

Interactive comment on “Multiproxy reconstruction for Kuroshio responses to Northern Hemispheric oceanic climate and Asian Monsoon since marine isotope stage 5.1 (~ 88 ka)” by X. Shi et al.

Anonymous Referee #1

Received and published: 14 April 2014

Dear Dr. Min-Te Chen, editor in Climate of the Past,

This study shows a long-term record of the ocean environmental changes in the Okinawa Trough by using quality data. I think the authors put a lot of effort into this study. Multiple proxies allow us to capture the paleoceanographic changes from several perspectives. However, I would like to recommend that the authors re-arrange the text and figures, because of the reasons mentioned below:

(1) Any interpretations should be excluded in the results. In this part, the data from each proxy must be described clearly. Otherwise, it's not easy what the proxies indicate.

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(2) I found mismatches between the text and figures at many points. Some comparison data from the previous studies are lacked in the figures. In particular, it's not easy to compare the changes of different proxies shown in multiple panels. Even if the authors indicate the correlation between the proxies, I cannot recognize which changes or peaks are mentioned.

(3) Some interpretations in the discussion part are not understandable. I recommend that the authors carefully and logically explain their interpretations with additional references.

(4) The title and abstract imply that the paper is going to focus on the change of the Kuroshio in the past 88 ka. However, this message is not fully displayed in the text. The authors need to show what are the proxies for the Kuroshio and how they have changed since MIS 5.1.

When the authors modify the MS, I strongly believe that the MS will be accepted to the journal "Climate of the Past".

[Specific comments]

4. Results

Please explain the changes of indexes sequentially from the past to the present (or the present to past). It's not easy to understand their differences between the periods or ages.

4.1. Grain size analysis

The amount of coarse grains increased during the MIS 1 and 5. It seems that these materials were supplied by the erosion or mixing of the Kuroshio Current. I would like to ask the opinions of the authors.

4.2. Planktonic foraminiferal assemblages

Please organize the information about species. A single species is sometime used as different water indexes. I cannot understand the relationships between species and water masses.

4.4. Alkenone SST

I have a question about the description of the last paragraph. If $\delta^{18}\text{O}_{\text{ruber}}$ indicates summer oceanic condition, we have another hypothesis: summer SST during MIS 5.1 was different from that of MIS 1?

4.6. Depth of thermocline

The same data (planktonic foraminifera assemblage) were used for Figures 8c, d, and e. These changes could be associated each other, because they are from same data source. I don't understand what the authors want to discuss based on three non-independent indicators. Moreover, the ratio of shallow/deep dwelling species shows the difference between MIS 1 and MIS 5.1. I would like to recommend that the authors give us more explanation and interpretation about this thing.

5. Discussions

I recommend that the authors re-arrange the figures, because it's not easy to compare the changes among the multiple proxies. I cannot follow the text, comparing the separately drawn graphs. For instance, the graphs of *G. quinqueloba* abundance and SSS were separately shown in Figs. 5 and 7 without any remarks.

5.1. Multiproxy hydrographic reconstructions

I think the authors may misunderstand the meaning of factor analysis. (Page 13: lines 5 to 14) Each factor usually has a "single" meaning. Factor 2 may indicate "warm water" or "Kuroshio". If this factor means "dissolution", the scores of first two species (*G. ruber* and *G. glutinata*) and *P. obliquiloculata* must be opposite. In the list of planktonic foraminiferal fauna, these three species have positive scores for factor 2. Moreover, we can find other species, which could be susceptible or resistant to dissolution, though

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these others don't have any scores. (Pages 14: lines 5 to 6) If Factor 4 also shows "upwelling" condition, two factors (1 and 4) have same meaning.

(Page 14: lines 13 to 15) The sea-level affects on geographic change, which probably blocked the Kuroshio flow and moved the river mouth close to the studies area. However, precipitation itself is not directly controlled by this geographic change. (Page 14: lines 11 to 30) I cannot completely agree the interpretation by the authors, because SSS seems to associate with the insolation at equator. Please see Fig. 10.

[Specific and technical comments]

Please see more comments written in the MS.

Please also note the supplement to this comment:

<http://www.clim-past-discuss.net/10/C213/2014/cpd-10-C213-2014-supplement.pdf>

Interactive comment on *Clim. Past Discuss.*, 10, 1337, 2014.