

Interactive comment on “Validation of remotely sensed profiles of atmospheric state variables: strategies and terminology” by T. von Clarmann

Anonymous Referee #1

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1 General Comments

This paper constitutes a nice and detailed overview and classification of terminology and methods to be implemented for the validation of remotely sensed profiles. It will certainly prove to be very valuable to all investigators in charge of such validations. I would thus recommend its acceptance for publication as a technical note in ACP, after the minor comments listed below are addressed by the author.

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2 Specific Comments

- p. 4974, l.17-21: To me, validation is first the characterisation of all systematic and random errors of a measurement... then, by necessity, it amounts to the statistical analysis of the differences with other instruments. But the primary goal should be stated somewhere... also, if the process implies that validated instruments are used as references for new validation, the validation process shall also include a step in which bias causes are identified and removed, and iteration of the whole cycle until no detectable bias is contained in the new measurements anymore... (as stated later on in the text, indeed).

- p. 4976, eq (6): we are missing the contribution from the smoothing error here. One common way of writing up things is $S_{tot} = S_{sys} + S_{var} + S_A$, where S_A is the smoothing error. In case S_A was already included in one of the other two components in the author's view, then this should be noted somewhere.

- p. 4976, eq. (7-9): consistently with the above point, we would then have $\sigma_{tot}^2 = a^2 + s^2$, where s is the smoothing error component.

- p. 4977, l. 1-2: "to suggest a bias correction": also to eliminate its cause...

- p. 4977, eq. (11): what is S_{coinc} and how is it calculated? Any reference making use of this term? Please explain it better and mention that it is an addition to the Rogers and Connor formula.

- p. 4977, eq. (12): I do not understand this equation. How is C_{total} calculated?

- p. 4978,, l.3-6: the comment in () is confusing, as the term "mismatch" is used again a few lines later. Might be better to remove as not essential to the understanding of the paper.

- p. 4978, l. 15-19: this sentence is somewhat confusing. Might be better to write: "Whenever the mismatch is large enough for differences in the functional dependence

to be important, or when the mismatch is large enough for nonlinear differences to become important, then the functional term...".

- p. 4978, eq. (13): wouldn't it be simpler to write $x_{ref} = x_{uncorr} + M(d_{val}, d_{ref})$, where M is a function of the distance between d_{val} and d_{ref} ? Why has the indicated special form been chosen?

- p. 4978, l. 23: "residual random term": ... which one? That of the quantity distribution? Let's name the last one S_{distr}^{ast} . Is it also right to assume then that S_{coinc} in (11) is S_{distr}^{ast} ? If yes, might wish to mention this here.

- p. 4982, eq. (20): more generally, one should rather write $x_r = x_a + A_{hor}(x_r - x_a)$...

3 Technical Corrections

- p. 4975, l.9: replace "expection" by "expectation"

- p. 4976, l. 10-11: notation unclear, maybe put the indexes (n,n) in ()?

- p. 4982, l. 2: replace " x_r " with " \hat{x}_r "

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 4973, 2006.

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