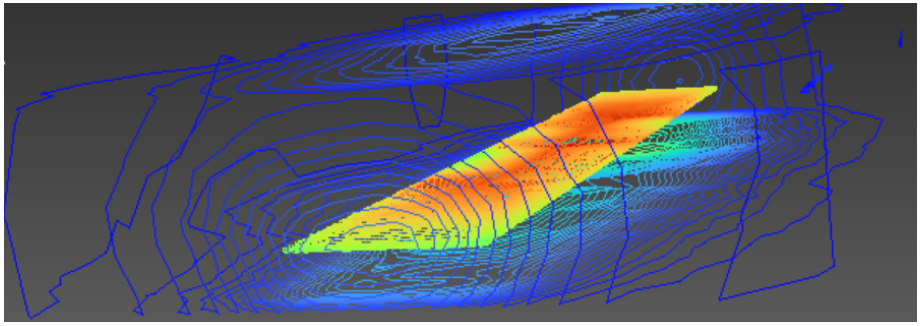


All-Silicon Update

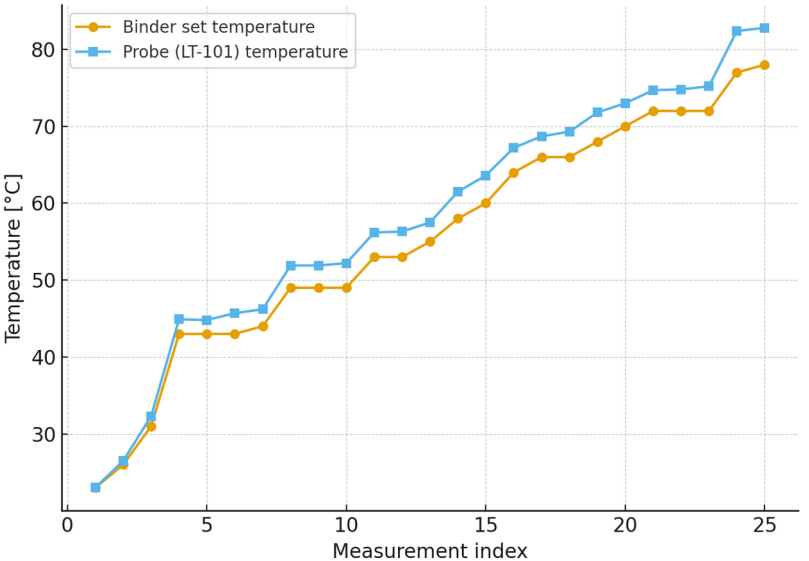
11.12.2025

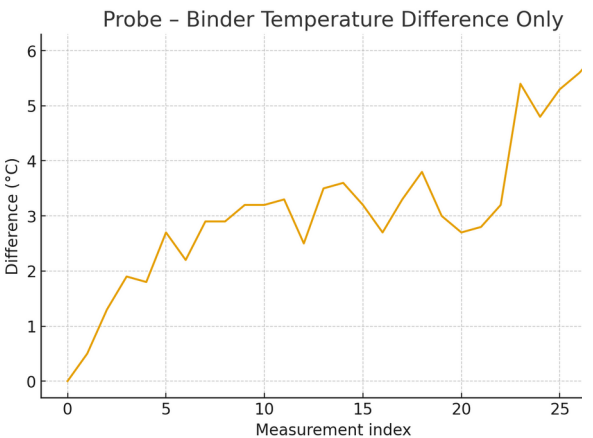
Nana Chychkalo

Seniors: Prof. Dr. Arnulf Quadt, apl. Prof. Dr. Joern Groesse-Knetter

Comparisons of temperatures: furnace versus T probe

Difference becomes bigger with the temperature growth

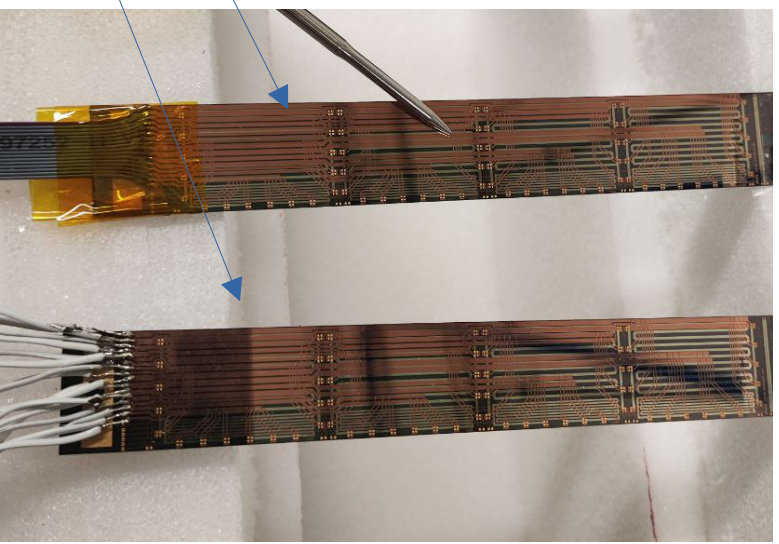




Airflow Measurements

Too optimistic → needs further measurements.

Module	Matrix V (V)	Matrix I (A)	Periph. V (V)	Periph. I (A)	Matrix Power (W)	Periph. Power (W)	Total Power (W)	Temp No Fan (°C)	Fan V (V)	Temp With Fan (°C)
