GEORG-AUGUST-UNIVERSITÄT
GÖTTINGEN IN PUBLICA COMMODA SEIT 1737

All-Silicon Updates

08.05.2026

Nana Chychkalo

Steady state simulations with 300 micron dummy

Received second fan and speed of air measurement device.

Constructed a duct.

Simulated the steady-state with gases (Full All-Si setup)

and transient with maximum temperature, heat flux, pressure and shear stress (per segment – simplified segmented setup).

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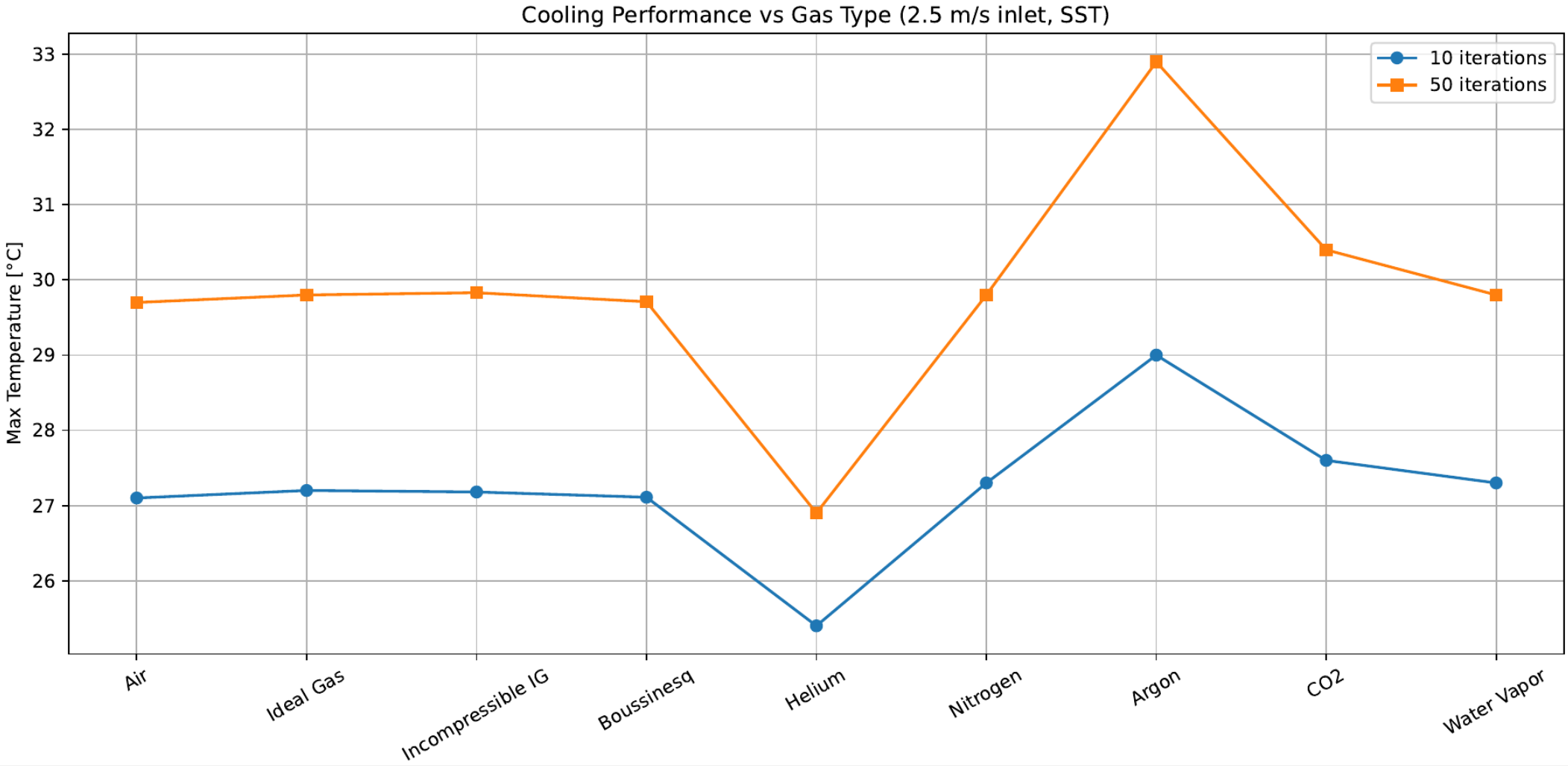
Steady state simulations with 300 micron dummy: gases



