



Surface air and ground surface temperature coupling in the Iberian Peninsula: dataset and analysis of thermal propagation

L. Fernández-Donado (1), J. F. González-Rouco (1), J. P. Montávez (2), J. J. Gómez-Navarro (2), V. Rath (3), and H. Beltrami (4)

(1) PalMA Res. Group, UCM Madrid, Spain (fidelgr@fis.ucm.es), (2) Dpt. Physics. University of Murcia, Spain., (3) Applied Geophysics and Geothermics RWTH Aachen University, Germany, (4) Environmental Sciences Research Centre, St. Francis Xavier University, Antigonish, Canada

A dataset consisting of 51 stations over the Iberian Peninsula recording soil temperatures at 5 different depths (5, 10, 20, 50 and 100 cm) is presented. Records start in the oldest sites at the beginning of the 1980s and continue until nowadays with a temporal resolution that varies with the subsurface level at which data are registered: 00, 07, 13 and 18 h for the top 4 levels and at 18 h for the two deepest ones.

A quality control is carried out to detect erroneous values by comparing the time series at the various available depths and using the heat diffusion equation. This improves the reliability of a dataset that offers potential both for the validation of regional climate models in there performance to reproduce aspects of the recent subsurface climate history, and also for assessing conceptual aspects relevant to paleoclimate borehole reconstructions, namely, the coupling between Surface Air Temperature (SAT) and Ground Surface Temperature (GST). The tracking of SAT and GST is specifically examined over the various climate regions at different timescales; the thermal characteristics of the different soil types are also illustrated.