400 µm	3.3	0.726	4.5	0.918	2.396	4.131	6.527	**91.9**	11.8	**34.1**
400 µm	3.29	0.782	4.32	0.987	2.573	4.264	6.837	**90.1**	6.15	**42.5**
300 µm	3.52	0.684	4.76	0.872	2.408	4.151	6.558	**84.7**	11.81	**32.8**
300 µm	3.46	0.686	4.79	0.881	2.374	4.22	6.594	**86.0**	6.25	**38.3**

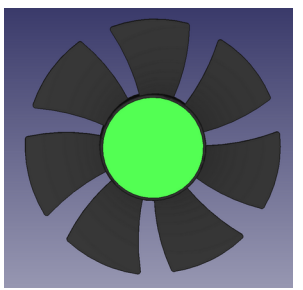


Power recovery algorithm was used in every measurement.

Temperature with fan stabilized after 3-5 minutes.

Thicker module gives slightly higher temperatures.

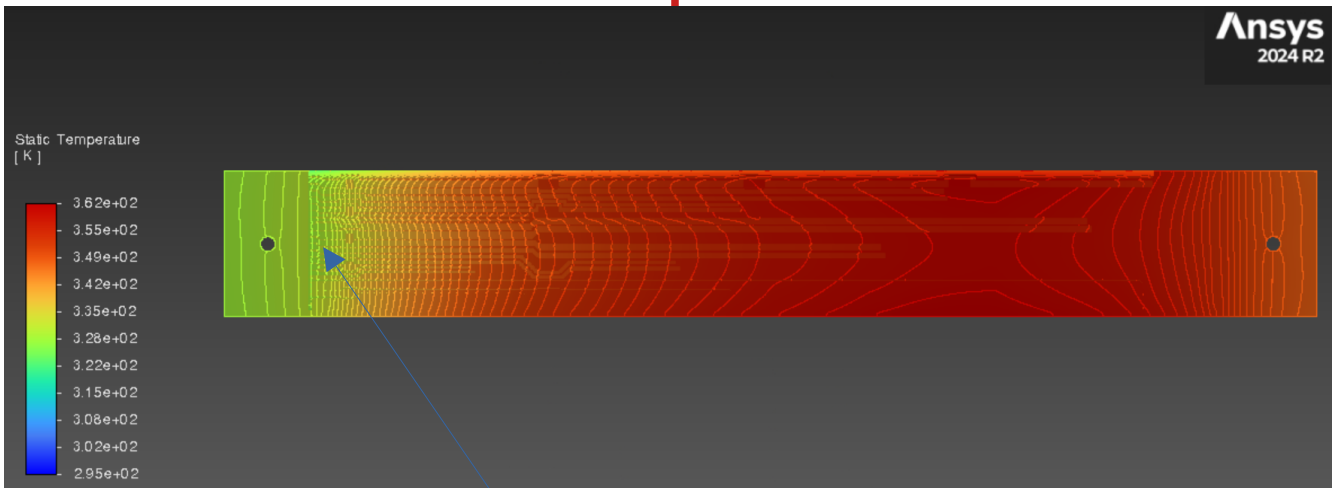
Aircooled: below specifications (<50°C) even with minimally powered fan.



