



Simulation of Extreme Rainfall Influence to the Water Regime of Unsaturated Soil

A. Tall (1), M. Gombos (2)

Institute of Hydrology, Slovak Academy of Sciences (uhsavmi@stonline.sk)

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A. Tall, M. Gombož

Institute of Hydrology, Slovak Academy of Sciences, Bratislava, Slovak Republic uhsavmi@stonline.sk / Phone: +421 56 6425147

A two - domain structure in heavy soils occurs when cracks are present: the domain of cracks and the domain of soil matrix. As a result of this phenomenon in heavy soils, are amount of water inflow to the topsoil and evapotranspiration rate divided into two domains. The first one is determined by the total crack area at the topsoil, the second one is represented by the mosaic of clods. This fact has a very important consequences to the water dynamics and to the water balance in soil profile. Scientific synthesis of soil characteristics mentioned above leded to numerical simulation of water regime and volume changes in two-domain soil structure using mathematical model FLOCR (FLOW in Cracking soils). This contribution deals with numerical simulation of water regime under the condition of two-domain soil profile. Simulated was one year period (2001) in heavy soil profile in Senné (part of East Slovakian Lowland). During the simulation, extreme rainfall, statistically obtained from 30-years daily rainfalls from the nearest meteorological station in Vysoká nad Uhom, was added to the inputs. With one-day time step were simulated groundwater level, volumetric moisture of soil profile and surface runoff. Outputs from model and the data from own field-monitoring were mutually compared and evaluated. Extreme rainfall caused a surface runoff and the rest was absorbed mainly via cracks. Retention volume of crack network could be therefore significant for absorbing of large amount of water in case of extreme rainfall. Successful application of numerical simulation in heavy soils is useful for better understanding of water regime in these soils. Together with regional climatic

scenarios it can be possible to develop prognosis of water regime under the conditions of expected global climatic changes and extreme meteorological events.