

# ***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***

## **Anonymous Referee #1**

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In this paper, the thickness of the PBL is observationally determined by 6 different methods in the Amazon region. Furthermore, the evaluation is performed over 4 different periods, comprising a substantially large time of observations. These reasons make this a very unique study, as very rarely such a comprehensive comparison is available. Therefore, the micrometeorological community might benefit from these results in terms of the evaluation it provides for different tools for PBL thickness determination. At the same time, there are many different communities that do research in Amazonia that could benefit from the knowledge of the typical daily evolution of this

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quantity. The comparison between years with contrasting characteristics provides additional information in that regard. For these two reasons, I think this study should be published, as it might provide very important support to other researchers, in different fields.

I do have some suggestions, and they mostly relate to aspects that have not been shown and made me curious. Such a detailed dataset might answer many more questions than the authors raised, and my suggestions go in that direction:

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 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;

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;

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;

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 the "truth" and the comparison would be limited to the periods when radiosondes

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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.

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