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Spatial variability of simple scaling properties of extreme short-term rainfall in the Western Carpathians

L. Gaal, M. Bara, J. Szolgay, S. Kohnova

Department of Land and Water Resources Management, Faculty of Civil Engineering, Slovak University of Technology, Slovakia (ladislav.gaal@stuba.sk, marta.bara@stuba.sk, jan.szolgay@stuba.sk, silvia.kohnova@stuba.sk)

Rainfall intensity-duration-frequency (IDF) curves are of a great practical importance in water resources management e.g. for the design of hydraulic structures and urban drainage systems, and for the estimation of flash flood risk. The significant spatial/temporal variability of extreme rainfall especially for shorter durations, and the lack of rainfall data with sufficient temporal resolution (limited number of raingauges with continuous recording), however, does not generally allow constructing maps of extreme short-duration rainfall with the desired spatial resolution. In such cases the simple scaling model, which has proved its applicability in various regions of the world, offers a relatively straightforward solution to this problem. Using the scaling hypothesis, it is possible to estimate design values of rainfall of selected recurrence intervals and durations shorter than a day by using only the daily data, which is available from a considerably denser network of non-recording raingauges.

The poster presents a case study, which focuses on adopting the simple scaling theory of rainfall in the Western Carpathians, where complex rainfall generation mechanisms (intensive rainfall caused by diverse atmospheric circulation patterns, orographic effects and convection) are observed over a relatively complex mountainous terrain. The basic data set consists of rainfall intensities of 8 durations ranging from 15 minutes to 180 minutes, and daily rainfall amounts, respectively, from over 20 raingauges from the region. The scaling exponent is estimated, and the IDF curves are analytically derived at the selected stations. The study, beyond being the first step in assessing the applicability of the simple scaling theory in the selected region, focuses on the spa-

tial variability of the simple scaling properties with the long-range goal to accomplish a regionalization of the IDF relationships. The spatial variability of the scaling exponent will be examined and relationships between these and characteristics of long-term regime of precipitation and climate will be sought.

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