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TOPBAL: A TOPMODEL version developed for an improved simulation of the water balance of diverse vegetation types.

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TOPBAL has been developed within the semi-distributed structure of TOPMODEL to simulate the response of catchments with diverse vegetation types and high climatic seasonality. In this version of TOPMODEL an evapotranspiration subroutine allows the presence of several types of vegetation cover, distributed in patches, controlling the local soil water balance but not the overall shape of the water table. It explicitly considers rainfall interception by vegetation and two-way exchanges between the root-unsaturated store and the phreatic store. This version was tested and compared with the classical TOPMODEL using the GLUE methodology in the Can Vila small catchment (Vallcebre research area, NE Spain). Results indicate that for similar efficiency, TOPBAL improved the simulation of recession curves and provided a better simulation of water balance along the studied period than TOPMODEL. The results allow the analysis of the effect of the root-unsaturated zone submodel parametrization on the behaviour of the saturated part of the model, maintained as in the original formulation of TOPMODEL.