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A datafusion method for QPE: pre-operational application at the Italian national level with 6 years of observed data

Flavio Pignone, Nicola Rebora, and Francesco Silvestro
CIMA research foundation, CIMA research foundation, Savona, Italy (francesco.silvestro@cimafoundation.org)

The estimation of rainfall fields, especially its spatial distribution and position is a crucial task in nowcasting, modeling catchment and predicting flash floods in the small catchments typical of the Mediterranean area. In Italy, Civil Protection has the duty of managing and generate reliable QPE products useful for warning and monitoring purposes in case of severe events over the Italian territory. The method used operationally is called "Modified Conditional Merging" (MCM) and derives from Conditional Merging proposed by Sinclair and Peagram (2004). The core concept is that raingauges provide a punctual measure of the observed "real" rainfall while the remote sensors (radar network or satellite constellation) supply rainfall estimation maps which give an idea of the correlation and structure of covariance of the observed field. In this work is presented the operational use of the MCM (its characteristic and innovation as the interpolation method used within) actually running hourly on Italy. In fact on the Italian territory are available a dense network of raingauge measurements (about 4000 stations with a time resolution of 5-10 minutes) and a National radar network composed by 23 C-band radar (space resolution of 1km and time resolution of 10 minutes) that cover the whole domain. The presence of such amounts of data allowed us to reproduce the last 6 years of merged rainfall field and will be the starting point for an accurate hydrological validation in order to calibrate hydrological and nowcasting model.