



## **Some previous ABL measurements in the Duero and Ebro valleys**

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Evapotranspiration in semi-arid regimes needs improved understanding and representation in numerical models. Most of the Iberian Peninsula (IP) upper soil in summer becomes dry which makes of it a good area for field campaigning and numerical modeling. The two large basins at the northern IP, Duero (essentially non-irrigated cereals) and Ebro (large irrigated areas surrounded by typical mediterranean vegetation), have already seen some ABL research efforts in the last decades.

The CIBA site is located over a plateau in the centre of the Duero basin. The plateau has shallow soil over karstic rock, contrarily to the lower areas that are essentially sedimentary. There radiation and fluxes of biogenic gases have been measured during decades by the University of Valladolid. Since 1998 the renovated 100m tower has been used to study the ABL, focusing essentially in the nocturnal stably stratified regime, the mesoscale low-level jets, the effect of surface heterogeneities and fog events. Studies have been supplemented with use of satellital information and high-resolution mesoscale simulations.

The center of the Ebro basin was the site of ABL measurements between 2008 and 2011, when a surface energy budget (SEB) station and a WindRASS were operating in the middle of a large vineyard, occasionally irrigated during the summer season, keeping the soil always with enough water content to sustain the needs of the vines. Similar topics as for the Duero basin were inspected, here supplemented by the effect of the surrounding topography and the wet-dry terrain heterogeneities, both contributing to intensify the strength of low-level circulations. The SEB imbalance was quantified and the terms compared to the ones from the ECMWF model, finding very significant differences.

The SEB and WindRASS were installed in 2015 in the large Pyrenean valley of La Cerdanya, through which the Segre river (a main tributary of the Ebro) flows. The soil in this area usually retains enough water during all year and does not experience summer soil dryness. This allows that rain events on the mountain may runoff as soon as they take place and a substantial part of the water may reach the dams downriver. A very strong cold pool develops any season of the year in the valley, which usually presents the lowest temperature values of Catalonia.