7.24 MULTISOURCE DATA VERIFICATION OF A WEATHER RADAR SURFACE PRECIPITATION TYPE PRODUCT

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Snowfall at low altitudes, despite it is a relatively rare phenomenon in southern Europe and the Mediterranean coastal regions, can cause major problems of road safety and transport during the cold season. For this reason, the Meteorological Service of Catalonia (SMC) implemented in 2006 a weather radar derived surface precipitation type product (SPT) in order to provide valuable information to decision-makers in surveillance tasks (Bech et al. 2014).

Four C-band single-polarization Doppler weather radars and a dense network of 185 automated surface observation stations cover the complex topography of Catalonia (NE Spain) and feeds the diagnostic system that discriminates precipitation type into snow, sleet and rain. The methodology is based on the original scheme described by Koistinnen and Saltikoff (1998) implemented in Finland and later adapted to the complex orography of Norway (Gjertsen and Odegaard, 2005). An empirical formula, dependant on surface temperature and relative humidity, is used to provide a conditional probability field of precipitation type. Then, this field is combined with the precipitation field obtained from quality-controlled radar data which results in a real-time estimation of surface precipitation type. The aim of this study is to provide a verification of the SMC SPT product to test its applicability particularly for events where snow and rain may be present concurrently.

Different sources of precipitation type observations are available for this verification study. Firstly, a meteorological observers network and a surveillance network, both formed by volunteer citizen-scientists supported by the SMC. Secondly, a nivometeorological manned station network, mainly located in mountain areas, and a small number of METAR and SYNOP observations. Thirdly, inputs from social networks. Fourthly, disdrometric and Micro Rain Radar (MRR) data for a specific location in the Pyrenees mountain massif. Additionally, for specific snow episodes, diagnostic data from the Local Analysis and Prediction System (LAPS) is also considered. Altogether these sources provide valuable information to verify the SPT product between 2010 and 2017 and to adjust and improve the operational version of the SPT product implemented at the SMC. This study was partly supported by projects CGL2015-65627-C3-2-R (MINECO/FEDER), CGL2016-81828-REDT (MINECO) and DI065/2017 (Industrial Doctorate Programme of the Regional Government of Catalonia).

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