



## **Numerical and Experimental Quantification of coupled water and water vapor fluxes in very dry soils.**

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In arid and semi-arid regions with deep groundwater and very dry soils, vapor movement in the vadose zone may be a major component in the total water flux. Therefore, the coupled movement of liquid water, water vapor and heat transport in the unsaturated zone should be explicitly considered to quantify subsurface water fluxes in such regions.

Only few studies focused on the importance of vapor water diffusion in dry soils and in many water flow studies in soil it was neglected. We are interested in the importance of water vapor diffusion and condensation in very dry sand. A version of Hydrus-1D capable of solving the coupled water vapor and heat transport equations will be used to do the numerical modeling. The soil hydraulic properties will be experimentally determined. A soil column experiment was developed with negligible liquid flow in order to isolate vapor flux for testing. We have used different values of initial water contents trying to generate different scenarios to assess the role of the water vapor transport in arid and semi-arid soils and how it changes the soil water content using different soil hydraulic parametrization functions. In the session a preliminary experimental and modelling results of vapor and water fluxes will be presented.