



Modelling transient variably saturated flow under natural conditions using Hydrus-1D

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The Hydrus-1D software package (Simunek et al., 1998), based on the Richards equation, was used to study variably saturated flow and deep drainage in an old abandoned terraced area under grass. The field site was located in the Vallcebre research catchment of the Eastern Pyrenees in North-Eastern Spain. A split test was carried out to calibrate and evaluate the model using observed water potential and water content profiles. Results obtained with the calibrated soil hydraulic parameters showed good agreement with the field data during wetting cycles at relatively high water contents. However, observed water contents and pressure heads were overestimated during periods of high evaporative demand (low near-surface water contents). Some of the results may have been caused by the presence of shrinkage/swelling processes in the silt loam soil, which were only partially accounted for in the model. Furthermore, a sensitivity analysis was carried out to study the effects of several soil hydraulic parameters on simulated results for different saturation conditions.