**Atmospheric
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Discussions

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Interactive comment on "Polly^{NET}: a global network of automated Raman-polarization lidars for continuous aerosol profiling" *by* H. Baars et al.

Anonymous Referee #1

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The present paper describes the PollyNET performance on many campaigns for continuous aerosol profiling. There is a significative overall performance of these system and a criterious description on the dataset filtering aiming to provide good quality data.

However I would like to see not only the system performance but also scientific results based on the observations, just mentioning typical and/or extraordinary aerosol optical properties is not sufficient in a journal as ACP. I strongly suggest a new section describing what WAS the current knowledge before the measuring campaign in each site and what became clear or new insights after Polly performed the measurements.

Other aspects is the timespan covered and the increase of performance of the Polly system. I believe that all improvements in hardware and software were incrementally

added to the system but is somehow hard to follow which dataset had which improvement. In other words how the dataset and system setting were when a campaign was carried on in Manaus, for instance and which settings were present in Evora, at the present paper format is hard to follow.

Other points to consider are before publishing this paper are:

1. In the abstract the authors mention 532 nm measurements, but in the text 355 nm, 532 nmand 1064 nm were mentioned to be performed I believe an unified information should be given.

2. In the text the limitations of other networks are limited in technical aspects and PollyNEt claims to be the unique network to solve these flaws. I think this statement is too bold and scientifically not useful since each newtork has its own advantages and disavantages but all together are meaningful both in TIME and SPACE since PollyNet would need to provide about 200 stations such as the AERONET stations in the globe to be the ultimate lidar network.

3. Also there are many improvements in the Pollynet development were initiated whithin EARLINET protocol and good practice enviroment and despite the citations in the text more proper credit should be given.

4. The data quality and data processing are known to be very carefully and with many details being taken into account however the way this paper is structured it looks more like a log book with their highlights given and a statistical approach should be give an aerosol typing in the way CALIOP/CALIPSO teams make should be performed otherwise the informations provided in this paper seem scattared without a BIG SCENARIO description should be given. Let us take the example of the greek site which is an ongoing project and take figure 6. What kind of information can be extracted from these plots ? For the lidar community

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perhaps it is useful but in the atmospheric science I see little contribution in this form of presenting the data.

5. Table 1 and Table 2 are very useful but need to be more carefully presented. For example 5 ± 0.6 is not a good way of showing with the correct number of digits: either 5 ± 1 or 5.0 ± 0.6 please correct this and other cases in this table.

6. What about uncertainties in the plots and in the results presented ? It is true that this is not straightfoward task however which improvements have been achieved along the Polly system development in the data SNR and corresponding effects on the optical parameters obtained throughout the data inversion process.

7. In the appendix A - Buchholtz 1995 is out of date there are more recent publications worth mentioning e.g. 10.1364/AO.51.002135. In equation A1 correct the superscript β^{attn} to β^{att} .

8. Equation A10 has the indexes z_{ref} and z_{test} but there is no subscript in the variables ? Is that correct ?

9. Please rewrite equation A11 - if Δz_{test} is a variable of function X it should be explicitly shown or given in other relation on the right of the equation (A11).

10. Aren't error bars needed in plot 5 ?

11. Finally, given the number and many affiliations in the author list. It is worth mentioning in which degree each group contributed to the knowlegde acquired in the system deployment and/or data analysis and performance and scientific goals achieved by each group clearly stating so.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 27943, 2015.