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Evaluation of a EURO-CORDEX ALADIN-Climate experiment focusing on Hungary

Ilona Kruzselyi and Gabriella Szepszo
Hungarian Meteorological Service, Hungary (kruzselyi.i@met.hu)

For adaptation to the climate change impacts it is indispensable to know the future evolution of the climate system and the most physics-oriented way to describe it is modelling. Global climate models are capable of reliably simulating the progress of large-scale patterns, and based on their results regional climate models provide detailed information desired for impact studies. The CORDEX initiative aims to create numerous regional projections over common regions of the Earth, and particularly the EURO-CORDEX cooperation focuses on Europe on 50 and 12 km horizontal resolutions. These ensemble systems are analysed jointly in order to characterise the uncertainties of regional projections due to the choice of emission scenario, global model, domain, internal variability, downscaling tool, etc.

The Hungarian Meteorological Service is involved in EURO-CORDEX with the ALADIN-Climate regional climate model. ALADIN-Climate was developed in an international cooperation at Météo France and adapted at the Hungarian Meteorological Service in 2005. In the framework of the CECILIA project, some simulations were carried out on 10 km resolution with the model over a domain covering the Carpathian Basin. The validation results implied that the applied integration domain is too small, considering the too low temperature and too high precipitation values also over the "heart" of the area, but especially at its boundaries. It was concluded and expected that the extension of the model domain will improve the results over the area of our interest.

In the framework of EURO-CORDEX, a new validation run was achieved at 0.44-degree resolution over the EURO-CORDEX domain (including the whole continent) for the period of 1989–2008 and ERA-Interim data were applied as lateral boundary condition. Contrary to our expectations, the model behaves similarly over this bigger area than before: it underestimates the temperature apart from East European Plain and exaggerates the precipitation over the largest part of the year. The presentation intends to perform the preliminary results of the evaluation concentrating on Hungary.