Atmos. Chem. Phys. Discuss., 8, S5863–S5864, 2008
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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Continuous monitoring of the boundary-layer top with lidar" *by* H. Baars et al.

H. Baars et al.

Received and published: 12 August 2008

Please find below our reply (in italic) to the comments of Gert-Jan Steeneveld (in bold):

G- Steeneveld

1. The problems you mention with the critical RI in COSMO can be circumvented using the work of Vogelezang D. H. P., and A. A. M. Holtslag, 1996: Evaluation and model impacts of alternative boundary-layer height formulations. Bound.-Layer Meteor., 81, 2458211;269.

We add some sentences, stating that there alternative approaches, and give the references (Vogelezang and Holtslag, 1996, and Steeneveld et al. 2007). This is done in the COSMO section 3.1

In section 5.4, it is mentioned in addition, that possible reasons for the observed underestimation of the BL top by COSMO and how this problem can be overcome are discussed by Steeneveld et al. (2007).

2. Furthermore the authors could make a remark in the paper on how useful the Polly s for nighttime PBLs. Since the NBL height is even more critical for air quality than the daytime PBL depth. If Polly is also applicable for nighttime, futher verification of the new NBL height proposal in this paper is extremely useful (evaluation of the Zilitinkevich paper you refer to): Steeneveld, G.J., B.J.H. van de Wiel, and A.A.M. Holtslag, 2007: Diagnostic Equations for the Stable Boundary Layer Height: Evaluation and Dimensional Analysis. J. Appl. Meteor. Climatol., 46, 2128211;225.

The goal of the paper is BL detection with lidar. We leave out to discuss the special point of nighttime BL detection. Sorry!

POLLY is a tropospheric aerosol profiler, and is simply not optimized for nighttime BL research.

Ceilometer should allow a good detection of nighttime BL.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 10749, 2008.