

## ***Interactive comment on “Inter-comparison of lidar and ceilometer retrievals for aerosol and Planetary Boundary Layer profiling over Athens, Greece” by G. Tsaknakis et al.***

### **Anonymous Referee #1**

Received and published: 25 January 2011

Review for manuscript “Inter-comparison of lidar and ceilometers retrievals for aerosol and Planetary Boundary Layer profiling over Athens, Greece”.

The interest to the use of ceilometers in the PBL study is growing, and this manuscript presents useful results on intercomparison of aerosol backscattering vertical profiles evaluated with lidar and ceilometer. The paper is well written and can be published after minor revisions.

The specific comments p.77 ln13 “The inner part of the lens is used for the alignment of the instrument and for the laser beam emission, while the outer part is 15 used for the collection and focusing of the backscattered radiation onto the receiver”. The

C13

description of instrument is not very clear. The authors should provide either more information on ceilometers design or give a proper reference.

p.82, ln.5. To compare UV lidar and IR ceilometer backscattering coefficients the authors use extinction Angstrom exponent. However extinction and backscattering Angstrom exponents may differ. Actually backscattering exponent can be taken from AERONET retrievals, if these are available.

The authors use Klett method for calculation of aerosol backscattering. Probably due to low ceilometer signal the choice of the reference point (region with pure molecule scattering) should be a problem. It would be good if authors could make comments about corresponding uncertainties.

Pg.83, ln.25. The comparison with Raymetrics lidar was performed at 355 nm, while in the case of NTUA Raman lidar data are given for 1064 nm. Why different wavelengths were used? Why not to use Raymetrics at 1064 nm?

Backscattering profile from Raman lidar in Fig.7 looks “more smoothed” when ceilometer profile. Did both instruments have the same range resolution?

p.85, ln.24. “An additional uncertainty is introduced by the use of a lidar ratio of 30 sr used by default by the ceilometers..”. Why not use the same lidar ratio for lidar and ceilometer?

Please also note the supplement to this comment:

<http://www.atmos-meas-tech-discuss.net/4/C13/2011/amtd-4-C13-2011-supplement.pdf>

Interactive comment on Atmos. Meas. Tech. Discuss., 4, 73, 2011.

C14