

Reply to Reviewer Y. Cao

We wish to thank the reviewer for her/his constructive comments. We reply to each comment below (original comments in bold and our response in regular font).

1. The authors conducted two model experiments for seven light use efficiency models in order to examine the reliability of simplified parameterization. The results did not showed significant differences in model performances of two sets of parameters. The results implied the vegetation-invariant set of parameters can be used at seven light use efficiency models, and which would help to improve the applicability of LUE models globally. In general, it is well-written and important for mapping global vegetation production as well as carbon uptake. I am concerned with several issues however, and detail these concerns in the following.

Thanks for the positive comments. We studied carefully the comments and revised the manuscript accordingly.

2. This study missed some vegetation types and to say the constant parameters globally. At Table 1, we would like to see the results at shrubland and savanna or others which have been included at FLUXNET datasets.

We added shrubland and wetland ecosystems into the analyses. We did not consider cropland and savanna, because C4 plants are dominant at these ecosystems, which have strong photosynthesis ability. Theoretically, potential light use efficiency at C4 plants is larger compared with that of C3 plants. Future study should investigate the potential light use efficiency of C4 plants for global simulating. We added one paragraph to discuss this issue.

3. Table 1 shows the inversed parameters with the range values (after ”. How to get the range values? According to the method, you select half sites to calibrate parameters, then you only can get one set of parameter, how to test the differences? The authors need added more details to explain the method clearly.

Sorry for confusion. Each round, 50% of the sites were selected to calibrate model

parameters for each vegetation type, and the remaining 50% of the sites were used to validate the models. This parameterization process was repeated until all possible combinations of 50% sites were achieved for each vegetation type. We introduced this into the revised manuscript.

4. I am curious about the results that no significant differences at the two model experiments. Will the model performance impact the conclusion? Some papers already reported the low accuracy of GPP models, including the LUE models. It will be helpful to discuss this.

Nice point. It is true that model performance is poor at some eddy covariance towers. However, it will not change the conclusion that a universal set of parameters, which is independent of vegetation cover type and characteristics, can be adopted in prevalent LUE models. According to the Fig.1, there were no significant differences of GPP estimates between the two different parameterization schemes at sites with high or low model performance. We added one paragraph to integrate this issue into the discussion section.

5. If these issues are all addressed it can be published.

Thank you very much for taking your time to review the manuscript. We believe by addressing your insightful comments the manuscript has improved substantially.