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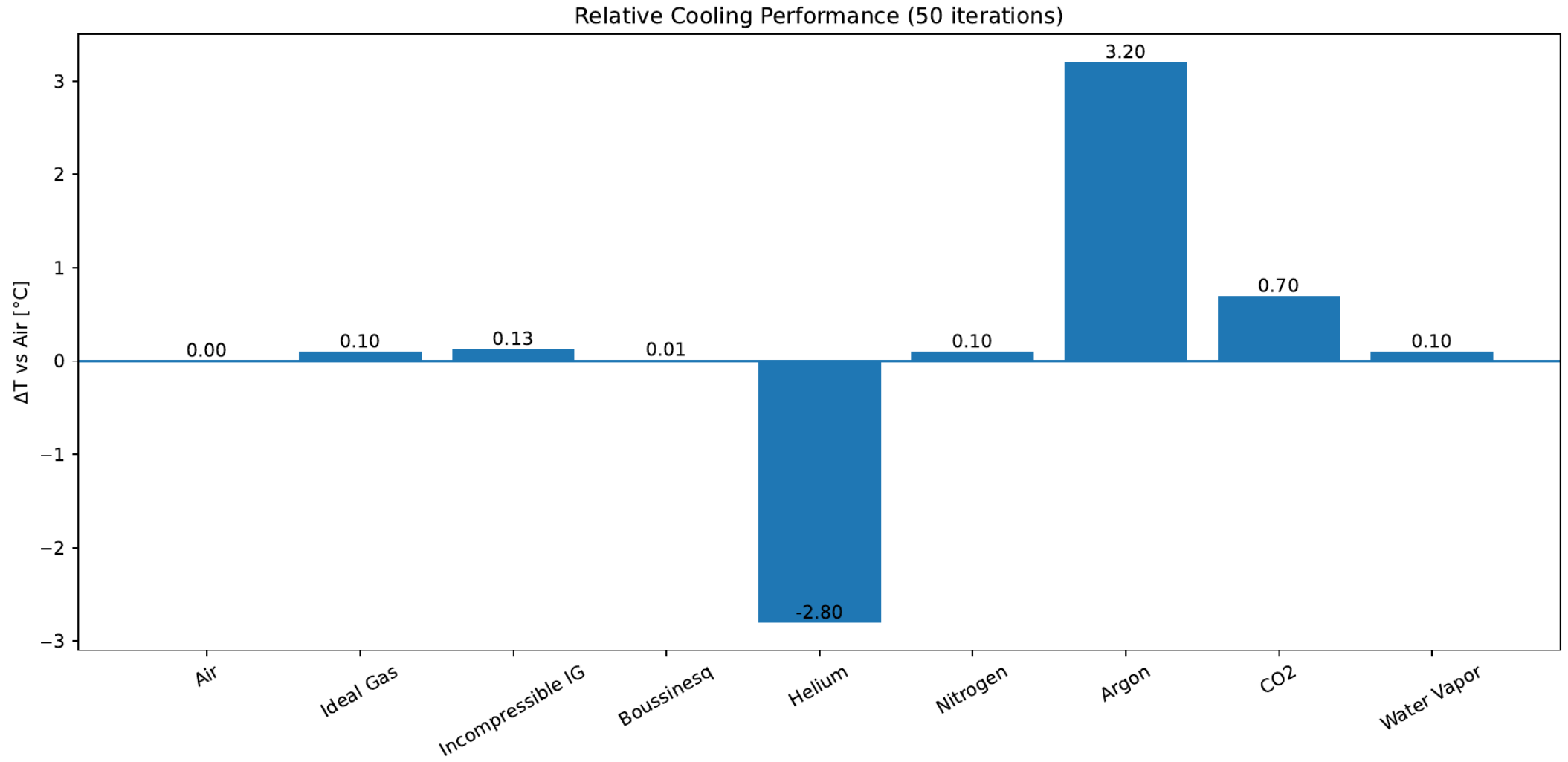
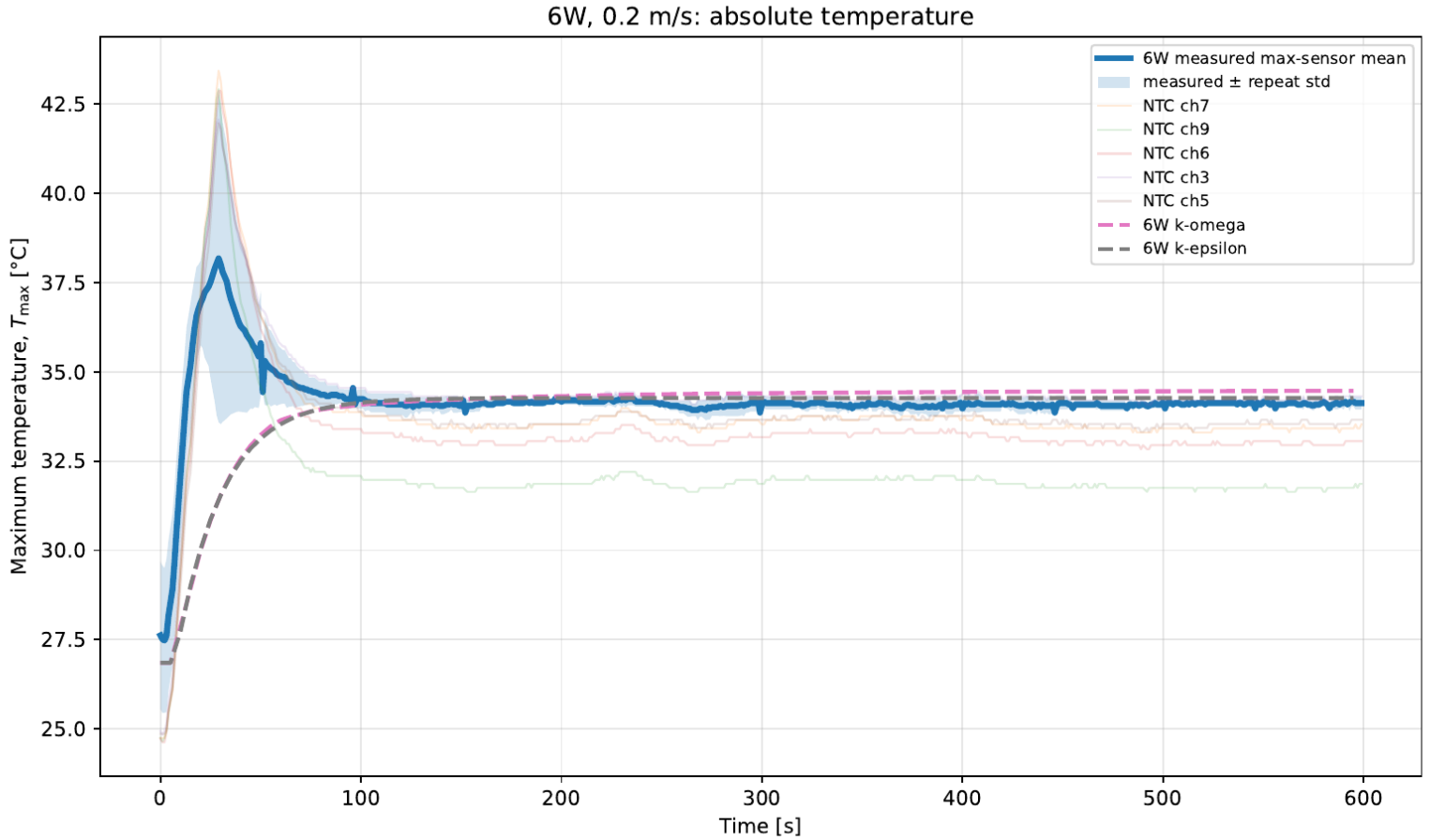
Steady state simulations with 300 micron dummy: gases

