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The greatest recent flood in Spain: a WRF simulation of the 1962 Valles flood event

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On 25th September 1962 an extreme event of intense precipitation occurred in the area of Vallès, 30 km from Barcelona. The accumulated precipitation reached 250 mm in less than 3 hours in many places that caused the greatest flood in Spain during the XX century, with more than 700 fatalities and a large number of damages.

This historical event cannot be only explained by analyzing the synoptic features. The NCEP Reanalysis at 500 hPa geopotential height on 25th September 1962 at 00 UTC shows a ridge from North Africa affecting the West Mediterranean basin. At 850 hPa a warm air mass from North Africa affected the Iberian Peninsula and the West Mediterranean basin, following the ridge present at 500 hPa. Over the Northeast of the Iberian Peninsula, the temperature was higher than 15ºC at 850 hPa. At surface, the pressure was around 1015 hPa. A slight and small relative low pressure was placed over the Gulf of Valencia.

In order to analyze and to better understand the causes of this extreme precipitation event, the WRF mesoscale model has been used to describe the atmospheric conditions. To analyze the role of the local and regional factors as a triggering mechanism that may explain better the causes of this event, four nested domains have been defined, the smaller centered in the Terrassa (one of the most damaged cities), with 1 km of horizontal resolution.

The first results indicate that local orography may play an important role enhancing the depth convection and precipitation rates.