

A new gauge adjustment procedure for Meteo France QPE radar products

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At Meteo France, a gauge adjustment procedure was first introduced in 2006 to improve the real-time quantitative precipitation estimation (QPE) radar products. For each radar, a mean field adjustment factor is calculated every hour using the radar rain gauge ratios obtained from all the non-zero rain gauges found within 80 km of the radar over the past hours (with greater weight given to the most recent data). The adjustment factors calculated are then applied in real-time to the individual radar 5' accumulations by assuming that 1) the calibration factor is persistent from one hour to the next, 2) the correction is uniform across the entire area of radar coverage.

Recent work has been undertaken to reduce these limitations and make the gauge adjustment technique more adaptative to the spatial and temporal variability of the derived precipitation fields. A spatialised technique called "calibration 2.0" has been designed to estimate an adjustment factor value for each pixel. The new technique relies on an iterative three-step downscaling of the original adjustment procedure. The use of sub-hourly gauges has also been introduced. Initial results have shown substantial improvements and additional studies are currently being conducted to prepare the development of an operational solution. For instance, data from Martinique is used to look at how a gauge adjustment scheme could be implemented in a tropical environment characterised by a large variability of precipitation intensities over very small distances. Another study is looking at how sub-hourly rain gauges owned by the Regional council of Seine Saint Denis near Paris could be used to produce better products for urban applications. Results from these studies will be presented, limitations and advantages of old and new calibration methods will be discussed and illustrated and a perspective will be given on the operational deployment of calibration 2.0.