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Mesoscale convective systems producing severe weather in Catalonia

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The present analysis is focused on the identification of those MCSs occurred in Catalonia (NE of the Iberian Peninsula) that have produced severe weather. In order to do this, we have selected those convective systems detected using weather radar imagery for the period 2012-2016 (both included). In total, 342 MCSs were detected and included in a database, where many features associated with the radar data have been used to characterize each one of the systems (maximum and averaged area, percentage of convective precipitation, duration, length of the path, maximum and median reflectivity...). To discriminate which MCS have produced severe weather, we have used the warnings recorded offline by the Lightning Jump algorithm, operated in the Servei Meteorologic de Catalunya. This algorithm was created for nowcasting this type of phenomena (mainly large hail, downbursts and strong wind gusts, but also some tornadoes linked with mesocyclones), and has showed near 90% of success and a low false alarm rate. Then, it is possible to characterize the systems according to the occurrence of severe weather or not. We have centred the study on seasonal and daily maxima occurrence, radar parameterization and lightning activity associated to the MCSs.