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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Boundary layer dynamics over London, UK, as observed using Doppler lidar" *by* J. F. Barlow et al.

Anonymous Referee #1

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The paper is interesting, but the analysis of the lidar data remains preliminary. The evaluation should be a bit more enhanced for a successful scientific paper.

Major issues:

(1) Features such as time shift between zMH and zAER are mentioned, but not really discussed and explained. Such a feature has already been published in Emeis, S. and K. Schäfer (2006: Remote sensing methods to investigate boundary-layer structures relevant to air pollution in cities. Bound-Lay. Meteorol., 121, 377-385). This time shift hints to a principal problem of optical remote sensing of the PBL structure. It has to be assumed that the aerosol structure has adopted to the thermal PBL structure. This may take some time. This issue deserves more attention in the paper.

(2) The time-scale discussion is not really integrated into the paper, but appears to be attached only loosely. For example, the time-scale analysis could be used to interpret the found time shift between zMH and zAER.

Minor issues:

(3) The reference to the paper Emeis et al. (2008) is incomplete. Please update.

(4) The interpretation given in the fifth paragraph of the conclusions is contradicting the information given in the sixth paragraph of the introduction. Most likely, the interpretation given in the introduction ("regionally formed LLJ") is more correct.

(5) The reference Emeis (2004a) should be complemented by the reference Emeis, S., K. Baumann-Stanzer, M. Piringer, M. Kallistratova, R. Kouznetsov, V. Yushkov (2007: Wind and turbulence in the urban boundary layer – analysis from acoustic remote sensing data and fit to analytical relations. Meteorol. Z., 16, 393-406). This paper contains much more information on remotely sensed wind and turbulence profiles over cities. In addition, the effects of regionally formed LLJ are also mentioned in this paper.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 19901, 2010.