**Hydrology and Earth System Sciences Discussions**

# Interactive comment on "A simple three-dimensional macroscopic root water uptake model based on the hydraulic architecture approach" *by* V. Couvreur et al.

**Anonymous Referee #1**

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In this manuscript a model was proposed to take into account the root water uptake and plant water stress predictions for 3-D soil water models. The authors developed a model of the root system hydraulic architecture for simulation of 3D root water uptake distribution which is commonly treated empirically (or neglected) in hydrological models due to the complexity of the water flow in complex root system hydraulic architecture.

The proposed model includes three macroscopic parameters (named as the standard sink distribution, the root system equivalent conductance, and the compensatory conductance) which are defined at the soil element scale but still sensitive to the root

system hydraulic architecture. These parameters can be estimated by inverse modeling of water dynamics data (or based on Doussan equation for a given root system). Using the above parameters, two equations were derived (Eqs. 14 and 15) to simulate the hydraulic characteristics and behavior of the root system.

Considering the importance of this topic on plant growth and vegetation, on water balance, on water flow and distribution in soil, on evapotranspiration and many more hydrological processes, this manuscript will be of great interest to the readership of Hydrology and Earth System Sciences and broader hydrology community. The paper is interesting, well-written and the analysis appears to be of good quality. Thus, I recommend acceptance of the manuscript for publication in Hydrology and Earth System Sciences.