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Atmospheric Measurement Techniques Discussions

Interactive comment on "Controlled weather balloon ascents and descents for atmospheric research and climate monitoring" *by* A. Kräuchi et al.

Anonymous Referee #2

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This manuscript describes the technical details and advantages and disadvantages of two controlled balloon-descent techniques for scientific researches. At least, the fact that one of the techniques has been used for the long-term NOAA FPH sounding is well known in the stratospheric climate community, but there was no publication about the details of the technique itself. This is an important manuscript not only for those who are making balloon measurements but also for those who use data taken with these techniques. Therefore, this is appropriate for AMT. I have only minor comments which are written below.

p. 12561, around lines 26-27: Please add a short paragraph (or a few sentences)

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that explains why descent data are necessary. It would be nice to describe the original motivations by Mastenbrook and by Hergesell. Also, how about the potential advantage to obtain two vertical profiles at slightly different location and time in a single balloon launch?

p. 12563, lines 16-26: Please provide typical temperature-difference values of cooled/heated balloon skin and of the balloon wake with respect to the ambient air temperature.

p. 12564, lines 10-11: "GRUAN" was defined in Introduction.

p. 12564, line 16: collects –> is collected

p. 12566, lines 1-12: I think that there have been several historical changes in the details since Mastenbrook. A short summary would be useful.

p. 12566, lines 15-17: If more helium escapes, the buoyancy would be reduced and the descent rate would be increased. Please add more explanation why the descent rate is actually decreased.

p. 12566, around lines 21: Please explain why a parachute is attached. Is it for this potential failure?

p. 12567, line 13: "then": please give a typical period of time until the descent rate becomes stable.

p. 12568, line 16: I do not understand what is the Doppler velocity here. Please explain it or give an equation (e.g., in the caption of Figure 10).

p. 12569, around line 7: There is also a possibility of the direct influence of warmed radiosonde package. The sensor may measure the wake of the payload package.

p. 12570, lines 3-28: Please give typical temperature-difference values from Figures 14 and 15, and compare them with, e.g., the uncertainty of the SRS-C34 temperature measurements. The SRS-C34 uncertainty information may be taken from Nash et al.

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(2011). In this way, we can make the judgement that the differences are "small."

Nash, J., T. Oakley, H. Vömel, and W. Li (2011), WMO Intercomparison of high quality radiosonde observing systems, Yangjiang, China, 12 July - 3 August 2010, World Meteorological Organization Instruments and Observing Methods, Report IOM-107, WMO/TD-No. 1580. [Available at https://www.wmo.int/pages/prog/www/IMOP/publications-IOM-series.html]

Figure 6, caption: "IBRU" should be defined here, or in the text, not in the caption of Fig. 7.

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 12559, 2015.