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Hydrology of plants: Modeling the interaction between infiltration and evapotranspiration.

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It is known that measuring and modeling of water and solute fluxes across soil-plant-atmosphere is nowadays a very important challenge because of the complexity of both soil and plants. In particular evapotranspiration (Schymanski and Or, 2017) is related with radiation, temperature, relative humidity, wind but it depends also by the water content in soil. Specifically, the water content varies with precipitation and with the water properties of soil, soil water retention curves and soil hydraulic conductivity.
To consider the effects of water content on the rate of evapotranspiration it is necessary to study infiltration and evapotranspiration processes and find a physical, but also, a modelling point of view to coupled these processes.

Considering the 1D problem we implement a virtual lysimeter model in which we coupled infiltration and evapotranspiration by using stress factor (Collatz at all, 1991), with which we can compute effective evapotranspiration and remove it from Richards' equation balance (Casulli and Zanolli, 2010). In addition, the modeling of water and solute fluxes across soil-plant-atmosphere is made possible by implementation of travel times of waters within vegetation, the growing of the roots and in general the growing of the plants.

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