

Comment on wcd-2021-82

Anonymous Referee #2

Referee comment on "Modulation of the El Niño teleconnection to the North Atlantic by the tropical North Atlantic during boreal spring and summer" by Jake W. Casselman et al., Weather Clim. Dynam. Discuss., <https://doi.org/10.5194/wcd-2021-82-RC2>, 2022

The authors use observational analysis and model experiments to investigate the role of tropical North Atlantic (TNA) in modulating the ENSO teleconnection during boreal spring and summer. The inter-basin relationship between the equatorial Pacific and Atlantic is also examined in this study. This is a potentially constructive contribution to our understanding of how TNA modulates the influence of ENSO on the North Atlantic European region. However, this paper is a little difficult for the reader to follow. There are too many different analyses and indices, but an explanation that ties everything together as a whole story is lacking. I discuss these issues in detail below.

- Shorten the introduction. There is too much information and each paragraph is disconnected.
- Line120 "...regression values are multiplied by 4...": The maximum of the SSTA in the Pacific looks too strong ($\sim 4^{\circ}\text{C}$) and may not appear in the observations. Since you consider the non-linear process of the ENSO influence, too strong ENSO amplitude can lead to an unrealistic ENSO response. The caveats of this approach should be discussed.
- Section 3.1 and 3.2: I understand that the authors wanted to focus first on the tropical interactions. However, too many features are pointed out here (Walker index, RWS, PCD...). This makes it difficult for the reader to understand and to know how these features are related to your main question. I suggest reorganizing these two sections and relating these characteristics to your main question before and after the analysis. Why are we discussing the walker index, RWS, PCD..., and what we know from these features?
- Lines 208-213: Here is a summary of the previous section. It is better to move this part to the end of the previous section.
- Line 216: Although the authors have defined the indices in the Methods, I suggest simply re-stating them in the text when they first appear.
- Figure 3: Only the upper part of the panel is discussed (TNA, ENSO, PCD lead Walker index). It is unnecessary to show the bottom part of the panel [Walker Index

JFM(0)-DJF(0)].

- Lines 238-240: Here is a summary of the previous section. It is better to move this part to the end of the previous section.
- Figure 4: Delete the "200 hPa" from the title.
- Line 340 "the Walker response to AP forcing is approximately 0 for both season": This is not correct. It should be "varies around 0".
- Figure 9 & 10: The information in these two figures is almost the same as in Figure 6 & 7. The authors can just use Figure 6 & 7 directly to discuss the ENSO teleconnections.
- Figure 6 & 7: The authors can mark the EA and NAE regions in these figures. This makes it easier for the reader to understand.