

Interactive comment on “Biophysical effects on the interannual variation in carbon dioxide exchange of an alpine meadow on the Tibetan Plateau” by Lei Wang et al.

Anonymous Referee #1

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General Comments

This manuscript presents 4-year data set of CO₂ exchange for a high elevation grassland on the southeast margin of Tibetan Plateau. The statistic model HOS is used to partition the inter-annual variability in net ecosystem exchange between climatic variability and functional change. The annual patterns and inter-annual variability of NEE were showed in this study too. Many studies have revealed the relationship between the climate variables and the CO₂ exchange. This paper means to discuss the biophysical effects on inter-annual variation in CO₂ exchange. It is supposed to give us some new understandings. However, the authors just partition the climatic and biotic effects and give more analysis on the climatic effects. The key point should be focus on

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the biophysical effects on the inter-annual variability in NEE. The authors should make more effort on revising this manuscript.

Specific Comments

1. Page 2 Introduction There are some flaws in the consistency in this section. The English writing should be improved attentively. Though the manuscript is understandable, it reads awkwardly in some sentences due to the structure or the chosen word. The authors should make more effort English writing for the entire paper.

2. Page 3 The site is in Yunnan Province, locates on the southeast of the Tibetan Plateau. The climate condition, such as annual precipitation and mean air temperature, is quite different with Tibetan Plateau. This alpine meadow has limited similarity with the grasslands on Tibetan Plateau. Thus, the site location should be described more specific in the title.

3. Page 2 line 48 The phrase (global warming) appears abruptly here. The author should explain unambiguously what they want to express.

4. Page 6 line 170 There were many study on grasslands in Tibetan Plateau. The author can compare the study with other results of different alpine grasslands on Plateau. Line 174 I think the authors mean the ecosystem became a carbon sink when daily NEE was negative. The date when the ecosystem started to absorb CO₂ was much earlier than the date when the negative value of daily NEE appeared. The expression in this paper should be more precise.

5. Page 7 The HOS model was interpreted in detail in Hui's paper which was published in 2003. However, I think the models and the abbreviation (SSf, SSi, SSs, SSe) should be briefly and clearly introduced in this paper. Otherwise, the readers must find out Hui's paper and figure out what the models and abbreviations mean. The variation of RE_{diff} 2014-2012 was quite different with the other RE_{diff}. How the authors explain this result?

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6. Page 8 The authors compared NEE and the ratio of RE/GPP of this alpine meadow with other grasslands. Several values were listed in this paragraph. However, more discussion is necessary. What's the purpose for this comparison? How the difference occurs?

Table 7 How many years' data were used to obtain the mean annual variables in different sites?

Actually, the discussion section is short and some paragraph is still describing the result. Please go deep into the results and present more discussion on the possible reasons of the phenomenon. The authors pay more attention on the climatic variables. However, the focus should be on the 'biophysical effects' as stated in the title.

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