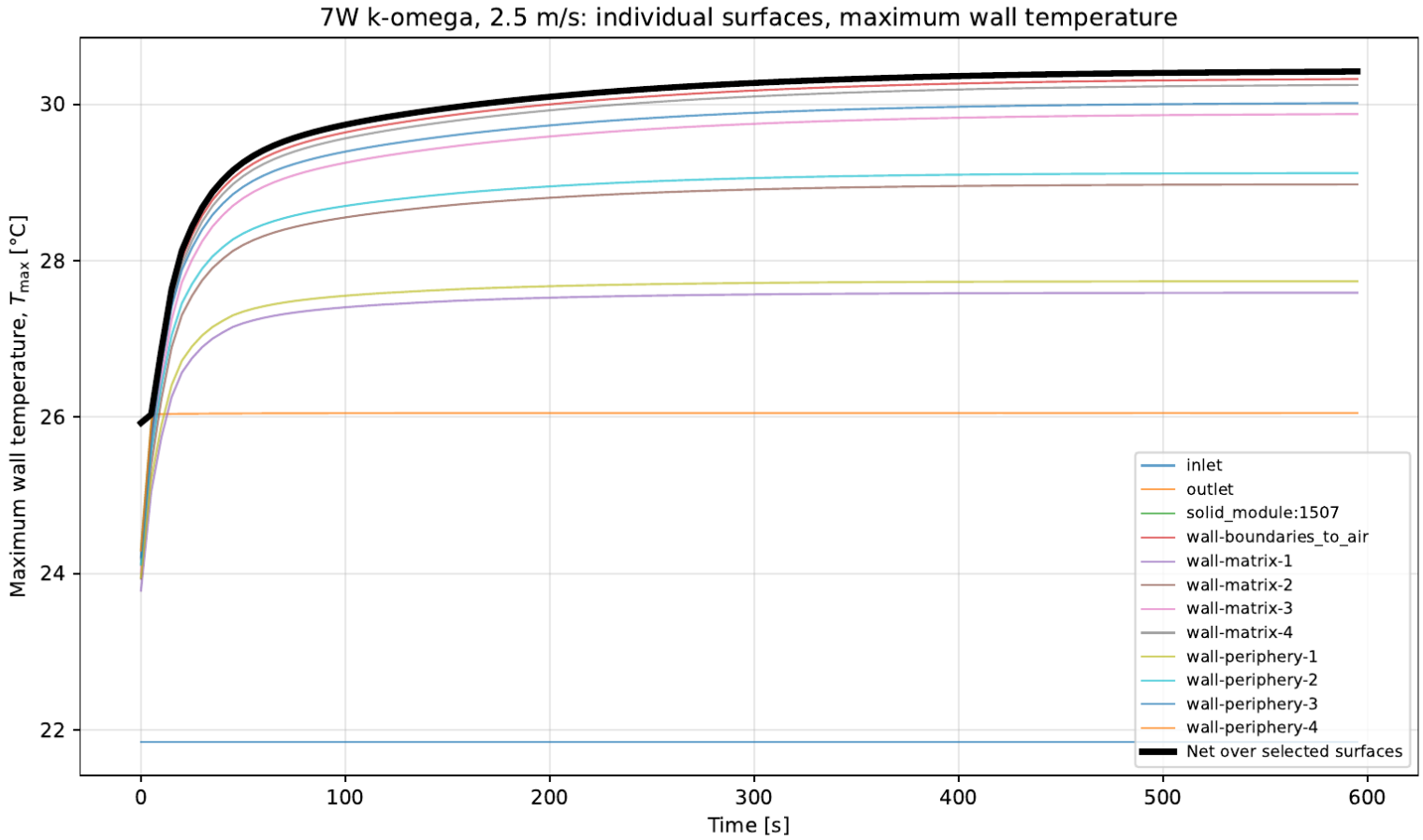


Transient simulations with 300 micron dummy



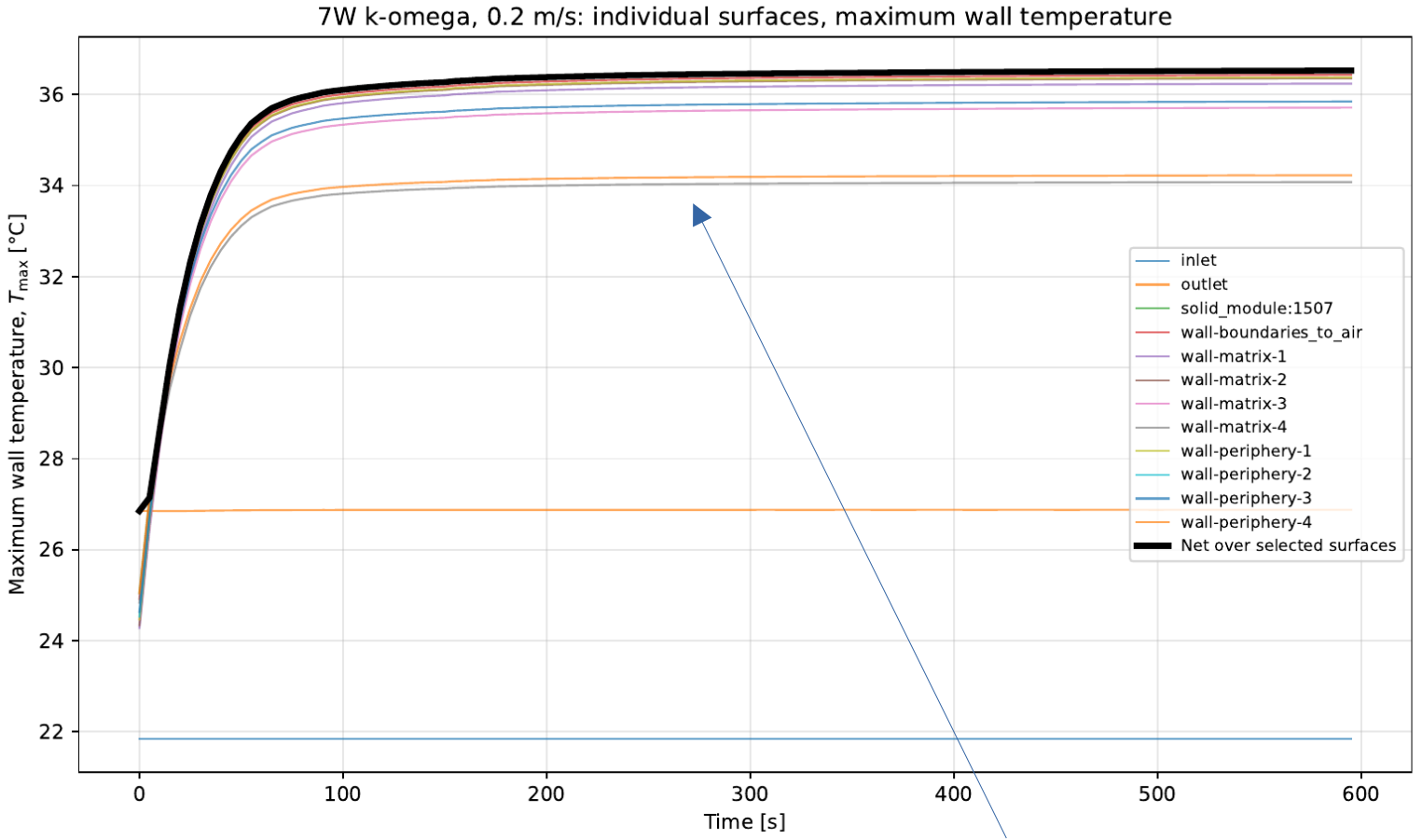
NTC 5 selected sensors, maximum temperature each – from measurement (blue). Pink and gray – simulation models.

