



## **Weekly cycles in Spain and their possible connections with changes in atmospheric circulation**

Josep Calbó (1), Arturo Sanchez-Lorenzo (2), and Javier Martin-Vide (3)

(1) University of Girona, Dpt. Physics, Girona, Spain (josep.calbo@udg.edu), (2) ETH Zürich, Zürich, Switzerland, (3) Group of Climatology, University of Barcelona, Barcelona, Spain

Weekly cycles of different climatic variables, such as temperature, rainfall, cloudiness or sunshine duration have been detected over Spain. The analyzed series are derived from stations located in different climatological and geographical areas with different level of urban influence. Therefore, the weekly cycles can hardly be related to direct urban effects. Contrarily, we suggest that the weekly cycles may be related with changes in the sea level pressure (SLP) associated to perturbations in the atmospheric circulation over Western Europe and the North Atlantic. We hypothesize that these perturbations may be due to an indirect effect of anthropogenic aerosols. We detected opposite signals between wintertime (Sanchez-Lorenzo et al., 2008) and summertime, in accordance with findings by Gong et al. (2006) for China and Bell et al (2008) for the southeastern U.S. In fact, we observed an increase (decrease) in SLP over Southern Europe during the weekends (weekdays) and consequently a decrease (increase) of anticyclonic conditions during the central weekdays (weekends) during the wintertime (summertime).

### References:

- Bell, T. L., D. Rosenfeld, K.-M. Kim, J.-M. Yoo, M.-I. Lee, and M. Hahnenberger (2008), Midweek increase in U.S. summer rain and storm heights suggests air pollution invigorates rainstorms, *J. Geophys. Res.*, 113, D02209, doi:10.1029/2007JD008623.
- Gong, D.-Y., D. Gou, and C.-H. Ho (2006), Weekend effect in diurnal temperature range in China: Opposite signals between winter and summer, *J. Geophys. Res.*, 111, D18113, doi:10.1029/2006JD007068.
- Sanchez-Lorenzo, A., J. Calbó, J. Martin-Vide, A. Garcia-Manuel, G. García-Soriano, and C. Beck (2008), Winter “weekend effect” in southern Europe and its connections with periodicities in atmospheric dynamics, *Geophys. Res. Lett.*, 35, L15711, doi:10.1029/2008GL034160.