

We would like to thank both reviewers for their valuable comments and critics that we tried to take into account in the revised version of the manuscript. Hopefully, all the major and minor corrections pointed out by the reviewers have been corrected now. A detailed answer follows below. We provide replies to the reviewers' comments in bold. As well, corrections included in the manuscript are marked in red.

Answer to Referee 2

The paper presents two Lagrangian methods used to study atmospheric river events. In general the paper is written in poor language and grammar, it lacks explanations and validations. The conclusions are not demonstrated clearly in the text. Specifically, the paper lacks references in the introduction and comparison to similar studies. The paper needs to be rewritten to improve the language and correct grammar, the text should include references to the figures included in the text and the figure captions should be expanded to describe the figures in more detail.

The Introduction has been extended to incorporate *(i)* references on the tropical moisture export, and *(ii)* new figures (Suppl. Info.) concerning the precipitation rate for both case studies. New references have been added to compare with previous model simulations of ARs. We have double checked the English and grammar, and all figures are cited in the text.

Model validation has been done in terms of the IWV obtained from the analysis (Figs. 7 and 10). Unfortunately, there are no other sources for validation. Moreover, the IWV obtained from the analysis accumulates, not only that vapor coming from the Tropics, but also any other vapor from other sources, so a precise validation is uncertain.

In Section 2 the assumptions used for the variables in the equations should be explained in relation to the context of the paper.

Physical variables used in our model are now explained in the text. All of them have been related to atmospheric variables.

Figure 7 and 10 should include legends, all figures should have titles, and the figure caption for Figure 11 and similar figures should be expanded.

All captions have been enlarged. Concerning the legends in figures 7 and 10, the used symbols are described in the caption, but we leave the Editor to consider what the best option for the journal is.

In addition, calculations of the percentages presented in the conclusion should be described and shown in the results section along with validation the results.

The sentence has been deleted. The reviewer was right. We could calculate the RMSE for the IWV simulated and observed but that value has no sense as observations correspond to the total amount of vapor, while in our case only the vapor transported from the tropics is represented. This is more obvious for the Atlantic case as during the first two days no vapor coming from

the tropics was obtained near the Iberian Peninsula (see Fig.10).