Transient simulations with 300 micron dummy



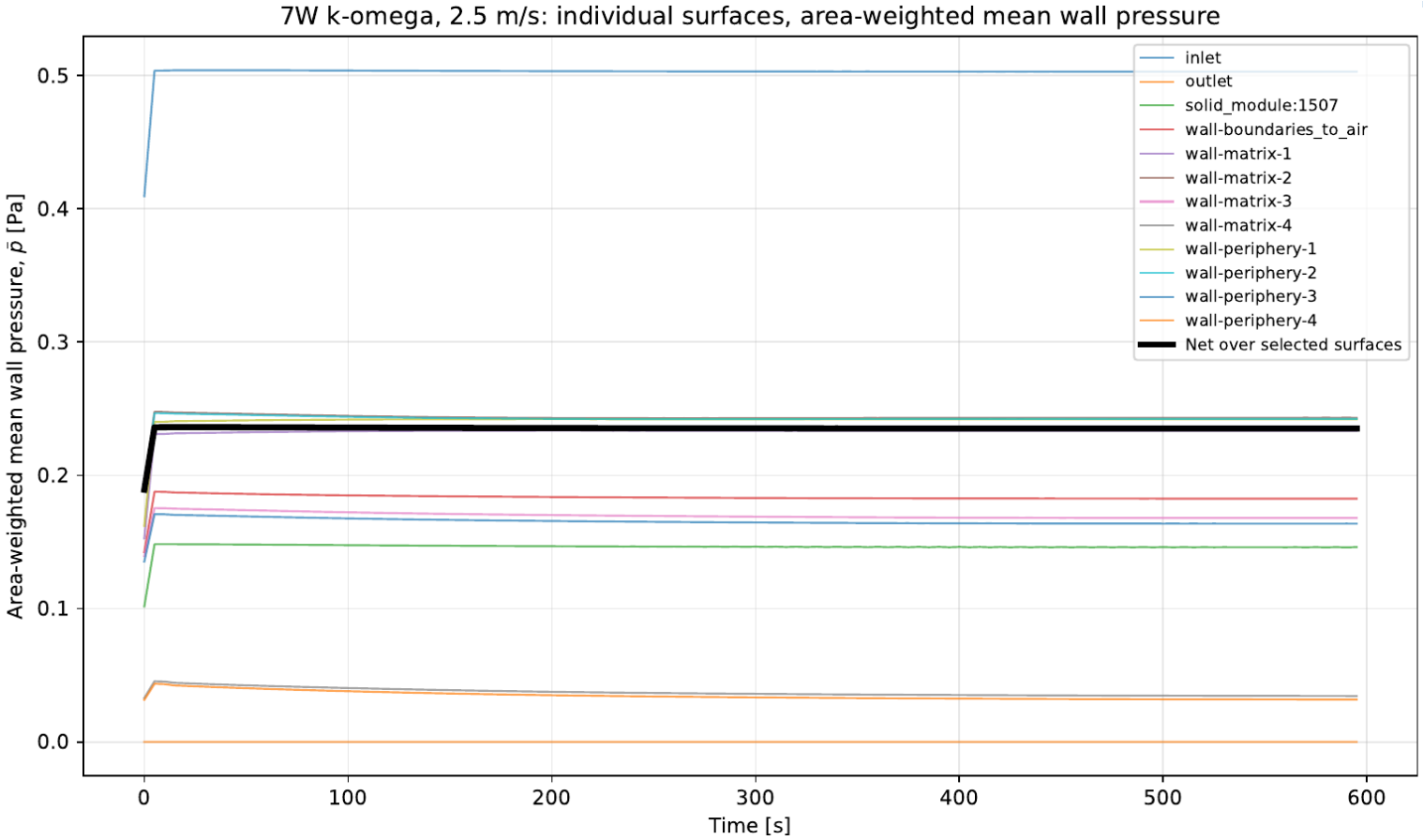
Maximum temperature of each segment (matrix-1 – closer to the airflow, matrix-4 – further).

Transient simulations with 300 micron dummy



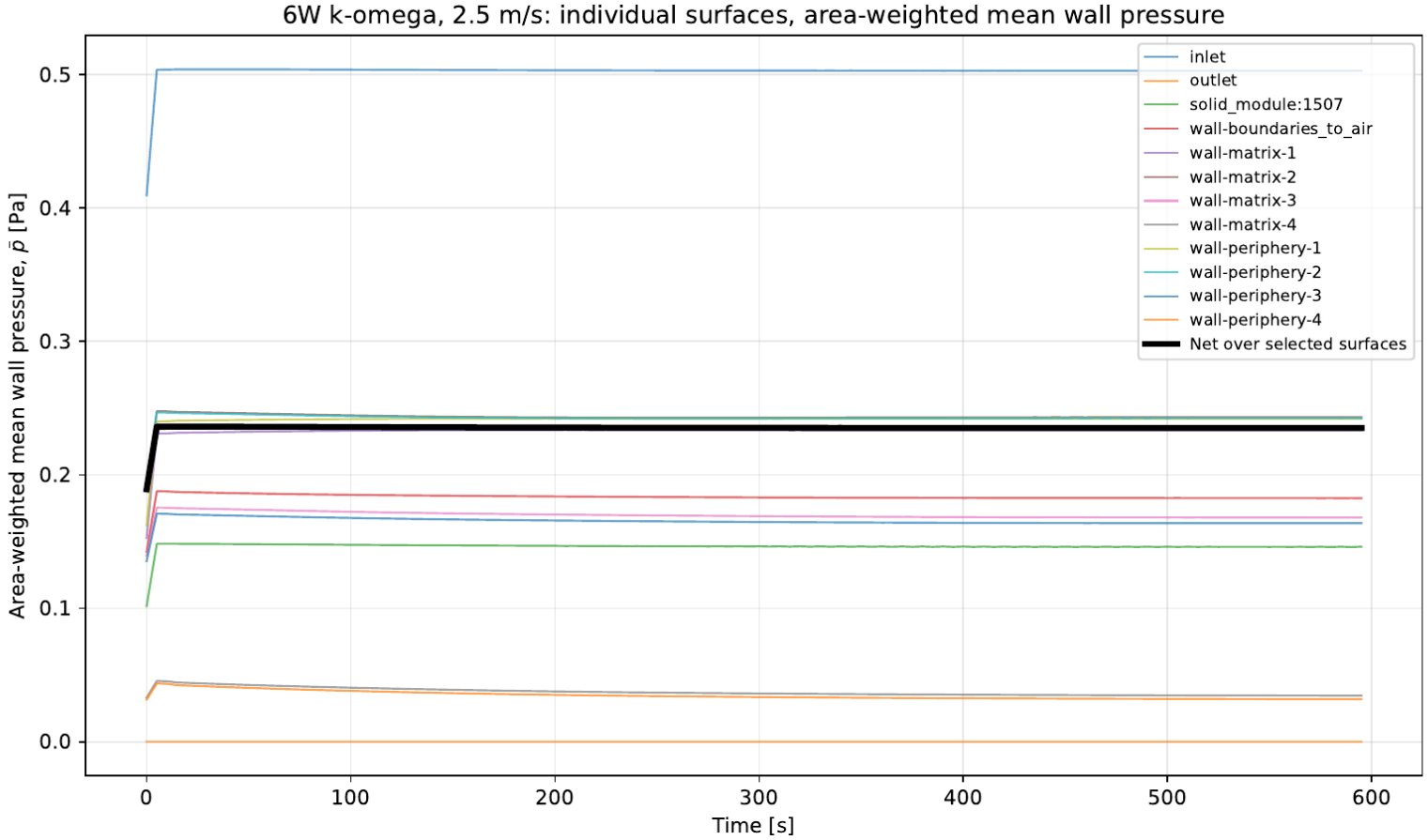
With the change of the airflow speed, segments cool down in different manner.

