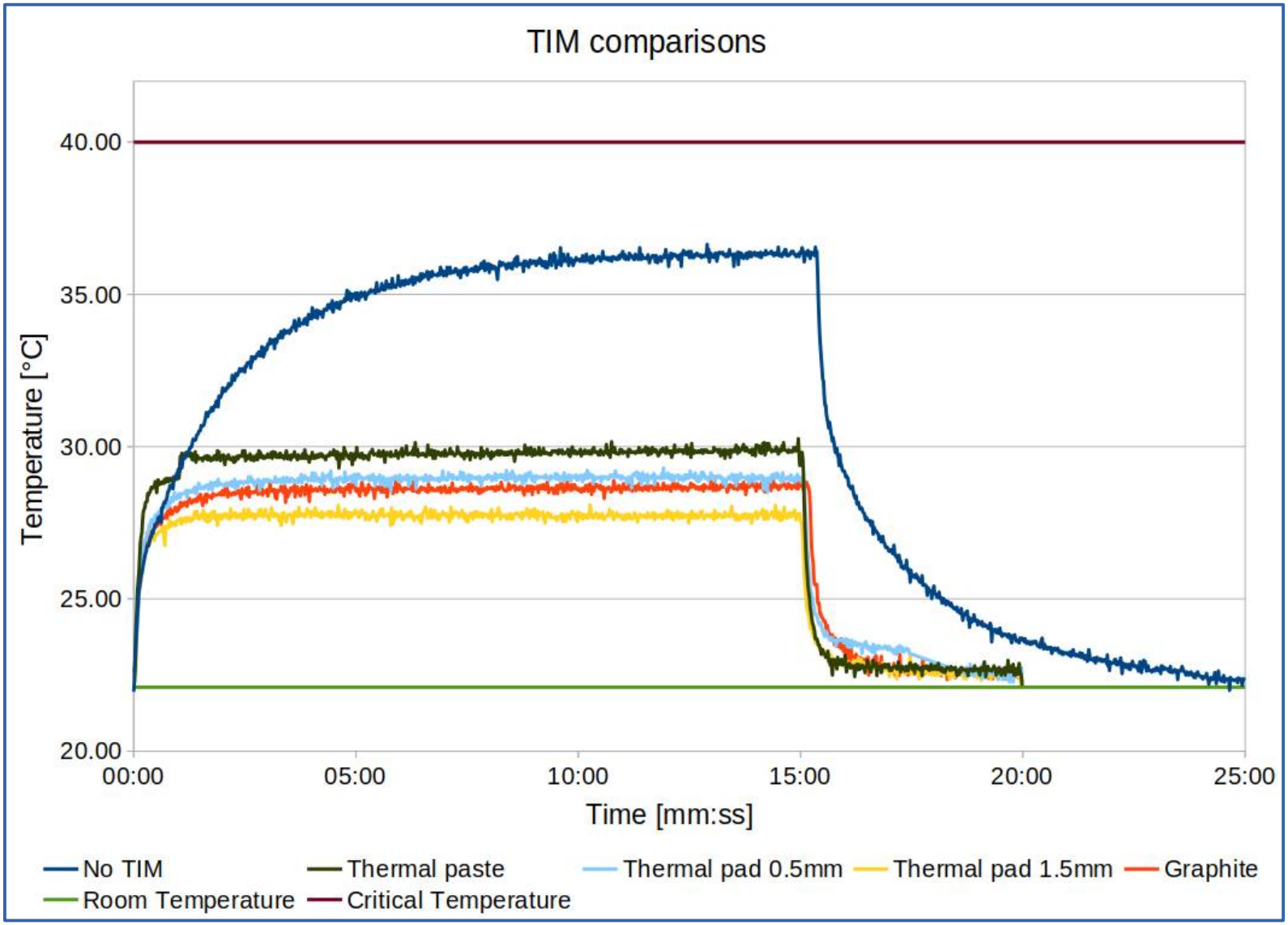
- **Goal:** Test thermal performance of cooling system for reception tests and first steps of integration site qualification. In particular, test several Thermal Interface Media (TIM).
- **Procedure:**
  - Install ITkPix module on the cold plate: thermal contact, power and NTC reading.
  - Turn on alim at 5.5A. We measure 1.65V drop at the module and ~2V at the PSU with our setup.
  - Monitor temperature until equilibrium is reached (~15min).
  - Turn off.
  - Monitor temperature until equilibrium is reached (~5min).
  - Repeat with a different TIM.

