3D Heating Rates in Cloud Resolving Models – Methods and Impact on Cloud Evolution and Organization of Convection

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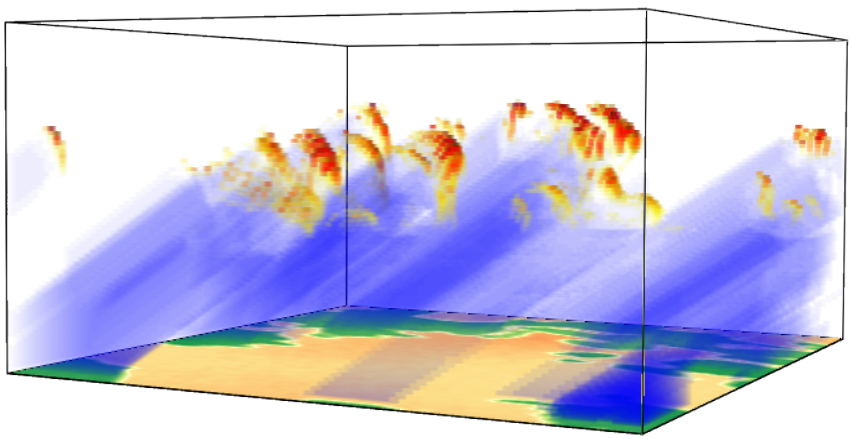
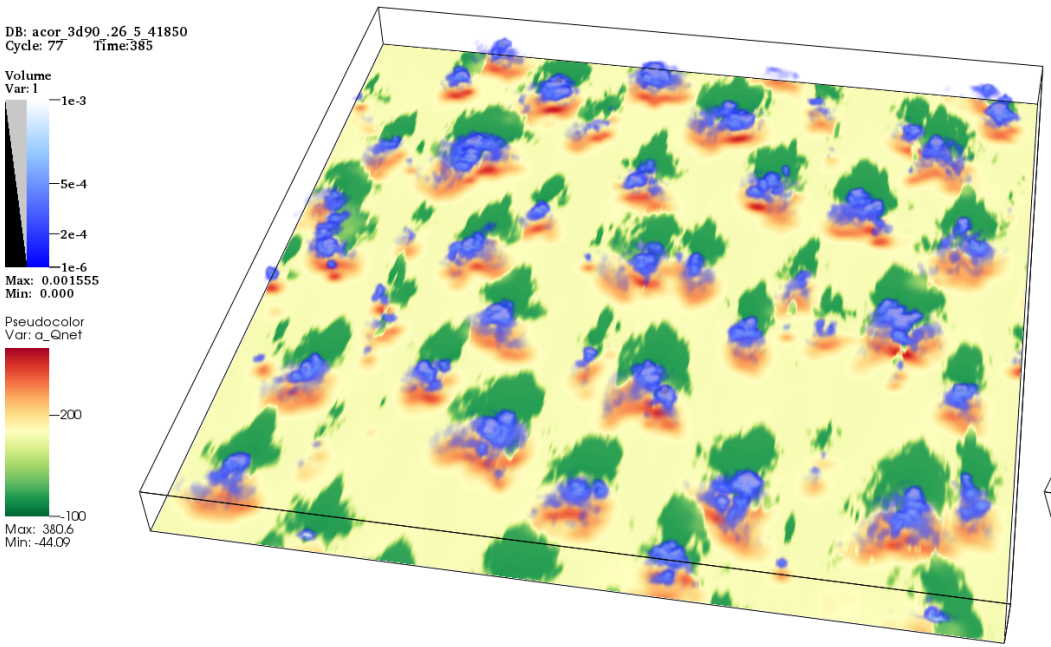


