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Atmospheric Measurement Techniques Discussions

Interactive comment on "Advancements, measurement uncertainties, and recent comparisons of the NOAA frostpoint hygrometer" *by* Emrys G. Hall et al.

Anonymous Referee #2

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Review report on "Advancements, measurement uncertainties, and recent comparisons of the NOAA frostpoint hygrometer" by Hall et al.

This paper describes the historical NOAA FPH instruments and the recently developed corrections to the old thermistor data, discusses the measurement uncertainty budget, and shows some recent intercomparison results for the latest version of the NOAA FPH. This is a very good summary paper for the instrumental details of the NOAA FPH whose >30-year record at Boulder, USA is one of the key climate data record for stratospheric water vapor. The paper is very well written. I only have some minor comments.

Pages 4-5, Sections 2.1-2.4. It would be very useful to show a photograph of each

version together with the combined radiosonde.

Page 5, lines 2-3; page 6, lines 4-5; page 6, line 18. Pressure sensors are mentioned. I think they are for the mirror temperature controller, not for the calculations of mixing ratio, geopotential height, etc. Please explicitly write this to avoid confusion.

Page 8, line 3. The actual temperature points should be written here, not at page 9, lines 22-26. This is in part because there are some discussions on the temperature points at page 9, lines 9-11.

Page 11, lines 21-22. It would be useful to have a summary of the uncertainty information on the VIZ A radiosonde as well.

Page 12, lines 22-23. The implication of this sentence ("The older analog instruments switched gains around -55C instead of -53C") is unclear. Is there a possibility that the older instruments may have the cubic ice issue? If so, is there any way to detect the issue and to correct the vapor pressure data? Also, it would be interesting to show an example of the FPH data actually affected by the cubic ice.

Page 15, Section 7.2. I do not understand why frostpoint temperature is shown in Figure 10 while mixing ratio is shown in Figure 11. In mixing ratio comparisons, the radiosonde pressure sensor uncertainty is included.

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