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## ***Interactive comment on “Modelling and assimilation of lidar signals over Greater Paris during the MEGAPOLI summer campaign” by Y. Wang et al.***

### **Anonymous Referee #2**

Received and published: 25 November 2013

General Comments: This paper investigates the ability of the POLAIR3D CTM model to simulate lidar aerosol backscatter profiles from model aerosol concentration outputs. The paper presents original ideas and can be published after corrections have been made.

Specific Comments: 1) I fully agree with points A, B and D, presented on 25 November 2013, by Anonymous Referee #1. 2) Several citations of the paper are too old or missing and need to be updated. 3) AOD should be given the meaning of these initials. However, AOT should be replaced by AOD everywhere in the paper. 4) Page 6, L176-177. It is completely unclear how the aerosol water content is calculated. What

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are the input values to ISORROPIA to do this calculation? Is ISORROPIA I or II used. In any case, more recent citations to ISORROPIA (by Nenes et al., and Fountoukis et al.) should be provided. 5) Page 7, L199. Explain why lidar signals at higher levels are attached to higher uncertainties. 6) Page 9, L277. Replace "boundary layer" by "Planetary Boundary Layer (PBL)". 7) Provide geogr. coordinates for all stations examined (lat., long., height a.s.l.) as well as do not use capital letters for stations names. 8) To my opinion the correlation between measured and simulated signals are not successful, especially for certain days (without DA). When DA is used, then things are better (in most cases). Authors should apply DA techniques to all simulations shown in this paper and extract conclusions. 9) Abstract needs to be more specific and less general. Correlation coefficients calculated \*without and with DA) should be discussed. 10) Units should be provided in all figures (Y-axis in "m"). All X-axis should read "Lidar signal  $\times 10^3$ ". 11) Table 3 should also contain units (Obs. mean, Sim. mean and RMSE in  $\mu\text{g}/\text{m}^3$ ). More details are given in the attached annotated manuscript). 12) Provide an additional figure, as Fig.1 showing the methodology of the paper (methodology-input-output). 13) The dotline of PR2 signals in all figures, should be less bold, to show better the existing signal variations.

Please also note the supplement to this comment:

<http://www.atmos-chem-phys-discuss.net/13/C9408/2013/acpd-13-C9408-2013-supplement.pdf>

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 27115, 2013.

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