



Local scale soil moisture dynamics and its relation to catchment scale hydrological response

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The Can Vila catchment (0.56 km²) located in the Spanish Pre-Pyrenees, has been monitored since 1995 to characterize both the hydrological response at the outlet and the internal dynamics of the catchment. Like most of the slopes in the area, the original topography of the catchment was modified by the construction of small terraces (typically 10 to 20 m wide) for agriculture in the XIXth century. Results obtained up to now allow a rather complete understanding of the hydrological behaviour at the catchment scale. However, processes occurring at the local (terrace) scale remain unclear, although field mapping of runoff contributing areas has shown the relevant role of terraced topography on the development of saturated areas. In order to investigate further the role of the terraced topography in runoff generation, a single terrace (1000 m²) has been monitored with 128 automatic TDR probes placed on a regular grid in order to capture spatio-temporal dynamics of soil moisture in the first 30 cm of the soil. Additionally, a small V-notched weir has been installed a few meters down slope of the terrace to measure runoff occurring in a small drainage ditch, as a way to control hydrological connectivity between the terrace and the stream located at less than 75 meters. Preliminary results corresponding to a summer shower (around 80mm in few hours), confirmed that topsoils easily reached saturation, but in the same time runoff measured in the ditch remained very low, illustrating the lack of hydrological connectivity between the terraced area and the stream for this event. In these summer conditions, runoff measured at the outlet was therefore produced outside of the terraced area, most likely on less permeable rocky areas of the catchment. Similar analysis under different hydrological conditions is ongoing and may help to get a more complete vision of the seasonal behaviour of this Mediterranean catchment.