Comparison of correction methods for inhomogeneities in daily time series of air temperature

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Prior to any data analysis, data quality control and homogenization must be undertaken in order to get rid of erroneous values in the time series. In this work, we have focused especially on a comparison of methods for the correction of daily data inhomogeneities. Two basic approaches for the adjustment of inhomogeneity were adopted and compared: (i) the "delta" method – the adjustment of monthly series and projection of estimated smoothed monthly adjustments into an annual variation of daily adjustments and (ii) the "variable" correction of daily values according to the corresponding percentiles. The "variable" correction methods have only emerged in recent years. Their results have been investigated more deeply in this work and they were mutually compared. HOM of Paul Della-Marta, the SPLIDHOM method of Olivier Mestre and our own methods (DAP) are among those analyzed. We applied a multi-element approach (using e.g. weather types) as well and investigated whether or not this can improve the models. The comparison of available correction methods is also the current task of the ongoing COST action ESO601 (www. homogenisation.org).

The performance of the available correction methods (on a daily scale) is shown through an example of a Central European series of air temperature. Comparisons among the methods were investigated, as well as their various modifications (parameters settings). For this task, ProClimDB software was used (read more at www.climahom.eu).