



## Development of ALARO-Climate regional climate model for a very high resolution

Petr Skalak (1,2), Ales Farda (2,1), Radmila Brozkova (1,2), Jan Masek (1,2)

(1) Czech Hydrometeorological Institute, Department of Climatology, Praha, Czech Republic (skalak@chmi.cz), (2) Global Change Research Centre AS CR, Brno, Czech Republic

ALARO-Climate is a new regional climate model (RCM) derived from the ALADIN LAM model family. It is based on the numerical weather prediction model ALARO and developed at the Czech Hydrometeorological Institute. The model is expected to be able to work in the so called "grey zone" physics (horizontal resolution of 4 - 7 km) and at the same time retain its ability to be operated in resolutions in between 20 and 50 km, which are typical for contemporary generation of regional climate models.

Here we present the main features of the RCM ALARO-Climate and results of the first model simulations on longer time-scales (1961-1990). The model was driven by the ERA-40/Interim re-analyses and run on the large pan-European integration domain ("ENSEMBLES / Euro-Cordex domain") with spatial resolution of 25 km. The simulated model climate was compared with the gridded observation of air temperature (mean, maximum, minimum) and precipitation from the E-OBS version 7 dataset. The validation of the first ERA-40 simulation has revealed significant cold biases in all seasons (between -4 and -2 °C) and overestimation of precipitation on 20% to 60% in the selected Central Europe target area (0° – 30° eastern longitude ; 40° – 60° northern latitude). The consequent adaptations in the model and their effect on the simulated properties of climate variables are illustrated.

**Acknowledgements:** This study was performed within the frame of projects ALARO (project P209/11/2405 sponsored by the Czech Science Foundation) and CzechGlobe Centre (CZ.1.05/1.1.00/02.0073). The partial support was also provided under the projects P209-11-0956 of the Czech Science Foundation and CZ.1.07/2.4.00/31.0056 (Operational Programme of Education for Competitiveness of Ministry of Education, Youth and Sports of the Czech Republic).