

***Interactive comment on* “The Importance of Biological Particles to the Ice Nucleating Particle Concentration in a Coastal Tropical Site” by Luis A. Ladino et al.**

Anonymous Referee #4

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This manuscript presents the properties of ambient particles and INPs in the tropical latitudes using several instruments and sampling techniques, in order to provide a comprehensive analysis of the chemistry and biological properties of the INPs. Characterizing INP concentration around the world and understanding the contribution of bioaerosols are important, and therefore I find this study a valuable contribution, especially since there is little data from tropical latitudes.

The introduction part is good and the manuscript is well written. However, at some parts of the manuscript I felt the need for more details, as in the ice nucleation part (see below). Also, I do not think that the title reflects the findings well. I think it confuses

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the reader to think there is some new evidence on biological INPs, however, it was not proved that the bioaerosols are responsible for the ice nucleation activity that was detected, and I personally still not convinced. Thus, I would recommend changing the title to a more suitable one, or provide the proof for the importance of the biological particles to the INP concentrations.

I think that the parts related to the freezing experiments and results, should be revised and clarified. There is not enough technical details about the method, such as the instrumentation or the temperature uncertainty, and what are the limitation of the analysis that was done. Also - there are no error bars (or any error analysis) throughout the manuscript, which is very surprising, and must be done before resubmission.

Specific comments: Line 10: I guess should be “tropical” and not topical Line 13: for -> from Line 29: is -> was Line 40: I suggest to detail how the concentration affect on water drop formation Line 88: present -> presents Line 110: What is wet? Line 235: if possible, please explain here how was the cold front determined, and send to the supplementary figures Line 250: Please explain why do you believe that there is no significant difference and that during front did not changed much. To me it seems that their slope is different and that the concentrations are also differ. Line 265: I suggest rephrasing this sentence; especially the word important, it does not fit here. Line 332: I suggest removing or rephrasing this paragraph; it is a speculation that is not accurate. Line 353: Can you detail what is the “uncertainties of analysis” Line 451: fix reference of Chen et al. 2011. Fig.2 – I suggest to write “entire” instead of “whole” Fig 2. It seems to me that there is daily cycle of the aerosols? For example seen clearly in days 27-28.1.17. Figure S1. I would consider replacing the use of brackets in this caption. It was not clear to me at first what I see there. Figure S3. Why there are no error bars? That way it will be easier to understand if the two distribution are actually similar.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2018-1215>, 2018.

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