



Factors generating turbulence in a mesoscale basin

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Practically all locations on land where turbulence data is gathered are inside a basin with some degree of heterogeneity. The later can include varying topography, different characteristics of the soil and of land uses, proximity of the coast or a lake, differential heating depending on the part of the basin, among others. These spatial differences generate baroclinicity at several scales that set a variety of flows, which in turn have turbulence associated.

The turbulence generated in the Ebro valley by some of these factors is analyzed through the inspection of the observed surface energy budget plus the thermal and dynamic state of the lower 360 m above the ground provided by a Scintec Windrass, helped with the outputs of several mesoscale simulations of the basin. The presence of quasi-steady advective flows contributes to the generation of dynamical turbulence and to the relaxation of regional temperature differences. At night, local circulations related to slopes and valleys, together with the moisture at the upper parts of the soil and the phase changes related to dew and frost also play an important role.