

Interactive comment on “Estimating immediate post-fire carbon fluxes using the eddy-covariance technique” by Bruna R. F. Oliveira et al.

Anonymous Referee #2

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The paper by Oliveira et al., provides exceptional and very valuable information about the CO₂ flux behavior immediately after a wildfire, and therefore I encourage its publication. However, the paper, in its present form is difficult to follow and should be re-structured before its publication. Results section 3.1 and 3.2 should be moved to methodology. And the section 3.3 about results should not have references. References (and its arguments) should be moved to the discussion section. See my specific comments below:

The objective mentioned at the end of the introduction section is not a real objective. The "in-depth analysis of the obtained EC data" is the way (the method) to analyze the behavior of CO₂ and water vapor fluxes and its dominant factors immediately after a wildfire (your objective). Another objective of your paper could be the optimization of

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the quality tests for EC data to correctly interpret the obtained fluxes immediately after a wildfire.

Table 1. I think there is a mistake about the frequency of sample for net radiation. It should be 0.02Hz. This info is correctly written in the above paragraph.

Ln 139-140 "For the cumulative fluxes over the first post-fire year, all EC data with quality classes 1-8 were combined with gap-filled data" What about the footprint area? Did you also selected footprint areas that consisted for more than 80 % of the Maritime Pine stands?

Section 2.3.1. To include the % of missing half-hourly flux data due to measurement failures or rejection after the data quality check could be a very interesting information. This info can be divided into daytime and nighttime data.

Ln 109, A parenthesis after (table 2 is missing. I would located sections 2.3.6 and 2.3.7 before section 2.3.4 because they are also related to EC measurements.

Ln 223 "The test was carried out with 12,011 30-minute records that" There is something wrong in the numbers.

Section 3.1 "Additional data quality test" should be section 2.4.

Section 3.1.2: Since the objective of this study is not to investigate the closure of the energy balance, I would recommend to remove this subsection and to include a sentence in section 2.3.1 with the % of the gap in the energy balance closure (that is in the range reported by most EC sites). If the authors consider that part of this subsection must appear in the manuscript, just move it into discussion section (4.1 data analysis)

The first paragraph for section 3.2.1 is "methodology" not results. Please, move this paragraph to section 2.3.2. What is more, the second paragraph is mostly discussion. Figure 7 is a result, but should be better explained in the text in order to show its relevance.

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Section 3.2.2 is again "methodology" not results. Please, move this paragraph to section 2.3.2. Again, despite table 3 is a result, should be better explained in the text in order to show its relevance.

Section 3.2.3 should be also moved to "methodology" section. Ln 336 Please include information in the methodology section about the storage term.

I would recommend to move the figure S10 into section 3.3.1. The inclusion of Figure S10 (maybe it is not necessary to include the four days) would help to the lector to better understand the Figure 8. I would also improve the Figure S10 (and next) including the 0 Y line for NEE and the time in the X axis. The period showed in Figure 8 can be shadow in Figure S10.

The measured CO₂ uptake in September and October 2017 should be due to the presence of plant cover in the studied area. Do you have some pictures to test it? Otherwise, you should provide another explanation, for the CO₂ uptake in September and October 2017 (Eucalipts?).

Section 4.1. Just curiosity..., did you try to compare the cumulative NEE using your procedure for rejecting data and filling gaps and with the "standard procedure" available in <https://www.bgc-jena.mpg.de/bgi/index.php/Services/REddyProcWeb?>

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