About simulated influence of roof- and wall-greening on an old people’s home in Helsinki, Finland, during the 2018 heatwave event

Achim Drebs, FMI; Tim Sinsel, University of Mainz, Germany; Kirsti Jylhä, FMI

Simulation run 1: extended heat-wave, 13.7. - 5.8.2018, roof greening (control run)
run 2: 15. - 26.7.2018, roof greening
run 3: 15. - 26.7.2018, roof and wall greening
run 4: 15. - 26.7.2018, without any greening

Contact address: achim.drebs@fmi.fi

EMS2021-221

Simulated parameters (among others)
(1) Wall: Temperature Node 1/ outside (°C)
(2) Wall: Temperature Node 7/ inside (°C)
(3) Wall: Shortwave radiation received at the facade (W/m²)
(4) Wall: Incoming longwave radiation (W/m²)
(5) Building: Temperature of building (inside) (°C)

Green infra settings: Funkia (hosta), ENVImet®, v.4.4.5 default settings
The simulated influences of the 2018 heatwave on wall temperatures (exterior and interior), incident short- and longwave radiation, and building interior temperature

Run 2: Roof surface essentially cooler due to greening, wall surface temperatures follow the daily sun circle

Run 3: Roof and wall surfaces essentially cooler due to greening throughout the day

Run 4: High roof surface temperature due to no greening, shelter, wall surface temperatures follow the daily sun circle

Simulation results, 15. - 26.7 2018

A combination of green roofs and green walls (run 3) decreases wall (exterior and interior) and building interior temperatures, compared to green walls alone or no greening (runs 2 and 4). For building interior temperatures, the difference is about 5 °C.

The results of run 2 differ from the expectation that green roofs provide cooling to the building. A possible reason for this may be the averaging of the simulation values.