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Impact of Hurricane Nadine on the predictability of severe weather in the Mediterranean

Florian Pantillon (1,2), Jean-Pierre Chaboureau (1), and Evelyne Richard (1)

(1) Laboratoire d'Aérologie, University of Toulouse and CNRS, Toulouse, France (florian.pantillon@kit.edu), (2) Karlsruher Institut für Technologie (KIT), Institut für Meteorologie und Klimaforschung (IMK), Karlsruhe, Germany

Nadine was a North Atlantic hurricane with a very long and unusual life cycle in Autumn 2012. It suffered from a low predictability while it was slowly moving over the eastern North Atlantic in mid September. A number of forecasts erroneously predicted its landfall over the Iberian Peninsula. Downstream of Nadine, heavy precipitation was recorded on 24 September over the Cévennes range and was well sampled during the HyMeX field campaign. The synoptic conditions that led to the heavy precipitation also suffered from a low predictability – the lowest of Autumn 2012.

By clustering the ECMWF ensemble forecast, we show that Nadine impacted the predictability of the heavy precipitation downstream. The strength of the interaction between Nadine and a cut-off low constrained both the track of Nadine and the triggering of heavy precipitation. Forecasts with a moderate interaction erroneously predicted Nadine to make landfall over the Iberian Peninsula. Only forecasts with a weak interaction correctly predicted heavy precipitation, but too early if the interaction was too weak. The strength of the interaction was itself sensitive to the initial position of both Nadine and the cut-off low. This result illustrates the crucial role of upstream dynamics for the predictability of severe weather in the Mediterranean.

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