Project: **992**
Project title: **HD(CP)2 - II S5, TP6**
Project lead: **Rieke Heinze**
Report period: **2016-01-01 to 2016-12-31**

Due to lack of personnel, it was not possible to commence the planned simulation work in 2016 as originally planned. Instead the work will begin in the second quarter of 2017 with the hiring of the post-doctoral scientist as described in the S5 TP4 proposal.

In the framework of the HD(CP)² evaluation task force synthetic satellite images were computed from the high-resolution ICON-LES runs carried out at DKRZ. The fast forward operator for visible and near-infrared satellite images developed at LMU Munich was used to process the model output on full-resolution unstructured ICON grids. Due to the large amounts of data involved in this process and the computational effort caused by taking 3D effects into account a parallel version of the operator had to be developed. In particular the synthetic MODIS images with 250m resolution (see Fig. 1) proved very useful for the model evaluation, as they allowed for a direct comparison of model clouds and real clouds at scales down to the effective model resolution. These images and the cloud size distributions derived from them became an important contribution to the model evaluation publication Heinze et al. 2016.

References

Heinze, R., A. Dipankar, C. Carbajal Henken, C. Moseley, O. Sourdeval, S. Trömel, X. Xie, P. Adamidis, F. Ament, H. Baars, C. Barthlott, A. Behrendt, U. Blahak, S. Bley, Slavko Brdar, M. Brueck, Susanne 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. Laar, Andreas 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, Large-eddy simulations over Germany using ICON: A comprehensive evaluation, *Quart. J. Roy. Meteorol. Soc*., accepted.

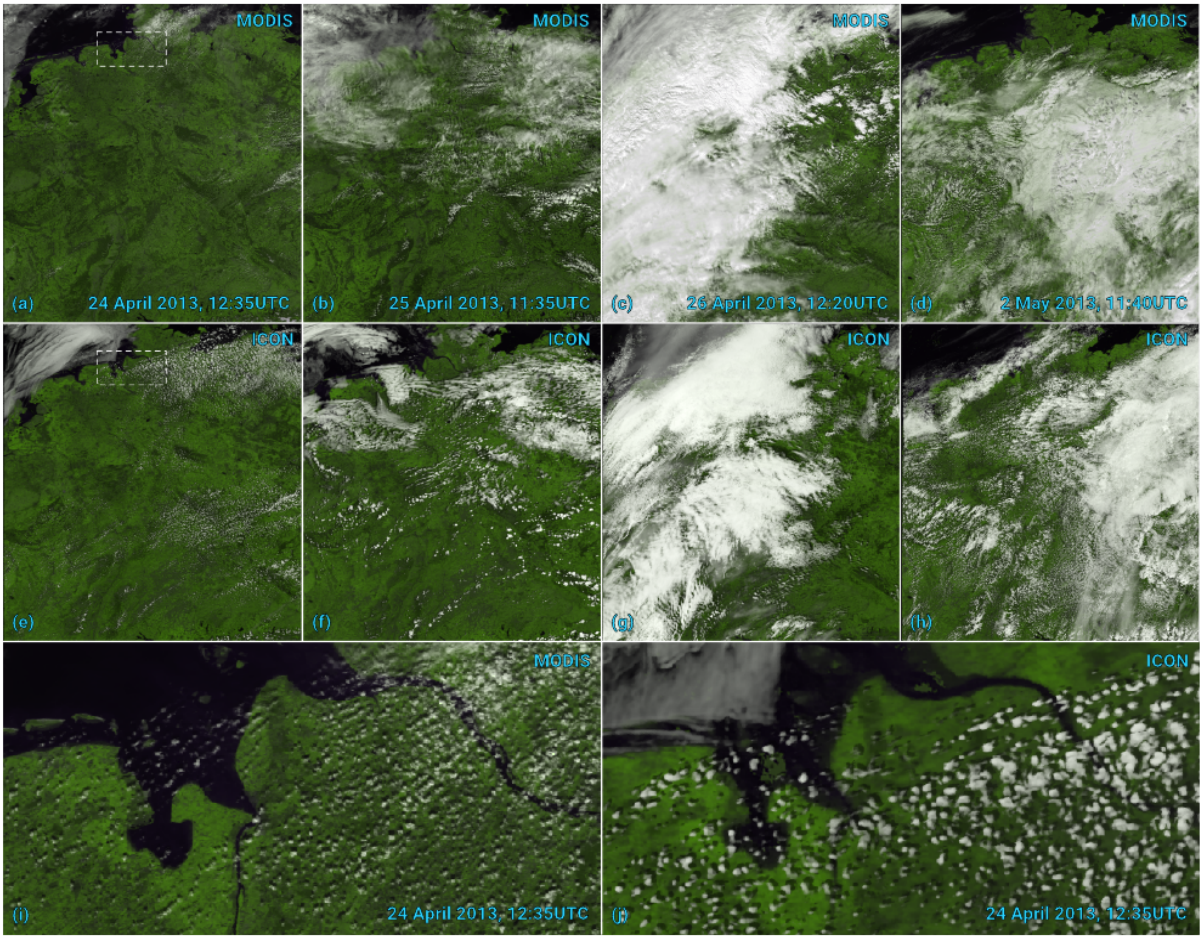

Figure 1: MODIS satellite images (a-d,i) and corresponding synthetic images based on ICON model runs (e-h,j) of the HD(CP)² domain for four days in April and May 2013. Panels (i) and (j) show magnified views of the rectangular regions marked with dashed lines in panels (a) and (e), respectively.