Transient simulations with 300 micron dummy



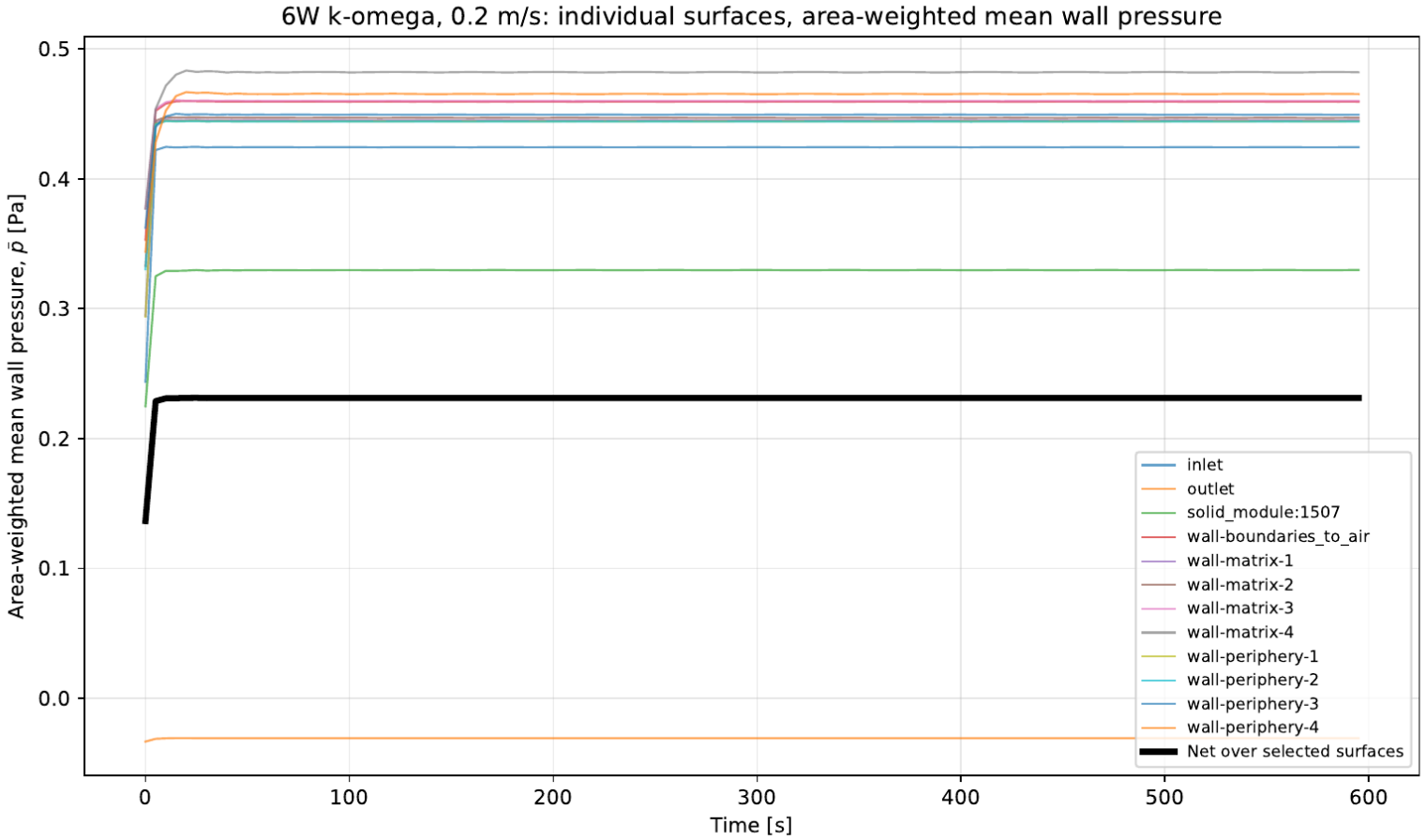
Simulated pressure per segment: 7 W total power.

Transient simulations with 300 micron dummy



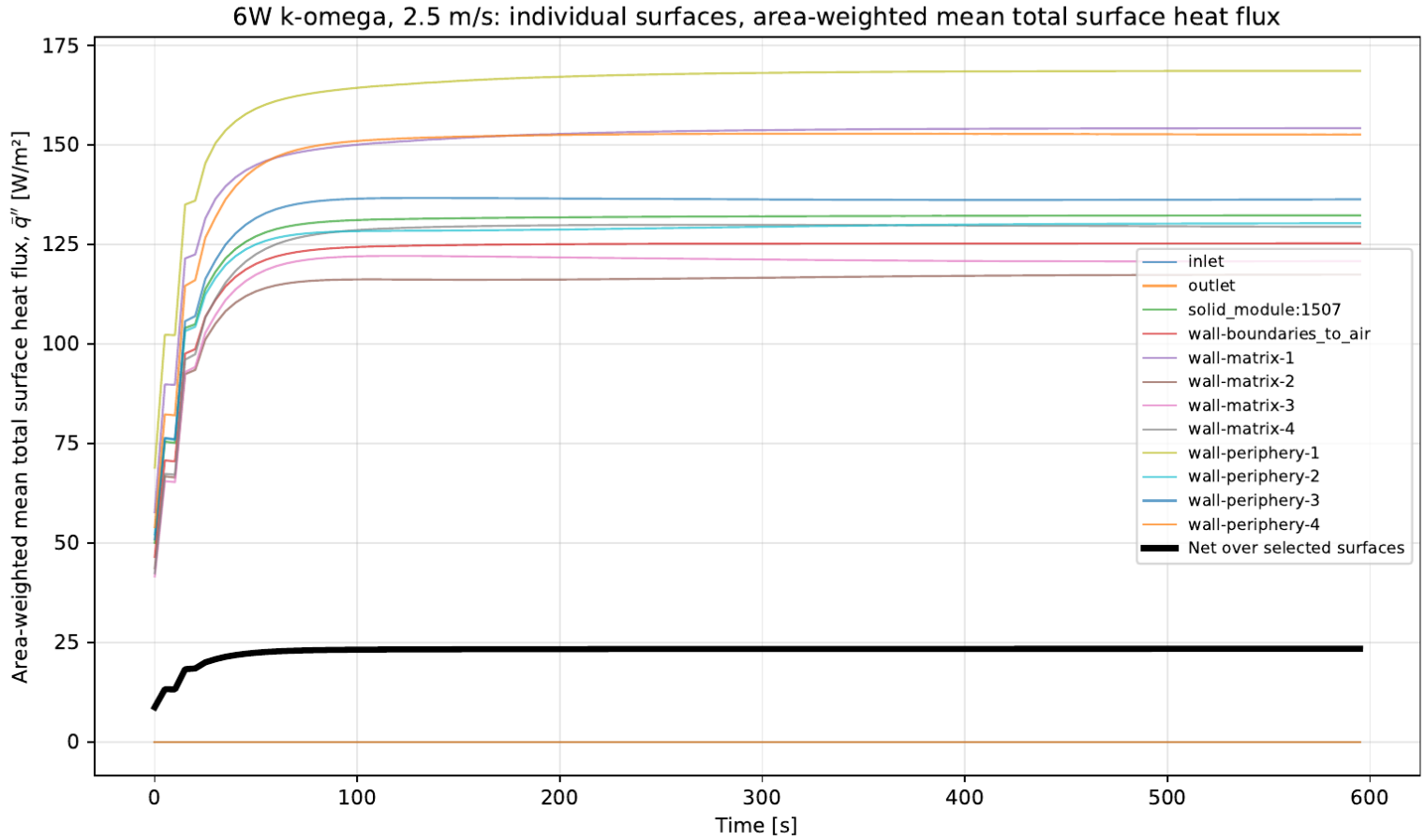
Simulated pressure per segment: 6W total power. No difference as expected.

