



A diagnostic Study of a High Impact Weather Episode in the Western Mediterranean Region: IOP8 a HyMeX case

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Fall season heavy rainfall in the western Mediterranean region is one of the most threatening phenomena in the area. Devastating flash floods occur every year somewhere in eastern Spain resulting in a large amount of property losses, destruction of infrastructures, enormous agricultural losses and human fatalities. The forecast of the underlying HIW is a subject of special concern for local meteorologist because of its catastrophic nature.

Within the framework of HyMeX (Hydrological cycle in the Mediterranean eXperiment) a HIW (High Impact Weather) event took place on the south and eastern part of the Spanish coast, particularly in Andalusia, Murcia, Valencia, Catalonia and less pronouncedly in the Balearic Islands, moving afterwards towards France southern coast. During this event casualties and important economic damage were registered. The amounts of precipitation locally overpassed 200 mm in 24 hours and a tornado occurred in Gandia (Valencia).

The main objective of this work is to provide a comprehensive description of the physical atmospheric processes giving rise to the intense precipitation in this event and its movement along the Spanish coast. High-resolution COSMO-CLM model simulations supported by the analysis of observational data sets will be presented.

The model simulations and observational data sets, such as a dense network of global positioning systems (GPS), raingauges, surface measurements and radiosoundings are analyzed to document in detail the evolution of the warm and wet air masses which fed the high precipitation event (HPE) systems, as well as the low-level convergence to which the main convective systems were associated.