

General Comments

The main objective of this article is to report a freshening of the Antarctic Intermediate Waters (AAIW) in the South Atlantic in the past decade. The authors showed this change using a monthly climatological field based on Argo data. Two WOCE hydrographic section were used for validation. The changes in the AAIW were associated to a decrease in the Agulhas Leakage transport which in turn was related a weakening in the wind stress over the Indian Ocean. The authors did not perform any any direct calculation of freshwater transport to back up their claim. The associations between signals and trends are done just looking at simple statistics such as mean. The findings are interesting and maybe even important if a more careful study is carried out. For instance, show that the transport of the Agulhas Current is really changing in terms of freshwater flux. A qualitative study is not enough to be provided as evidence for the freshening.

The manuscript needs improvements in terms of clarifying some ideas but also with the written part. I find very noble that one of the reviewers is helping them to accomplish that. I have some suggestions which I included as specific suggestions below but I did not spend much time in correcting their English. As I stated earlier, I think that as a scientific paper the manuscript needs a huge improvement specifically about their hypothesis which is that the freshening is controlled by the Agulhas Currents. They need to think more about that and include some concluding evidences.

I strongly suggest that they include more work, maybe try to follow some of their own suggestions of quantifying the different contributions to the changes. It is my opinion that the manuscript in the present form should be rejected.

Below are some more specific comments.

Specific Comments

- line 33: Ocean. Bindoff ... (period instead of comma)
- line 34: Indian Ocean. Curry et al...
- line 35: "showed a" instead of "discovered the"
- Line 42: " is centered at the depths of 600 m and 1000 m
- Line 49: "The first popular one" is very informal.
- Lines 49–54 : Please, explain better what are the concepts involved in each one of the arguments.
- line 68: "greatly large" by "dominant".
- line 71: 21s?
- line 71: The acronym is not used any more.
- line 77: the uncertainty for the research has decreased or the uncertainty of the estimates? Just decadal variability? What about the other scales?
- lines 79: Replace "discovers" by "reports".

- line 99: Replace “occupations” by “cruises”. Replace elsewhere.
- Line 144: Explain why warming of surface waters lead to colder trends of AAIW.
- Line 149: “mixing with more saline surrounding waters cannot give rise to a salt loss in the salinity minimum region”
- line 152: The diagrams from JAMSTEC data is not very clear. Expand the lines in the little square.
- line 164: “P minus E”
- line 177: Replace “Here we further” by “Additionally we “
- Line 185: A transatlantic cruise is not exactly a “snapshot”. Remove “snapshot”.
- line 192: Replace “little lesser” by “smaller”.
- line 190–192: The salinity difference is estimated between the two WOCE sections which occurred in a interval of 8 years. To compare the results from fig 3b and 5b, maybe it is a good idea to show the salinity difference divided by 8 years, so that we can have a better comparison. In any case, the difference between these two sections seems to be similar as one the one calculated as salinity trend.
- line 192–193: What is “Bellow the salinity minimum”? Refer to the neutral density values in Fig. 5b to make the discussion clearer. The comparison between Fig 3b and 5b induces to a faulty conclusion. If you show a salinity difference over a period of 8 years, then you will have 0.0013 S/year. When you compare to the trend in Fig3b, this values is not that large.
- line 194: Shouldn't be Fig. 5b?
- line 209: It is not very clear what do you call “source region”. Be specific.
- line 201: Replace “supplement” by “increase”.
- Line 216: reanalysis
- line 337: Fig. 6a: Interim
- Line 240: Remove “in the years 00-04
- line 243–244: Replace “concomitant with” by “in corroboration with”
- line 249–250: I don't see in the present study a concrete evidence that the AL transport has a decadal variation. The authors showed evidence for wind stress changes averaged over the Indian Ocean. How much of these changes will effectively affect the transport of water in to the South Atlantic?
- line 263–264: The evidences for such decadal changes in the South Atlantic salinity should come from strong quantitative arguments. There is no causal relation between the Atlantic and the Indian Ocean changes in the salinity. You have not actually estimated the freshwater fluxes changes from the Agulhas Current and that is the weakest point of the study. Indirect evidences are not enough.