



Analysis of soil moisture probability in a tree cropped watershed

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Probability density functions (pdfs) of soil moisture were estimated for an experimental watershed in Southern Spain, cropped with olive trees. Measurements were made using a capacitance sensors network from June 2011 until May 2013.

The network consisted of 22 profiles of sensors, installed close to the tree trunk under the canopy and in the adjacent inter-row area, at 11 locations across the watershed to assess the influence of rain interception and root-water uptake on the soil moisture distribution.

A bimodal pdf described the moisture dynamics at the 11 sites, both under and in-between the trees. Each mode represented the moisture status during either the dry or the wet period of the year. The observed histograms could be decomposed into a Lognormal pdf for dry period and a Gaussian pdf for the wet period. The pdfs showed a larger variation among the different locations at inter-row positions, as compared to under the canopy, reflecting the strict control of the vegetation on soil moisture. At both positions this variability was smaller during the wet season than during the dry period.