EMS Annual Meeting Abstracts
Vol. 13, EMS2016-670, 2016
16th EMS / 11th ECAC

Results from the recent Dynamical Core Model Intercomparison Project (DCMIP2016) for ICON

Daniel Reinert (1), Marco Giorgetta (2), and Günther Zängl (1)

(1) Deutscher Wetterdienst, Offenbach am Main, Germany (daniel.reinert@dwd.de), (2) Max Planck Institute for Meteorology, Hamburg, Germany

In June this year, the Dynamical Core Model Intercomparison Project (DCMIP2016) Workshop and an associated two-week summer school took place at the National Center for Atmospheric Research (NCAR) in Boulder. One objective was to bring together developers of NWP and climate models for a model intercomparison, focusing on the impact of different dynamical core designs and grid refinement strategies on the simulation of atmospheric flow phenomena. In total 13 modeling groups participated in this intercomparison. A test case suite of intermediate complexity was implemented and run by each modeling group, which incorporates dynamics coupled with simplified physics parameterizations. The suite, developed by the workshop organizers, is targeted to provide a missing link between traditional highly idealized dry dynamical core test cases on the one hand and full physics experiments (e.g. APE, AMIP) on the other hand. The test suite comprises

- a moist baroclinic wave test [1] including a terminator "toy" chemistry [2], the latter mimicking a simple dynamics-chemistry coupling.
- a tropical cyclone test case [3] with simplified physics (taking into account only grid scale condensation, surface fluxes of heat and momentum and PBL mixing).
- a mesoscale storm test [4].

A modeling group from Deutscher Wetterdienst (DWD) and the Max Planck Institute for Meteorology (MPI-M) participated with the Icosahedral Non-hydrostatic (ICON) global model. Since January 2015, ICON is the basis for global NWP at DWD. We will show selected results for ICON with some focus on preservation of linear correlations for tracers as well as grid refinement and compare those with results from other participating models.

References

[1] Ullrich, P. A., T. Melvin, C. Jablonowski and A. Staniforth (2014): A proposed baroclinic wave test case for deep- and shallow-atmosphere dynamical cores. *Q. J. R. Meteorol. Soc.*, **140**, 1590–1602

[2] Lauritzen, P. H., A. J. Conley, J.-F. Lamarque, F. Vitt and M. A. Taylor (2015): The terminator "toy" chemistry test: a simple tool to assess errors in transport schemes, *Geosci. Model Dev.* **8**, 1299–1313

[3] Reed, K. A. and C. Jablonowski (2012), Idealized tropical cyclone simulations of intermediate complexity: A test for AGCMs *J. Adv. Model. Earth Syst.*, **4**, M04001

[4] Klemp, J. B. and R. B. Wilhelmson (1978): The simulation of three-dimensional convective storm dynamics. *J. Atm. Sci.*, **35**, 1070–1096