

A probability distribution function approach to modelling rainfall–runoff response for data-sparse catchments

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Abstract A rainfall–runoff (RR) model considering the spatial variation of rainfall, soil infiltration capability and soil storage capacity over a catchment and based on probability distribution functions, is used for rainfall–runoff modelling. The model combines infiltration excess (Horton) and saturation excess (Dunne) mechanisms. Moreover, it is applied to a data sparse catchment. Model parameters of the studied data sparse catchment are inferred from its parent gauged basin. In addition, a semi-distributed RR model called TOPMODEL is also employed in the parent gauged basin for comparison. Results show that the RR model can, to a certain extent, be applied to data sparse regions based upon hydrological similarity between the study catchment and its parent basin.

Key words spatial variation; probability density functions; rainfall–runoff models; data sparse regions; Yellow River