

Operational applications of radar rainfall data in urban hydrology

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Abstract With the aim to perform real-time management of urban drainage systems, in this work an automated method is developed in order to track and forecast in the short term (5 min to 1 h lead times) the evolution of rain fields in time and space, as observed by weather radars. The model identifies single rain cells, tracks their motion and evolution, then forecasts their position, intensity and area on the basis of the information obtained during cell tracking. The model capability to provide realistic rainfall fields was assessed by comparing generated fields with radar observations in the study area. Simulated rain fields were used as an input to a rainfall–runoff model calibrated for the service area of the southside wastewater treatment plant of Rome, Italy. Results show how the proposed model can forecast the storm cell motion satisfactorily, when the past development is known. However, an improvement in cell area and intensity forecasting method is required.

Key words weather radar; storm tracking; urban drainage systems