



A study of the propagation of rainfall uncertainty in flow forecasting using radar QPF ensembles

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Radar-based rainfall observations and nowcasts have been successfully used for flow forecasting in small- and medium-sized basins when coupled with distributed rainfall-runoff models. However these quantitative precipitation estimates and forecasts (QPE and QPF) are affected by a number of errors that introduce uncertainty in flow simulations.

Recent efforts in the description of the structure of the errors affecting radar QPE and QPF allow us to statistically simulate a number of realizations of these errors respecting their structure in space and time. The analysis carried out here consisted in a Montecarlo experiment of coupling these ensembles of equiprobable rainfall scenarios with the distributed rainfall-runoff model DiCHiTop simulating real-time conditions.

The study has been carried out in the Besòs basin (~ 1000 km²), located in the vicinity of Barcelona (NE Spain). This is a typical Mediterranean basin, highly urbanized, with steep slopes and in which floods occur specially in autumn when convective storms hit the basin. The purpose of this work is twofold: (i) analyzing and quantifying the uncertainty the uncertainty in the resulting flow forecasts, and (ii) studying how the uncertainty in flow forecasts depends on the meteorological situation.