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Effect of the bias correction on computed extremes based on simulations of ALADIN-Climate/CZ for the area of the Czech and Slovak Republics

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Outputs of regional climate models are biased to some extend, resulting either from errors in driving data or from given regional climate model (RCM) itself (smoothed orography, physical parametrization etc.). Such biased outputs can lead then to biased results for computed extreme indices. The influence of the bias correction on RCM data in the scenario experiment was studied. The investigation was focused on the selected extreme indices calculated either from corrected or original uncorrected RCM data. The data for analysis of extremes were taken from two IPCC SRES A1B scenario experiments that were carried out by the regional climate model ALADIN-Climate/CZ driven by global circulation model (GCM) ARPEGE- Climat for the near (2021-2050) and far (2071-2100) future These experiments as well as the definition of the extreme indices definition were prepared in frame of the EC FP6 project CECILIA (2006-2009).

The model data were corrected according to validation results carried out for the period 1961-1990. For this task a new gridded dataset of station observation was created. All input station observations were quality controlled and homogenized in daily scale and then recalculated to the ALADIN-Climate/CZ grid of 10 km horizontal resolution. Gridded dataset of station observations was then compared with the RCM simulation (driven by GCM) of the past climate (1961-1990) in each model grid point. According to relationship between the gridded station dataset and RCM past climate simulation, outputs of A1B scenario integrations of the future climate were corrected applying an approach of Déqué (2007) that is based on a variable correction using individual percentiles. After the correction, the model outputs are fully compatible with the station (measured) data. The gridding and all data processing including the presented analysis were done by ProClimDB database software (free download from http://www.climahom.eu/) for processing of climatological datasets (Štěpánek, 2008).

For the analysis presented here, the grid points with the highest and lowest altitudes within the area of the Czech and Slovak Republics were selected and then compared separately. The results are investigated both for corrected and uncorrected RCM outputs.