



The catastrophic case of heavy rainfall and flash flooding of 14–15 October 2018 in south-western France: a multi-scale observational and modelling analysis

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During the night of 14 to 15 October 2018, the Aude river basin, located in south-western France between the Mediterranean Sea and the Massif Central highland region, experienced sustained, heavy rainfall which led to calamitous flash floods in the region. Fifteen persons died, 75 persons were injured, and the damage amounted to 220 million euros. Heavy rainfall was caused by a quasi-stationary line of convective cells that remained over the very same area for several hours.

The presentation will review the large-scale context conducive to this catastrophic event, including a description of the respective roles of hurricane Leslie, the prevailing weather synoptic-scale patterns and the sea surface conditions before the event. The description of the event at mesoscale will focus on the ingredients responsible for the quasi-stationarity of the convective line. Crowdsourced observations complementing the institutional observation networks were used to both characterize the event and understand its causes. The crowdsourced observations were collected by a network of commercial personal weather stations measuring pressure, temperature, humidity, wind, and precipitation. Numerical modelling including convective-scale ensemble prediction was used to assess the predictability of the event and identify its sensitivity to several key meteorological features such as mean-sea-level pressure and near-surface temperature and humidity.