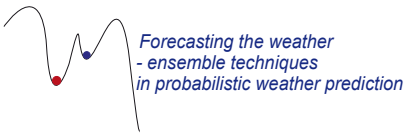
EMS Annual Meeting Abstracts
Vol. 8, EMS2011-102, 2011
11th EMS / 10th ECAM



The historical pathway towards the more accurate homogenisation

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Several homogenisation methods have been developed in the last one hundred years to improve the quality of observed climatic time series. In the recent years an enhanced effort was devoted to evaluate the efficiency of these methods, an important one being the COST ES0601 (COST HOME) project. The efficiency of homogenisation methods depends on several factors; the statistical characteristics of the examined series are a substantial one of these. For this reason, it is difficult to obtain an overall valid picture about the efficiencies, relying only on efficiency-tests. In this presentation not the test-results, but the historical methodological development is the basis on which the appropriateness of some widely used homogenisation methods is evaluated, though some test-results of the COST HOME are also presented. The main stages of the historical development are presented and their effects on the efficiency-improvement are evaluated. Some important steps are the appearance of the examination of accumulated anomalies (Double Mass Analysis) and non-parametric methods in the middle of the 20th century, then the cutting algorithm and the Standard Normal Homogeneity Test (1986), the use of weighted averages for composing reference series (1994), methods for estimating change-points and trend-like inhomogeneities (1997), search of optimal step function plus the Caussinus – Lyazrhi criterion (1997), pair-wise comparison of inhomogeneous time series, MASH (1999), ANOVA for the estimation of correction-terms, PRODIGE (2004), use of annual variables in the detection of annual cycle of inhomogeneity-size, ACMANT (2010).
The analysis of the theoretical properties and that of the test results coincidentally prove that the MASH, PRODIGE, ACMANT and USHCN methods offer the highest efficiency, i.e. they provide the highest quality for observed climatic time series, although skilled homogenizers may achieve similarly good results with the combination of simple statistical methods and visual-based expert decisions. Along with the demonstration of the best homogenisation methods some still existing doubts and problems are briefly discussed.