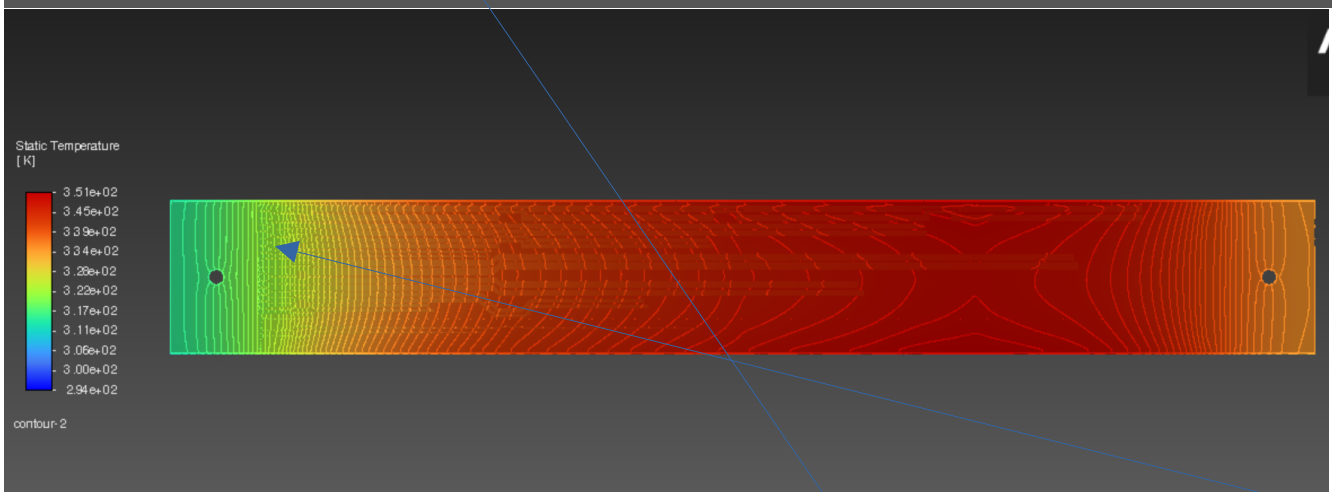
← 12 cm →

Airflow improvements

Previously



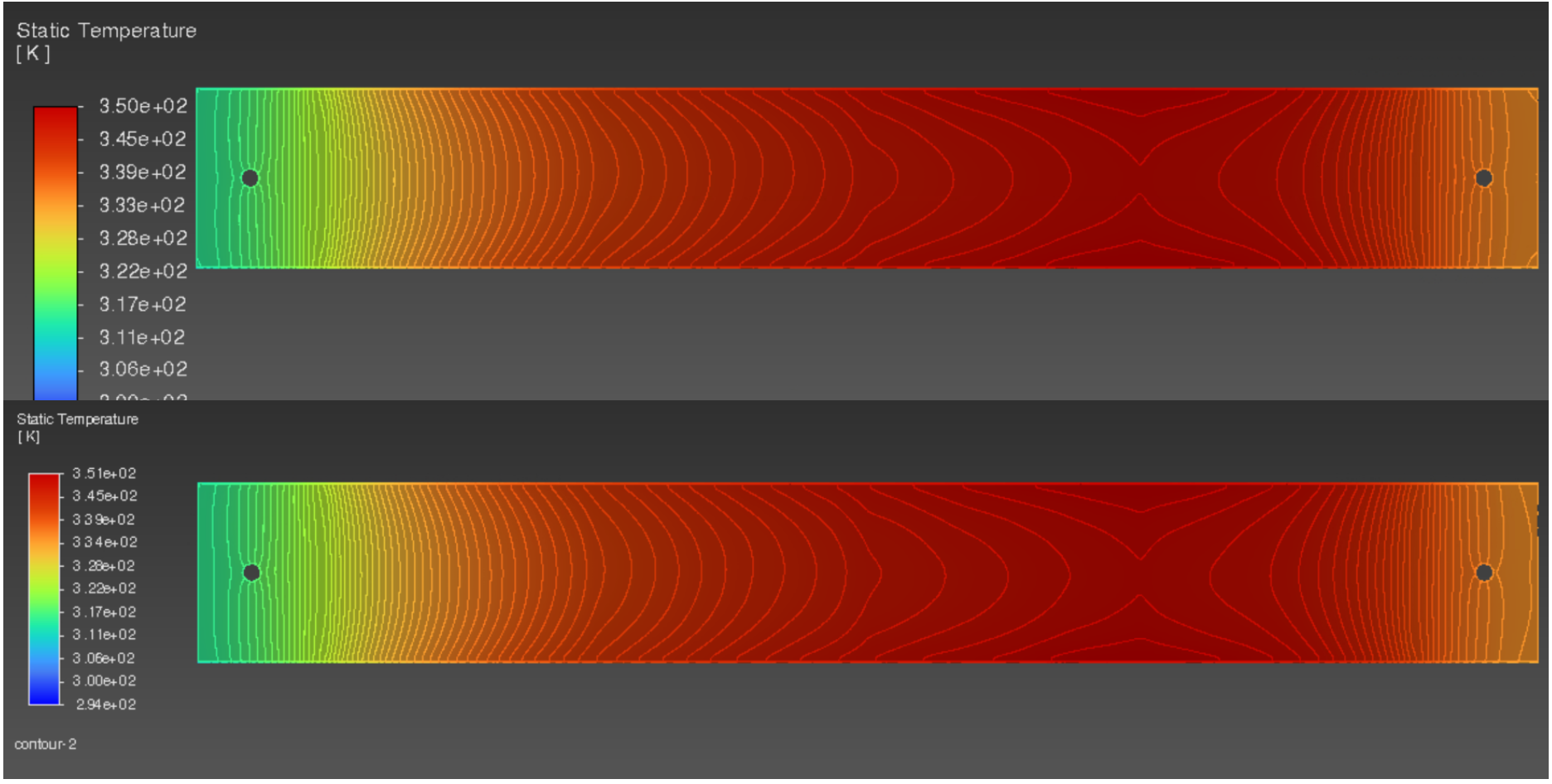
After major improvements



Improvements: max T from 105°C (August 2025), 88,85°C (October 2025) to 77,85°C (December 2025); new methods implemented: wall treatments, wfv precomputations, etc

Improved Airflow: RDL influence comparison

New airflow setup shows 1-2°C difference with and without RDL.

