

## **A four years (2007-2010) classification of long-lasting deep convective systems in the Mediterranean basin**

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The Mediterranean basin, for its geographical position in-between a subtropical and a mid-latitude zone, is a very favourable area for the development of deep long-lasting convective systems. The spatial and seasonal variability of these Mediterranean events have been investigated for the 2007-2010 years, using both geostationary (e.g., Meteosat Second Generation) satellite data for their detection, and atmospheric analysis data (from ECMWF) for the recognition of the most favourable synoptic conditions of their formation.

The performed analysis shows the existence of some preferential areas of genesis, mainly located in the central part of the Mediterranean basin (i.e., Sicilian channel, Ionic and Tyrrhenian seas), where convective systems develop and grow preferentially in the autumnal season. The selected synoptic features, as precursors of convective activity genesis, show how the totality of the identified cases occurs in mid-troposphere (500 hPa) troughs or cut-off circulation within southerly flow, with values of mean sea level pressure ranging mainly between 1010-1020 (hPa), and high  $\theta_e$  (850 hPa) values distributed on average between 50-60 °C. Further, the genesis and dynamics of these events appear to be well correlated with the presence of upper and low level jets, together with a dynamical tropopause anomaly.

Among all the detected (269) cases, 94 ones are associated with severe weather reports extracted from the ESWD archive: a statistical analysis was performed on these cases resulting in valuable information about the nature of the selected systems.

The long-term objective of this preliminary study is to build up a climatological database of deep convective events occurring in the Mediterranean sea which may critically impact on the Italian peninsula and potentially affect population: an algorithm which can help regional meteorological services in making early decision and a better forecasting of the development and effects of these extreme events has planned to be developed in the very next future.