

Ocean Sci. Discuss., referee comment RC1
<https://doi.org/10.5194/os-2021-5-RC1>, 2021
© Author(s) 2021. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on os-2021-5

Anonymous Referee #1

Referee comment on "On the low western Pacific sea levels observed prior to strong East Pacific El Niños" by David J. Webb, Ocean Sci. Discuss.,
<https://doi.org/10.5194/os-2021-5-RC1>, 2021

General comments:

This study investigates the origin of western equatorial Pacific sea level anomalies that seem to be related to the strong El Niño 1982/83 via modulating the North Equatorial Counter Current. This is motivated by a previous study about the importance of these sea level anomalies in driving the strong El Niño 1982/83. Using a global ocean general circulation model forced by different atmospheric wind fields, the author rules out different possibilities for causing the anomalously low sea level in the western equatorial Pacific, such as the annually occurring Rossby wave or a remote wind field, coming to the conclusion that it is the local wind anomaly field that drives the sea level anomalies driven by Ekman divergence.

The study is interesting as it sheds light on further processes that seem to be relevant in driving overly strong El Niño events beyond the conventional processes that are typically addressed in this context.

The manuscript has rather the form of a report-type publication rather than a classical research article. However, this does not degrade the fact that it is informative. The methodology, the analytical reasoning and the writing are adequate. The overall quality of the current stage of the manuscript is however such that it is partly built too complicated, especially regarding the way the figures are presented (see specific comments). There are some typos and some phrases that are difficult to understand (see technical comments).

Specific comments:

- I suggest to rephrase the title of the manuscript to "On the origin of western equatorial Pacific sea level anomalies prior to the 1982/83 El Niño".
- I strongly encourage the author to provide a few more references about driving mechanisms of the strong El Ninos and the role of anomalous wind fields in the introductory section, especially more recent ones.
- A lot of figures can be merged to reduce the total number of figures and also ease the comparison among them. For example, one could merge figures 1, 2, 7 and 8; figures 3, 4, 9 and 10; figures 5, 6, 11 and 12; figures 13 and 16; figures 14, 15, 17 and 18; figures 19 and 20; figures 25 and 26. The author may find a more reasonable order of merging some figure, but I think some merging should be done in a way that it reduces the total amount of figures and such that it puts those figures side-by-side that should be compared to one another.
- The author may add the observed sea level and temperature field for that time period to the supplement to complement the model validation.

Technical corrections:

- There are some typos such that double-occurring words: "from from", "that that" – please search for these occurrences and correct.
- I also suggest to add the information of the physical units to the figure captions.
- I also think that is called "Hovmoeller" rather than "Hovmuller" diagrams.
- 147-148: Please check structure and meaning of the text - unclear