Geophysical Research Abstracts
Vol. 15, EGU2013-958, 2013
EGU General Assembly 2013

Dynamical aspects of errors due to lateral boundaries in downscaling experiments in the mid-latitudes

Luka Honzak (1) and Nedjeljka Žagar (1,2)
(1) Center of Excellence SPACE-SI, Ljubljana, Slovenia, (2) University of Ljubljana, Ljubljana, Slovenia

The impact of lateral boundaries on the magnitude of forecast errors inside the limited-area model domain in mid-latitudes is studied by using realistic simulations with the WRF-ARW model nested into the operational ECMWF analyses over an extended time period.
Ensembles of simulations are carried out on the mid-latitude channel domains extending between 35°N and 70°N and between 30°N and 80°N. The WRF model is run at the same grid with resolution (0.25°x0.25°) as the coupling ECMWF analyses in order to isolate the impact of imperfect coupling. Results are verified against the ECMWF analyses in terms of conventional statistical parameters. The mid-latitude channel results are then compared with simulations on two smaller domains, the half-channel experiment covering the half of the globe (100°W-60°E) and the quarter-channel simulation extending between 45°W and 35°E.
Results from the channel domains show that the tropospheric wind errors are amplified in baroclinically active regions of Atlantic and Pacific. In the Atlantic and to a smaller extent in the Pacific, the zonal wind errors in WRF have a dipole structure. The meridional wind errors maximize between 50°N and 60°N. In the quarter-channel simulation, that is still larger than the majority of limited-area domains used for the regional climate modelling in Europe, the internal variability over the wider European area nearly disappears and the errors due to imperfect coupling become largely homogeneous both horizontally and in the vertical direction.