Overview of two heavy precipitation events in 2016 on Corsica

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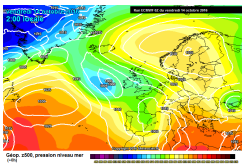
Despite recent improvements in operational forecasting, numerical models still have difficulties in capturing with precision the intensity and average distribution of heavy rainfall at small scales. These difficulties are particularly present in mountainous terrain (where the flow is complex) and over maritime areas (where the upstream observations are scarce). In Corsica, both of these difficulties are present. Corsica is located close to the Gulf of Genoa, which is the area the most prone to cyclogenesis in the western Mediterranean. It is regularly affected by violent winds, intense precipitation, strong waves which erode the coastlines, droughts and forest fires.

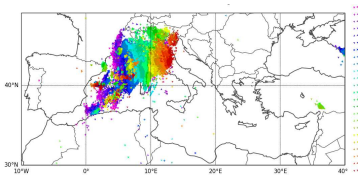
Corsica was one of the Atmospheric Sites of the HyMeX 2012 SOP1 campaign. The observations collected at the Corsica site allow the precipitating events to be studied in an environment characterized by insularity and steep orography. The Corsica site is still active through the CORSiCA atmospheric observatory (http://corsica.obs-mip.fr/) (see Lambert et al., P4.8) in the frame of the HyMeX Long Observation Period, mainly in support to ST-Lightning activities through the SAETTA network (see Coquillat et al., T2.1, P1.9) and in preparation for the EXAEDRE campaign (see Defer et al., P1.7, P1.8).

This study presents a short overview of two heavy precipitation events which impacted Corsica in 2016. Preliminary high-resolution (500m) numerical simulations have been carried out with the research model Meso-NH. They are being used to examine the different ingredients which lead to intense rainfall events and to assess the capacity of the model to reproduce these events with respect to the collected observations, including atmospheric electrical observations provided by the SAETTA network.

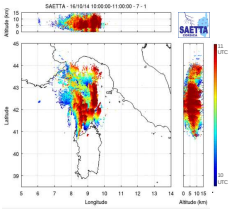
14 Oct. 2016: intense lightning activity and strong wind



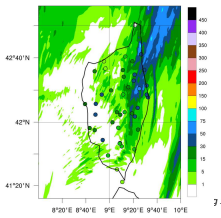
14 Oct. 2016 00 UTC: ECMWF analysis: 500 hPa geopotential (colour) and mean sea level pressure (white contours)



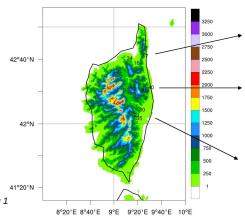
Met Office ATDnet fix locations during 14 Oct. 2016



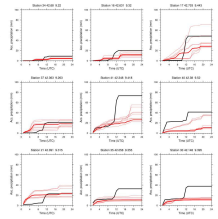
VHF sources by time, detected by SAETTA 14 October 2016 from 10 to 11 UTC:



Computed 24h accumulated precipitation superimposed with surface station observations (circles)



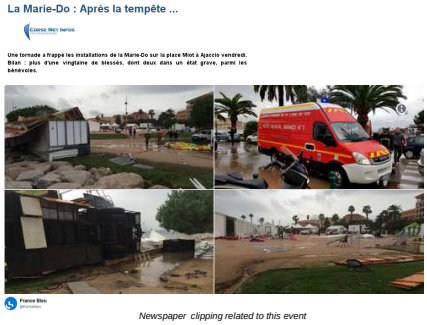
Topography and location of specific surface stations



Time evolution of the accumulated precipitation at selected surface stations observed (black) and computed (red). Thin red lines: neighbouring points.

Moderate precipitation over NE Corsica ahead of a cold front.

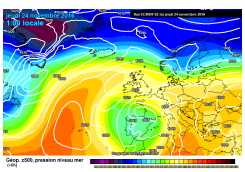
Underestimation of the daily precipitation amount and inaccurate timing of the frontal passage.



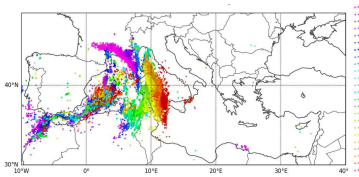
Newspaper clipping related to this event

Future work:
Investigate the interaction between the front and the topography together with its impact on the electrical activity.

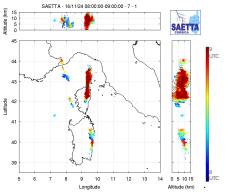
24 Nov. 2016: HPE, red vigilance



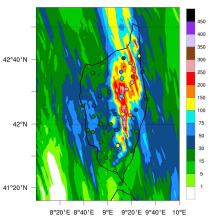
24 Nov. 2016 00 UTC: ECMWF analysis: 500 hPa geopotential (colour) and mean sea level pressure (white contours)



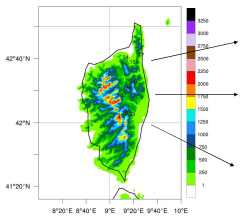
Met Office ATDnet fix locations during 24 Nov. 2016



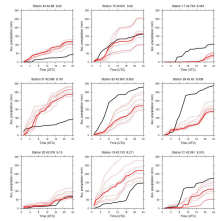
VHF sources by time, detected by SAETTA 24 Nov. 2016 from 8 to 9 UTC:



Computed 24h accumulated precipitation superimposed with surface station observations (circles)



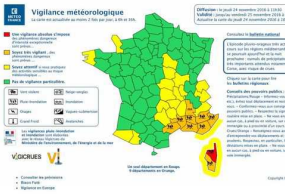
Topography and location of specific surface stations



Time evolution of the accumulated precipitation at selected surface stations observed (black) and computed (red). Thin red lines: neighbouring points.

Heavy precipitation over East Corsica associated with a deep cutoff located over Spain.

Precipitation intensity fairly well captured but location slightly shifted inland.



Vigilance map from Météo-France on 24 Nov. 2016

Newspaper clipping related to this event

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