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Atmospheric Chemistry and Physics Discussions

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

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General comment

The manuscript presents the Polly lidar network, PollyNET. The paper presents an overview of the capabilities of the Polly lidar, describing the technical features and the automatic processing procedure developed for the network. It also presents a review of results, presented in previous publications based on the use of Polly lidar, and illustrates the automatic processing, using a study case. New results of the network are presented focusing on the analyses of the data gathered at different places. The variety of geographical location is used to offer a broad overview of the vertical structure of the aerosol in different regions, although using only graphical information on the visible channel, 532 nm. More detailed information is obtained from places with long-term monitoring, offering a seasonal characterization of the aerosol vertical profile.

The paper is well written and presents useful information on aerosol vertical profiling. The paper has enough quality and it is suitable for publication, after reviewing some aspects reflected in the detailed comments. Anyway, for the reasons I explain more in deep bellow, I think that the paper is more appropriate for Atmospheric Measurement Technology.

Detailed comments

Presenting details on the instrumental features and the processing applied in a lidar network is interesting to the atmospheric community. In this sense, the manuscript offers a really interesting overview of the automatic procedures applied in the network for the processing of elastic and Raman signals. Particularly, the Appendix included in the manuscript in really useful for lidar researchers. Nevertheless, this emphasis on methodological aspects suggests that the manuscript would be more appropriate for Atmospheric Measurement Technologies.

In section 2, after offering a short list of details on the first Polly system the authors include detailed information on the most recent version of Polly. Nevertheless, the results summarized in section 3 and the rest of analyses presented in the manuscript have been obtained with different versions of the system. In this sense, it is necessary to specify in Figure 1 the different versions of the system used in each place, specially indicating where are deployed the systems of the new configuration. Furthermore, considering the evolution of the Polly system along the last 10 years the authors must be careful with statements like the following, included in the abstract: "All Polly lidars feature a standardized instrument design and apply unified calibration, quality control, and data analysis."

In section 3 the authors include a summary of previous results, presented in previous publications. This section must be merged with the analyses presented in section 6, supporting the results presented in this section with the results of particular studies developed in the different regions. In some sense, this would reinforce section 6, justi-

fying some of the statements that are difficult to support only based on the analyses of the profiles of the backscatter coefficient at 532nm. That is, the information gained in previous studies on the aerosol properties analyzing multiespectral optical properties, will support better the discussion in section 6, if merged appropriately.

It is a pity that only section 5 offers an insight on the multiespectral and polarization capabilities of the system, but only at a place and applying it to a study case. It would be worthy to have some results that illustrate the whole capacity of the system at the network level, or at least covering the study case in various stations. Some discussion on this limitation of the manuscript is needed, especially considering that the manuscript is devoted to the network.

The way section 6 has been developed is appropriate to show the general overview of results in different regions, but seems too poor after showing all the capabilities of the more advanced version of the Polly system. In the end, it seems that only the information on 532 nm is available for a global analysis of the network data.

Some formal questions are concerned with the size of diagrams shown in figures 6, 7. They are too small. This kind of representation would be useful to offer a broad overview but it would be worthy to organize these figures in panels with larger diagrams, although this would require splitting them in several figures (panels). This will allow following the discussion more easily.

As I stated before, Appendix A is really worthy. Nevertheless, concerning the overlap treatment I expected some indications on how to use the new Poly design that includes near field measurements in 1 elastic and 1 Raman channel.

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