

Reply to Referee #1

(1) Authors did not respond to the first point of Dr. Chen's comments.

We clarified the fig.4 and fig.5 as follows: The result probably due to the appearance of photo-inhibition. At 13:00, the increased PPFD and temperature induced the stomas closed to avoid wasting much water .Although the PPFD increased, the rate of CO₂ became the leading limiting factor. And the vegetation also experience higher heat load, which enhances respiration, and thus lowers their photosynthesis rates (Chen et al.2009).

(1) Authors did not respond to the second point of Dr. Chen's comments.

We speculated that the shape of GPP-LAI shown the upward trend instead of the tendency to level off because rang of the LAI was from 0 to 4.0, just was in the stage of rapid grown.

As to the aspect to the calculate NEE,

(2) The correlation between GPP and Reco shown in Fig. 7 does not make sense because the GPP was derived by the equation $GPP = -NEE + Reco$. Of course, this equation makes the correlation much better because they are linked by the equation. Yes, Law et al. (2002) and Xu and Baldocchi (2004) have published similar patterns. However, you should not continue doing so as they did something wrongly. I suggest that you delete the Fig. 7.

According to your advice, the fig.7 has been deleted.

Illustration of sentences with English problem:

P.2, L6: "...is critical important...", should be "...is critical..." or "...is important..."

It has been revised

P.2, L9: "The measurements covered three years and were made using the eddy covariance method."

It has been revised as "The measurement was used the eddy covariance approach during October

2003 to December 2006.”

P.2, L10: Seasonal trends of both GPP and Reco followed closely changes in Leaf Area Index (LAI).

It has been revised as “Seasonal patterns of GPP and Reco were closely associated with that of leaf area index (LAI).”

P.2, L11-13: Reco exhibited the same exponential variation as soil temperature with seasonally-dependent R_{10} at the soil temperature reach 283.16K.

It has been revised as “ R_{eco} exhibited the same exponential variation as soil temperature with seasonally-dependent on R_{10} (R_{10} is the ecosystem respiration rate when the soil temperature reach 283.16 K (10 °C))”

P.2, L13: Although yearly average is used sometime, annual average is more common

It has been revised as annual average

P.2, L14, 15: “for ×××× year” is better to be replaced by “in ××××”

It has been revised

P.2, L19: ...alpine wetland meadow is a source of CO₂...is repeated as L16.

It has been deleted.

P.2, L20: it is unclear what do “the microclimatology areas” refers to.

For avoid confusing, the sentence have been deleted.

P.3, L1: The result is contradicted observations in alpine shrubland meadow

It has been revised as “This result is inconsistent with the result observed in alpine shrubland meadow.”

P.4, L8: “The rate of decomposition of organic carbon, i.e., the CO₂ flux from the plateau, is high because of the rich organic carbon load in the soil.” There is a logical problem with this sentence. The good reason for the rich organic carbon stored in the soil is that the rate of decomposition of organic carbon is low.

For avoid confusing, the sentence have been deleted.

P.6, L17: ‘recoded’ should be replaced by recorded.

It has been revised.

P.6, L20: The grassland starts to green at...

It has been revised as “the grassland turns green”

P.8, L2: ...considered as insignificant...

It has been revised as “consider insignificant”

P.10, L21: ...and ranged about...

It has been revised as “was around”t

P.11, L12: ... the temperature dependence (of what variables) was higher....

It has been revised as “the temperature dependence of R10 was higher...”

P.12, L12: 'at afternoon' should be in the afternoon.

It has been revised

P.14, L1-3: 'The periods' is confusing. You used the A.M and P.M. in the text and used 0 in the Fig. 9. You should keep them consistent.

They have been revised.

P.14, L4: NEE from 1:00 P.M to 5:00 P.M trend is not indicated in Fig. 9 where the data shows the 'diurnal sequence' (P.13, L.16).

I was puzzled for the fig.9 has indicated the NEE from 1:00 P.M to 5:00 P.M trend.

P.14, 15: The word "uptake" has already specified the direction of CO₂ flux, therefore, the negative sign should be omitted.

The negative sign have been deleted.

P16, L18: A seasonal variation occurred in NEE, which is the difference between two large CO₂ fluxes of CO₂ release by Reco and CO₂ uptake by GPP.

It has been revised as "Furthermore, this variation was that large CO₂ fluxes of the release by Reco and CO₂ uptaked by GPP."

P17, L3-4: The relationship between GPP and PPFD as shown in Fig.4 resulted from the fact that LAI was so small that the rate of canopy photosynthesis was smaller than the CO₂ emission rate from both plant respiration and soil emission.

It has been revised as "The relationship between GPP and PPFD as shown in Fig.4. The fact result from that LAI was so small that the rate of canopy photosynthesis was smaller than the CO₂ emission rate from both plant respiration and soil emission. "

P17, L7: ...did not changed...

It has been revised as "did not change"

P17, L8: That because...

It has been revise.

P.17, L15: ...that there apparently was no PPFD saturation in the afternoon (Figs. 3 and 4).

For avoid confusing, the sentence has been deleted.

P.18, L10-11: Thus, the exponential function for ecosystem respiration holds for a limited time period when LAI and soil moisture are similar.

For avoid confusing, the sentence has been deleted.

P.19, L3: Is 'The maximum values of...' referred to seasonal maximum?

It has been revised as daily maximum.

P.20, L13: This values outside the range (1.3–3.3) reported by Rainch and Schlesinger (1992), but within the range (1.9–5.5) given in other reports for forest (Massman and Lee, 2002).

It has been revised as "These values outside the range (1.3–3.3) which was reported by Rainch and Schlesinger (1992), but within the range (1.9–5.5) given in other reports for forest (Massman and Lee, 2002)."

P.21, L10: Too many 'Therefore' in one sentence.

It has been revised.

P.21, L19-22: These different conclusions regarding the coupling between Reco and rain events may explain the differences of opinion regarding the coupling between Reco and rain events may explain the differences of opinion regarding the effect of soil moisture on Reco. The study site was icebound during the non-growing season, and the soil temperature was relatively steady.

It has been revised.

P.22, L3: The abbreviation CR is not mentioned in previous chapters.

The abbreviation CR has been replaced as continuing rain events

P.22, L15: We suppose that not only high soil organic matter (wetland: 28.06%; shrubland: 7.54%; Kobresia humilis meadow: 5.19%, Zhao et al. 2005) but also relatively low grazing intensity (wetland: 38.8-62.6 %; Kobresia humilis meadow: 82.7-87.1 %) promote ecosystem respiration; as a result, this ecosystem may release a substantial amount of C.

It has been revised as “Both higher soil organic carbon content (wetland: 28.06%; shrubland: 7.54%; Kobresia humilis meadow: 5.19%, Zhao et al. 2005b)and lower grazing intensity(wetland: 38.8-62.6 %; Kobresia humilis meadow: 82.7-87.1 %) may stimulate ecosystem respiration, and thus lead to a large amount of C release.”

P.39: ...soil temperature at a depth 5 and 40 cm...

It has been revised as “soil temperature at the depth 5 and 40 cm”

P.40, 41: Data were from 2004 to 2006 season, and half-hourly during...

Data were half-hourly during high turbulence conditions ($u^ > 0.1 \text{ms}^{-1}$) from 2004 to 2006.*

P. 46, check the units on the figure.

The units of figure have been revised.

P.47, 48: You used Fc in Fig.9 and NEE in Fig. 10. I assume that both are the same. Please keep them consistent.

It has been revised.