Project: **982**
Project title: **HD(CP)2-II S4 (Land Surface Heterogeneity)**
Project lead: **Christopher Moseley**
Report period: **2016-01-01 to 2016-12-31**

In the reporting period, only a small fraction of the granted computing time has been used. The reason is that the planned simulations could not be started yet, as explained in the following. The project S4 officially began in April 2016, and the first informal meeting with all project partners took place in July 2016 at the University of Bonn. Therefore, the planning of the S4 specific simulations could not be done earlier. The planning is now in the starting phase, and first short-term test simulations have been started, which will allow the performance of the extensive simulations described in the resources application for the reporting period. These will then be shifted to 2017, as explained the our new resources application. The main work, which was done during the reporting period, was an HD(CP)^2 wide extensive evaluation of the high resolution simulations covering Germany conducted by the M project. The results are published in Quart. J. Roy. Meteor. Soc. (Heinze et al, 2016), in which participants of all sub-projects of HD(CP)^2-II are involved.

A large part of the used computing resources granted the HD(CP)^2 S4 for 2016 have been used for finalizing simulations with a semi-idealized ICON-LEM setup of HD(CP)^2-I, which are also part of the publication Heinze et al. , as well as for testing small-domain setups, covering certain regions of Germany (with and without nests), with the realistic ICON-LEM framework as it is used by the M project. As these test simulations were yet only performed for short time periods, the required computing time is minimal. Such a test setup is now running and builds the basis for the simulations as they are requested in our new DKRZ resources application for 2017, in line with the original S4 proposal at BMBF.

Several participants of HD(CP)^2-II, including the sub-project S4, have requested a tutorial for the conductance of such small-domain simulations at DKRZ, which cannot be covered by the M project alone. S4 is involved in the organization of such a tutorial, which will take place in November 2016 at MPI-M in Hamburg. The simulations, conducted by participants during the tutorial, can be performed on the computing account of S4. Afterwards, the participants will be able to conduct their own individual simulations within the HD(CP)^2 ICON-LEM modeling framework, using the requested resources of their specific DKRZ projects.

Heinze, R., A. Dipankar, C. C. Henken, C. Moseley, O. Sourdeval, S. Trömel, X. Xie, P. Adamidis, F. Ament, H. Baars, C. Barthlott, A. Behrendt, U. Blahak, S. Bley, S. Brdar, M. Brueck, S. Crewell, H. Deneke, P. Di Girolamo, R. Evaristo, J. Fischer, C. Frank, P. Friederichs, T. Göcke, K. Gorges, L. Hande, M. Hanke, A. Hansen, H.-C. Hege, C. Hoose, T. Jahns, N. Kalthoff, D. Klocke, S. Kneifel, P Knippertz, A. Kuhn, T. van Laar, A. Macke, V. Maurer, B. Mayer, C. I. Meyer, S. K. Muppa, R. A. J. Neggers, E. Orlandi, F. Pantillon, B. Pospichal, N. Röber, L. Scheck, A. Seifert, P. Seifert, F. Senf, P. Siligam, C. Simmer, S. Steinke, B. Stevens, K. Wapler, M. Weniger, V. Wulfmeyer, G. Zängl, D. Zhang, and J. Quaas (2016): Large-eddy simulations over Germany using ICON: A comprehensive evaluation. Accepted for publication in Quart. J. Roy. Meteor. Soc.