Geophysical Research Abstracts
Vol. 13, EGU2011-13985, 2011
EGU General Assembly 2011

Regional patterns of weekly weather cycles across Europe

Patrick Laux (1), Harald Kunstmann (1,2), Arturo Sanchez-Lorenzo (3), Harrie-Jan Hendricks-Franssen (4), and Stefanie Vogl (2)

(1) Karlsruhe Institute of Technology, Institute for Meteorology and Climate Research, Garmisch-Partenkirchen, Germany (patrick.laux@kit.edu), (2) University of Augsburg, Institute for Geography, Regional Climate and Hydrology, Augsburg, Germany, (3) ETH Zürich, Zürich, Switzerland, (4) Forschungszentrum Jülich GmbH, Agrosphere Institute (IBG-3), Jülich, Germany

Daily rainfall and temperature data of 158 weather stations in 8 European countries and Iceland are investigated to set up a weekly cycle. The time series are divided into 5 time slices that are analysed separately. As they depend strongly on the data availability, the significance of weekly cycles is generally higher for the past three time slices of 1931-1960, 1961-1990, and 1991-2005 compared to the two earlier analysed time slices of 1871-1900 and 1901-1930.
Precipitation does not follow any distinct significant weekly cycle. For temperature, however, significant weekly cycles exist in all analysed countries. The weekly periodicities cannot be explained by random effects. A clear weekly signal is detected by means of a stationary block bootstrap approach. The cycles of temperature vary with the region and the time slice. However, they are found to be more stable for the last two time slices. In Germany, persistence can be observed for the weekday holding the minimum value of the temperature variables. The minimum is observed to occur on Saturday for the past two time slices. When judging from significant results exclusively, most other countries also show persistence for the past two time slices, except for the weekday with the maximum value of the temperature variables. This weekday either is Tuesday for Iceland and England or Wednesday for Sweden and Norway.