



## **Scaling field hydraulic properties of a structured soil using a bimodal form of the *ARYA&PARIS* approach**

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This study deals with the scaling of soil water retention and hydraulic conductivity for structured soils. The hydraulic properties available at core scale along a transect on a hillslope will be used to derive representative hydraulic properties at the hillslope scale. The objective of the study is threefold: Firstly, the performance of uni-bimodal water retention approaches will be analyzed, when applied to a large data set from a hillslope with different soil units. In order to describe the unimodal and bimodal retention curves, the classical van Genuchten (1980) and the Ross and Smettem (1993) functions will be considered, respectively. Second, similitude based media scaling will be applied to the data set for characterizing the spatial variability of soil hydraulic properties, by individuating reference hydraulic properties at the hillslope scale. Finally, with those reference hydraulic properties at hand (considered the “truth”), the predictive capability of the A&P approach for both the water retention and the hydraulic conductivity will be verified, when used in the classical unimodal configuration and, alternatively, by introducing a bimodal configuration specifically developed in this study. The predictive potential of the uni-bimodal A&P approaches will be verified by comparing the corresponding mean scale hydraulic properties, obtained by applying the similar media scaling to the local A&P predictions, to those from the reference method (by scaling the measured hydraulic properties as described by uni-bimodal retention models).