



Online model evaluation of large-eddy simulations covering Germany with a horizontal resolution of 156 m

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Large-eddy simulations have been performed since several decades, but due to computational limits most studies were restricted to small domains or idealised initial-/boundary conditions. Within the High definition clouds and precipitation for advancing climate prediction (HD(CP)²) project realistic weather forecasting like LES simulations were performed with the newly developed ICON LES model for several days. The domain covers central Europe with a horizontal resolution down to 156 m. The setup consists of more than 3 billion grid cells, by what one 3D dump requires roughly 500 GB.

A newly developed online evaluation toolbox was created to check instantaneously for realistic model simulations. The toolbox automatically combines model results with observations and generates several quicklooks for various variables. So far temperature-/humidity profiles, cloud cover, integrated water vapour, precipitation and many more are included. All kind of observations like aircraft observations, soundings or precipitation radar networks are used. For each dataset, a specific module is created, which allows for an easy handling and enhancement of the toolbox. Most of the observations are automatically downloaded from the Standardized Atmospheric Measurement Database (SAMD).

The evaluation tool should support scientists at monitoring computational costly model simulations as well as to give a first overview about model's performance. The structure of the toolbox as well as the SAMD database are presented. Furthermore, the toolbox was applied on an ICON LES sensitivity study, where example results are shown.