



Hectometer-scale variability of atmospheric and surface variables and assessment of average values provided by satellites and numerical models

Gemma Simó (1), Daniel Martínez-Villagrasa (1), Maria Antònia Jiménez (1), Vicent García-Santos (2), Alvaro López (1), Rodrigo Picos (1), Vicente Caselles (2), and Joan Cuxart (1)

(1) University of the Balearic Islands, Physics, Palma de Mallorca, Spain (joan.cuxart@uib.cat), (2) University of Valencia, Earth Physics and Thermodynamics, València (Spain)

Many tools used in Earth system studies, like numerical models or satellite images, provide average values of estimated surface temperatures or other magnitudes, the information given at the scales between tens of meters and some kilometers. These outputs must be validated or calibrated against independent observational information. Over land in midlatitudes, terrain is normally heterogeneous and the value obtained from these tools should be an adequate weighted average of the different subpixel or submesh contributions. However, validations are usually made against single-point observations, neglecting implicitly the degree of local variability in the process.

A set of stations has been displayed in the Campus of the University of the Balearic Islands, in a semi-rural area on the Mallorca Island. This is approximately a square of 1-km side, including faculty buildings, different types of vegetated terrain and several parking lots. Stations are able to provide estimations of the different terms of the surface energy fluxes, values of the main atmospheric variables (some at several levels) and values of the surface and ground temperatures. The Campus also disposes of a full reference surface energy budget station and operational radiosoundings are released every 12 hours at a distance of 5 km.

This display is expected to allow to: i) estimate the hectometer-scale variability of the surface layer and ground relevant variables and inspect if the related advective motions are significant in the surface energy budget; ii) provide detailed ground-truth at the hectometer scale for the assessment of the goodness of the satellite values of surface temperature for the Campus; iii) verify at fine scale high-resolution numerical simulations and identify shortcomings in parameterizations. Preliminary results will be shown in the conference.