Atmospheric
Measurement
Techniques

Discussions

Interactive comment on "A generalised background correction algorithm for a Halo Doppler lidar and its application to data from Finland" *by* A. J. Manninen et al.

Anonymous Referee #1

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From my point of view, the paper constitutes an important contribution to all users of the widespread Streamline Doppler lidar system. It is of importance for this large community to be able to cope with the presented arbitrary background-effects. The algorithm that is proposed in this paper is pragmatic and can be used to correct historic datasets. It is of great advantage that the software is provided together with the paper. The article should be published in AMT together with the provided software. However, listed below, are some remarks about the paper that should be incorporated before publication. Comments marked with an asterisk (*) are considered major points.

1*) Perhaps the most important issue: What is the general aspect of the problem? Are

you only correcting errors in the Doppler lidars data acquisition software (which would be actually the task of the manufacturer) or are there general benefits for atmospheric research? Could, e.g., the proposed cloud mask be used in combination with other instruments to improve cloud detection in general?

2*) One thing does not become completely clear from beginning: Does the correction method reduce the time or height resolution of the dataset? Is, e.g., Doppler velocity still available on the original time and height grid after the correction has been applied?

3.) Some technical notes about the provided software: - Please specify with what version of Matlab the program can be run - Could You provide also a short atmospheric measurement and a ready-to-run example program that invokes the correction method? That would greatly enhance the usability of the software.

4.) Please specify - Is the noise-jump a general feature of Doppler lidars? - Are there any plans to incorporate the solution into the standard software of the instrument? - Is there a statement of the manufacturer about the noise problem? - In the paper, there is little insight into the origin of the bias. Is it temperature dependent? Looks like a thermal oscillation over time? What does the manufacturer say to this error?

Line-by-line critics:

Formulas (1) and (2): These relations can not be considered to be common knowledge. How can these formulas be derived? (A citation should be sufficient)

p. 11140 l.5: "from studying the variation in velocities": This is too general. Please explain what kind of "velocities" we are looking at.

p. 11141 l.13 "represent a cost-effective solution". There is a certain issue here: If You really want to mention "cost-effective", then You have to put it into context. An ultrasound anemometer can also measure wind and is even more cost effective. Do not concentrate on the financial aspect so much, better put forward the advantages of Doppler lidars against other wind-measuring instruments!

p. 11142 l.6. "The instrument is configured to cover a range from 90 to 9600m with 30m resolution": Better would be: "In the context of this work the instrument has been configured to cover..." (or similar)

p.11144 l.5: Please be careful with the word "trivial". The time of a background measurement might be known, but it still has to be checked if a jump in SNR has actually happened.

p.11143 l.4 "Since software version 10" is a little bit general... What if there are any changes in future software versions? If the error discussed in this paper is so limiting ("this threshold places a severe restriction on data availability") should it not immediately be implemented in the next software version?

p.11144 l.25: What is Cook's distance? Please insert the Citation (Cook, 1982) already here.

p.11152 l.8. One "=" too much

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