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Ocean Science Discussions

Interactive comment on "Impact of intraseasonal wind bursts on SST variability in the far eastern Tropical Atlantic Ocean during boreal spring 2005 and 2006. Focus on the mid-May 2005 event" *by* Gaëlle Herbert and Bernard Bourlès

Anonymous Referee #1

Received and published: 16 November 2017

This study deals with SST variability in the Cape Lopez region in 2005 and 2006 based on observational data and output of a ROMS model simulation. It is argued that intraseasonal wind bursts from the South Atlantic played an important role for the boreal spring cooling, mainly due to increased upwelling and vertical mixing. A particular focus lies on a cooling episode in May 2005.

The results of the study are interesting and certainly worth publishing in Ocean Science. There are, however, a number of issues that should be clarified. Some of the figures and the writing will need some work as well (see comments below).

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Major comments:

1) The study focusses on the years 2005 and 2006. Most of the features discussed in section 4.2, however, appear to occur in both of these year. Maybe it would be more instructive to contrast 2005 to an interannual warm event year?

2) Also, it is not clear whether the processes discussed in section 4 and 5 are specific to 2005 or whether some of them play a role in every spring cooling and/or other interannual cold events as well. In other words: Do intraseasonal wind bursts impact SST in the Cape Lopez region in every summer or during every interannual cold event or just in very specific years as 2005?

3) Related to point 1 and 2, the time scales discussed tend to get mixed up a bit. The relationship between the intraseasonal wind bursts, the seasonal cycle of SST, and interannual variations should be sorted out more clearly.

Specific comments:

1) I am missing a motivation on why the Cape Lopez region is of interest.

2) Related to comment (3) above, the time scales of interest should be specified somewhere in the beginning, and it should be stated whether the data were filtered or averaged over time to focus on them individually.

3) line 184/185: The highest temperatures occur more towards boreal spring than winter.

4) line 188/189: I think all of the references given here discuss biases in coupled climate models while in this study an ocean-only model is used.

5) lines 200-202: A number of previous studies have shown this and could be cited (e.g. Schouten et al., 2005).

6) It is hard to directly compare the conditions in 2005 and 2006 as they are presented in different figures (Fig. 3 and 4) on different pages of the manuscript. I would suggest

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to combine those figures. Also, the individual dates given in the text (e.g. lines 231 to 233, lines 257 to 259) are impossible to identify in these figures and should be illustrated in a different way.

7) lines 254/255: Are the data filtered to focus on the intraseasonal time scale? (see comment above)

8) line 336: How did the timing of the preconditioning impact the intensity of the cooling?

9) Fig. 7 and Fig. 10 are very small and thus hard to read.

10) Section 5.2: You mention in the introduction that the monsoon onset happened early in 2005, but this information should be repeated in this section.

11) Fig. 13 looks rather strange because of the discontinuities between May of one and April of the next year. Maybe you could separate the years more clearly with vertical black lines.

12) Instead of Fig. 14 a and b, I would suggest to show a map of the surface pressure for May 2005. The time series can then highlight that the pressure gradient was special.

13) Please check that the figures are numbered in the order in which they are referenced in the text.

Technical corrections/ comments concerning the writing:

line 11: “few documented”: please rephrase (e.g. the region of... that has not been studied in detail so far)

line 12, 13 and throughout the text: I would suggest to use the term “cooling episodes” instead of “cooling events”. The term “events” sound much longer lasting to me. Alternatively, you could specify the time scale.

line 21: “made the event as a decisive event”: please rephrase (“made this event so

special" maybe?)

line 30: "of" instead of "on"

line 69/70: please refer to map shown in Fig. 2

line 88-90: "multiple processes" instead of "multiplicity of processes". I am also not sure what is meant by "very low thermal inertia"

line 99: "trigger" instead of "triggered"

line 103: "show" instead of "put into evidence"

line 189/190: reproduces. . .very well

line 191: related to

line 223: "Analysis of cooling episodes in the CLR" instead of "Analyze of cooling events in CLR"

line 243/244: "in the CLR" belongs after "cold anomalies"

line 256-259 and thereafter: please refer to figure.

line 320 and 349: "western" instead of "west"

line 364: returned to its initial position

line 439: "generation" instead of "excitation"

line 465: "at play" instead of "in play"

line 533: "in Fig. 12" instead of "on Fig. 12"

line 559: I suggest "What made the mid-May 2005 event so special?"

line 564: "over" instead of "along"

line 628-630: I do not understand that sentence, starting from "but for some"

line 641: an upwelling Kelvin wave

line 647: for the years 2005 and 2006

line 652: “at” instead of “with”

line 669: “that” instead of “than”

Fig. 1: I would suggest to plot the line for 2005 on top of the other lines as it is very hard to see. It would also be helpful to plot a larger area in the maps on the right hand side. What are the vectors shown in Fig. (b) and (c)?

Fig.5: I would suggest to use red for deeper and blue for shallower thermocline to be consistent with SST.

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