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Interactive comment on "Proposed standardized definitions for vertical resolution and uncertainty in the NDACC lidar ozone and temperature algorithms – Part 1: Vertical resolution" *by* Thierry Leblanc et al.

Anonymous Referee #1

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Overall: This is a well-written and thorough manuscript for standardizing the definitions of vertical resolution throughout an important measurement community (NDACC). It is clear the authors have invested a significant amount of effort in putting this manuscript together in a logical manner and have cited an adequate amount of previous literature. Two standardized definitions (FIR and cut off frequency) describing homogeneously and unequivocally the impact of vertical filtering are recommended. Although the mathematics may be get involved at times, it provides the reader with a concise document (particularly section 4)) to reference in the future. This will overall lead for more completeness and transparency within the NDACC archive.

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The following are technical suggestions/clarifications that may improve readability, although they are not critical. Technical Suggestions:

P2L14- Are these final impacts largely affecting absolute concentration? uncertainty? Quality of the data?

P3L43 – This appears to be the first use of full-width half maximum. Define acronym FWHM here and use throughout.

P2L10 – Vertical filtering may also be chosen in order to capture the vertical scale of some geophysical process. (e.g. stratospheric intrusion/gravity waves). It may be useful to use a "real life" example of a geophysical feature that was smoothed different ways and the resultant differences (as opposed to a random signal) in Figure 1.

P2L20 – Are there any citable references from the TOLNet/Gruan efforts?

P2L35 – Python (sp)

P3L15 – remove or reword "the simplest kind of digital filters"

P6L19 – Sentence starting with "It is more abstract.." needs to be reworded

P6L28 – is radian.bin the appropriate unit? Is the "'." Necessary?

P7L19 – remove tab/carriage return here

P7L25 – for completeness, generally define c_o

P8L2 - gain of the filter is already defined

P8L5 – Transition to discussing z(k), it may be helpful to define equation 19 in terms of z(k)

P8L10 – perhaps there is a better way than saying "smoothing by ns" in the title here. "Smoothing via the transfer function"

P8L26 – Reword this sentence starting with "We recognize. . ." – do you recognize the

coefficients?

P9L20/25 – remove wiggles and use ripples throughout the section

P11L13 -remove carriage return

P11L23 remove for prior to e.g.

Section 3 – perhaps a bulleted list of the instruments would help organize this section. In the current state there are some sentences that may need reworded (P12L20). It's important for the audience to understand why this standardization is so important (i.e. it looks like there are many variations on archived data and unifying them will help the community as a whole).

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