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Alternating blocks design storm using the time scaling and time dependence properties

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The alternating blocks method is the most usual way of sorting out a design storm from an intensity-duration-frequency curve (IDF). Nevertheless, this procedure commonly used in a design practice, does not take into consideration temporal dependence which implies an overestimation of the design hyetograph and consequently also an overestimation of the design hydrograph as the result of hydrological modelling. The proposed Dependence Joint Estimation Model (MECD) involves properties of the temporal scaling and the temporal dependence of the maximum annual rainfall intensity series that belong to different time interval lengths. This extreme value model incorporates a polynomial that describes the temporal dependence between mentioned maximum intensity series. The choice of a marginal distribution function of the model depends on keeping the temporal scaling property hypothesis. The MECD methodology defines the marginal and conditional distribution function. The former has a direct application in the IDF curve estimation process. The conditional distribution function allows to obtain directly the expected value of the maximum intensity which represents the design intensity for each of the design hypetograph blocks. The usual conditioning is the time of concentration of the basin. Since the internal structure of a storm is taken into account, the overestimation of the design hydrograph may be avoided.