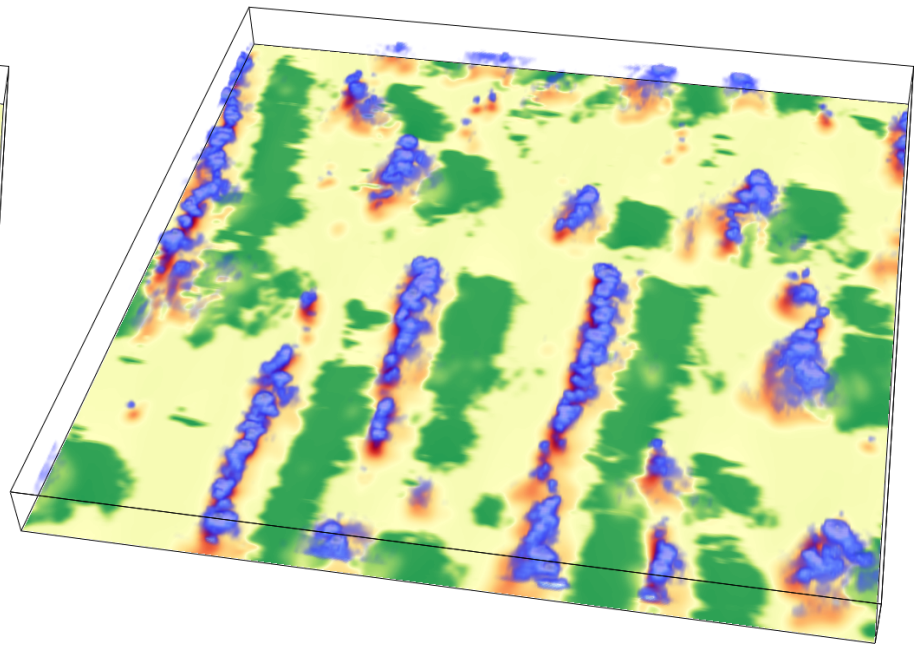
Sept 5, 2017

Convective Organization in Streets

Sun in the South



Sun in the West



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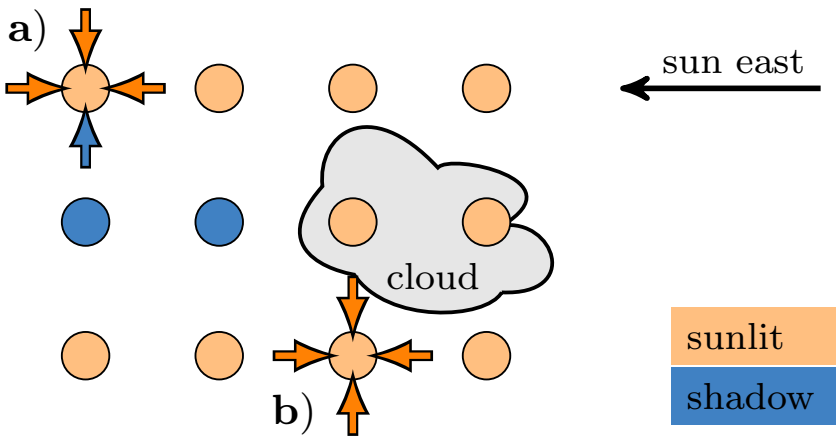
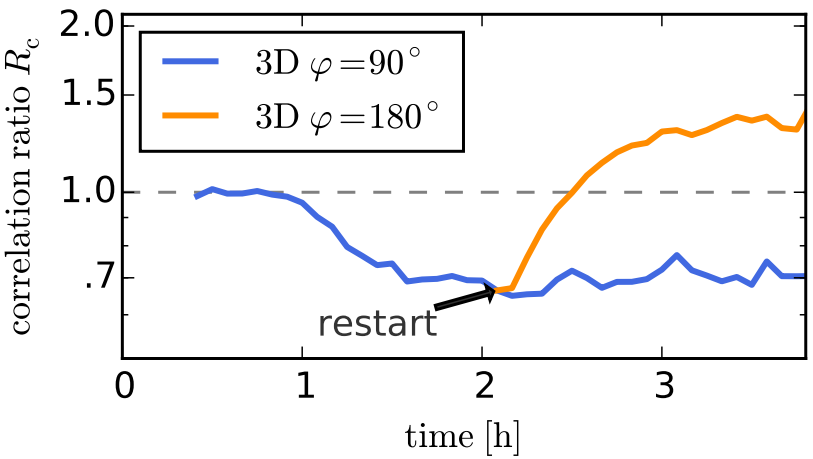
Mechanism and Timescales of Convective Organization



