

Review of ACP-2021-354

Overall, I think the authors have written a nice study on the meteorology, energy balance, and CO₂ fluxes of an urban forest in South Korea. I found the study informative and interesting to read. I have a few suggestions on the manuscript; most of these suggestions relate to clarifying the text and fixing grammar in a few places. Note that, although I am a CO₂ flux modeler, I am not a technical expert on eddy flux measurements. Hence, I do not have many technical comments on the actual measurement or partitioning approaches used in this study.

Reply: Thank you for your constructive and critical review and we appreciate your effort. We tried to revise our manuscript based on the reviewer's comments.

- Line 17: I'm not sure that "stipulate" is the right word here. Perhaps "find" or "hypothesize"?

Reply: We revised the word as the reviewer suggested.

- Line 25 "our life trajectory": Whose life trajectory are you referring to here? Are you referring to the life trajectory of all humans? Maybe a different phrase would be better here (e.g., "human civilization heavily depends").

Reply: We revised the word as the reviewer suggested.

- Abstract and intro: The authors use the word "our" frequently in the text. Sometimes, I think the authors use this word to refer to themselves, and sometimes I think the authors use this word to refer to all of humanity. I would try to be clearer or more careful with the use of "our".

Reply: We carefully checked this word in these parts.

- Lines 33-38: This text feels generic and vague. I would cut these sentences from this paragraph.

Reply: We revised the word as the reviewer suggested.

- Line 82: I don't think the verb "affects" works in this sentence. I would delete it and replace "affects and shows" with "mirrors a steep global warming trend."

Reply: We revised the word as the reviewer suggested.

- Line 159: I would remove the word "additionally". It's not clear from this sentence what these observations are in addition to.

Reply: We revised the word as the reviewer suggested.

- Line 247 "similar net radiation": Did radiation show a similar decrease as precipitation, or is radiation in the second year similar to the first year? This distinction wasn't clear to me from the text.

Reply: We revised the word as the reviewer suggested for better readability.

- Line 253 "Figure 6 shows...": This sentence doesn't feel like a very effective topic sentence. Instead, I would start with a sentence that summarizes the main result of Fig. 6.

Reply: We revised the word as the reviewer suggested.

- Line 271: I would replace the word "produces" with "is".

Reply: We revised the word as the reviewer suggested.

- Line 306: I think you could also construct a more effective topic sentence here. I would start out with the main conclusion about temporal dynamics of net CO₂ exchange and then refer to Fig. 9 to support that conclusion.

Reply: We revised the word as the reviewer suggested.

- Line 324 "As photosynthesis decreases, FC changed": The two verbs at the beginning of this sentence have different tenses ("decreases" versus "changed"). I would use consistent tense.

Reply: We corrected it.

- Line 332 "With such apparent seasonal FC variation, it is notable that its...": What does "its" refer to in this sentence?

Reply: We revised the word as the reviewer suggested.

- Line 333: What do you mean by "flux source area"? Are you referring to different land cover or land use types? Overall, I'm confused by this sentence. The sentence seems to say that variability in CO₂ fluxes depends on spatial-temporal variability in CO₂ fluxes.

Reply: In flux measurements, flux values change with measurement footprint. We revised the word as the reviewer suggested for better readability.

- Throughout the results and discussion, there are a lot of abbreviations. On one hand, I think those abbreviations are very useful to avoid repeating longer phrases. On the other hand, there were several instances when I had to look up numerous abbreviations to understand a topic sentence. Lines 340 - 341 are a good example. In these abbreviation-heavy sentences, I wonder if it's possible to state the conclusion in simpler terms and subsequently bring in technical

abbreviations to illustrate that point.

Reply: By our mistake, we omitted an appendix for the abbreviation. We added the abbreviation in the manuscript. We revised the manuscript as the reviewer suggested and please check our revision carries simpler conclusion.

- Line 390: I think this topic sentence could be strengthened (as per previous suggestions).

Reply: We revised the word as the reviewer suggested.

- Line 411 "and similar to that in the urban forest in East Asia ": What urban forest are you referring to here? Or are you referring to urban forests more broadly?

Reply: The urban forest studies are rare, and we cited natural forests in the similar climate zone. We revised the word as the reviewer suggested for better readability.

- Line 425: See previous suggestions about strengthening topic sentences.

Reply: We revised the word as the reviewer suggested.

- Lines 459-460: Awkward wording. This sentence also feels out of place in this paragraph because it describes results, whereas other sentences in the paragraph describe the measurement site and site context.

Reply: This sentence indicates climate conditions during the measurement period and accordingly, we may be able to retain this sentence but change its position.

- Line 508 "make significant traces": I'm not sure what this phrase means. How about "has a significant effect on".

Reply: We revised this sentence for better readability as the reviewer suggested.