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Atmospheric Measurement Techniques Discussions

Interactive comment on "The Development of the "Storm Tracker" and its Applications for Atmospheric High-resolution Upper-air Observations" *by* Wei-Chun Hwang et al.

Anonymous Referee #1

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This paper describes at an in-depth technical level the development of a low-cost radiosonde built using standard off the shelve parts. The low-cost values of such a system is one novel point. The second is the potential to have several in the air at a time allowing a swarm approach to measurements in the troposphere. However the scientific reward of this is poorly demonstrated.

The technical description is quite thorough and in depth and should be simplified through the use of tables and using more general descriptions of the components used so that an audience from a wide community can understand the description.

In Section 3 this can be better presented in terms of figures used. It appears the

authors have got all the data they need to undertake a comprehensive comparison and they've missed the mark a bit. Firstly, I'd like to see a plot of vertical profiles of temperature and RH (Use RH and avoid Dewpoint as Dewpoint is derived from the RH on the RS41) from both the Storm tracker and RS41 on the same plot for day / night cases and with and without the protective screen. Avoid using a skew-T diagram as these are a function of pressure. Instead use the GPS height from both the storm tracker and RS41. They have similar Ublox systems within once you take the covers off.

Also, the standard RS41 does not contain a pressure sensor. It back infers pressure from GPS using the hydrostatic balance. Unless it is an RS41 GP which does contain a pressure sensor, probably worth checking when undertaking a comparison with the BMP280.

The histograms are good. However, the real story appears in the profile plots (Fig 10-13). I'd suggest moving the histograms to a supplementary figure and using the profile plot differences instead.

Section 4 is somewhat confusing, when I began reading it I was expecting to see a case study where a swarm of sensors had been launched and a temperature contour map at a given pressure surface would be displayed for a given altitude or pressure. Or a height time temperature contour map. However, only the trajectories were plotted. I feel to highlight the novelty of this work a preliminary result showing either temperature, humidity or wind component as a function of height or area is needed.

Following on from this Section 4 seemed to also be the conclusions. Section 4 and the conclusions need to be in two separate sections.

There are numerous typos and grammatical errors that also need rectifying some are highlighted below:

Line 30 and throughout: Strom should be Storm

Line 49-55: I suggest making a table here with the various radiosondes and their weights and potential cost per sonde.

Lines 52-55: You need to be clearer here about what kind of field campaigns you are on about. What are you trying to measure that would make a normal radiosonde not fit for the job both logistically and financially? (I think you make a case for it further down in this section. But I'd bring that argument earlier on)

Line 82: MCU , I guess you mean Micro Control Unit. You need to define this.

Line 92: Remove the from before TE

Line 102-104: I'm not familiar with the LORA technology but saying thins like setting is 7 for spreading factor and 4/5 for code rate, will not yield any useful information to the general reader. Either describe in everyday terms what these settings mean or relegate to supplementary material. Do however included the baud rate

Line 117-129: Figure 1b shows a nice block diagram. I advise to rewrite this paragraph stepping through and describing how the received signal is parsed through the system. At each stage describe in simple terms what each part of the circuit does. For example, say the main CPU is a MT7688 (The configuration is not that important)

Line 151: attached

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