- Our hypothesis: Organization through stationary surface heating patterns
- Timescales depend on surface heat capacity and wind



- Radiation may organize convection on timescales of less than 1h
- $1/e = .5\,\mathrm{h};\ \approx 7.5°\mathrm{s}$*olarangle*

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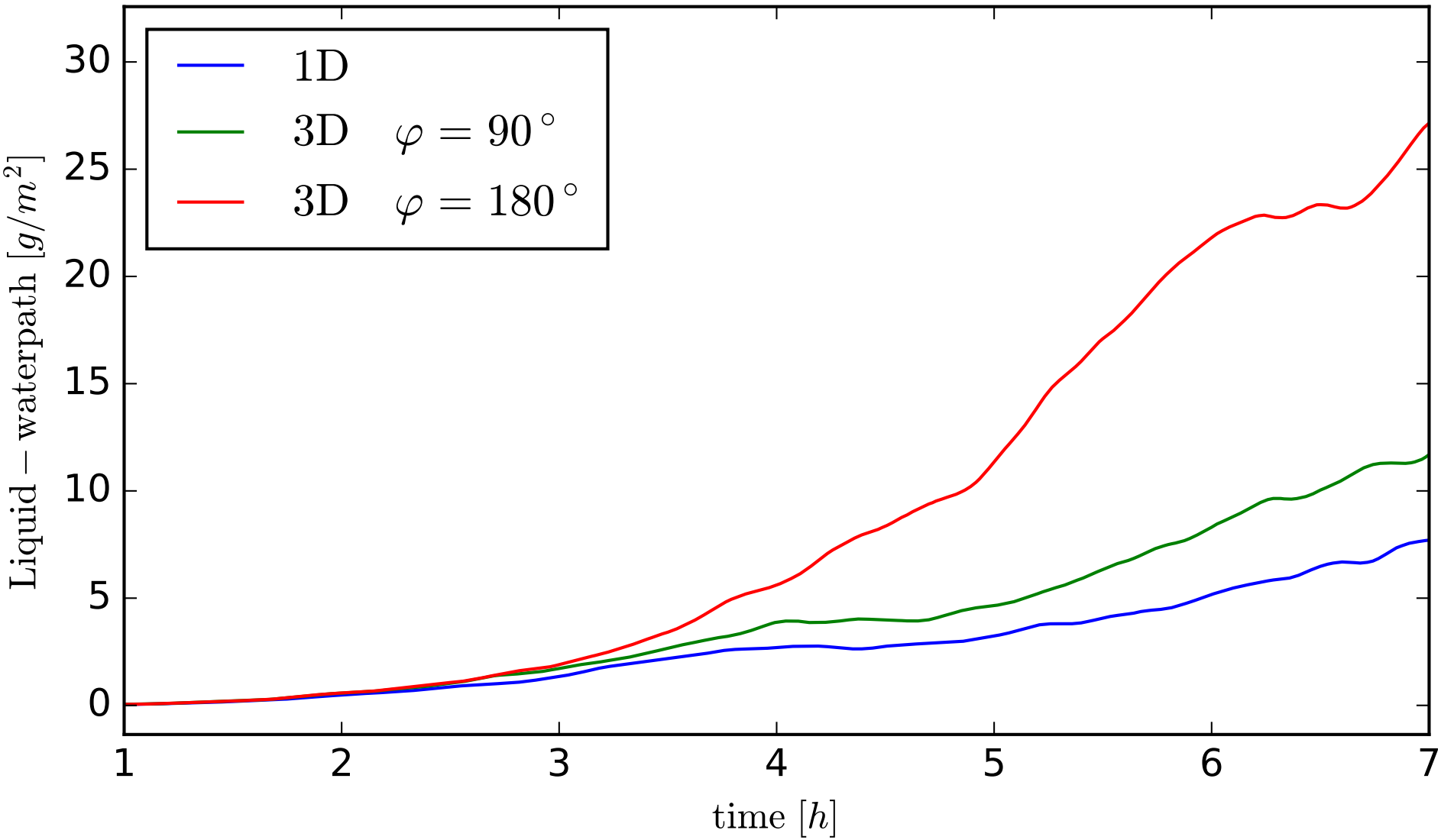
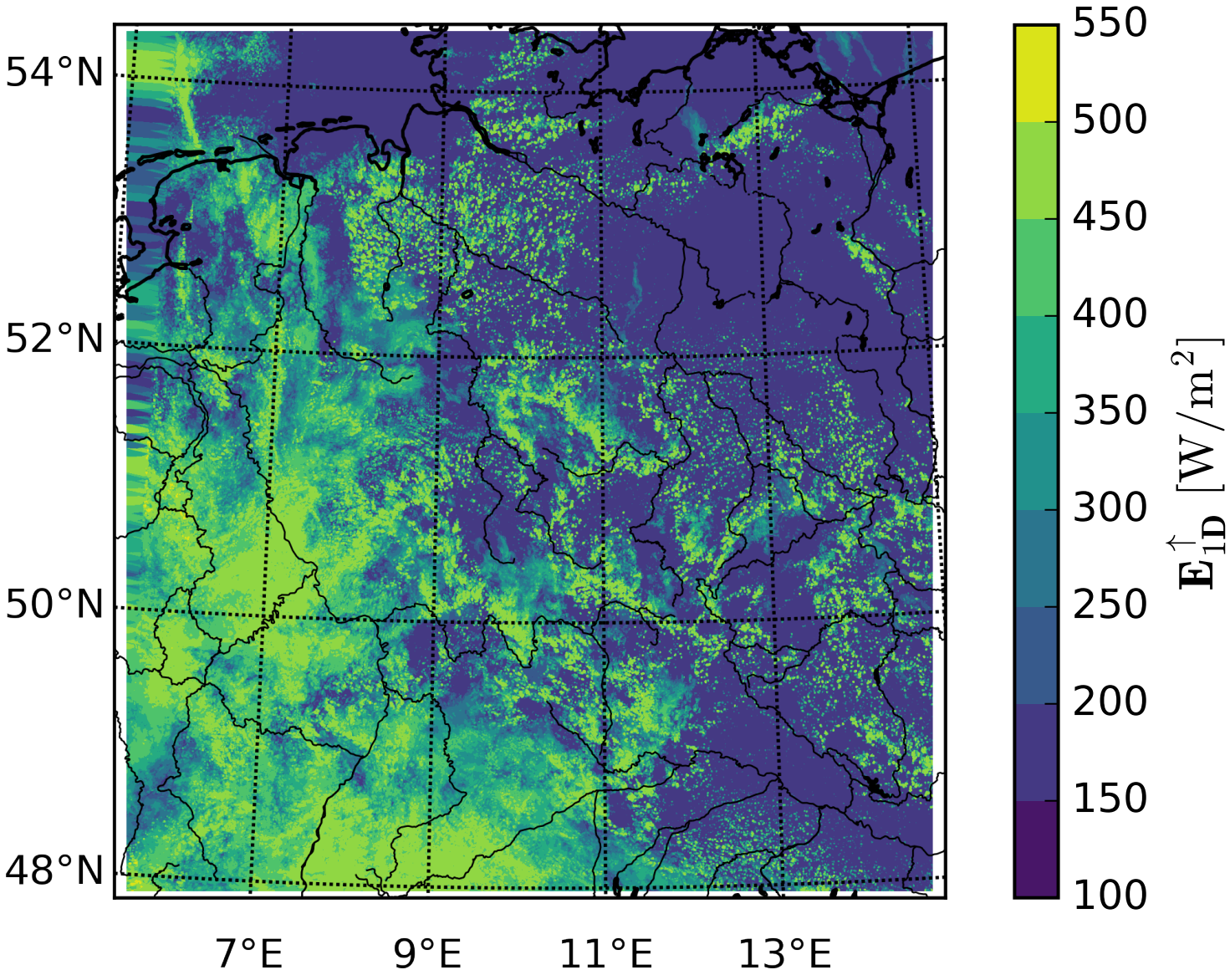
Different Evolution due to Solar Azimuth



