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Improving QPF by blending techniques at the Meteorological Service of Catalonia

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Abstract. The current operational very short-term and short-term
quantitative precipitation forecast (QPF) at the Meteorological Serv
Catalonia (SMC) is made by three different methodologies: Advecti
radar reflectivity field (ADV), Identification, tracking and forecastinç
convective structures (CST) and numerical weather prediction (NW
models using observational data assimilation (radar, satellite, etc.)
precipitation forecasts have different characteristics, lead time and
resolutions. The objective of this study is to combine these methoc
order to obtain a single and optimized QPF at each lead time. This
combination (blending) of the radar forecast (ADV and CST) and
precipitation forecast from NWP model is carried out by means of d
methodologies according to the prediction horizon. Firstly, in order
advantage of the rainfall location and intensity from radar observa
phase correction technique is applied to the NWP output to derive
additional corrected forecast (MCO). To select the best precipitatio
estimation in the first and second hour (t+1 h and t+2 h), the infor
from radar advection (ADV) and the corrected outputs from the mo
(MCO) are mixed by using different weights, which vary dynamicall
according to indexes that quantify the quality of these predictions.
procedure has the ability to integrate the skill of rainfall location ar
patterns that are given by the advection of radar reflectivity field v
capacity of generating new precipitation areas from the NWP mode
the third hour (t+3 h), as radar-based forecasting has generally lo
only the quantitative precipitation forecast from model is used. Thi
blending of different sources of prediction is verified for different ty
episodes (convective, moderately convective and stratiform) to ob
robust methodology for implementing it in an operational and dyna

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