



EGUsphere, referee comment RC2
<https://doi.org/10.5194/egusphere-2022-217-RC2>, 2022
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Comment on egusphere-2022-217

Anonymous Referee #2

Referee comment on "Drone-towed controlled-source electromagnetic (CSEM) system for near-surface geophysical prospecting: on instrument noise, temperature drift, transmission frequency, and survey set-up" by Tobias Bjerg Vilhelmsen and Arne Døssing, EGU sphere, <https://doi.org/10.5194/egusphere-2022-217-RC2>, 2022

In its present form the paper introduces the methodology of using a CSEM system from a UAV/drone. It covers a number of different configuration settings and presents the collected data along with identification on system performance due to instrument noise, temperature drift, transmission frequency and overall survey setup. The paper has value to future users of UAV flown CSEM systems as well as the community that uses this data. In time UAV will start to be the platform of choice and such CSEM systems will overcome the observed effects on data quality to a level that the science and industry communities can trust the data as much as their current methods. Also the paper gives a good basis for future research and development of UAV CSEM platforms. In conclusion this paper would be beneficial to the research community and clearly the sensors once fully developed have clear potential to be used for geophysics on a regular basis.

None the less the paper in its present form could be improved greatly and be of greater value to the community, though this will involve reasonably extensive restructuring and addition prior to publishing. I detail below the main issues:

- The paper is very method heavy and at points repetitive, I would like to see more focus on the comparison of the data collected against either a baseline data set or data collected in the conventional way by ground methods or aerial methods from helicopters or aircraft. Once the comparison is made the observed effects from temperature etc. effect the measurement/data collection could be quantitatively and qualitatively assessed against current methods and how much work is required to get equivalence or near enough to be a useful trusted method. This would be very useful for future research either by the authors or other researchers.
- More context initially of the advantages and disadvantages of the studied system against the current systems used to collect EM data would help provide context for later discussion of the results.
- With more analysis and comparison to systems currently used, a conclusion could be

drawn on how far away in data quality the studied system is from those currently used. Having the comparison would also start to indicate how the system could be improved, whether this is by method of use, system improvements, enhanced processing, or by using additional data to provide models for correcting the EM data such as a temperature based calibration table.