

## ***Interactive comment on “Aerosol profiling using the ceilometer network of the German Meteorological Service” by H. Flentje et al.***

### **Anonymous Referee #2**

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The submitted paper shows the capability of the DWD lidar ceilometer network in aerosol profiling through 3 examples of detection of aerosol in the free troposphere. The topic of ceilometers capability of aerosol detection is a very important and interesting topic. However, the paper does not describe in a quantitative way the limitations of the ceilometers, neither discusses the error of the backscatter profiles related to the different needed assumptions. This paper is only qualitative, simply showing that if there is a sufficient (no quantified) aerosol load above the PBL (up to which altitude?) ceilometers are able to see that layer and if ancillary instruments are available backscatter profiles (and additional info) of a good quality are retrievable. This is really interesting but all these aspects should be reported in a more quantitative way. Authors refer, for a more quantitative description of the ceilometers performances, to the ac-

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tually in discussion paper by Heese et al 2010 b. If performances of the ceilometers are discussed into details in that paper, I do not see any reasons for the publication of this paper, since the ceilometers capability to detect and identify also thin layer is already reported to the scientific community in a paper of the same authors Flentje et al. ACPD( under review for ACP) 2010. For this reason I should not recommend the publication of this paper.

In the following I report also some detailed comments: Pag. 3647 line 20, Pappalardo et al., 2004 discusses Raman retrieval and there is a little of bit of confusion among simply elastic retrieval and elastic/Raman one (so needed LR assumptions). Please try to be more clear in order to avoid confusion Page 3647, line 27: Be careful! You could calibrate your profile using AOD, but the uncertainty on the extinction profile is not only due to the total resulting AOD. For example, you could have two different profiles with the same resulting AOD. In your case the difference would be different LR constant values or profiles. Page 3648 line 10: what happens to the calibration if there is a layer (and therefore an AOD contribution) at upper altitudes where ceilometers SNR is not sufficient? Page 3651: comparison with high power lidar very qualitative, there are no info about difference of geometrical and optical properties of the layers Page 3656: it is not surprising that profiles calibrated by AOD give very close values of AOD! Page 3657: authors state that could be interesting, for enlarging the geographical coverage of high power lidar networks, to transferring their calibration to the ceilometers network. Great! This is a good point! Why is it not discussed at all here?

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Interactive comment on Atmos. Meas. Tech. Discuss., 3, 3643, 2010.

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