



Mesoscale Convective Systems in the Western Mediterranean

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Mesoscale Convective Systems (MCS) play a very important role in floods and other adverse weather phenomena in Catalonia and the surrounding areas, as it was shown in Rigo et al. (2007) –hereafter, R07–, and other papers. The organization of this type of structures results fundamental in the large rainfall accumulations observed in specific areas, as well in the generation of favourable mechanisms prone to severe phenomena.

The present study takes over the analysis done in R07. However, some substantial differences with the preliminary work can be easily observed: here, the identification of the MCS has been made considering a continuous series of radar images, instead the initial selection made taking into account rain gauges data. Moreover, the radar data presents substantial improvements with respect to the original analysis: firstly, a larger spatial coverage allows better tracking of the MCS across their life cycle; use of the radar composite product also enables better identification of the structures, avoiding some classical errors of radar QPE (e.g. path attenuation by heavy rainfall, beam blocking produced by topography). Furthermore, this analysis used improved QPE processing (including removal of non-precipitating echoes, or the improvement of the signal associated with precipitating echoes affected by different external atmospheric conditions).

With all these improvements, a first analysis has been made considering exclusively radar data. The work has been centred in the identification of those structures that present the spatial and time conditions exposed in R07. The main features of the identified MCSs (duration, intensity, percentage of convective areas, and trajectories) have been retrieved. Besides, we have searched for those regions in the domain more prone to be associated with the initialization of the MCS, the months in which are more habitual this type of structures, and also the link of the life cycle with the diurnal cycle.

Future work includes the analysis of the electrical activity, the vertical properties of the MCSs from the point of view of the radar observations obtained with the radar network of the Meteorological Service of Catalonia, or the relationship between MCSs and different patterns shown by the simulations of numerical weather prediction models. This work has been done in the framework of the Project of the Spanish Ministry of Economy and Competitiveness FFHazF (CGL2014-60700R).