Bias in Reflected Solar Irradiance in ICON Simulations, 2014 07 29 DOM3, -17.5 W/m^2



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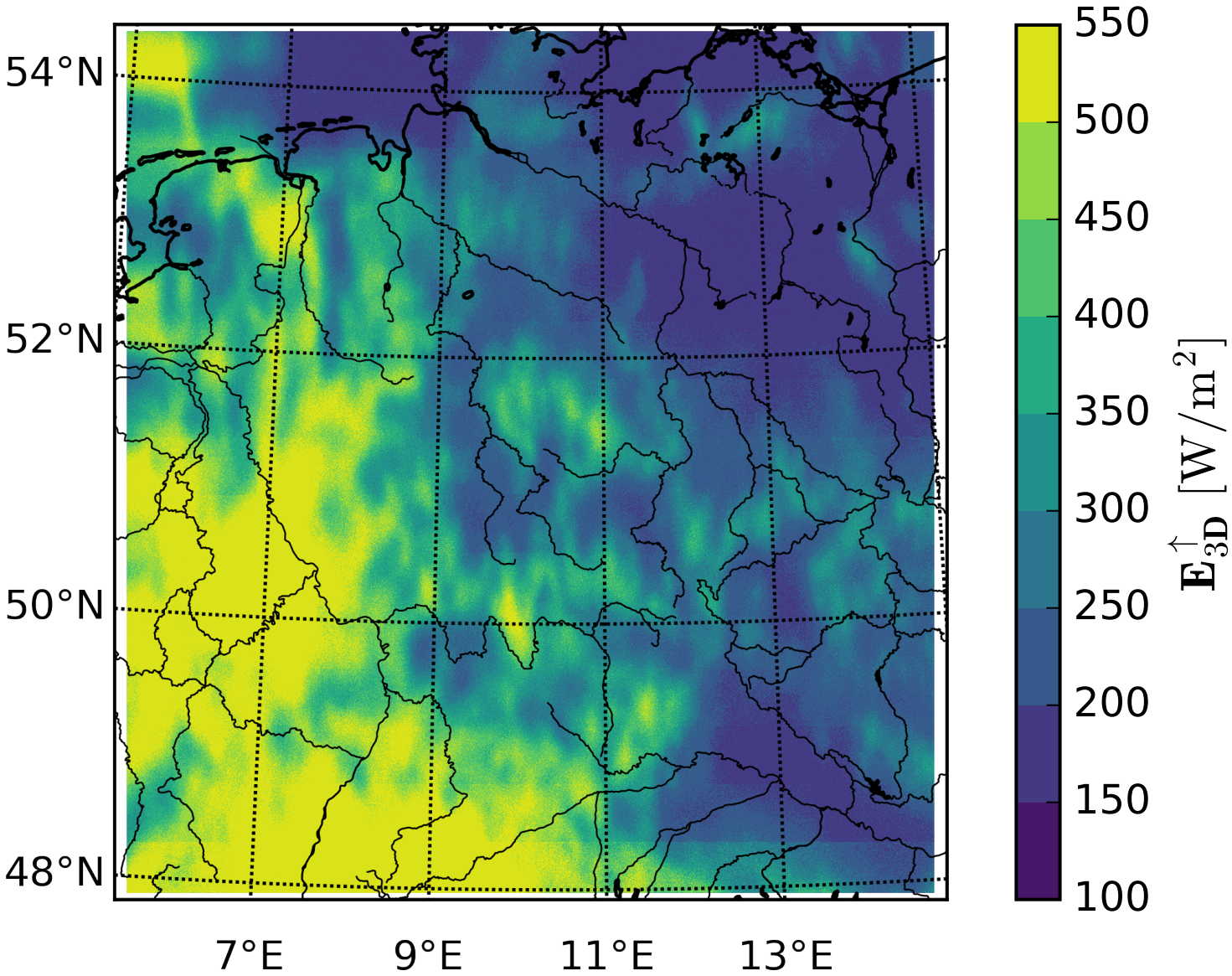

