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Conference on European Tornadoes and Severe Storms

Torrential rain events on the Spanish Mediterranean coast: Relationship between spatial precipitation patterns and synoptic conditions

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The Valencia Region is a typical Mediterranean area characterised by mild rainy winters, hot, dry summers and the periodic occurrence of torrential precipitation events. These events show different types of genesis and present specific patterns of spatial distribution. The aims of this paper are, first, to define the synoptic situations in which torrential precipitations take place in the region in order to establish a genetic classification and, second, to analyse the spatial distribution of these precipitations in relation to the genetic classification. To select torrential events, records above 125 mm. have been located in the daily precipitation data series of the basic meteorological network. This study of the torrential rain events during the period 1971-95, has allowed us to identify three types of synoptic situations in relation to the genesis of the events and to establish some sub-types within these two generic groups. The two most important ones are: the Eastern advections and the summer orographic-convective storms. A third, less frequent but potentially very important since it may lead to the development of large Mesoscale Convective Complexes, is the convergence of weak synoptic westerly flows with (easterly) seabreezes along the Iberian Cordillera system in late summer. Several precipitation distribution patterns have been distinguished on the basis of the location of the maximum precipitation area. One of the most interesting results is that, in both genesis types, the coastal area of the Gulf of Valencia-Cape of San Antonio is the area most affected by torrential rains in the whole region, and even in the Iberian Peninsula.