

Atmos. Meas. Tech. Discuss., referee comment RC2
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Reply on AC1

Anonymous Referee #1

Referee comment on "Exploiting Aeolus level-2b winds to better characterize atmospheric motion vector bias and uncertainty" by Katherine E. Lukens et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-277-RC2>, 2021

Question 1 from you:

Because we are comparing the AMV and Aeolus HLOS_V, a scalar quantity, our statistics can only be analogs of the standard one. We plan to state that and include the formulae for all the statistics used in an appendix. Will this be satisfactory?

> Yes; this will be completely satisfactory. This will be useful for anybody reading the paper.

Question 2 from you:

We have coined this term to define a specific definition of "bias", which we feel is used in many different ways in various contexts. Would you suggest we replace MCD everywhere with "mean collocation difference"?

> No, I just simply want that you relate both elements: the name "mean collocation difference" with the abbreviation MCD the first time you use it, and that you define the corresponding formula. Once you have done this for the first occasion, you can use MCD in the rest of the text.

Question 3 from you; asking about including the text:

"To increase the size of our collocation data set, we compared all types of AMVs to both Rayleigh-clear and Mie-cloudy winds. We excluded Rayleigh-cloudy and Mie-clear winds as they are not yet recommended for use by ESA. In addition, we do not show results from WVclear AMV collocations with Mie-cloudy winds as correlations for this category of collocations are poor and the sample size is small, and this result may be unreliable. With a larger data set it might be possible to compare Rayleigh-clear and Mie-cloudy winds to clear and cloudy AMVs only, respectively."

> This sentence is better, but I think it still misses some indication to the fact that wind observations obtained from clear air and cloud AMVs do not behave exactly in a similar way. For example, it is a recognized fact inside the AMV community that time scales of

winds related to clear air AMVs are longer (30-60 minutes) than the time scales of winds related to cloud AMVs (10-15 minutes), and this is enough so that show some differences.