

Project: 1156

Project title: High-resolution ICON simulations for the EUREC⁴A field campaign

Principal investigator: Vera Schemann

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Up to now we simulated 23 days around the observation supersite BCO (Barbados) with a 4-nest setup covering resolutions from 600 m up to 75 m. Until the end of the year we will simulate at least 7 more days, to have one full month of simulations. These simulations will be compared to observations at the supersite to investigate how well the variability of liquid water, water vapor and precipitation is captured by the model. The 4-nests with an increase in resolutions enables us to additionally analyze the influence of the resolution and hopefully estimate a required resolution for a reasonable representation. This comparison is already ongoing work. Later on, we will investigate the formation of precipitation in more detail.

The formation of precipitation is also of key interest for some sensitivity simulations, which we already performed for the region that was covered by the circles of the HALO aircraft. So far, we simulated only a few days of this larger region to refine the setup and also estimate the general capability of the ICON-LEM to capture specific structures and developments of clouds. During the next period we will intensify the research on simulations of the HALO circles and also connect both setups. For example we could analyze, if the model performance differs for BCO or HALO. Both setups can be seen in Fig. 1.

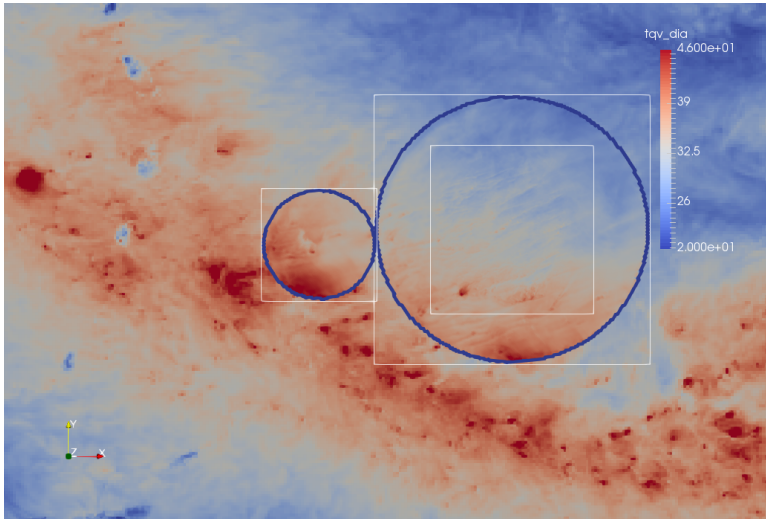


Figure 1: Setup (domain size) for simulations with the ICON-LEM around BCO and the HALO circle. Background shows the forcing data (ICON-NWP). Colors show the integrated water vapor.

As a third part we started to perform simulations around the location of the research vessel Maria St. Merian for specific days of interest. These simulations are covering a third region which can be compared with the first two. But the main focus of these simulations will be the analysis based on detailed remote sensing cloud observations which have been taken on board. All work just started and is ongoing.