Transient simulations with 300 micron dummy



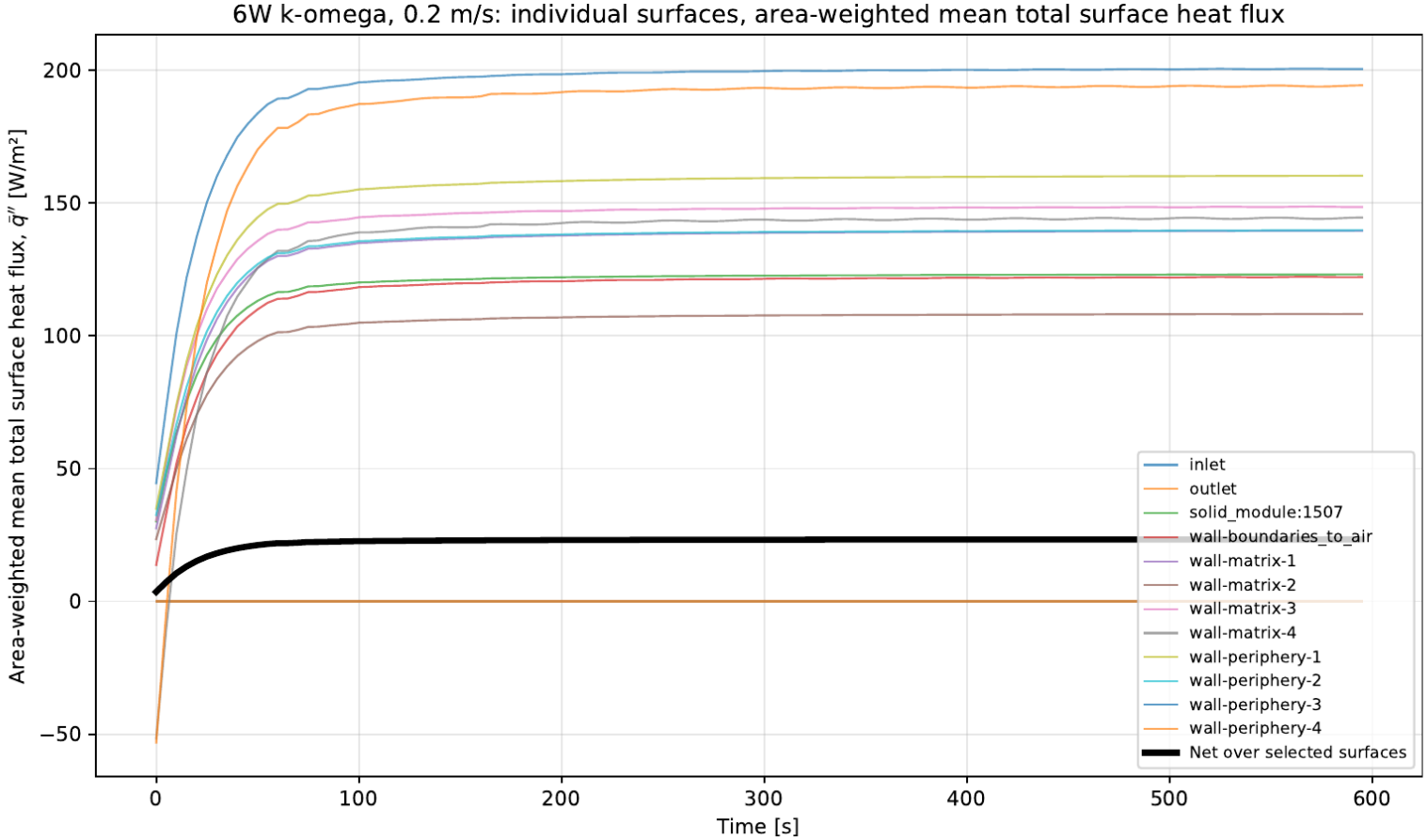
Simulated pressure per segment: 6W total power. Reduced inlet air speed.

Transient simulations with 300 micron dummy



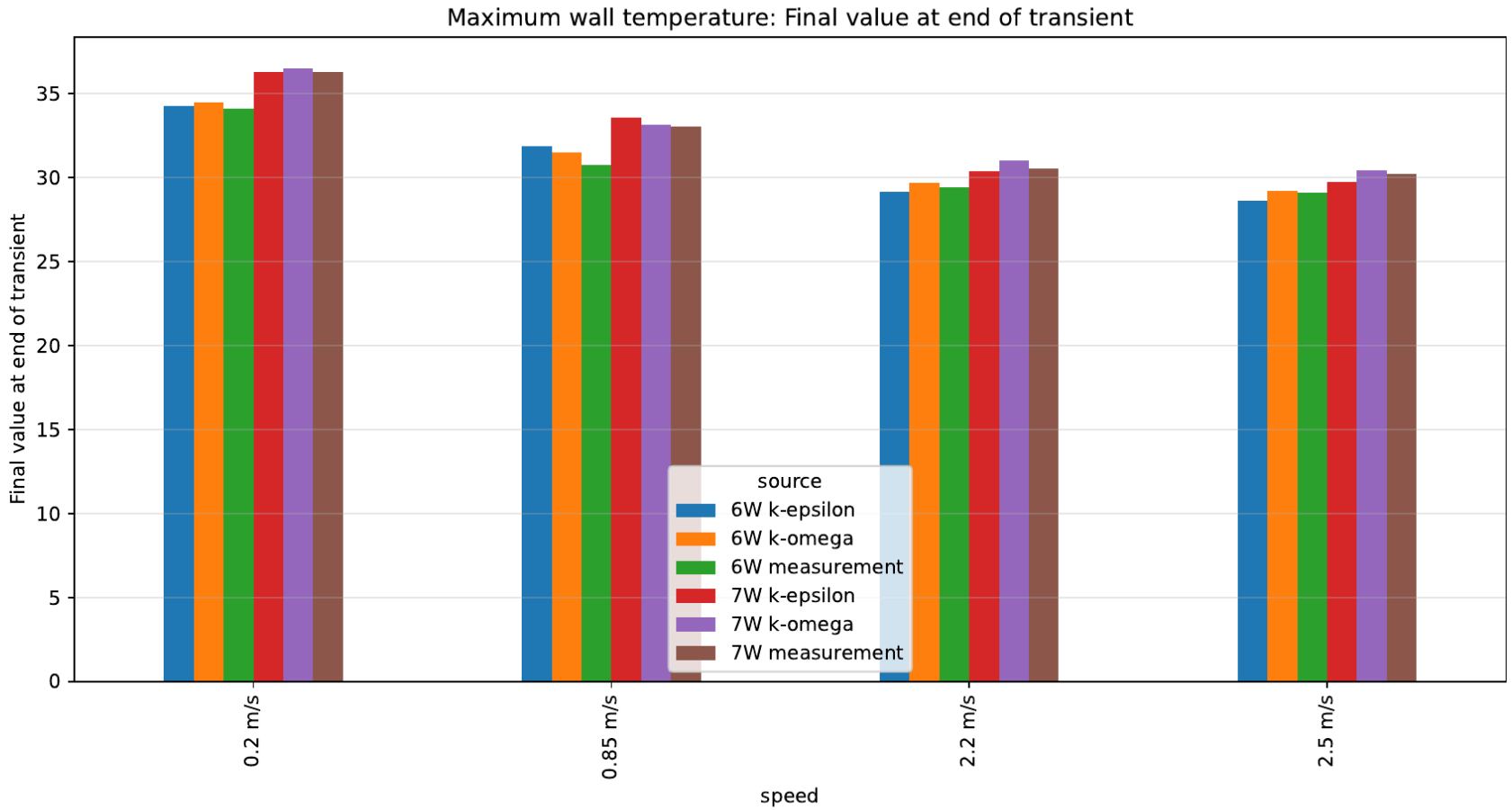
Simulated heat flux per segment: 6W total power.

