

Interactive comment on “The RAMNI airborne lidar for cloud and aerosol research” by F. Cairo et al.

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In the following, the reviewers' comments have been reported and answers are specifically provided. Additions to the manuscript have been reported and tagged with respect to the corresponding (page/line) on the previous discussion paper, when possible. Changes to the manuscripts to not limit to those hereby reported. The new version of the manuscript is attached.

Reviewer: The paper in question has some very nice results and shows very interesting aspects of the hardware employed to render this type of experiment. As mentioned by other referee the paper lacks some language and typing revision which somehow impairs the paper quality, without a proper revision the paper might not be published. In my opinion this paper could be split into two, one devoted to the hardware and software

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analysis/processing itself, the other to the validation (case studies) results. Following that reasoning in some parts of the paper more details on the hardware could be given as in the Receiver and Transmitter sections specially describing in more details the optics employed in the system setup. In the error analysis on the other hand there is an little excess of information which should be somehow taken for granted considering the reader background and the results and formulas used could be invoked before in the paper as most of it is based on the paper by Russell et al. Concerning the data merging (gluing) some information should be given on the data sampling range in which this process is valid. Figure 1 tells you part of the story but there might other issues when this procedure should be carried on.

Authors: The text has been thoughtfully revised. The description of the optics layout has been slightly expanded. The Uncertainty Analysis has been placed after the Data Processing paragraph and completely reformulated, giving more space to the computation of uncertainties to be attributed to backscatter and depolarization coefficients for the data presented. A better description of the data merging procedure is a point also raised by the second referee. Please refer to our answer to him. In the rewriting, we have tried to meet the reviewer's suggestion to separate the hardware/software description from the presentation of the data, but we are willing to keep them both in a single manuscript, whose main aim is the presentation of a new airborne instrument, unique in our national community. Figures have been re-edited and their quality is improved.

Questions and Remarks: Reviewer: 1-One question I had is if the data are automatically or manually processed ? Authors: The data are manually processed, since a visual inspection and assessment of the region to be used for the Rayleigh calibration is needed. The following sentence has been added to the text (1264/22): " The data processing is done manually, immediately after the end of the measurement session, with an originally implemented software code. Quality checked data can be delivered after one hour from the measurement."

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Reviewer: 2-In Fig 3. the color bar scale does not have a correspondence for the brown (?) patches in the plot. Authors: Fig. 3 has been redrawn with the color scale matching the depolarization value range.

Reviewer: 3-Was not a sunphotometer available in the region for matching the AOD, instead of MODIS ? Authors: We are not aware of any sunphotometric measurement available in proximity of the volcanic cloud, at the time of our measurement.

Reviewer: 4-Overall all plots should use the same height scale (0 - 6 km) Authors: Done. A common altitude range (0-12 km as some volcanic ashes were expected at that range) has been adopted for all plots,

Reviewer: 5- In equation 1 what is sdiv ? Authors: In the text (1257/4) we have expanded the acronym half divergence (sdiv).

Reviewer: 6 - What expansion factor was used ? Authors: In the text (1257/4) we have stated that the beam expander factor is 7.

Reviewer: 7 - For the backscattering and extinction coefficients I would avoid using Mm^{-1} and $10^{-3} km^{-1}$. Either choose one or the other. Authors: We conformed to $10^{-3} km^{-1}$.

Please also note the supplement to this comment:

<http://www.atmos-meas-tech-discuss.net/5/C1104/2012/amtd-5-C1104-2012-supplement.pdf>

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 1253, 2012.

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