Geophysical Research Abstracts, Vol. 9, 02189, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-02189

CLIMATE VARIABILITY AND CHANGE IN THE GREATER ALPINE REGION OVER THE LAST TWO CENTURIES BASED ON MULTIPLE VARIABLE ANALYSIS

M. Brunetti(1), G. Lentini(1,2), M. Maugeri(2), T. Nanni(1), I. AUER(3), R. Boehm(3), W. Schoener(3)

(1) ISAC-CNR – Institute of Atmospheric Sciences and Climate of the National Research Council, Bologna, Italy

(2) Istituto di Fisica Generale Applicata - Università di Milano, Milan, Italy

(3) ZAMG-Central Institute for Meteorology and Geodynamics, Vienna, Austria

The work investigates climate variability and change in the Greater Alpine Region (GAR) (4˚E-19˚E, 43˚N-49˚N, 0-3500m asl) based on the HISTALP database. Such database consists of monthly quality-controlled, outlier-checked and homogenised secular records. It encompasses 242 sites and concerns temperature, pressure, precipitation, sunshine, cloudiness, vapour pressure and relative humidity. The climate information in HISTALP is not only stored in station-mode, but also available as gridded data and as Coarse Resolution Subregional Mean series (CRSMs). Such CRSMs have been used in our analyses. They permit a synthetic description of the GAR, condensing most of the climatic signal of the 242 sites in a few subregional mean records.

Long-term trends have been estimated over the common period of data availability for all variables. Moreover, to describe the complex time evolution of the different variables, the CRSMs have also been subjected to running trend analysis, which provides an in-depth investigation over different subperiods, allowing to visualise climate trends on a wide range of time-scales. Besides the comparison of the long-term behaviour of the different HISTALP variables, the agreement in their high frequency variability has been investigated. To do this, the correlation among the different variables has been analysed. Moreover, the temporal stability of such results has been

investigated by calculating the running correlations within a 30-year window moving through the common period of data availability of all possible pairs of variables.

The aim of our research is to give a comprehensive picture of secular climate variability and change in the GAR, by means of the analysis of a wide range of relevant meteorological parameters. The simultaneous analysis of such different variables is significant for better investigating the atmospheric processes which modulate and trigger the variability and trends shown by single meteorological parameters and for understanding the mutual interactions among the different variables. Moreover the availability of a multi-elemental database allows to verify the consistency between the behaviour of the different variables, permitting to increase the confidence in the results of the analyses.

Our presentation will show some preliminary results of the research and will discuss the problems and the potential of the analysis of wide multi-variable secular datasets like HISTALP.