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***Interactive comment on* “The BLLAST field experiment: Boundary-Layer Late Afternoon and Sunset Turbulence” by M. Lothon et al.**

Anonymous Referee #2

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This paper is an early report on the BLLAST experiment, which is focusing on the afternoon boundary layer transition from unstable to stable. It describes the experimental campaign, its motivation and illustrates the potential of the data with some basic results. Golden days are defined and classified according to characteristic boundary layer behaviour. Although the topic is "late afternoon transition", there is no real scientific analysis yet. The shown material is of illustrative nature.

The paper is not a scientific paper, as it only introduces a scientific issue but does not really analyse it. The introduction of the paper is of interest by itself because it is well written and has a comprehensive review of the literature and a description of what is known and not know about the topic. It is followed by a motivation for the experiment, and a description of the experiment. The preliminary results are also of

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interest because they clearly demonstrate the potential for further research.

The main goal of this paper is to advertise a major experimental campaign. The authors are preparing for modelling studies to interpret the data, but they probably also look for collaboration. Because BLLAST was a major campaign, that produced an important data set, publication is in my view well justified.

The paper can be improved on a few points:

1. It is not very clear why the location near the Pyrenees was selected for the experiment? It is probably due to practical and logistical reasons. The problem with this location is that it consists of complex terrain with height variability and heterogeneous vegetation cover. No doubt it will induce a complex meso-scale flow with its own diurnal cycle which will be difficult to disentangle from the evening transition. Meso-scale and LES models will help but also in these models it will be a challenge to prescribe a boundary condition, that is realistic and does justice to the variability in momentum, heat and moisture fluxes. The current manuscript is glossing over this issue, but it would be good to dedicate more discussion to this point, because I feel that a strategy is needed to handle the effects of meso-scale variability.
2. Fig. 5 is nice, but perhaps not all that informative and therefore not necessary.
3. Fig. 7 is an important figure because it documents the meso-scale variability in surface fluxes. Unfortunately, the figure is too small and the individual lines are impossible to distinguish. Also the legend is difficult to read. I also suggest to have the same stations for all panels (except perhaps e), i.e. have solar radiation and wind also for the other stations.
4. In Fig. 9, the thick black lines can be distinguished from the other lines, but the thick and thin grey lines look too similar.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 10789, 2014.

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