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Homogenisation of minimum and maximum air temperature in northern Portugal

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Homogenization of minimum and maximum air temperature has been carried out for northern Portugal for the period 1941-2010. The database corresponds to the values of the monthly arithmetic averages calculated from daily values observed at stations within the network of stations managed by the national Institute of Meteorology (IM). Some of the weather stations of IM's network are collecting data for more than a century; however, during the entire observing period, some factors have affected the climate series and have to be considered such as, changes in the station surroundings and changes related to replacement of manually operated instruments. Besides these typical changes, it is of particular interest the station relocation to rural areas or to the urban-rural interface and the installation of automatic weather stations in the vicinity of the principal or synoptic stations with the aim of replacing them. The information from these relocated and new stations was merged to produce just one but representative time series of that site. This process starts at the end 90's and the information of the time series fusion process constitutes the set of metadata used.

Two basic procedures were performed: (i) preliminary statistical and quality control analysis; and, (ii) detection and correction of problems of homogeneity. In the first case, was developed and used software for quality control, specifically dedicated for the detection of outliers, based on the quartile values of the time series itself. The analysis of homogeneity was performed using the MASH (Multiple Analysis of Series for Homogenisation) and HOMER, which is a software application developed and recently made available within the COST Action ES0601 (COST-ES0601, 2012). Both methods provide a fast quality control of the original data and were developed for automatic processing, analyzing, homogeneity testing and adjusting of climatological data, but manual usage is also possible. Obtained results with both methods will be presented, compared and discussed along with the results of the sensitivity tests performed with both methods.

COST-ES0601, 2012: "ACTION COST-ES0601 - Advances in homogenisation methods of climate series: an integrated approach HOME". Available at http://www.homogenisation.org/v_02_15/ [accessed 3 January 2012].