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Latitude belt convection permitting simulation using the Weather Research and Forecasting (WRF) model

Kirsten Warrach-Sagi, Thomas Schwitalla, and Volker Wulfmeyer
Institute of Physics and Meteorology, University of Hohenheim, Germany (Kirsten.Warrach-Sagi@uni-hohenheim.de)

Extreme events like the heat wave in summer 2003 in Central Europe and in August 2010 in Russia (which was associated with floodings of the Odra an in Pakistan) and severe floodings in Germany were caused by persistent so-called omega and blocking Vb weather situations in Europe. They are caused when quasi-stationary, quasi-resonant enhanced and quasi-resonant Rossby waves develop in mid-latitudes. To simulate quasi-stationary Rossby waves in numerical weather prediction and climate models at least a resolution of 20 km is required, however, to simulate the associated extremes the simulations need to be convection permitting. Further the high resolution allows the small scale structures to feed back to the large scale systems. Most of the current limited area, high-resolution models apply a domain which is centered over the region of interest. Such limited area model applications may suffer from a deterioration of synoptic features like low pressure systems due to effects in the boundary relaxation zone when downscaling reanalysis or global model simulation data. For Europe this is mainly caused by the longitudinal boundaries.
A way to overcome these types of difficulties is to run a latitude belt simulation model. We applied the Weather Research and Forecasting (WRF) model with 3 km horizontal resolution for July and August 2013 forcing the model 6-hourly with ECMWF analyses data at 20°N and 65°N and with daily sea surface temperature data from the OSTIA project of the UK Met Office at 6 km resolution. The model domain encompasses 12000*1500*57 grid cells. First results of this so far unique simulation will be presented.