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Atmospheric Measurement Techniques Discussions

Interactive comment on "Temperature profiles with bi-static Doppler-RASS and their accuracy" *by* B. Hennemuth et al.

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Overall comments:

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This paper deals with the temperature profile estimate with the bi-static Doppler-RASS method. In particular, it addresses the range dependant scattering angle correction with the Kon approach and proposes an improved scheme based on an empirical effective antenna aperture parameter. Then, it describes application results in different measuring conditions.

This paper is generally well written and easy to read. It offers some interesting new developments but aught to be somewhat lightly review to make a more significant impact.

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Content related remarks that need to be addressed:

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Section 4.2: You select an effective radius of 0.8 which is said (in the abstract) to be empirically defined. How did you end up with this value rather than any other arbitrary one (obviously below 1.0). You should show the corresponding sensitivity study that brings you to make that choice, or at least describe the reasoning that made you select this value, knowing that it might be difficult perform comparisons with "true" measurements of the temperature profiles to provide support. Likewise, the comment regarding Fig 4 that "the corrected profiles appear to fit the near surface profiles better" is slightly overstated. That is not visually obvious. Finally, your argument regarding Fig 6 which justifies the Kon method correction as physically reasonable does not validate the possible height range for this correction.

Section 5: These are interesting case studies and descriptions... However, how do they support the improvement in the retrieved temperature profiles by using your proposed method. What is the benefit of the Kon corrected RASS estimate in these studies. It seems to me that the trends described here (and the conclusions provided) would certainly have been the same with UN-corrected RASS profiles! Thus, this is not exactly a validation of the new method. Without demonstration of benefit of method, case studies are not the object of the article

Conclusions: Again, "empirical tuning" and "optimal value" need to be developed and demonstrated before.

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Detailed remarks:

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Abstract, L.4: “effective” or “equivalent” rather than “efficient”.

P2, L13-14: “Typically, these systems. . .”

P2, end o fpage, you might want to provide references for Equ.(1) and for the Ts / Tv relationship.

P3: Add “ , hence” just before equation (5)

P4, L4: “according to” or “following”

P5, L1: “according to”

P5, L16: “by Kon (1981) provides a maximum”

P5, L25-27: “a robust validation”. . . “which enable a plausible examination” (?)

P5, L39-40: respect the order between “more negative and near zero” with “unstable and neutral straticfication” respectively

P6, L10: “according to Kon (1981) as being physically”

P6, L13: “supplementary”

P6, L16: “evolution within the”

P6, L25: “very stable condition”

P7, L20-21: “heights, where . . . dominates, the local”

1st reference: “. . . profiler and RASS . . .”

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 1075, 2012.