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Biogeosciences
Discussions

Interactive comment on "Effect of plateau pikas disturbance and patchiness on ecosystem carbon emission of alpine meadow on the northeastern part of Qinghai-Tibetan Plateau" *by* Yu Qin et al.

Anonymous Referee #2

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This study aimed to address the impact of patchiness and pika disturbance on ecosystem respiration at an alpine meadow grassland. The topic is interesting and meaningful and they have presented a good dataset that is sufficient to address the questions they brought up. However, I think the storyline can be better organized and many technical details still need to be added. General comments: 1. According to the title of the article, the whole story should be centered on the ecosystem respiration. Therefore, I suggest the authors to re-organize the storyline by: (1) using the "intact grassland" type as a reference, which is the natural status of the site, and compare other types to IG to indicate the effects of patchiness or pika disturbance. (2) presenting the CO2 flux first, then environmental conditions and use the differences in soil conditions to explain the

flux differences. This applies to abstract, result, order of the figures and discussions. Particularly for discussion, consider separating the sections based on different effects (patchiness and pika disturbance) and explain what factors caused the difference in fluxes compared to the reference type (IG). 2. Method section needs to be expanded with more information on the details. See my comments on each specific line.

Specific comments: L52, other substrates? Such as? L57, ecological system? Ecosystem! L68, this definition of patchiness need to be referred to earlier in the paragraph. L89, not clear, others also studied the effect of pika disturbance and patchiness, which are what you meant as "heterogeneity" to my understanding. What makes your study different from theirs? L93, "underlying surface" sounds a little awkward. Change it to land surface or soil surface. Check this expression throughout the manuscript. L94, I think what you meant was "the spatial heterogeneity of Re" in aim (3). L105 "plant" species L121, according to your description, seems the fluxes were measured in different plots from ones that measured environmental conditions, right? If yes, how far away are they? Are they comparable? L126, "were" logged . . . L129, soil hardness is not a very familiar concept. Explain it and what unit is used? L131, since the respiration measurement is the key of this study, more details are needed. How big is the chamber? Transparent of opaque? How many replicates? Only one gas analyzer was used? How many minutes did one measurement take? What is the frequency of the data? During which period (specific dates) were the measurements taken? Also, how the fluxes were calculated? How the air temperature inside of the chamber was measured? L138 change "determined" to "collected". L142 from each surface type? L149 how many replicates? L150 change "sampled" to "determined" L152 each type? L169 according to your figure, this seems like correlation analysis instead of regression. Figure 2, which year? Average Ta? Figure 3, monthly average? Figure 8, μmol instead of umol Figure 9, this is not a good way to present correlation results. First, specify what analysis in the caption. Second, the full correlation table looks redundant as it presents two copies of each pair of variables. Also, correlation coefficients and P value need to be included. Was the correlation done across the different surface types?

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