

WRF

- Meteorological fields
- Large-scale forcings
- Auxiliary 10 min output files containing: downwelling short- (direct + diffuse) and long-wave downwelling radiation

PALM-meteo

- Downscales meteorology and radiation fields
- Horizontal interpolation
- Vertical adaptation
- Vertical interpolation
- Dynamic driver file generation

Dynamic driver

Meteorological fields
+
Large-scale forcing tendencies
+
Radiation fields

PALM/RTM

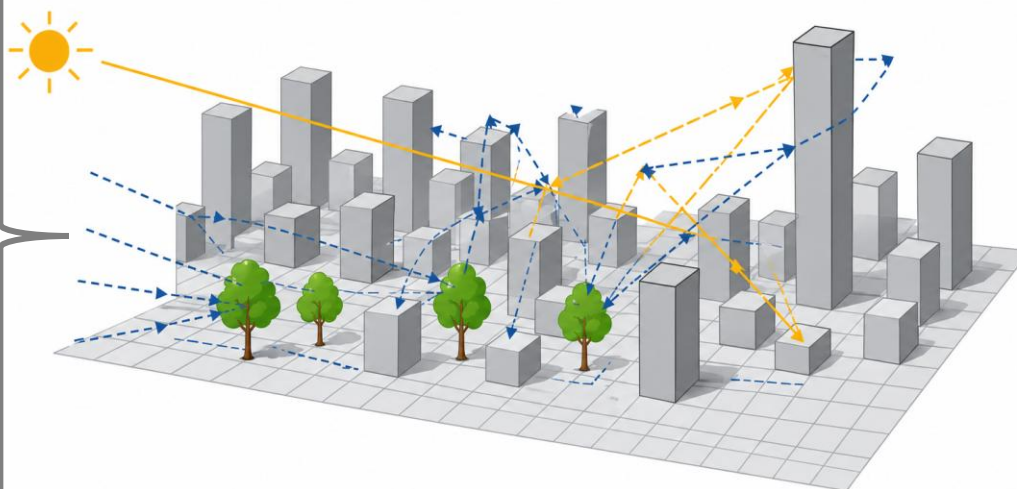
- SW and LW radiation processing
- Absorption, reflection, and emission for surfaces and canopy grid boxes
- Shading, mutual visibility, and reflections with urban surfaces
- Radiation transfer through vegetation

Direct short-wave radiation

- Treated as a directional beam
- Shadow projections and blocking
- Reflections and absorption (depending on solar zenith angle)
- Semi-transparent vegetation (penetration or absorption)

Diffuse short-wave radiation

- Omnidirectional and reaches the ground from the sky (calculated using Sky-View Factors)
- Trapping and reflections



PALM/RTM outputs

- Absorbed, reflected, and emitted radiation for every face (both horizontal and vertical)
- Absorbed and emitted radiation for each grid box containing the resolved plant canopy