

Weather Clim. Dynam. Discuss., author comment AC2
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Reply on RC2

Nicholas L. Tyrrell et al.

Author comment on "Sudden stratospheric warmings during El Niño and La Niña: sensitivity to atmospheric model biases" by Nicholas L. Tyrrell et al., Weather Clim. Dynam. Discuss., <https://doi.org/10.5194/wcd-2021-62-AC2>, 2021

In the manuscript, the authors examine the effect of a bias correction process in a general circulation model on the representation of the ENSO-SSW teleconnection in the model. The authors use GCM bias-corrected and control runs and compare them to reanalysis data.

The manuscript is well-written and clear. The results are interesting and bear importance for the atmospheric modeling community. Therefore, I recommend publication after the following minor revisions are addressed:

Figure 1: What do the dashed lines and bold parts represent? Please add this to the caption. In addition, in line 370: c) -> d)

The dashed line shows the response of El Niño/La Niña minus control, and a solid line indicates significance. The figure caption has been updated.

Figure 2: Is the polar-cap geopotential height cosine-weighted?

Yes, it is, the figure caption has been updated.

Figure 4: No November statistics. It seems like in December the difference is not so large between CTRL and ERA5, so I wouldn't put it in the same category with March.

According to, for example, Butler et al. 2017: A sudden stratospheric warming compendium, there have been SSWs in November 1958 and November 1968, but no November SSWs for the period 1979-2019.

Thank you for the comment, we agree that the December statistics of ERA5 and CTRL are similar, text changed

Line 164: Figure 4 -> Figure 5

Thank you, changed

Line 190: Please mention

Apologies, we are unsure what exactly we should add to the text regarding this line.

However, rereading the text we realized that the text regarding the significance test was not clear enough and edited it as follows: "Solid lines indicate dates when the composite anomalies are significantly different from zero at the 90% confidence level."

Reference:

Butler, A. H., Sjoberg, J. P., Seidel, D. J., & Rosenlof, K. H. (2017). A sudden stratospheric warming compendium. *Earth System Science Data*, 9(1), 63-76.