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Analysis of Catalan, Andorran and French temperature series from the early 20^{th} century to the present using different homogenisation approaches

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Climate Change analysis requires of high quality homogenised data, in order to calculate robust trend values and thereafter derive valid conclusions. The authors have recently engaged in an effort to quality control and homogenise the databases of the Meteorological Service of Catalonia and the Snow and Mountain Research Center (CENMA) of the Andorran Research Institute. In this work, we present a preliminary study conducted over a set of temperature stations located in Andorra and Catalonia (Spain) consisting of 20 stations, including some meteorological sites located at high elevations with data from the early decades of the 20^{th} century. The dataset is complemented with about 10 bordering French stations provided by Météo-France to constitute a multi-country dataset.

A first step consisted in the data quality control (QC), based on the usual procedures of the Climate Change Research Group (Brunet *et al*, 2007; 2006). After QC, homogeneity breaks are determined by combining and comparing the results obtained with the Standard Normal Homogeneity Test (Alexandersson, 1986; Alexandersson and

Moberg, 1997) using the procedures and software described in Aguilar *et al* (2002); those from the application of the RHTest (Wang, 2007a; 2007b; Wang *et al*, 2007; Wang, 2003) and those derived from the application of the Caussinus-Mestre method (Caussinus and Mestre 2004). Once the statistically derived homogeneity breaks are validated with the help of visual analysis and the available metadata, adjustment factors and their impacts over trends in monthly, seasonal and annual values are assessed. These monthly factors are interpolated into the daily data, using the approach by Vincent and Zhang (2002) and the resulting data, compared via the analysis of extreme indices.

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