Transient simulations with 300 micron dummy



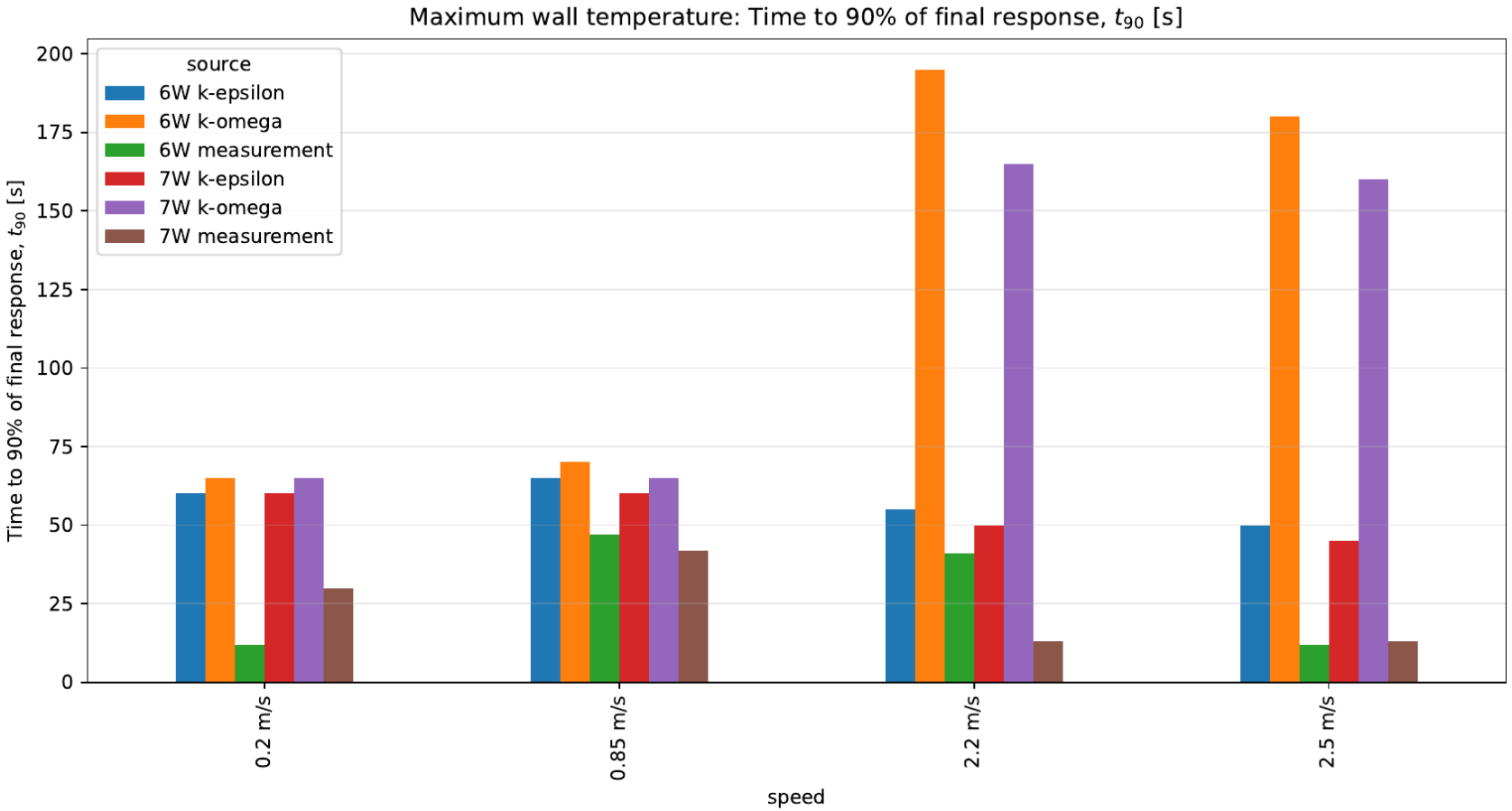
Simulated heat flux per segment: 6W total power. Reduced the inlet air speed.

Transient simulations with 300 micron dummy



Maximum temperature: final value.

Transient simulations with 300 micron dummy



T90 - when the curve received 90% of it's final change.

