**Climate
of the Past
Discussions**

Interactive comment on "Mid-Holocene ocean and vegetation feedbacks over East Asia" *by* Z. Tian and D. Jiang

Anonymous Referee #1

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In the paper "Mid-Holocene ocean and vegetation feedbacks over East Asia", Tian and Jiang analyzed the ocean and vegetation feedbacks over East Asia in their mid-Holocene experiment. The experimental design is very nice in the study. With the six experiments in the study, the ocean and vegetation feedbacks are distinguished clearly. The study is interesting and important for understanding mid-Holocene climate in East Asia from modelling side. Therefore, I suggest that the paper should be published on the Climate of the Past.

However, there is one fundamental weakness in the current version. This weakness should be carefully addressed before the publication.

Weakness:

Here, the two authors used the low resolution version of CCSM4, coupled with the dynamic vegetation model, to simulate the pre-industrial and the mid-Holocene climate. As I know, these simulations (with dynamic vegetation) are pioneer works. In other words, the authors should validate the model ability in simulating vegetation firstly, at least in East Asian area. Since the authors want to investigate the dynamic vegetation feedbacks, good model ability in simulating vegetation is very fundamental. On the other hand, the simulated vegetation change between 6ka and 0ka is very small in this study. This small change is also related to the model ability. The authors should at least demonstrate that such small change is robust from modelling side (not wrong in their simulations). If the model does a bad job in simulating vegetation in East Asia, the vegetation feedbacks revealed by this study do not make any sense.

Thus, I suggest the authors, in the revised version

1) add one section to show the vegetation simulations both for AVO0k and AVO6k experiment,

2) if the change between 6ka and 0ka vegetation is very small, the author needs to discuss the potential uncertainties in the vegetation feedbacks revealed by this study.

Minor points:

The English in the paper needs to be improved. I list some confusing sentences here.

1) Page 77, line 25-28. The sentence is confusing. Please reword.

2) Change "less attention" to "less attentions"

3) Page 78, line 10. The sentence is wrong. Do the authors mean that there are almost no modelling works carried for East Asia?

4) Page 78, lines16-21 need to be rewritten.

5) Page 80, line 16, it is not precise to say "the model captured well". It is better to say "the model captured reasonably". Actually the low resolution version of CCSM4 does

not well simulate precipitation in East Asia.

6) Page 83, line 5. The citation is wrong. Did Berger in 1978 point out that the 6ka insolation reduced by 0.36 W m-2 in East Asia relative to the pre-industrial? You should write the sentence like line 16, "according to the algorithm of Berger(1978), . . .".

7) Page 85, line 22. Change "were present" to "appear"

8) Page 85, line 24. Change the sentence to "As a result, the intensified southerly winds bring more water vapour from the South China Sea . . ."

9) Page 97, line 20. This is a very important conclusion that can be drawn from this study. It is clear that the insolation forcing plays a more important role than ocean and vegetation feedbacks in controlling simulated 6ka climate in East Asia, at least in this study. The author should use one paragraph to emphasize this conclusion.

10) Page 98, line 29. This is a wrong sentence. The uncertainties of 6ka proxy data are generally caused by the uncertainties of dating and climate interpretation. Sparse spatial distribution is not a main reason.

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