- ITkPix module: CERNPixDQ20
  - NTC TDK B57230V2103F260
- Chiller: 100W, link
- Cold plate:
- PSU:
- TIMs:
  - Thermal Paste
  - Thermal Pads
  - Graphite Pad

The setup



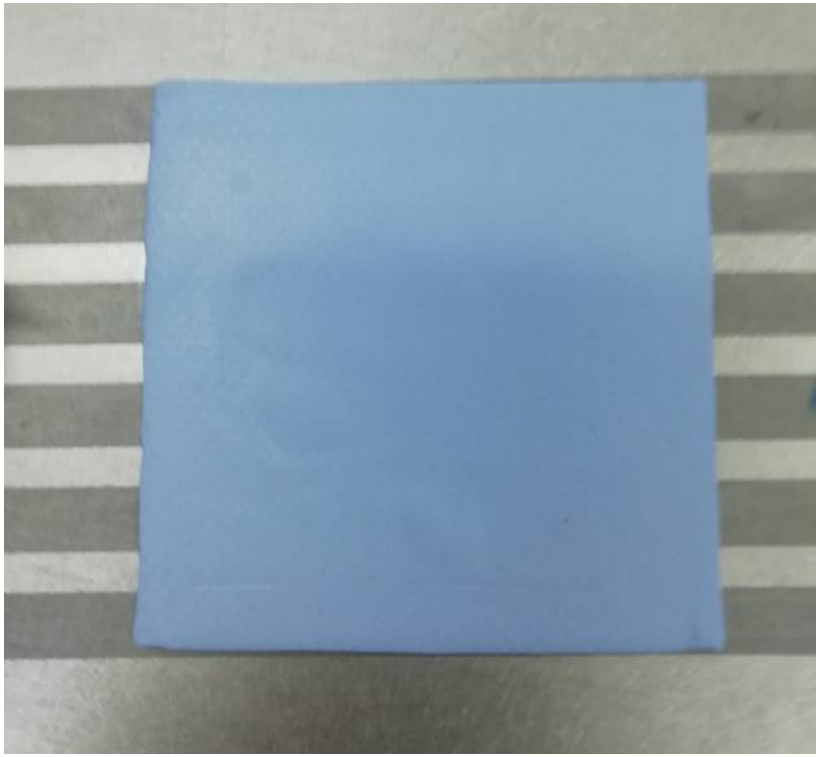


Temperature uncertainty is ~0.5°C, as taken from NTC RT table.

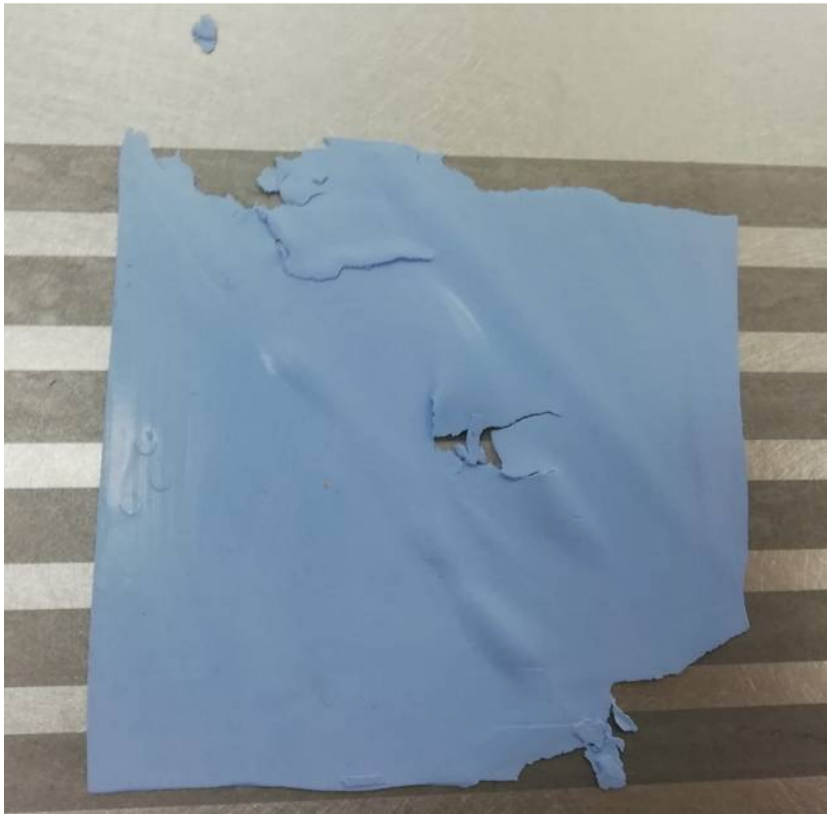
Additional notes:

- Water temperature raised from 21°C to at most 22°C over the whole testing procedure.
- Thermal paste:
  - difficult to have homogeneous thickness
  - difficult to clean
- Thermal pad:
  - A bit sticky enough to keep the module well in place
  - The 1.5mm pad does not tear apart when module is removed
  - No need to clean the carrier afterwards
- Graphite pad:
  - It does not stick to the cold plate
  - Good thermal contact without applying additional pressure
  - Cleanest solution

1.5mm



0.5mm



Conclusions

- Arctic TP-3 pad 1.5mm thick for the moment is the retained solution for our test stand.