



## **Classification of reconstructed daily SLP patterns 1850-2003 and links to the occurrence of extreme events in Central European climate**

J. Rathmann (1), A. Philipp (1), J. Jacobeit (1)

(1) Institute of Geography, Universitaetsstrasse 10, D-86135 Augsburg, Germany  
(jucundus.jacobeit@geo.uni-augsburg.de, joachim.rathmann@geo.uni-augsburg.de,  
andreas.philipp@geo.uni-augsburg.de)

Within the EU-funded project EMULATE (European and North Atlantic daily to MULTidecadal climAte variability) reconstructed daily mean sea level pressure (MSLP) patterns of the North- Atlantic - European region have been classified for the extended period from 1850 to 2003. This classification will be used to explore long-term changes of the atmospheric circulation on a daily scale and to assess changes in relationships between the large-scale atmospheric circulation and Central European temperature and precipitation including their extremes.

The complex SLP data set was classified by a simulated annealing clustering technique with diversified randomisation leading to robust partitions close to the global optimum. In lack of reliable hints for the number of clusters by conventional indices, this number was determined by an external indicator using the so-called dominance criteria for t-mode principal component analysis. The resulting types of pressure patterns reveal pronounced long-term variability as well as significant trends in seasonal cluster frequency, but also distinct within-cluster changes of Central European climate characteristics. Reconstructed and classified SLP data are especially used to study extreme events of precipitation and temperature resulting from a Central European and a Greater Alpine regional Index. By means of different composite analyses and principal component analyses extended in the time dimension, it is possible to determine characteristic circulation patterns and pattern sequences in relation to the occurrence of particular extreme events. In order to derive relationships between the large-scale atmospheric circulation and climatic extreme events more specifically in a Central Euro-

pean context, another SLP classification is additionally used based on so-called Grosswettertypes objectively derived by means of zonal, meridional and vorticity indices for the daily reconstructed SLP fields 1850-2003.