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Atmospheric Measurement Techniques Discussions

Interactive comment on "0.355 µm direct detection wind lidar under testing during a field campaign in consideration of ESA's ADM-Aeolus Mission" *by* S. Lolli et al.

Anonymous Referee #1

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General Comments : The paper's topic is little unusual, as it reports results of a field campaign conducted 14 years ago. However, the paper presents an interesting and relevant scientific work in the context of ADM/Aeolus wind lidar concept validation. To my mind, it is relevant for publication in AMTD. Intercomparisons between several instruments with various resolutions and operation constrains are always challenging, and such studies are worth being published. The paper is well written and structured. The abstract could be more precise (see specific comments).

My main comment concerns the analysis method. Two criteria, the CC and RMSE, are introduced to quantify similarities/discrepancies between the various instruments

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results. Values are obtained, and it is concluded that the agreement is good, but the reader may wonder : - what is the significance (statistically) of the computed CC and RMSE values : it is said that at least 20 points are used, but a limit of 20 appears quite low to get an unbiased estimation of CC/RMSE. - what are the threshold values that CC and RMSE values are desired to overcome in order to conclude that the agreement is "good". To my mind, the analysis would gain in clarity if these questions were adressed with more details.

Specific comments Abstract The abstract could more specifically introduce what is reported in the paper, perhaps by including parts of the 2nd paragraph of section 1 page 4554

Section 1 Direct detection wind lidar do not all employ Double-Fabry-Perot etalons as suggested here. Systems employing Mach-Zehnder or Michelson interferometers, or iodine notch filters are also employed. "Atmospheric particle loading has been questioned" : To the author's knowledge, did any study finally evidence the non-suitability of the particle loading for ADM-Aeolus ?

Section 4 The significance of the computed CC and RMSE coefficients would be worthwhile to discuss.

Conclusion It is said that the agreement is "good" between 0.355 μm lidar and radiosoundings, with a 0.78 average CC value and 3.67 m/s average bias. It would be nice if the author could explain, with respect to the pursued scientific objectif, why these CC and bias values can be considered as "good".

Tables in Table 2, the precision of the 10.6 μm heterodyne lidar is written to be 0.4 m/s. The corresponding altitude should be mentionned, since it is unlikely that such performance is obtained all along the 1.5-12 km range

Figures Fig.2 is very blurry and should be improved

Technical corrections Section 1 : Acronym for WMO should be mentionned at first oc-

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curence. The brillouin part of the Rayleigh Brillouin spectrum involves acoustic effects, not only the thermal distribution. Section 3 : Typing error at the end of the HDL section : line of sight. Section 5.1 Typing error: "the balloon can drifted" is uncorrect

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Interactive comment on Atmos. Meas. Tech. Discuss., 6, 4551, 2013.