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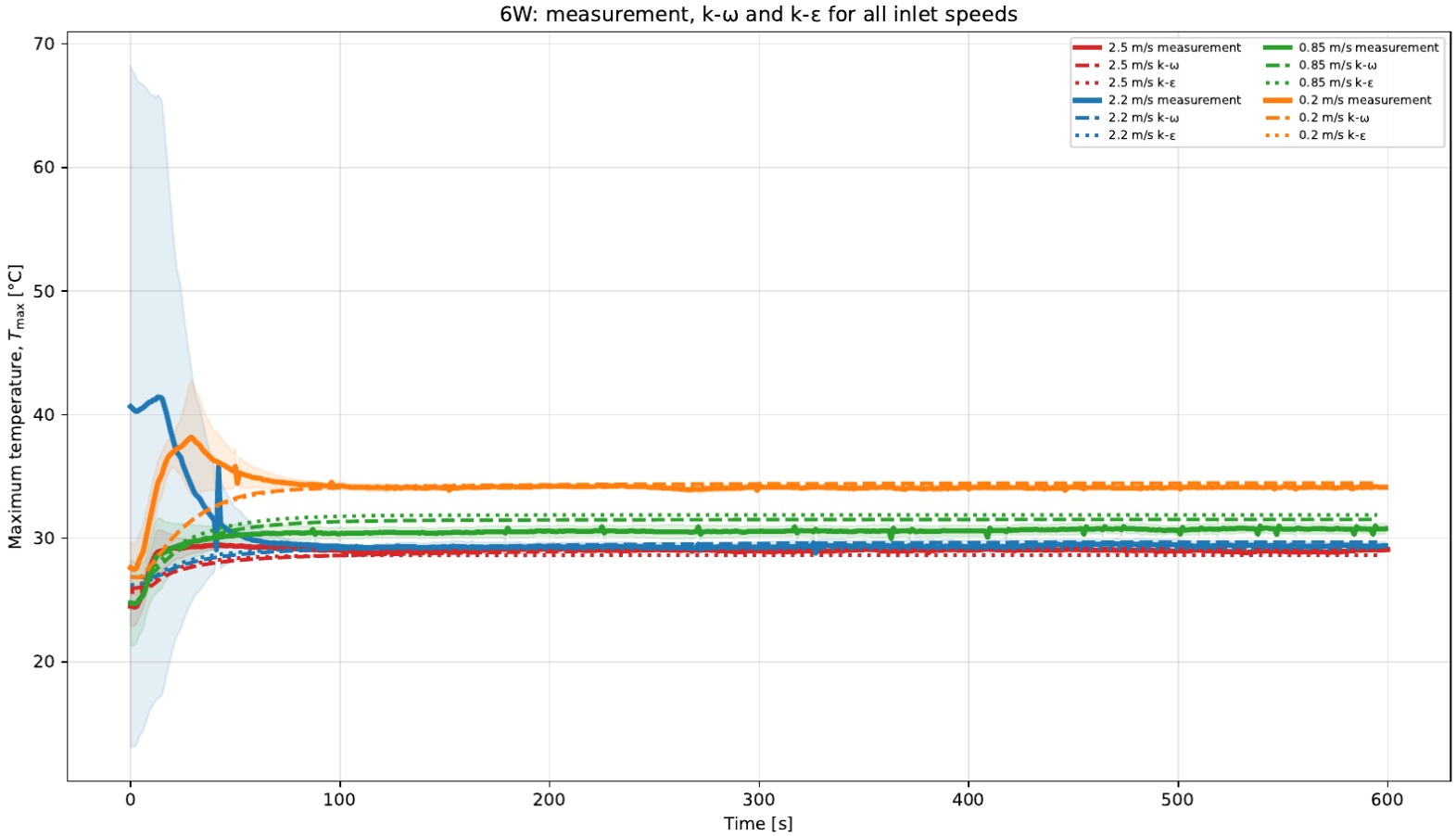
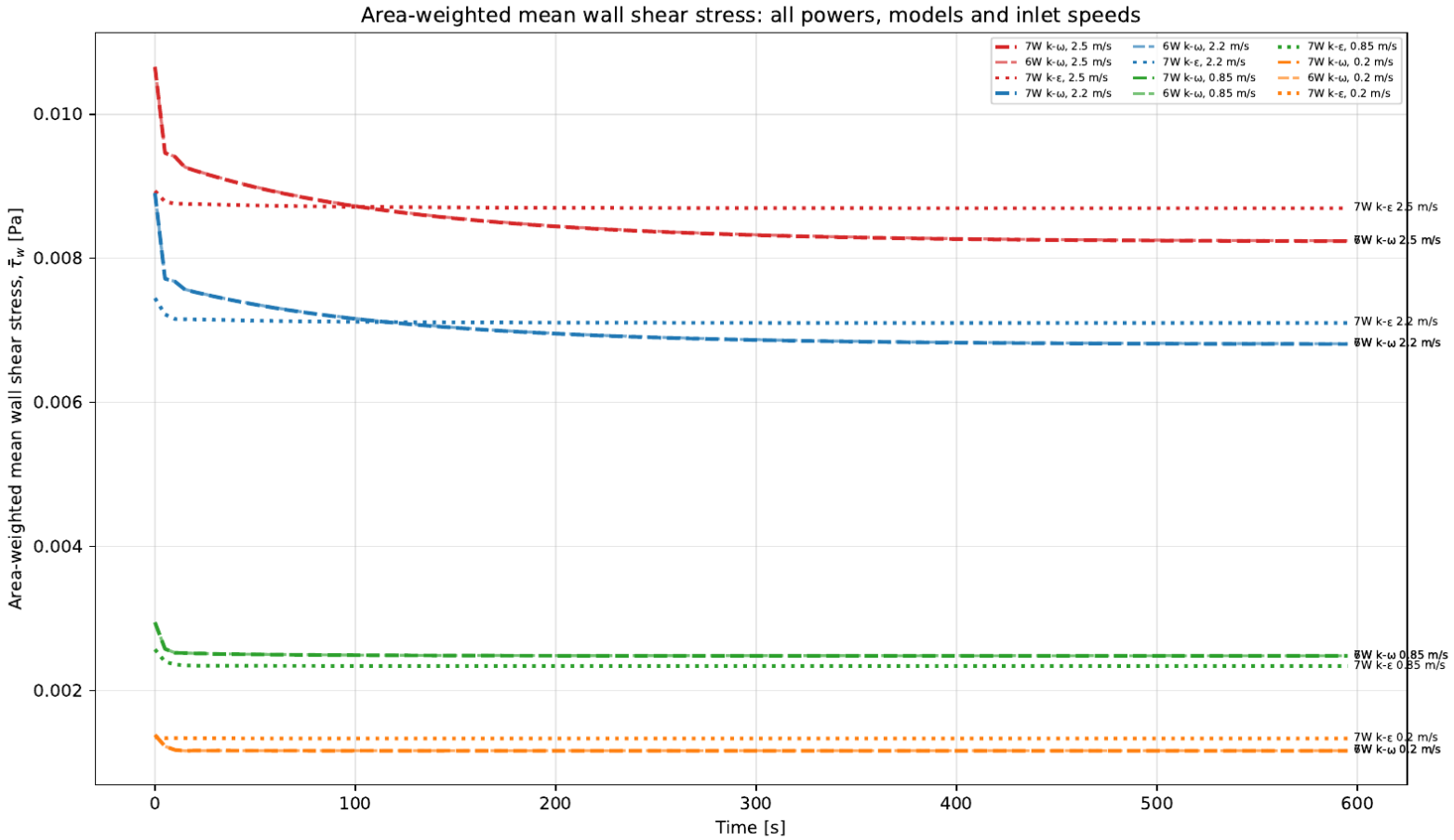
Transient simulations with 300 micron dummy



4 inlet speed comparisons: 2.5, 2.2, 0.85, 0.2 m/s vs simulated.

Transient simulations with 300 micron dummy



The change of the shear stress change depends on selected simulation model.