

Reply to Review of “Extreme weather anomalies and surface signatures associated with merged Atlantic-African jets during winter” by Sohan Suresan, Nili Harnik, and Rodrigo Caballero

We thank both the reviewers and the co-editor for their constructive comments. Following is the response to the comments received on the revised manuscript. The comments are highlighted in blue font, and the responses to the comments are highlighted in red font. Note that all line and figure numbers refer to the earlier revised manuscript version unless specified.

Response to Reviewer #1

We thank the reviewer for dedicating the time to review this paper. We appreciate the reviewer's feedback and constructive comments. The responses are as follows:

This paper seeks to uncover unique signals associated with the dynamic regime shift of the Atlantic-African merged jet in boreal winter, in relation to extreme surface temperature, surface wind, and precipitation. The aim is to understand whether the extreme weather patterns during the jet-merging winters result solely from the combined influence of the NAO and El Niño, or if there are additional unique signals. I commend the authors for their efforts in adding statistically significant tests to the results and improving the clarity of the text. They have fully addressed my previous concerns and suggestions. I recommend publication after minor technical revisions.

Minor Technical Issues:

1) Line 3: relation -> relationship

Updated Line 3.

2) Line 10: anomalous -> anomalously

Updated Line 10.

3) There are quite some repetitions about the Atlantic jet being eddy-driven, e.g., lines 42 and 45.

Thanks for pointing this out. This is updated in the revised manuscript. The repetition in Line 45 is removed.

4) Be consistent with key terminology. E.g., El Nino should be consistently used as El Niño.

The revised manuscript and supplementary material are updated with consistent use of El Niño.

5) Line 80: "regime shift". "Regime shift" is about a long-term shift in climate trend or circulation pattern. Consider simplifying the sentence by removing "the possible dynamic regime shift of".

The sentence "the possible dynamic regime shift of" is removed from Line 80.

7) Line 196: remove (like from -ZJI/...) as it does not provide clarification but potential confusion.

Removed and updated.

6) I personally find -NAO and -ZJI disruptive to my reading and understanding of the results and implications. Given you mostly discussed results related to the negative phases of the NAO and the merged jet, why not just use negative NAO and negative ZJI when discussing the results, especially in "Discussions and Conclusions".

All the “-NAO” and “-ZJI” usage are updated with terms “negative NAO” and “negative ZJI” respectively in the revised manuscript and supplementary material.

Response to Co-editor’s comment

Minor suggestion: in response to major point 2 by reviewer 2, I suggest you consider adding a parenthetical remark in line 126 (track changes): "(see values in parentheses in Table S2)".

Added and updated.