

# ***Interactive comment on “Turbulent and non-turbulent exchange of scalars between the forest and the atmosphere at night in Amazonia” by Pablo E. S. Oliveira et al.***

## **Anonymous Referee #1**

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This paper analyzes wind and scalar turbulence measurements during several nights at the ATTO project site. A great deal of the analysis is about comparisons between two specific nights. One of these nights is classified as being “fully turbulent”, and the other as displaying “intermittent turbulence”. Most of the analyses are made using multiresolution decomposition.

The results are interesting and should be useful to understand nighttime scalar exchanges between the forest and the atmosphere. However, the text needs a significant reorganization, as the comparisons between the two nights and the several heights proceed in a rather disorderly way. In this regard, I recommend that all discussions

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start with the turbulent night and proceed whenever possible level by level; that the same be done for the intermittent night; and that, finally, comparisons between the two nights are made. Most of the time, this should be done in different paragraphs. This will enhance readability significantly.

Moreover (“major issues”),

1. The text is ambiguous about the role of the low frequencies’ contribution to the above-canopy fluxes.
2. Gradients of temperature and velocity are being used in the Richardson numbers, but no mention to the systematic errors in the measurements between the levels is made. This should be addressed.
3. Turbulent bursts and activity are not quantitatively defined.
4. The discussion starting on p. 11, l. 5, on the turbulent regimes seems to be a re-packaging of results already presented in the manuscript. It does not seem to bring any new information.
5. Clear indication must be given when only 2 nights are being compared and when all data are being used.
6. The effect of averaging per frequency without taking stability into account should be investigated.

Please also note the supplement to this comment:

<https://www.atmos-chem-phys-discuss.net/acp-2017-638/acp-2017-638-RC1-supplement.pdf>

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