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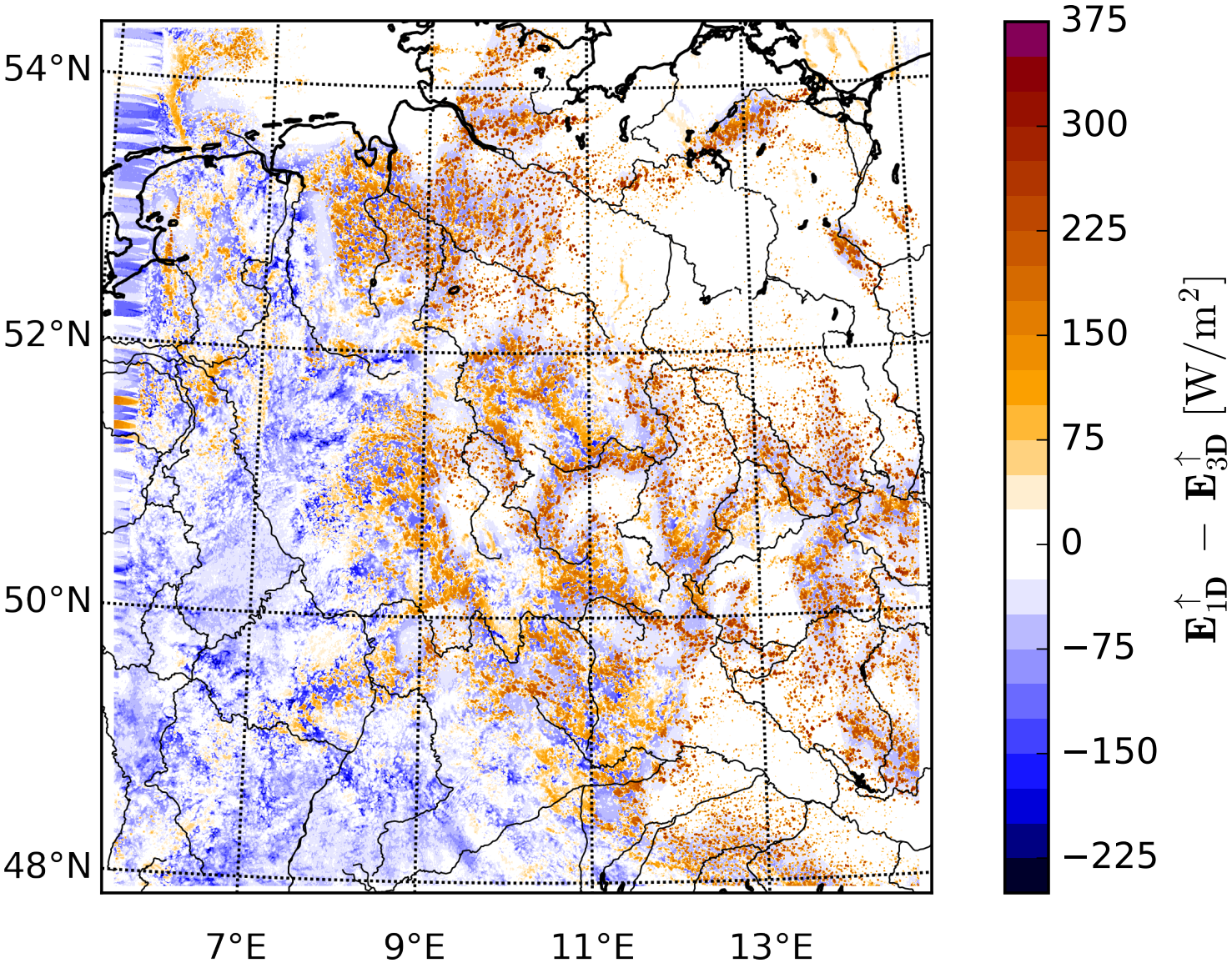

3D Radiative Transfer in ICON-LEM