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Estimation of canopy drying time after rainfall using leaf wetness sensor in Pinus pinea in a Mediterranean forest in Córdoba, Spain

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The minimum inter-event time is a fixed rainless period that is frequently selected with the goal of identifying events that could be regarded as independent. In studies of canopy interception, the minimum inter-event time is often selected such that there is sufficient time between events for the canopy to dry, so re-establishing the full canopy storage capacity prior to the commencement of rain. This is intended to permit the data from each event can be interpreted independently. Determining the canopy drying time is therefore very important to fix the minimum inter-event time.
The aim of this study is to determine the canopy drying time after rain for Pinus pinea in a Mediterranean forest in Córdoba (Spain) to select the minimum inter-event time. To quantify the magnitude of interception by Pinus pinea we conducted measurements of throughfall and stemflow, which have been frequently used to validate the interception models. In this study canopy drying time has been also used to validate the Rutter interception model. Including canopy drying time as part of the data for validation may cause an improvement in estimating interception.
The leaf wetness sensors, which detect the resistance between two stainless probes, were used to estimate canopy wetness in two Pinus pinea trees. Canopy drying time for each rain event has been defined as the time from rainfall cessation to the specific time derived from the leaf wetness sensor that determines the presence and duration of wetness on a leaf's surface.
The values of canopy drying time were successfully simulated compared with the observation results, although sometimes the Rutter model overestimated it, especially when rain was small. The total amount of simulated interception loss was underestimated compared with the observation with water balance method. The results show that canopy drying time is determined mainly by post-rainfall evaporation rates. This led us to calculate different canopy drying time values for summer (2 hours) and winter (8 hours) conditions.