



THE RADAR RAINFALL ESTIMATES IN A FLOOD FORECASTING SYSTEM FOR THE PO RIVER IN ITALY

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Abstract

The amount of residual risk must be taken in account, evaluated and controlled by opportune structural and non-structural measures. Among this latter a modelling system to forecast and control flood propagation along Po river has an important strategic feature in risk management context. The Italian civil protection directive was published for the management of national and regional operational activities during hydrogeological events. In particular, during flood events affecting a number of regions, it is identified an authority of civil protection, supported by an operative center collecting real time data and providing forecasting scenarios. The purpose of the system is to furnish a number of tools for the Po floods to be controlled and managed objectively by any civil protection unit and local/regional authority concerned, where the objective approach is a general consensus among all users concerning the validity of the methodology.

The operational system for Po flood forecasting in Italy takes into account deterministic and probabilistic meteorological predictions, modelling techniques for hydrological and hydrodynamic simulations. The innovations of the system relies upon its modular and highly configurable nature and the implementation of ensemble forecast techniques useful in estimating the prediction uncertainty. The system collects telemetry data

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from the hydrometeorological gauges and precipitation field estimations from radar network across the whole basin. Radar data are processed to remove artifacts like anomalous propagation clutter, bright band and to attenuate the beam blocking as results of the impact of orography on the radar propagation. The discharge simulations of the different radar QPE based on level of processing selected were analyzed in order to assess the relative impact of the algorithms implemented in the processing chain. The optimal configuration of radar data processing chain and the uncertainty related to radar QPE add a promising technique to the early warning system, in particular for small catchments, such as the Po tributaries.