Towards the improvement of monitoring and data quality assessment in the weather radar network of the Meteorological Service of Catalonia (SMC)

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The main objective of the SMC weather radar network (XRAD) is to provide with quantitative precipitation estimates (QPE) the area of Catalonia. The XRAD, which is composed of four C-band Doppler weather radars, and its subsequent products also give support to the operational weather surveillance that makes easier the management of warnings for civil protection. This is particularly challenging in a densely populated area, with complex topography and relatively small catchments prone to flash flooding by frequent heavy precipitation events.

Based on recommendations about quality provided by OPERA-EUMETNET and other international sources, such as the Global Precipitation Measurement Project (GPM), the SMC has focused on attaining a better quality control of its radar data generation. However, it has been necessary to establish priorities according to the current technology as well as local phenomena and meteorological considerations (e.g. complex terrain, warm sea, anomalous propagation episodes, high number of RLANs and wind farms, etc).

Through the last years, the SMC has developed ad-hoc methodologies to upgrade the XRAD performance assessment and the typification of non-desired echoes. In this context, some of the following developments are currently operational: a)Improved radar characterization and thermal stability in receivers; b)Sun interference detection: Monitoring receiver and antenna pointing calibration; c)Generation and monitoring of operational indexes (e.g. radar-QPE and dense raingauge network comparison); d)Characterization of interfering elements (e.g. RLANs); e)Analysis of windmill affectation over reflectivity fields.