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www.atmos-meas-tech-discuss.net/5/C3701/2013/

Atmospheric Measurement Techniques Discussions

Interactive comment on "Developing a portable, autonomous aerosol backscatter lidar for network or remote operations" *by* K. B. Strawbridge

Anonymous Referee #1

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Review of Atmos. Meas. Tech. Discuss., 5, 8609–8652, 2012 Developing a portable, autonomous aerosol backscatter lidar for network or remote operations by K. B. Strawbridge

This manuscript describes the logistical and technical setup of six similar, autonomous and continuously measuring lidar systems. The systems are distributed over the whole width of Canada. Together they form a network which enables to monitor the long range transport of aerosol clouds from local and remote sources. A brief example is given to illustrate this capability.

The descriptions of the technical details of the lidar systems and of the logistical problems and solutions for running them continuously and unattended are necessary as a

reference and for the interpretation of later published data from this network. Furthermore they contain valuable information for a planner of other lidar networks. In this view the paper is appropriate for the publication in AMT as an introduction to the CORELNet systems, like the first chapter in a longer paper.

Some necessarily short descriptions in this introduction should be expanded and deepened in the follow-up papers, but could also (don't have to) be included in this paper . For example, the determination of the calibration constants (p.8623) and their test with the colour ratio, as well as the the calibration of the linear depolarisation ratio (same page), should be explained in detail, maybe with examples, including the uncertainties of the calibrations.

Furthermore, the use of the the US Standard Atmosphere or similar for lidar calibrations introduces errors due to differences to the actual conditions during the lidar measurements. A much better choice is to use modelled temps for the actual time and place (see e.g. http://rucsoundings.noaa.gov/).

Things which should be corrected in this paper are:

The S ratio must be introduced.

p8629 line 2: Figure 10 => correct: Figure 7 line 7: The polarizations vary... => correct: The volume linear depolarization ratios vary...

p8631 line 2 ff, and p8632 line 9ff

As Hysplit trajectories are only shown for one arrival point in time and height, interpretations concerning the lower cloud/plume mixing seem to be speculations. If available, additional information should be provided or mentioned at least to support the conclusions, else the speculations should be skipped.

Figure 8: images too small

p 8632 line 11 ff "One should also note that the back trajectories shown in Fig. 10,

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indicated that the main transport was just south of the CORALNet UBC and CORALNet BLO sites, yielding smaller backscatter coeïňČcients at these sites, likely due to being on the periphery of the plume."

First: trajectories are not that accurate, and 2nd, the original source parameters (location, duration, intensity) of the fire plume and hence the whole spread and its variation in time and space are unknown (not shown), which, to my opinion, doesn't allow such detailed interpretations.

p 8632 line 15 ff "Not surprisingly the plume on 24 June is not visible in the standard CALIPSO (Cloud- Aerosol Lidar and Infrared PathïňĄnder Satellite Observations) satellite lidar total attenuated backscatter plot (not shown here)" => provide a link to CALIPSO data

p 8632 line 17ff "However, once the 80 km horizontal average products are analysed, the CALIPSO vertical feature mask and aerosol subtype algorithms correctly identiïňĄes the aerosol plume aloft as smoke at the same ..." => provide a link and references for CALIPSO data and algorithms.

Fig. 12 Plots are too small, bad resolution. Provide source reference.

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 8609, 2012.