

Interactive comment on “Observational analysis of the daily cycle of the planetary boundary layer in the central amazon during a typical year and under the influence of the ENSO (GoAmazon project 2014/5)” by Rayonil G. Carneiro and Gilberto Fisch

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Below are the responses to referee 1 (RC1)

1. The results are shown only in terms of typical daily cycles, which are important. However, it would be very nice to know the ranges of variabilities provided by each instrument. It could be done by adding error bars to the plots, but that would possibly make them "dirty". Another option would be to include additional plots of daily cycle of standard deviations for each platform used. This plot would tell the readers whether

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any of the platforms is more susceptible to errors that could just average out in the plots shown. Besides, that would give the readers an idea of the inherent variability observed for the PBL thickness in the region;

I agree that inserting the error bars in the plots would make the figure "dirty", so the standard error was represented by shading (Fig. 4 and 6). However for the RS measurements the error bar was used as requested by RC2.

Therefore, I am sending you Appendix included two tables that show the standard deviation for 4 intervals of the daily cycle of PBL at each IOP. If you deem it necessary, I will add them in the final version.

2. Along the same line of the previous comment, it would be very nice if the authors could go a step further and identify for the same years what drives deeper or shallower PBLs. This suggestion might be a bit more complex to address, so it may be done at a later study;

In the present work, some forcing factors that influenced the deepening of PBL (R_n , H , etc.) were discussed. However, what suggested has been developed for a next study, through observations and modeling.

3. I would like to see case studies comparing the PBL thickness found by each method, for both a diurnal and a nocturnal event. This comparison would give the community a clear idea of what each method is capable of doing. I think this would be specially good for the nocturnal case, where there are still large uncertainties in the determination of the PBL thickness;

As previously answered (question 2), another article is being developed, which is analyzing typical days at each IOP during the transition between the night (NBL) and daytime (CBL) PBL periods.

4. Is it possible to provide scatterplots comparing the thickness found by the radiosondes to those from other methods? In that case, I am assuming the radiosonde would be

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the "truth" and the comparison would be limited to the periods when radiosondes are available. Nevertheless, given the long temporal coverage of the dataset, there may be enough points for this analysis which would, again, provide important insights on the quality of the PBL estimation provided by each platform.

The scatter plot suggestion is quite valid, but the temporal coverage of IOP data is restricted to only 45 days and not a full year, thus making the sample with low representativeness.

Please also note the supplement to this comment:

<https://www.atmos-chem-phys-discuss.net/acp-2019-578/acp-2019-578-AC1-supplement.pdf>

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-578>, 2019.