

November 11, 2017

Dear Editor:

We are submitting responses to the referees' comments for our manuscript, "A temperature threshold to identify the driving climate forces of the respiratory process in terrestrial ecosystem" (MS No.: bg-2017-345). We greatly appreciate the referees' comments and suggestions about the manuscript, which will assist us to improve the quality of the manuscript significantly. The responses to the referees' comments are summarized as follows.

Referee #3:

This manuscript bg-2017-345 entitled "A temperature threshold to identify the driving climate forces of the respiratory process in terrestrial ecosystems" by Zhang et al. derived an annual mean air temperature (MAT) threshold for identifying the driving climate forces of the respiratory (R_e) process in terrestrial ecosystems using a global flux dataset. Quantile regression was used in their study. They found an ecosystem threshold of MAT was 11 °C. When MAT was below 11 °C, R_e was mostly a temperature dependent. When MAT was above 11 °C, R_e was a multifactor-driven process. In general, this topic is interesting focuses on an important research field fits into aims and scope of this journal. The authors used a global dataset try to find some macro regulation rules underline the nature at ecosystem level. This kind of research need to be encouraged with the sharply increase in observation dataset synthesis. Hence the author should be given a change to revise their manuscript that it can be accepted for publication. I mainly concerned that besides temperature, there are lots of other variables affect R_e directly, such as soil moisture, precipitation, soil C/N, vegetation type, biomass and even litter. How to separate these variable's effects? I recommend the authors try to classify their huge dataset with these aspects, for example, soil moisture, to make more sound conclusions.

Response: Many driving forces affect the respiratory process of ecosystem, including biotic and abiotic factors, and this study focused on the patterns of R_e response to micrometeorological factors under different temperature zones. In the revision, we will enhance the Discussion section to show temperature and other variables, such as soil moisture and vegetation types, interactively influence R_e rates.

Thank you very much for your assistance on our manuscript. Best regards.

Sincerely yours,
Renduo Zhang, Ph.D.
Professor

CC: Zhiyuan Zhang, Yang Zhou, Alessandro Cescatti, Georg Wohlfahrt, Minmin Sun, Juan Zhu, Vincenzo Magliulo, Feng Tao, and Guan hong Chen