
Interactive comment on “Effective resolution concepts for lidar observations”

By M. Iarlori et al.

Anonymous Referee #1

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Review of “Effective Resolution concepts for Lidar Observations” by Marco Iarlori, Fabio

Madonna, Vincenzo Rizi, Thomas Trickl and Aldo Amodeo Paper ID: amt-2015-89.

The authors thank the reviewer#1 for his/her suggestion and comments. Please see the authors' response to rev#2 for more details.

Reviewer comment: (...)However, there is excessive detail presented in the discussion of these filters which makes this paper difficult to read and too long. Rather than focus on the details of the SG and Gaussian filters for example, the authors could instead focus on the methodologies and recommendations for determining the effective resolution of the filters applied to lidar data processing. I would expect that the majority of AMT readers would appreciate a more condensed version of this paper with a more concise description of how to determine effective resolution of these filters, and the attributes of these filters, and would have less interest in detailed descriptions of these filters and all of their attributes. The authors could direct the readers to relevant literature to learn more details of these filters.

The discussion on SG based filters is due to their wide use in the lidar community and the Gaussian filter is presented as one of the valid alternative especially for its stop-band characteristic. For this reason and also to give operative examples on how the proposed methodologies work, we supply details/recommendation on these filters. In addition, we think that the methodologies presented in the paper for the Effective Resolution estimation are general enough to be applicable to others low pass filters. The Noise Reduction Ratio (NRR) criterion gives a general expression for the Effective Resolution estimation and a reasonable general expression is provided using the cut-off frequency analysis also for the Rayleigh criterion.

Reviewer comment: It would be beneficial to lidar researchers if the paper would provide references to other papers in this area that have examined the retrieval of aerosol extinction from such lidars and the errors associated with these retrievals. It would be worth discussing for example the papers of Whiteman (1999), Shcherbakov (2007), Pornsawad et al., etc. (2012) in the context of vertical resolution.

These papers are considered and cited in the new version of the manuscript.

Reviewer comment: The paper would benefit from a discussion of cases where the lidar data are processed such that the vertical resolution varies with range or altitude. In this case, the smoothing filter properties would have to change with altitude.

See the answer to rev#2, point (5) of “Major comments” section.

Reviewer comment: The paper is not particularly well written and so was difficult to read. The grammar, sentence, and paragraph construction needs to be improved. Many of these sentences are very long and

difficult to follow. I recommend a major revision whereby the paper focuses less on the details of the particular filters, and more on the methodology of what filters to apply and how to apply these filters.

Manuscript readability has been increased also by moving some contents in Appendix and the English is improved.