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Discussions

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Interactive comment on "Nocturnal boundary layer turbulence regimes analysis during the BLLAST campaign" by Jesús Yus-Díez et al.

Anonymous Referee #2

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The manuscript contains good science. The reader will learn important aspects of the hockey stick relationships between turbulence and mean winds. The most relevant ones are the dependence on the upwind terrain characteristics and the role played by the thermal gradients. I also found the characterization of the different types of intermittent events quite interesting, although it is a bit too simplistic. My main concerns with the paper regard its presentation. In that sense, I have two major suggestions and a few minor ones. I am classifying it as a major review because it may affect the manuscript largely.

MAJOR SUGGESTIONS:

1. I do not think the entire section showing how the IOP cases behave is necessary. Very similar plots are shown in the following section, specially given that one of the wind

directions considered coincides largely with the occurrence of IOP cases. It seems to me that no major conclusions are drawn from the IOP analysis alone. In fact, when reading that initial section of the paper, I was a bit disapointed, because I felt I was just reading an assessment on how the findings of Sun et al. (2012) apply to a different dataset. In the following section, on the other hand, there is novelty, related to the different hockey sticks and their dependence on the upwind terrain characteristics. Why not start with that, then? Moreover, why to keep the analysis on the IOP cases?

2. I would like to see some deeper development on the intermittency analysis. Maybe some statistics on how common each classes are, if they are favores under some type of external condition (large-scale wind direction) and how they affect the thermal structure.

MINOR SUGGESTIONS

3. Page 5, lines 10-12. It is not necessary to tell the rotations you applied to the different sonic data. These are associated to the sonic deployment, which is specific to your experiment;

4. I would drop Fig. 3, for reasosn detailed in point 1, above.

5. Page 12, lines 7-12. This type of explanations belong at the figure caption;

6. Page 12, line 33. It is very difficult to understand what "too deep to calculate the bulk potential temperature difference" means. Usually it is easier to evaluate gradients over deeper layers, as they are larger.

7. Page 14, lines 8-10. This issue can be easily solved by using the thermal gradient dT/dz instead of temperature difference alone.

Please note that although the comments above refer to the IOP analysis (which I suggested being removed from the paper) they also apply to the analysis of the whole dataset, which shows the same types of plots.

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