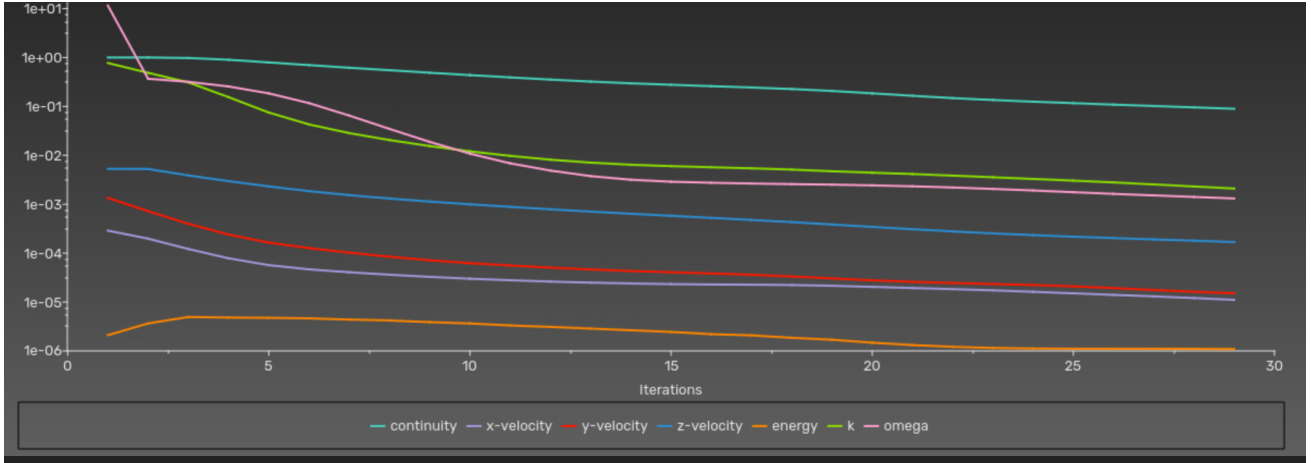


Without RDL

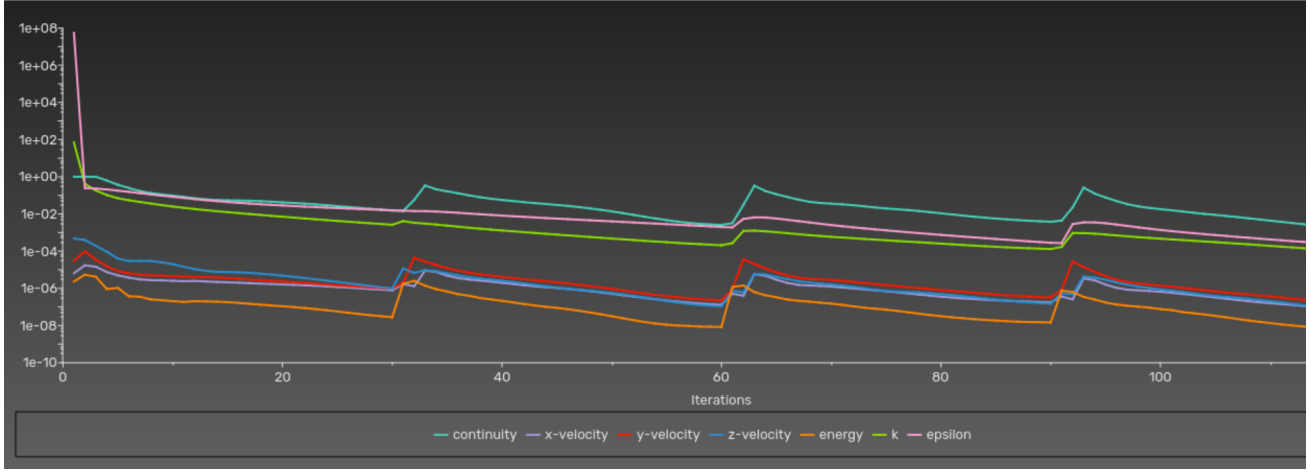
With RDL

Fluent Transient Tests – better performance allows using this tool

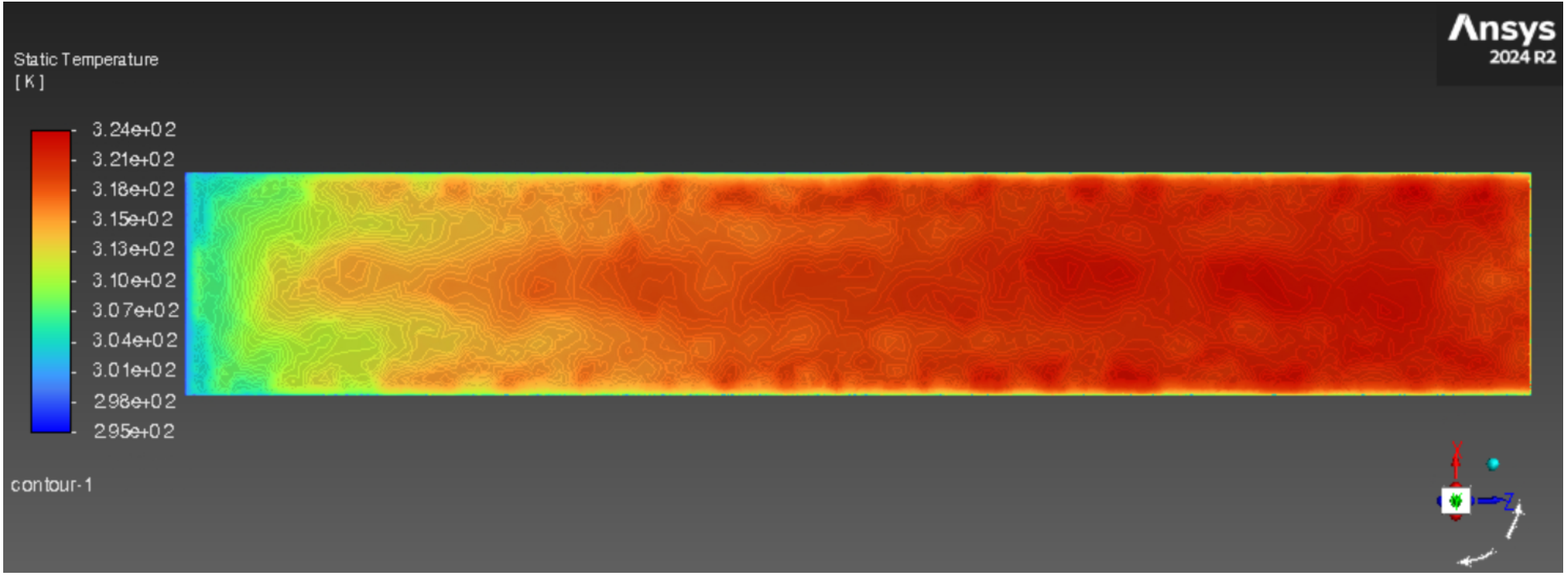
Steady State → always used this before



Transient (change over time) → new possibilities



Latest simplified airflow gives 51°C max



Accounts for many airflow effects.

It’s intermediate result only