Geophysical Research Abstracts
Vol. 18, EGU2016-17629, 2016
EGU General Assembly 2016
© Author(s) 2016. CC Attribution 3.0 License.

A year-long continuous Large Eddy Simulation of actual weather: subgrid and spatio-temporal scale issues

Harmen Jonker (1) and Remco Verzijlbergh (2)

(1) Department of Geoscience and Remote Sensing, Delft University of Technology, The Netherlands, (2) Department of Engineering Systems and Services, Delft University of Technology, The Netherlands

We analyse results of a single, continuous Large-Eddy Simulation of actual weather conditions during the timespan of a full year, made possible through recent computational developments (Schalkwijk et al, MWR, 2015). The simulation is coupled to a regional weather model in order to provide an LES dataset that is representative of the daily weather of the year 2012 around Cabauw, the Netherlands. This location is chosen such that LES results can be compared with both the regional weather model and observations from the Cabauw observational supersite.

The simulation yields a data-set of relevant atmospheric variables that cover a scale range from seconds to seasons. Analysis of the spatial and temporal spectra of wind and thermodynamical quantities reveals the scale mismatches that arise from the coupling to the large-scale weather model, and provides information on how to better choose the domain size of the LES.

In addition, as the single continuous run encompasses many different days and nights with widely varying atmospheric stabilities, we will discuss the high demands that are put on the LES subgrid model.