Hyetograph Simulation of High-Intense Rainfall Events

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Abstract. Hyetographs (rain-intensity curves) picture the time distribution of point rainfall and are important for hydrologic and hydraulic design issues. In the study of soil erosion, specifically on movement of soil particles by raindrop impact, kinetic energy is a commonly suggested indicator of the raindrop's ability to detach soil particles from the soil mass. The kinetic energy of raindrops can be estimated from rainfall intensity. Since only rainfall with sufficient intensity is effective, we focus on high-intense rainfall events. We compare two stochastic processes, belonging to different model classes. The first one is a modification of the scaling model introduced by Koutsoyannis and Foufoula-Georgiou (1993), which is based on a self-similarity hypothesis. The second one is is a Poisson rectangular pulse model (Rodriguez-Iturbe Cox and Isham, 1987) with a modified fine-scale structure. The heavy rainfall events taken into consideration are well separated and cluster effects are absent. We present a new simulation procedure for hydrographs, which avoid shortcomings of the generator proposed by Koutsoyannis and Foufoula-Georgiou.

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