



Nonhydrostatic simulations using regional climate model over the CORDEX FPS Convection region

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CORDEX FPS Convection is a dedicated CORDEX community activity for the purpose of the coordinated development and application of the nonhydrostatic regional climate models at the horizontal spacing between 1 and 4 km over the domain centred over the Alps. In this work, simulations using ICTP RegCM4 regional climate model at the 4 km resolution performed by the DHMZ RCM team are analysed over the parts of the Pannonian Basin for the period including 3 years (from 1999 to 2001). In our numerical experiments, RegCM4 lateral boundary conditions and sea-surface temperatures are provided by the ECMWF ERA-Interim reanalysis. In this first step, hydrostatic version of RegCM4 at the 12.5 km resolution over the EURO-CORDEX domain is applied, while nonhydrostatic version at the 4 km is one-way nested inside of the parent domain. Annual and daily cycles of the near-surface air temperature, relative humidity, total precipitation amount and near-surface wind speed are compared between the simulated (by both hydrostatic 12.5 km and nonhydrostatic 4 km simulations) and observed time-series over several locations in the continental Croatia. Also, CM SAF satellite-based total cloud cover fields and E-OBS gridded near-surface air temperature and total precipitation fields are compared with the models' results. Finally, for the location of the Zagreb Maksimir station, RegCM4 results will be compared against 00 and 12 UTC vertical soundings in terms of air temperature, relative humidity and wind speeds up to the levels between 10 and 15 km. Some limitations and challenges in the current model setup will be discussed, and suggestion for the common PannEx domain for the joint nonhydrostatic regional climate modelling activities will be presented.