

Dear Dr. Hassanzadeh

I would like to submit the revised version of the manuscript "Intraseasonal variability of wind waves in the western South Atlantic: the role of cyclones and the Pacific South-American pattern" authored by Dalton Kei Sasaki, Carolina Barnez Gramcianinov, Belmiro Castro, and Marcelo Dottori. We accepted the suggestions and corrected the issues highlighted by you and reviewer 2 and hope the improved and revised manuscript can be reconsidered for publication in Weather and Climate Dynamics. Your (and the reviewer's) comments are marked in bold characters, while our answers are marked by plain characters. We deeply appreciate all comments and suggestions.

Sincerely,

Dalton Kei Sasaki

Reviewer 1

Dear Authors,

Thank you for addressing the earlier comments and suggestions provided by both reviewers. Reviewer 2, while overall happy with the revised version, still has a few important comments that should be fully addressed. In particular, comment 2 (about Table 1) and the last two comments need your careful consideration.

Furthermore, while the paper is overall well-written and easy to follow, I believe that the text still needs some polishing. This is mostly to improve clarity and fix typographical errors and inconsistencies, and to ensure that all acronyms are defined the first time they are used. In non-public comments, there are some examples based on my own reading of the paper, but keep in mind that this is by no means an exhaustive list. Please carefully go through the paper to address similar and other typographical issues.

Thank you for submitting your interesting work to WCD, and I am looking forward to receiving the revised manuscript.

Sincerely yours,

Pedram Hassanzadeh

Non-public comments to the Author:

Dear authors,

Here are some suggestions based on my own reading of the manuscript. Some are just suggestions (and feel free to ignore) but some are typographical errors. Please carefully go through the paper and fix similar issues.

Title: it may not be clear to the reader what “wind waves” mean. I suggest using something like “ocean surface wind waves” in the title.

We accepted the suggestion, thank you.

Abstract: same as in the title, please make sure it is clear that this is about ocean surface winds; e.g., use “extreme significance wave heights (swh) at the ocean surface in the”

We accepted the suggestion, thank you.

Line 3 and other places (e.g., lines 24, 31): “wind-wave climate” or “wave climate” – it might be better to say “climatology of wave wind” and “climatology of waves”

In the text, sometimes wave climate is related to extreme cases. In these excerpts, we substituted ‘climate’ for ‘events’. In some cases we did really mean climate, but we understand that climatology is better suited in some contexts and we changed it accordingly. Thank you for the suggestion.

Wind-wave vs wind wave: is not consistent between title, lines 3, lines 16 etc

We corrected it, thank you.

Lines 3 and 4: time scales vs time-scales: use one consistently throughout the paper

We corrected it, thank you.

Line 11: u_{10} should be defined, for example in line 7 after 10m zonal wind

We corrected it, thank you.

Line 16: social-economic --> socio-economic

We corrected it, thank you.

Line 36: “global studies of wind–wave showed” --> “global studies of waves showed” given the statement in line 16

We corrected it, thank you.

Line 52: is PC already defined somewhere? It is later defined in page 5.

We did define it after line 52. We corrected the text, thanks.

Line 97: maybe I missed it, but what is the meaning of $\wedge 100$ here? Is it explained somewhere? It refers to the global centennial part. Since it is not used throughout the text it does look unnecessary and we removed it.

Line 125: EOF is first use in line 118 and should be defined there.

We corrected it, thank you!

Line 367: (2) Which are ... --> (2) What are ...

We corrected it, thank you!

Line 375: naval structure --> naval structures

We corrected it, thank you!

- in several places, enumerated items are presented in line. To improve clarify, e.g., on page 3 (line 70 and onward), i suggest to make a list with each item appearing on a separate line.

We changed the list of the items on separate lines, except for the enumeration case in the first paragraph of the conclusion. We chose to not modify the conclusion part since it won't improve the understanding and it doesn't look very good.

Review for “Intraseasonal variability of wind waves in the western South Atlantic: the role of cyclones and the Pacific South-American pattern” by Sasaki et al.

I acknowledge most of the authors responses – I believe I did not read carefully in places, but I am glad we identified so errors too, so the manuscript is largely ready to go. I still have a few questions/comments that I would like to see addressed before publication.

