

Comparison of Unit Hydrograph Models to Simulate Flood Events at the Field Scale

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Abstract : To ensure the overall coherence of simulated results, it is necessary to develop a robust validation process. In many applications, it is no longer content to calibrate and validate the model only in relation to the hydro graph measured at the outlet, but we try to better simulate the functioning of the watershed in space. Therefore the timing also performs compared to other variables such as water level measurements in intermediate stations or groundwater levels. As part of this work, we limit ourselves to modeling flood of short duration for which the process of evapotranspiration is negligible. The main parameters to identify the models are related to the method of unit hydro graph (HU). Three different models were tested: SNYDER, CLARK and SCS. These models differ in their mathematical structure and parameters to be calibrated while hydrological data are the same, the initial water content and precipitation. The models are compared on the basis of their performance in terms six objective criteria, three global criteria and three criteria representing volume, peak flow, and the mean square error. The first type of criteria gives more weight to strong events whereas the second considers all events to be of equal weight. The results show that the calibrated parameter values are dependent and also highlight the problems associated with the simulation of low flow events and intermittent precipitation.

Keywords : model calibration, intensity, runoff, hydrograph

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