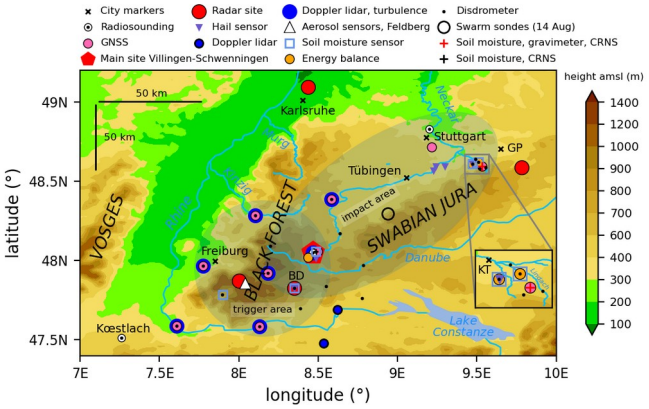
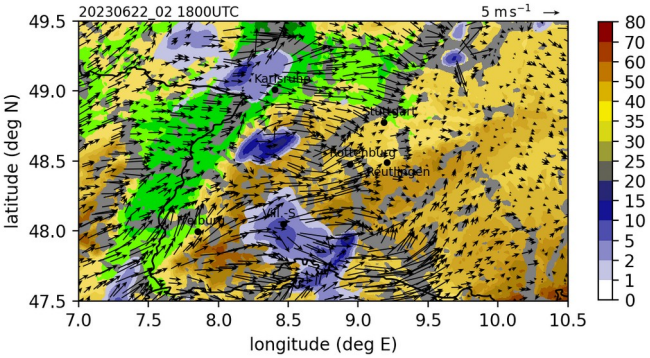
Quantitative Evaluation of an ICON ensemble for Swabian MOSES 2023

The Swabian MOSES campaign was conducted between May and September 2023 in the southeastern Black Forest, the Neckar Valley and the Swabian Alb in southwestern Germany. It focused on a **hydro-meteorological extreme**, which is not only of great relevance for the study area: local convective cells (thunderstorms), which are accompanied by **hail and heavy rain** and can lead to local **flooding** as well as **pollutant inputs** into water bodies. These events have increased significantly in recent years due to climate change and cause high damages in the region, which is a "hotspot" for convective storms in Germany.





Numerical simulations with the ICON model were conducted in which

- model resolution has been increased from 2 km to 1 km grid spacing
- single- and double-moment microphysics scheme were applied
- two different cloud condensation nuclei (CCN) activation schemes with each four different CCN concentrations

are used to create an ensemble of 20 members for a number of Intensive Observation Periods (IOPs). The goal of the work is to quantitatively evaluate the ensemble to the observational data from the field campaign and to assess which model configuration produces the best results and why. It shall also be assessed if and how the different CCN activation schemes differ and if the impact of aerosols on convection precipitation is similar or not.

Prerequisites:

- Interest in atmospheric convection and cloud processes
- Working with Linux systems
- Experience with Python

Simulations are available for 8 days:

- 17.6.21
- 8.6.23, 22.6.23, 11.7.23, 4.8.23, 14.8.23, 16.8.23
- 7.6.24

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