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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Long-term energy and CO_2 flux observations over an agricultural field in southeastern Tibetan Plateau" *by* Anlun Xu and Jian Li

Anonymous Referee #1

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General comments: This study presents more than a decadal continuous flux measurement in an agricultural field in southeastern Tibetan Plateau, which is very good data source to investigate the characteristics of the atmosphere-land interactions and turbulent exchanges of energy and mass in that region. However, after I read through the manuscript several times, I did not get more interesting findings except for knowing some numbers and magnitudes of several fluxes, which I think the study lacks significance and scientific contribution and therefore may need substantial work and more in-depth analyses and discussion. As the authors described in the introduction, I agree it is very important to understand the atmosphere-land interactions in the transitional zone between the TP and Yunnan-Guizhou Plateau. However, the study site is an open

and flat agricultural field and I wonder how well the flux measurements at the specific study site would be representative to the air-land interaction parameters in the transitional region, where more heterogeneity in land cover or topography may exist. The authors may need to stress more about the unique aspect of their study and reconsider: are the findings/results/data really relevant to what is currently described in the introduction and objectives? I also found that most of the results section is fully packed with numbers rather than result interpreting, for example, the authors spent one full page reporting all the meteorological data which are already clearly shown in Figure 2. I would suggest the authors could present the results by showing the key information in a concise way and including more in-depth analysis. In addition, all the discussion is about the correlation analysis results, which should be moved to the results section. Therefore, I think the manuscript may need a better organization overall. I also noticed that as one of the key results, there is an obvious step change in LE, H, and Fc after 2014 (Figure 6 or 7). In particular, Hs becomes very noisy and doesn't show any obvious seasonal pattern after 2014, which also applies to the seasonal variability of Fc. This is very interesting, but I wonder whether it is really caused by the environmental controls or just a systematic error. Unfortunately, the authors could not provide any explanation and discussion on this specific pattern of the inter-annual variability.

Specific comments: Line 30-37: what kind of field campaigns are they? Are these studies all about turbulent exchanges and relevant to this study? Line 56: The study site is a cropland. However, from the google map (Figure1b), it seems the site is very close to the Erhai lake. Without a scale on the map, it is difficult to figure out whether there are any signals coming from the adjacent non-cropland land cover (e.g. the lake). Line 90: Where are the global radiation and precipitation measurements coming from? Please describe in the methods section. Line 90-106: This part of results is literally repeating the same information shown in Figure 2. Suggest rewriting the results in a concise way that shows the key information rather than reporting the numbers. Line 111-113: suggest moving this sentence to discussion. Line 117-118: again, reporting numbers here. See my comment above. Line 131-140: one could easily get this

information from the figure. Line 170-185: these correlation analysis results are still “results”, which should not be presented in the discussion. Suggest moving it the results section. Line 195: the inter-annual variability of annual carbon sink is really large, but I couldn’t find there are any drivers or controls on this strong variability. Line 198: are there any physical or biophysical explanation on why wind speed affected the Hs? Figure1b: please add the scale to the map and rotate the map with N facing upward. Figure3: how to distinguish the wind >=28 m/s and 2-4 m/s, both are in yellow. Figure5: suggest adding the inter-annual variability of the monthly averaged diurnal patterns by showing the error bars. Figure 6 and 7 basically show same information. Suggest deleting one.

Technical corrections: Line 71: Hs instead of Ta? Line 81: suggest replacing “done” with “processed” Line 82: suggest deleting “used here” Line 92: round up 5066.1 to 5066. And please be careful about the significant digits throughout the manuscript.

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