

We would like to thank the reviewer for his/her constructive comments and suggestions on the manuscript. The modifications have been accomplished by replying to the reviewer's comments. The following is a detailed list of our responses and the changes we have made.

RC: Measurements were only made during a single rice growing season (120 days). This may be a good test of the technique, but needs to be stated in the methodology. Also the relationships may change with the other two landuses that occur during the rest of the year.

AC: *We have corrected it a bit.*

RC: More information is needed in the methods to characterise the vegetation. What proportion of the "paddy fields" were planted that year? Is it a homogeneous site, or a patchwork of different management treatments? What proportion were flooded and for how long?

AC: *Some more information regarding vegetation coverage and management practices have given in this section.*

RC: The site was 2 km from a residential site. Could there have been any industrial or domestic influence on the CO₂ concentrations at the site, especially under calm conditions?

AC: *The rice canopy reach maximum 1m of height at maximum growth stage and flux sensors are in 3 m, 12m and 32m, giving the tower footprint of about 1.5 km, 6 km and 16 km respectively at typical nighttime conditions but at stable condition the fetch requirement extended 2-3 fold than typical nocturnal conditions. At stable condition contamination from other farm and residence area might exist in our data but we have tried to minimize it by taking only in wind direction 45°-225° where maximum paddy cultivation area covered and also rejecting data at large fluctuation of CO₂ density condition.*

RC: Many sensors are mentioned and not all are used in the final manuscript, remove those not used

AC: *We have removed all unnecessary information regarding instrumentation accordingly.*

RC: Soil heat flux plates were installed in an adjacent grassland. Why not the paddy fields? Was there any attempt to determine energy budget closure?

AC: *Due to some critical situation (commercial farm not to allow installation sensors and take other physiological parameter like LAI and crop biomass) we could not take measurement of most meteorological parameters from paddy field which was taken from nearby grassland for evaluating energy balance closure and other purposes.*

RC: Page 1208 line 9. Was the site really homogeneous for all directions?

AC: The site was not homogenous in all direction rather patchy with some house building surrounded by tree. We have given more detailed description of study site in site description section.

RC: The CO₂ profiles were calculated as though the sensors were representative of the volume below their height. Maybe a better option would be to recalculate the storage using the inlets as representing the volume between the sensor and 50% of the height to the next sensor.

AC: We have changed the calculation method accordingly.

RC: Section 2.5 is a bit thin. Please give some idea of the amount of data that was usable and acceptable for further calculations.

AC: We have stated the percent of data survival and gap filled accordingly.

RC: The construction of an ecosystem respiration model is fraught with problems. Why is surface albedo used to separate growing periods. How was this measured and over what area? Is there any validation between albedo and ecosystem respiration rates. The relationship between albedo and plant biomass is not a linear function and it saturates at high biomass. Does the presence of absence of water make a difference to the measurement of albedo or the respiration rates?

AC: We have changed the text not to mention albedo used for separating growing period rather we separate periods into four phenological stages arbitrary considering the change of magnitude of ecosystem respiration in each stage and establish the model. We did not use any parameter like LAI for separating phenological stage because we did not measure it.

RC: Why did they use air temperature instead of soil temperature (especially as soil temperature was measured)?

AC: First of all there is a correction that soil temperature was measured in grassland not in paddy field so we used air temperature.

RC: Some of the time periods using respiration model indicate a decrease in respiration with an increase in “air” temperature. Is this correct? How much confidence do the authors have in a model with an r² of less than 0.3?

AC: After changing calculation method the coefficient value was changed and in every case r² values showed >0.4 and also there were no negative dependency of temperature with respiration.

RC: Figure 2 has “general” and alternate” methods – these are not described.

AC: *Figure 2 is alternate method and we corrected it.*

RC: The terms albedo, biomass index, biomass/leaf area index, and canopy cover are all used as variables, but are ill defined and data are not presented.

AC: *We used those terms considering the relative corresponding with soil respiration. We did not present those data due to lack of proper data but the relative importance of those data is quite large for this kind of analysis. Therefore for future studies it must be careful to measure those parameters.*

RC: Page 1210 line 24. “The NEE threshold was defined: : :” This needs to be better defined as it is of utmost importance in the context of the analysis.

AC: *We have already stated that effective nighttime data range was taken based on experience and evaluation of observation data. We evaluated percent of data availability at different data range and found that within 0-15 $\mu\text{mol}/\text{m}^2/\text{s}$ maximum number of data were present.*

RC: The volumetric soil moisture content in the grassland remained above 0.40 m^3/m^3 for the whole study, therefore no soil moisture deficit factor was needed or included in the ecosystem respiration model. However, if the paddy fields were flooded or drained may have had a large affect on the respiration rates.

AC: *It was our limitation that we did not keep record of field condition data for whole growing period. Therefore we stated it in our manuscripts that it must have impacts of irrigation and drainage period on respiration rate but did not give any evidence due to lack of our data.*

RC: Section 3.1 At the beginning of the growing season H was not around 100 W/m^2 , and was not similar to LE.

AC: *We have checked and corrected it.*

RC: P 1213 line 1. How do the authors know that the respired CO_2 remains trapped below 3.5m? It could be moving off site as near-laminar flow.

AC: *We calculated storage change at both stable and unstable condition and compared their magnitude. At stable condition some respired CO_2 remain trapped below 3 m sensor height as this period storage change had a contributor of R_e but at unstable condition the relative importance of storage change become diminish. Figure 6 showed the relative magnitude of storage change at different u_* condition.*

RC: Page 1214 line 5. Air/soil temperature is not dependent on soil respiration. It is the other way around.

AC: We found the mistake and corrected it.

RC: The conclusions seem contradictory. In conclusion 1 they state that underestimation of respiration is low under calm conditions, and in conclusion 2 they say that the addition of the storage term can greatly reduce the nighttime flux underestimation under stable conditions. If the underestimation is low then is the storage term needed at all? Is there a difference between calm and stable conditions, if so then please clarify.

AC: We have checked and modified it.

RC: Table 1 There are no units given for R_e (also in the text)

AC: We have included it

RC: Fig 2. Radar is mentioned but not described.

AC: It will be R_s (solar radiation) and we have changed it.

RC: Fig 4. Daytime E_c – is this the maximum or average flux?

AC: Daytime E_c flux is the averaged between 08:00 and 16:00 Beijing Standard Time (BST) and it was mentioned in figure caption.