REGIONALISATION OF PARAMETERS FOR A CONCEPTUAL RAINFALL RUNOFF MODEL IN THE MEDITERRANEAN REGION

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The MEDOR model, a daily lumped conceptual rainfall-runoff model with four parameters, was developed for Mediterranean catchments. The aim is to relate the different model parameters to both climatic and physical catchments characteristics.

The calibration of MEDOR is affected by the equifinality issue. Systematic scanning of the Nash criterion objective function, using parallel processing techniques, shows the existence of a basin-specific equifinality relationship among the two loss function parameters independently of the transfer parameters.

In fact, this article shows that, for a given basin, parameter's equifinality relationship (PER) can be determined using the annual balance of rainfall-runoff and generated daily rainfall data from a stochastic model calibrated for the region. Moreover, the analysis shows the importance of the stochastic structure of rainfall in the calibration of MEDOR. Thus, the parameters cannot be determined solely from the physical properties of the basin. It has been demonstrated that the stochastic structure of the rain is homogenous in the same climatic zone.

Coupled to a stochastic model of rainfall of a given region, MEDOR generates equifinality relations between runoff coefficients (CR) defining a surface in the parameters space. Several large areas have been identified in the Mediterranean region having a single reference CR surface (e.g., Balkan area, East Mediterranean islands...). The runoff coefficient of a given watershed located in one of these areas fixes the specific equifinality relation. This latter correspond to the PER of the loss function. Thus, the loss parameters of the daily model are defined using only the annual runoff coefficient.

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ABSTRACTS

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