



A concept for water and solute flow in repellent soil-experiments and numerical modelling

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Water repellence can be found in soils all over the world. It has great influence on water flow and solute movement. The presentation shows measurements and numerical simulations of a water repellent sandy site. The laboratory measurements show the soil hydraulic functions, including the effects of hysteresis and water repellence. Undisturbed soil cores from a 1.5 m transect were sampled with high special resolution. The results show a different behaviour for the unsaturated hydraulic conductivity and water retention. While the unsaturated hydraulic conductivity as a function of the matric potential shows only low spatial heterogeneity, the water retention shows high spatial heterogeneity. The results are in contradiction to the common concepts of hydraulic function like Burdine and Mualem or the concept of scaling from Miller and Miller. While the conductivity could be described by scaling procedures, the water retention could not. These and other measurements lead to a new concept to calculate the water movement in water repellence soils. The concept was implemented in a numerical model, first results are presented.