Comments:

l. 73: atmosphere -> atmospheric

Table 1: I am still confused by the negative values in the table. Are they a consequence of different signs of the EOFs and hence of the PCs (they do have arbitrariness in sign)? E.g. EOF1 swh & EOF1 v10 correlation is negative. Is this because EOF1 swh is e.g. a positive monopole and EOF1 v10 is a negative monopole? Therefore correlation of the corresponding PCs is negative? But it means that stronger swh is related to stronger v10 as alluded to in the text?

- **If this is true then I find this confusing. I would usually choose a sign of the EOF (e.g. positive monopole in an EOF) and then multiply PCs and EOFs by (-1) if the sign in the EOF is opposite. That way I can avoid this confusion. I recommend doing this, since I think this would make it much easier for the reader.**
 - **Given Fig. 5 I guess I would choose negative monopole to keep the additional work to a minimum.**
 - **Also, if this issue only applies to the correlations in Table 1 and you know all correlations would be positive if you defined all EOFs in a consistent way then you can just drop minuses in the Table 1 and that's that.**
- **If this is not true, I would recommend addressing this in the text – i.e. saying negative correlations mean stronger swh, weaker v10; positive correlations mean stronger swh & stronger v10 (v10 & swh here are just examples; feel free to adjust).**

Indeed the EOF1 swh and EOF1 v10 are monopoles with opposite values. *We are changing the table's values to make it coherent with the text, we appreciate the feedback.*

I. 199: “the wind and wave fields are partially coupled through wind waves” – do you mean they are “only partially” coupled? Since the amplitude is small and remote effects lower the links?

Before answering the question, we would like to make a comment. We realized that we used wind-wave with two different meanings throughout the text. In the first case, it means ‘waves forced by winds’ which is used in the title, abstract and introduction. In the second case, wind-waves are actually the locally forced waves (which are also known as wind-sea).

After clarifying this point, we point that waves forced by winds present, in theory, two components - the swell and the wind-sea. Between these components, only wind-sea are coupled to the winds. The swell is a result of the non-linear interaction of waves with different frequencies and directions, which produces a wave field component independent from the wind. Obviously, these are conceptual models that help understand these processes. Hence, the wind and wave fields may be partially coupled through wind-waves.

We are sorry for the confusion regarding the wind-wave meaning. We changed the text and updated the words to wind-sea and wind-wave.

I. 288: n -> in

We corrected it, thank you!

I. 291: Green dashed lines -> Thin green dashed lines

We accepted the suggestion, thank you!

I. 293: light green dotted lines -> thick green dotted lines

We accepted the suggestion, thank you!

I. 285-294: You mention westward propagating waves – are periods that show westward propagation related to e.g. larger (more planetary) waves, rather than synoptic waves (in scale)? Or is it largely same waves propagating eastward/westward? If the latter then no need to add any sentences.

By the Hovmöllers (Fig. 11), these westward propagating waves seem to have the same phase speed as eastward waves, so we understand that they are mainly synoptic waves in scale. Of course, a more robust analysis needs to be done in future research.

I. 297-303: You say that phase A has stronger wind, but weaker storm track, lower swh? But I thought you established a positive baroclinic feedback where stronger winds also have stronger storm track. Am I missing something again? Also because you then continue on saying “on the other hand”, phase B has weaker winds, weaker storm track

The reviewer's comment is correct. We described phase B incorrectly after the expression 'on the other hand'. We rewrote the text with the right description of it (lines 304-307):

On the other hand, the intensification of the surface winds, observed in phase B, may play a role in the strengthening of baroclinic wave growth, as long as it reflects directly to the upper-level jet and baroclinicity \citep{Hoskins1993,Ambrizzi1997}. In this situation, more frequent and more intense cyclones are expected to develop in the region representing, thus, a more efficient wave generation mechanisms.

Fig. 12: This figure is not mentioned anywhere thus redundant – please remove it or discuss it . I also find the figure confusing – there are linear relationships, but one shows negative the other positive regression coefficients. Is that again due to PCs having inconsistent signs? - ok

The PCs with weird signs are to blame for the confusing PCs signals. In summary, low pressure systems (Figure a - associated with troughs) strengthens the zonal wind in the EOF u10 on the monopole region. In Figure b, the center of the northern node of the dipole is enhanced by stronger u10 winds. This figure was meant to further emphasize the physical consistency of the EOFs and actual physical variables and is redundant with other results and for some reason the text that explained it was missing. We are removing the figure, as we believe it doesn't add much to the results or the discussion