

Kräuchi et al.

**“Controlled weather balloon ascents and descents
for atmospheric research and climate monitoring”**

Review

The manuscript describes two robust and smart techniques to control the ascent and descent of balloon-borne atmospheric research measurements. The paper is well structured and fluently written. The proposed control techniques are described in a comprehensible way and will be useful to the scientific community involved in balloon-borne in situ measurements. The manuscript is certainly appropriate for AMT, and should be published once the minor issues highlighted below are addressed.

- Page 2, line 29/30: point out importance of in situ measurements, but for completeness mention also the role of remote sensing
- Page 6, lines 22-26: What is the approximate weight that adds to the payload ? Is there a limitation to the weight of the payload ? What is the maximum payload weight that has been tested with the valve system ?
- Page 7, lines 22-25: The double balloon technique with IBRU has been tested in a moderate climate zone. What problems may occur under extreme conditions (e.g. high humidity in the tropics, low stratospheric temperature in polar regions) ?
- Page 7, line 28-29: What is the optimum distance for the two balloons ?
- Page 8, lines 11-21: What is the effect of the two-balloon set-up on the wind retrieval ? Can Lagrangian movement still be assumed with two tied balloons ?
- Page 11, line 4/5: “measurements of temperature and water vapor” add “in the UTLS”
- Page 11, Conclusion: It should be mentioned that the proposed techniques are not intended for the daily standard radiosondes but rather for research sondes. To underline the importance of the concept, other potential in situ instrumentation for controlled ballooning should be named in addition to the described FP hygrometers and radiation sensors.