

Advantages of continuous modelling for design hydrograph estimation in small and ungauged basins

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Estimating the design hydrograph (DH) is a crucial problem in practical hydrology and hydraulics. The development of reliable DHs is particularly challenging in small and ungauged basins due to the lack of observed discharge data that are needed for calibrating advanced models. For such basins, the modeler is often forced to adopt simple and conceptual modelling like the so called event-based approach. It consists in selecting a design rainfall event, which is related to an assigned return period, estimating the rainfall excess and then transforming it into the DH. In recent years, the continuous modelling approach was introduced. This relies on generating a long synthetic rainfall time series at sub-daily resolution that feeds a continuous rainfall-runoff model. Then, a discharge time series is produced that allows for estimating the DH. In this work, we would like to emphasize the added value of the continuous modelling approach in providing a more reliable estimation of the DH.

Keywords: design hydrograph, event-based approach, Continuous modelling, rainfall-runoff modelling.