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Interactive comment on "Use of automatic radiosonde launchers to measure temperature and humidity profiles from the GRUAN perspective" *by* Fabio Madonna et al.

Anonymous Referee #2

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This paper presents an evaluation of the performance of radiosonde atmospheric observations made using Automatic Radiosonde Launchers (ARL). Comparisons from different stations between the ARL and manually launched radiosonde data and with meteorological analyses are presented to quantify the performance of the ARL approach to radiosonde measurements. The evaluation is put into the context of the global ensemble of radiosonde stations running ARLs. The paper provides evaluation and relevant technical details for ARLs from 3 radiosonde manufacturers. The paper concludes that overall performance of the ARL launches is comparable to manual launches, although there are differences that would benefit from further investigation.

Overall this is a well-organized and substantial paper on a relevant topic for weather prediction and climate studies. There are some technical corrections which should be made before publication. These are itemized below:

Line 40: the abbreviation O-B (observation-background) should be defined here

Line 71: what is meant by "basic" equipment here? Does this mean rudimentary, or limited, or less capable (eg lower precision versus equipment in a conventional laboratory environment)? Please clarify.

Line 78: "progress" could be replaced with "innovation" for a better style

Line 165: "5% RH for" instead of "5% RH or"

Line 191-192: How accurate is this procedure? Eg, how high does the temperature need to rise before the RH is effectively zero relative to the desired calibration threshold?

Figure 2 top panel: the small white words are very hard to read. Can you enlarge the font?

Line 254: is there a reference available for the Rotronic HC2A-S probe?

Line 284: it is unclear what "a maximum number of 40 sondes adjustable" means, does this mean there is maximum of up to 40 sondes, and the maximum can be adjusted by the user?

Lines 304-307: the meaning of this is a little unclear; is it that at this time, Meisei considers the information proprietary, or that additional information is at a preliminary/developing state?

Figure 5: I'm concerned the font will be illegible due to small size when this is formatted for publication

Line 410: why was the switch made to Totex? Is there a cost or supply or reliability

reason the switch wasn't made earlier?

Figure 5: why is the % successful flights based only on 2018, when there are >2.5 years of previous data? Was the equipment/equipment operation not optimized until 2018?

Lines 518-520: more (but brief) information on what the Wilcoxon Rank Sum Test, and why it was used, would be good here. It's better described later in the text (eg around line 692)

Line 524: right panel of Figure 4 should say "shows" (grammar)

Lines 525-527: although the test data for Sondakyla are not shown, can you briefly summarize the outcome?

Figure 9: the noise in the profile plots makes them somewhat hard to grasp and interpret; would it be possible to replace by bar graphs binned by altitude for 3-5 altitude bins?

Lines 544-553: this text is repeated, please delete

Figure 18: why does the difference grow rapidly with height from 5-15 km and then stabilize? Is there just more variability in upper troposphere winds vs lower troposphere, and then calmer winds in stratosphere?

lines 788-795: is the probability close between the daytime and nighttime launches? It looks like the daytime launches differ more than the nighttime launches between ARL and manual.

Figure 6: what does the abbreviation "nb" mean?