

# ***Interactive comment on “A numerical study to investigate the roles of former hurricane Leslie, orography, and evaporative cooling in the 2018 Aude heavy precipitation event” by Marc Mandement and Olivier Caumont***

## **Anonymous Referee #1**

Received and published: 1 December 2020

### Generic comments

This study investigates the mesoscale dynamics of the heavy precipitation event affecting the Aude region during the heavy precipitation event of the 14-15 October 2018. After a (too ?) long and detailed description, the roles of former hurricane Leslie, the orography, and evaporative cooling are examined. The interaction of the incoming trough and surface cyclone with the orography helped the convective activity focusing west of the quasi-stationary cold front and downwind of the Albera Massif. Leslie's remnants are involved in the formation of the second cold front CF2 and contributed

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to the supply of low-level conditionally unstable air in the second part of the event. However, the grater contribution to the precipitation over the Aude department mainly originated from moisture coming from the Mediterranean Sea. Finally evaporative cooling did not seem to play a substantial role in the dynamics but only in the control of the total simulated amount of precip.

The paper is well written and clearly structured however I feel it sometimes goes too long in the description of the dynamics of the event in a disproportionate way compared to the focus of the research. The analysis of Leslie's contribution and evaporative cooling is resolved in a short part compared to the long introduction on the analysis of the event and the methodology of analysis which however I find accurate.

So I do not have a strong recommendation if not to make the article more concise and to the point.

#### Specific comments

I'm doubtful on the expression "personal weather station". What about "private weather stations" belonging to citizen weather observing networks integrating the official Mete-oFrance Network. Or something similar. I would also put a reference if this initiative is coordinated by the National Met Service.

The literature cited in the introduction is appropriate. I think that the synoptic description, as well the numerical simulations section can be shortened perhaps limiting to the essential level of details needed for the following dynamical assessment.

I'm also suggesting to shorten the Conclusions eliminating unnecessary details like time of the day references of values of single variables to have a more compact way to present results. In the conclusions bullet points (line 590), I would add the part on the evaporative cooling reported earlier at line 585

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Interactive comment on Weather Clim. Dynam. Discuss., <https://doi.org/10.5194/wcd-2020-54>, 2020.