



Assessment of stochastically generated rainfall time series for simulating extreme discharges

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In the framework of the European Flood Directive, flood risk maps need to be made. One way to obtain these maps is through the combined use of long time series of modelled rainfall, which satisfies the observed statistics, a hydrological and hydraulic model. In order to test this methodology, a 1000-year Bartlett-Lewis stochastic rainfall simulation is used in combination with the Probability Distributed Moisture (PDM) model in order to simulate run-off discharges of watersheds in Flanders (Belgium). Large discrepancies were found between the extreme statistics of the discharge based on either 105 years of observed Uccle rainfall (Brussels, Belgium) or 1000 years of simulated rainfall. Therefore, the deficiencies of the existing simulated rainfall time series, when combined with a hydrologic model, are analyzed thoroughly. Special attention is given to the temporal structure of the simulated (extreme) rainfall that causes extreme discharges and suggestions to improve the stochastic rainfall models are discussed.