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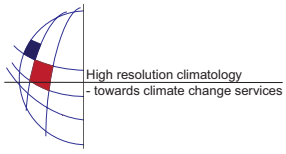

The future climate characteristics of the Carpathian Basin based on a regional climate model mini-ensemble

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Four regional climate models (RCMs) were adapted in Hungary for the dynamical enhancement of the global climate projections over the Carpathian Basin: (i) the ALADIN-Climate model developed by Météo France on the basis of the ALADIN short-range modelling system; (ii) the PRECIS model available from the UK Met Office Hadley Centre; (iii) the RegCM model originally developed at the U.S. National Center for Atmospheric Research and improved at the International Centre for Theoretical Physics in Trieste; and (iv) the REMO model developed by the Max Planck Institute for Meteorology in Hamburg. The RCMs are different in terms of dynamical model formulation, physical parameterisations; moreover, in the completed simulations they use different spatial resolution, integration domain and lateral boundary conditions for the scenario experiments. Therefore, the results of the four regional climate models can be considered as a small ensemble providing information about various kinds of uncertainties in the future projections over the target area, i.e. Hungary.

The mean changes and extreme characteristics of temperature and precipitation patterns (including their statistical significance) have been assessed focusing on the periods of 2021–2050 and 2071–2100 relative to the 1961–1990 reference period. The ensemble evaluation indicates that the temperature-related changes of the different RCMs are in good agreement over the Carpathian Basin and these tendencies manifest in the general warming conditions. The precipitation changes cannot be identified so clearly: seasonally large differences can be recognized among the projections and between the two periods. The presentation aims to give an overview about the results of the mini-ensemble and put special emphasis on estimating the uncertainties in the simulations for the territory of Hungary. Thus, preliminary results are also planned to be briefly discussed concerning the capability of the applied mini-ensemble to address the entire uncertainty range.