



Validation of the Regional Climate Model ALARO with different dynamical downscaling approaches and different horizontal resolutions

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At the Royal Meteorological Institute of Belgium (RMI), climate simulations are performed with the regional climate model (RCM) ALARO, a version of the ALADIN model with improved physical parameterizations. In order to obtain high-resolution information of the regional climate, lateral boundary conditions (LBC) are prescribed from the global climate model (GCM) ARPEGE. Dynamical downscaling is commonly done in a continuous long-term simulation, with the initialisation of the model at the start and driven by the regularly updated LBCs of the GCM. Recently, more interest exists in the dynamical downscaling approach of frequent reinitializations of the climate simulations. For these experiments, the model is initialised daily and driven for 24 hours by the GCM. However, the surface is either initialised daily together with the atmosphere or free to evolve continuously.

The surface scheme implemented in ALARO is SURFEX, which can be either run in coupled mode or in stand-alone mode. The regional climate is simulated on different domains, on a 20km horizontal resolution over Western-Europe and a 4km horizontal resolution over Belgium. Besides, SURFEX allows to perform a stand-alone or offline simulation on 1km horizontal resolution over Belgium.

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