Geophysical Research Abstracts, Vol. 9, 04207, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-04207

North Atlantic temperature and precipitation extreme statistics, and their relation with weather patterns

P. Yiou (1), M. Nogaj (2)

(1) Laboratoire des Sciences du Climat et de l'Environnement (LSCE/IPSL), CE Saclay l'Orme des Merisiers, 91191 Gif-sur-Yvette France, (2) Departement Mécanique des Fluides, Energies et Environnement, EDF, 6 quai Watier, 78401 Chatou Cedex, France

Extreme Value Theory (EVT) is a useful tool to describe the statistical properties of extreme events. Its underlying assumptions include some form of temporal stationarity in the data. Previous studies (e.g. Nogaj et al., Geophys. Res. Lett., 33, 10, doi:L1080110.1029/2005GL024251, 2006) have been able to treat long-term trends in datasets, to obtain the time dependence of EVT parameters in a parametric form. Since there is also a dependence of surface temperature (T) and precipitation (P) to weather patterns (e.g. Yiou and Nogaj, Geophys. Res. Lett., 31, L07202, doi:10.1029/2003GL019119, 2004), we determine the EVT parameters of T and P over western Europe conditional to the occurrence of a North Atlantic weather pattern. We use a clustering algorithm on geopotential height data over the North Atlantic to obtain those patterns. This approach refines the straightforward application of EVT on climate data by allowing us to assess the role of atmospheric variability on T and P extreme parameters. This study also investigates the statistical robustness of this role, and compares its importance with radiative forcings like the greenhouse gas content and sulphate aerosols.