



Evaluation of solute transport experiment done under ponded infiltration conditions

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Infiltration-outflow column experiments done under ponded conditions are commonly used as a sensitive method to indicate temporal changes of hydraulic properties of soils. When ponding experiment is coupled with the solute breakthrough experiment, the additional information is obtained about the actual pore spectra contributed to the flow. However, a standard rectangular shape of the concentration pulse or step function at the top of the soil column is difficult to achieve for the case of ponded infiltration. The aim of this study was to evaluate breakthrough curves, evaluated as the response to specific shapes of the concentration pulses applied to the top of the soil column. A series of laboratory experiments with a bromide and nitrate was conducted on two undisturbed soil cores and on the reference sand sample. Pulses of bromide and nitrate were applied during quasi-steady state flow. The concentration of solutes in the effluent was analyzed using ion selective electrode and breakthrough curves were developed. Experimental data were subject of inverse modeling by the dual permeability model S₁D coupled with a parameter estimator.