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Assessment of future precipitation change in ALADIN-Climate using various scenarios

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A project called KlimAdat for the assessment of climate change impacts in Hungary with regional climate model simulations is established in 2016 at the Hungarian Meteorological Service. The aim of the KlimAdat project is to create a complex database that is filled with detailed meteorological information aiming to supporting climate change impact studies in different sectors, adaptation strategies and related decision making. The meteorological information in this database is based on several regional climate models in order to quantify the projection uncertainties. This study is focusing on precipitation results.
Future precipitation change over the Carpathian Basin is especially uncertain due to the ambiguous location of the projected signal turn from a Southern European reduction to a Northern European increase in the climate models. Two 10 km horizontal resolution simulations of the ALADIN-Climate regional climate model (adapted at the Hungarian Meteorological Service) driven by different scenarios (RCP8.5 and SRES A1B) show opposite directions for Hungary in summer and winter. E.g., in summer +20 and -20% changes are projected by the end of the century. Moreover, investigating the two latest European ensemble families, it can be noticed that the ENSEMBLES simulations (using SRES A1B scenarios) show a summer precipitation decrease in this area with relatively high probability, while the Euro-CORDEX results – considering both RCP4.5 and RCP8.5 emission scenarios – are more ambiguous.
In the presentation, behaviour of various simulations of ALADIN-Climate achieved by different scenarios (from the European ensembles and locally runs) is investigated from the aspect of precipitation change over the Carpathian Basin and possible reasons behind the differences are given.