

## ***Interactive comment on “What is the benefit of ceilometers for aerosol remote sensing? An answer from EARLINET” by M. Wiegner et al.***

### **Anonymous Referee #3**

Received and published: 15 April 2014

#### General comments:

The paper "What is the benefit of ceilometers for aerosol remote sensing? An answer from EARLINET" describes general characteristics of optical properties which is obtained from ceilometers. This paper covers wide topics including near field overlap correction, upper limit of measurement, and water vapor absorption. Especially the analysis on the last one is useful to understand the behavior of backscatter profile obtained by ceilometers operated with wavelength of 905 nm. Description in Section 7 seems not comprehensive, but is acceptable if further analysis will be done in some separate papers. So this article is suitable for publication in AMT after minor revision on the issue raised below.

C537

#### Specific Comments and Technical Corrections:

P2500 Eq(7),  $S_m$  is not explained in the text. Beta  $m$  is function of  $z'$ .

P2502 Eqs(10)(11), integration should be done on  $z'$  ( $dz \rightarrow dz'$ ).

P2502 Eq(12), asterisk should be placed just after  $T$ .

P2503 L14, is  $\tau_p$  useful if upper limit of ceilometer is below tropopause?

P2506 L20,  $\beta(p, \text{ref})$  appears without explanation. It should be mentioned at P2505 L29.

P2508 Eq(15), remove ":" after  $F$ .

P2511 L4, range corrected signal is expressed as  $P_r^2$  here, but  $P_z^2$  is appropriate in this paper.  $r$  is repeatedly used as range (P2517 L21, P2518 L25, caption of Fig2).

P2514 Eq(20),  $\ln(P(z)z^2)$  is more appropriate than  $\ln P(z)z^2$  in parenthesis.

P2519 L1, Tough  $\rightarrow$  Though

P2519 L11, indicate vertical resolution (number of layers) because vertical distribution of aerosols is affected by this parameter.

P2520 L18, if authors mention dust forecast, depolarization measurement should be discussed here instead of P2522 L4.

References, remove reverse reference information at the end of each literature (e.g. 2493 at the end of Ansmann et al.)

P2539 Fig10, same as Fig 9.

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Interactive comment on Atmos. Meas. Tech. Discuss., 7, 2491, 2014.

C538