



Automatic homogenisation using HOMOP

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HOMOP is a combination of the break detection method PRODIGE (Caussinus and Mestre, 2004) including three different formulations of the penalised maximum likelihood function and the correction methods SPLIDHOM (Mestre et al. 2011) and INTERP (Vincent et al. 2002) used for homogenisation of stations time series at ZAMG (Zentralanstalt für Meteorologie und Geodynamik). Uncertainties in the break detection are estimated by the use of different reference stations for the calculation of the adjustment and bootstrapping.

Due to the claim of using metadata in locating breaks as reliable as possible based on the automatic break detection results, it's a very time consuming way of homogenising station data. Increasing need on homogenised data for analyses of past climate initiated the development of an automatization of this homogenisation procedure. The main objective was a reduction of workload without losing increase of homogenisation quality gained by the use of metadata. Therefore an automatic classification of metadata was developed taking into account that not all metadata is equally important for each climate parameter. Moreover the importance of the metadata in regard to breaks is defined and a ranking of the detected breaks is done. Stepwise homogenisation of different break options using a Greedy-Algorithm is done until a homogeneous solution is found or the station is dismissed. Possible problems causing a stop in the homogenisation of a station (e.g. no available reference stations) are provided in a protocol file. The results of the final homogenisation version are documented in a pdf-file including information on the station (geographical location, combination of single stations,...), detected breaks, the meta data associated, adjustments and uncertainties and comparison of original and homogenised time series. The automatic system yields comparable results to those of non-automatic homogenisation.

The automatic classification, the sorting algorithm of metadata importance and the structure of the Greedy-Algorithm will be presented and discussed and potential of further improvement pointed out.

Caussinus, H. and Mestre, O. (2004). Detection and correction of artificial shifts in climate series, *Journal of the Royal Statistical Society: Series C (Applied Statistics)* 53(3): 405-425.

Mestre O., Gruber C., Prieur C., Caussinus H., Jourain S., 2011: SPLIDHOM: A Method for Homogenization of Daily Temperature Observations, *Journal of Applied Meteorology and Climate*, 50, DOI: 2343-235810.1175/2011JAMC2641.1

Vincent LA, Zhang X, Bonsal BR and Hogg WD, 2002: Homogenisation of daily temperatures over Canada, *J. Climate*, 15, 1322-1334