

# ***Interactive comment on “Microbial dormancy and its impacts on Arctic terrestrial ecosystem carbon budget” by Junrong Zha and Qianlai Zhuang***

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We thank the Associate Editor and two referees for their providing constructive comments to this manuscript. Below we detail how we have revised the manuscript following their suggestions. 1. The problem of more degrees of freedom with more details models is equifinality: several combinations of parameters match the data similarly well. That needs to be incorporated in forward simulations, which usually become more uncertain with equifinality. Response: Thanks for the comments. To address the impacts of “equifinality” on our quantifications associated with parameters, we have conducted ensemble simulations for both 20th and 21st centuries with respect to uncertain parameters. These ensemble simulations shall cover the “equifinality” set of parameters in our model. In other words, these simulations shall have included the

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“equifinality” impacts. We presented the simulations results in Figure 11 and Figure 12 in this revision. 2. Fig 3: It is not clearly stated, how many parameters were calibrated and Fig. 3 is barely readable because of display quality. Are there only 3 out of the 6 sites displayed? Response: Thanks for the comments. We have revised Figure 3. Now six sites are shown and the figure shall be more readable. 3. Cost function (17): Why did you not consider uncertainty of observed NEE? Usually, you need this to determine, which parameter sets are viable. If you have larger NEE confidence bounds, also more different parameter sets will generate predictions that are still compatible with the calibration NEE. For my main concern above it is important to keep also the slightly less optimal but compatible parameter sets. Response: The error or uncertainty of the NEE data we used have not been provided by field experimentalists. Thus, in this study, the model parameters are only constrained by the observed magnitudes and temporal variabilities of NEE at those sites.

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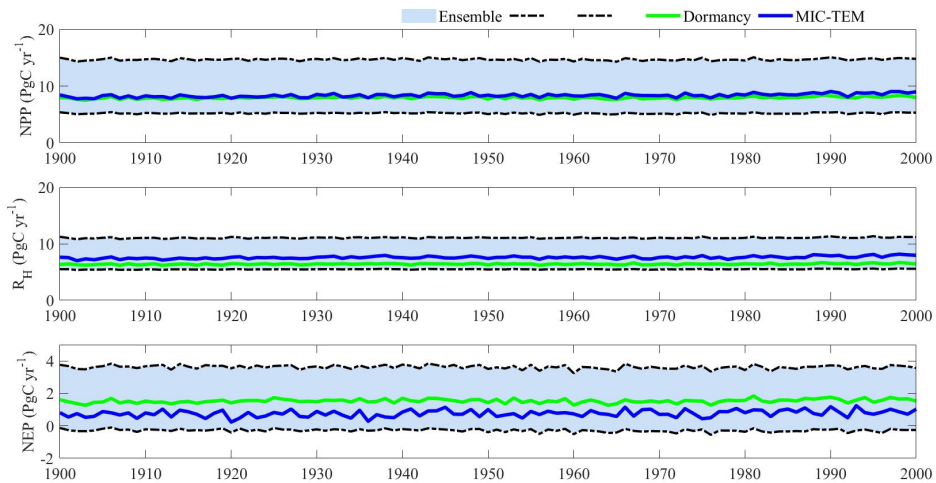


Fig. 1.

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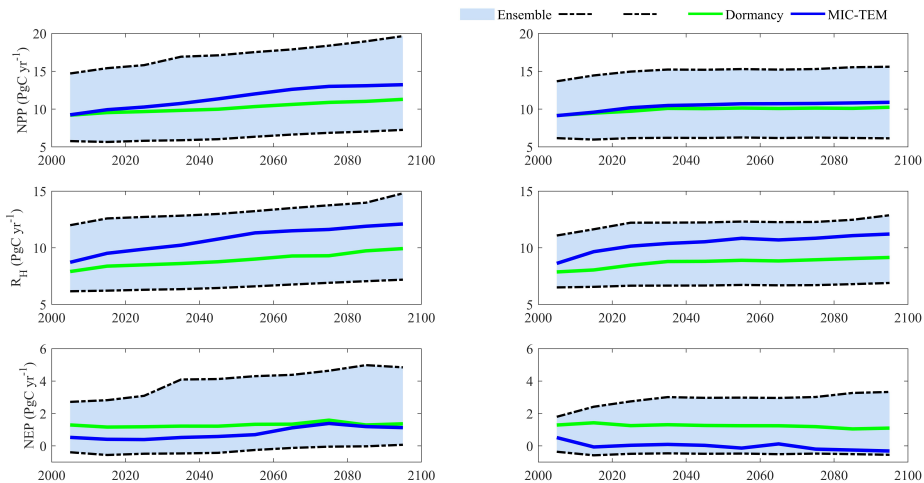


Fig. 2.