Atmospheric Measurement Techniques Discussions

Atmos. Meas. Tech. Discuss., referee comment RC2
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Comment on amt-2022-96

Anonymous Referee #2

Referee comment on "The DataHawk2 uncrewed aircraft system for atmospheric research" by Jonathan Hamilton et al., Atmos. Meas. Tech. Discuss., https://doi.org/10.5194/amt-2022-96-RC2, 2022

The paper deals with describing the uncrewed aircraft system DataHaw2 capabilities for atmospheric studies. The focus is on atmospheric variables such as temperature, pressure and wind profiles, and ultimately provides data related with atmospheric turbulence. The topic is of great interest for atmospheric sciences and therefore suitable for publication in Atmospheric Measurement Techniques. The paper is well written and structured. A lot of details are given about the airplane, including instrument developments and deployments.

However, I have a major concern before recommending its publication in Atmospheric Measurement Techniques and is about the result sections: In its current form, many details are given about the flights performed in different campaigns, but there are no discussions of study cases that show the potential in the airplanes. Only a few graphs are given, but without discussions and even with no appropriate description of the variables represented. Such discussion must include results about atmospheric measurement/topics. Therefore, result section need to be improved

My second point is not a concern. Indeed is a general comment that I would like the authors answer and if possible mention in the manuscript. Uncrewed aircrafts have a tremendous potential for atmospheric studies. However, there are many governmental limitations for flight operations, and that also varies with countries. Could the author provide their feedbacks about that and how to deal with it?

I also have some minor concerns that I believe must be addressed:

Introduction: I generally miss references in the Introduction section. For example, there are no references from line 30 to 40.

Lines 60 – 61: I do not understand how the compositions of the atmosphere affect the uncertainties in remote sensing measurements

Lines 62 – 63: Dial and Raman lidar for water vapor do not need particle backscattering. Please correct.

Lines 80 – 85: I would highlight the potential for studying spatial variability of atmospheric variables.

Line 93: After reading the manuscript, I did not find any instrument deployed in DataHaw2 for aerosol-cloud interactions. Is there a plan to install miniaturized instruments for that?

Lines 160 – 170: I am confused. Is there a final version of DataHaw2 commercially available? What would be the final cost?

Scientific Payload: I think that summarizing everything in a Table could make the paper easier to read.

Instrument Performance can be divided in several sub-sections to make the manuscript easier to read.

Figura 4 needs further explanation. I do not understand 'frequency' in Figure 4b

Section 4 ' Previous deployments and Scientific study cases': I think that a table summarizing all the campaigns and with the main flights characteristics and objectives could serve as a good illustration. Are data of the different campaigns free available? See also my main concern about the results section

Conclusions: I think this section need to be re-written. Authors focus more on negative points than in main achievements.