General comment:

The paper describes a methodology on the radiation correction of the Vaisala RS41 using a laboratory setup (SISTER) and its applications to the GRUAN data processing in detail. The paper provides detailed information on the construction of the SISTER setup as well as the characterization of its performances in terms of uncertainty. The paper is enriched by various experiments using the SISTER to obtain a parameterized formula for the radiation correction ($\Delta T$) as a function of pressure ($p$) and ventilation speed ($v$). The paper is of importance and well-organized in general and thus will be beneficial to users of radiosondes.

One major concern is that the SISTER setup operates only at room temperature. As previously reported, the radiation correction of the RS41 temperature sensor presented a temperature dependency (Lee et al. Meteorol. Appl. 27, e1855, 2020). In the paper, the radiation correction value ($\Delta T$) of the RS41 is increased by 18% as the temperature is decreased from 20°C to -70°C at a constant $p = 7$ hPa and $v = 5$ m/s. In this regard, the low temperature effect cannot be ignored by the sentence “However, it is not expected ... and the convective cooling.” in lines 665-668 in Summary and conclusions.

Recently, Lee et al. submitted a new paper to the Atmospheric Measurement Techniques (amt-2021-246) which deals with a potential solution for this issue by providing a formula to estimate $\Delta T$ at low temperatures by only using room temperature measurement. In the paper, $\Delta T$ of the RS41 is increased by 20% as the temperature is decreased from 20°C to -67°C at a constant $p = 5$ hPa and $v = 5$ m/s. Therefore, it is more desirable for the GRUAN to include the low temperature effect for the radiation correction for the GRUAN data processing. I would suggest the authors to comment on this point in their Conclusions.

Specific comments:

1) Line 665-668: The sentence “However, it is not expected ... and the convective cooling.” should be revised because the low temperature effect on the RS41 temperature sensor was observed previously and again recently (amt-2021-246). The same phenomenon was also observed for thermistor-type T-sensors even though there is no apparent air ventilation (Lee et al. Meteorol. Appl. 25, 283, 2018). Based on the fact that...
the low temperature effect appeared when the convective cooling was limited (no apparent ventilation), it is likely due to the $T^4$ dependent long-wave radiation from the sensor.