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Abstract

Implementation and calibration of a distributed hydrological model based on the finite volume method

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A distributed hydrological model has been developed on the basis of IBER, a previously existing two-dimensional hydrodynamic model (Bladé et al. 2014)(Cea and Bladé 2015). IBER solves the full shallow water equations using the finite volume method (Roe Scheme). The model has been enhanced to be used as a hydrological model adding the precipitation and losses processes as new source terms of the mass conservation equation.

In this work the model has been implemented and calibrated with precipitation and discharge data to simulate flood events in the basin of La Muga river (North East of the Iberian Peninsula). The main goal of the project is to obtain management strategies in order to maximize the water resources while minimizing flood risk, based on meteorological forecasts.

Within the PGRI-EPM project, the model was then operated using meteorological forecast for the same events in order to increase the forecasting lead time and to test the added value of accounting for meteorological uncertainties in rainfall-runoff modelling.

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