Development and testing of homogenisation methods: moving parameter experiments

P. Domonkos

Univ. Rovira i Virgili, Campus Terres de l'Ebre, Centre for Climate Change, Tortosa, Spain (peter.domonkos@urv.cat)

Several factors can cause undesired biases in observed climatic time series and hardly any long time series are completely free from such biases. A part of these biases can be eliminated with homogenisation. Homogenisation and the related statistical procedures (i.e. change-point detection, segmentation of time series, etc.) are widely applied in climatology and even in many other areas of science. Climatologists are interested in applying the most effective methods which are able to realise non-climatic biases with the highest probability and make adjustments with the highest accuracy possible. However, the selection of the best methods is not simple, since the efficiency depends also on the properties of the data field on which the homogenisation is applied. In addition, the observed efficiencies during tests may depend on the characteristics of test procedures. A moving parameter experiment is a series of efficiency tests that is accomplished varying some parameters of a chosen homogenisation method. In this study the basic method is ACMANT which is a newly developed, fully automatic method for homogenising networks of monthly temperature series. ACMANT was proven to be one of the best methods in the COST HOME European blind test experiments. In the presentation the results of the moving parameter experiments are shown and compared with the COST HOME results. The root mean squared error of homogenised monthly values and the remaining bias in the network mean linear trend estimations are presented. The results show that the performance of ACMANT is not very sensitive to changes in its parameterisation and all the observed efficiencies are high with small variation. Reasons why ACMANT has better performance than that of many other methods are discussed. The development of ACMANT is based on PRODIGE and already the parent method (PRODIGE) has been highly efficient.