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# Assimilation of soil hydrophysic properties to a bundle of parallel capillaries

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The study of hydrological soil behaviour can be accomplished in a simple analytical and conceptual way by characterization of soil as a bundle of parallel capillaries. In this work, the soil water retention curve and the curves of soil hydraulic conductivity and diffusivity are approached through the distribution function of capillaries diameters. In addition, water infiltration and its redistribution are analyzed. In the first, final infiltration is studied considering several scenarios: downward, upward and horizontal infiltration. Results show that the distribution function of capillaries diameters is in close agreement with the one of particle size distribution. Thus, using experimental results reported by other authors, the particle size has been correlated with the equivalent diameter corresponding to the capillary. On the other hand for saturated soils, a proposal is developed to extent the study of water movement to turbulence conditions where the energy head slope is not longer lineal to water velocity.

Results are presented as a Weibull distribution function of two parameters. Complementary, the inverse process is analyzed and distribution functions are developed fitting the Brooks and Corey and van Genuchten equations for water retention curves and unsaturated hydraulic conductivity. This analysis seeks proposals to improve the global consistency for all the phenomena analyzed.