

# REFEREE'S REPORT

Manuscript number: Geosci. Instrum. Method. Data Syst.; <https://doi.org/10.5194/gi-2019-36>  
Title: Progress in managing the transition from the RS92 to the Vaisala RS41 as the operational radiosonde within the GCOS Reference Upper-Air Network

## Abstract

- Lines 22 - 24: See my comments on section 5.2: corresponding modifications are needed here.

## 1 Introduction

- Lines 32 - 35: The sentence "The network consists ... in the processing chain." is very long, complicated and difficult to follow for a reader.
- Line 36: "the only GRUAN data products"
  - o Should this be "the only sources of the GRUAN data products"?

## 3 Change management

- Line 192: "each other's uncertainty coverage factor"
  - o the coverage factor only specifies the confidence level at which an uncertainty is given; therefore this text should probably be "the uncertainties of the data at the 95 % confidence level"
- Lines 207 - 208: "consider the metrological quantification aspects that are necessary in the current case."
  - o such as? to which aspects are referred here?

## 5.2 Results of the laboratory characterization

- There is a clear shortcoming in Section 5: This paper emphasizes several times the metrological aspects but no uncertainty values are given for the calibration systems in Section 5.
- Line 324: "from its width it can be inferred that the calibration uncertainty is smaller than 0.1 K."
  - o Such conclusion cannot be drawn without knowing the uncertainty of the reference. (Basically, you may possibly conclude that the equivalence between your reference and Vaisala's reference is within 0.1 K but the link to the SI realisations is still missing.)
- Lines 328 - 329: "which means that the uncertainty of the humidity calibration is smaller than 1 %RH."
  - o Same comment as for temperature above.
  - o Moreover, the uncertainty of the reference (both at Vaisala and Lead Centre) is significantly at different RH-levels; therefore analysing them together in single histogram is misleading.
  - o Asymmetry of the histogram indicates probably some systematic differences between Vaisala and Lead Centre at some measurement points.
  - o Finally, for me it looks strange that in Fig. 4 all visible data fall in claimed uncertainty but here a significant amount of data fall out from the range of claimed uncertainty.

## **6 Metrology**

- Lines 400 - 414:
  - o It's unclear to me why these two last paragraphs of this Section are needed here: I suggest focusing them in facilities/services/results developed/obtained at national metrology institutes that can be benefited in the transition from RS92 to RS41 (and in radiosonde measurements in general)

## **10 Summary and outlook**

- Lines 670 - 672 “2. Comparison with external references show calibration uncertainties of < 0.1 K for temperature and < 1% RH for the humidity sensor.”
  - o Ref. to my comments in Section 5.2, I don't agree with this sentence.