Dear Editor,

We would like to thank the reviewers for their time spent on reviewing our manuscript and their comments helping us improving the article. The inputs and suggestions from the referees have been taken under consideration and have been implemented in the manuscript. Below, the authors have tried to answer the questions and reply to the referee comments, point by point.

Sincerely,

Olle Nyström

Answers to Referee #1:

Specific Comments:

Referee #1 Comments	Author reply
1. Abstract – Define acronyms FFTS, IF and CW	Implemented
2. Why does altitude control matter?	In the case of Coskey et al the rocket was to be pointed at the earth's limb to obtain maximum enhancement of the signal. Improved technology allowed us to avoid the extra complexity and expense of altitude control at the expense of reduced observation time with maximum signal.
3. Sect. 2.1: ”Approximately 2m above...”	Re-written:The 557 GHz receiver, pointing parallel to the rocket axis, is placed approximately 2 m above in the nose section.
4. Sect. 2.1: ”During the observation...”	Re-written: The observation period starts at 40 km altitude for the 183 GHz radiometer and at nose cone ejection, at approximately 60 km altitude, for the 557 GHz radiometer. The observation period continues until approximately 100 s into the return trajectory. During the observation time the instrument collected data with 300 Hz sampling rate for the 183 GHz receiver and 10 Hz for the 557 GHz receiver.
5. Sect. 2.2: Define DC, RF, and LNA	Implemented
6. Sect. 4: The first sentence of the first paragraph requires revision.	Re-written: The laboratory results presented in the previous sections were performed at temperatures in the range 25-35 ºC. At each measurement session the physical temperature of the instrument was stable (+- 0.05 deg).
7. Sect. 4: I am surprised that the instrumentation was seemingly not tested under representative thermal and vacuum conditions prior to flight. Doing so may have revealed the temperature rise problem encountered during	Thermal vacuum testing is not standard for sounding rocket flights in sweden therefor this was unfortunately missed.

flight. Was there a reason for this?	
8. Sect. 4: The authors have performed post flight instrumentation analysis and have seemingly determined reasons for the unexpected thermal deviation. Will this be checked in a representative environment?	Prior to any new flights of the instrument, modifications will be made and relevant testing carried out.
9. Sect. 6: I am a bit unclear as to why the feedhorn design should have been singled out for especial treatment, particularly as the design concept is well known and previously demonstrated. A more unusual optimisation approach has been taken and measured pattern performance is interesting, so this might be sufficient justification for its retention.	Will be placed under section 2, Technical description of the instrument.
10. Sect. 6: However, no mention is made of the effects of the signal window on the beam pattern and calibration of the instrument. Are there any effects that would influence the scientific data?	The teflon window is assumed to have no impact on neither the beam pattern, nor the calibration of the instrument. The window was designed with a lambda/2 thickness and at an angle relative to the propagation direction, hence the standing waves are minimized and any residual reflections are deflected off axis.
11. Typing errors: There are a number of areas of the text that require adjustment. Mostly these are minor, but I would advise that the authors seek the support of a native English speaker.	The manuscript will be checked for any typing errors.

Answers to Referee #2:

Specific Comments:

Referee #2 Comments	Author reply
1. A single measurement has been presented which at least shows that the instrument works as intended, however, the authors made clear, that very carefull calibration is required to make use of the data. Though the authors leave it open, I guess, the whole dataset will be presented in a later publication.	Yes, the data set will be published in a later publication.
2. The section 6 which describes the horn antenna belongs in my view to the section 2, the description of the instrument.	We agree. This will be included under section 2.
3. Please introduce abbreviation before using them. Without completeness: CW onm the abstract, LO at page 275 line 19	Implemented.

FFT on page 275 line 19 and other places FEM on a few places.	
4. Page 273, line 10, source of information to this satellite.	Reference will be included: http://www.nasa.gov/mission_pages/aim/
5. Page 275, line 7-8: Is there any source for more information on the rockets? Please cite.	Suitable reference will be included.
6. Page 280, line16. Formula missing.	Included: delta=(Peak Hot- Baseline Hot)-(Peak Cold-Baseline Cold) and Uncertainty (%)=(delta/(Peak-Baseline))x100.
7. The authors use mainly Fig. and Figs. bit sometimes Figure for references to figures (e.g. page 284 line 2). Please use consistently.	All figure references are checked for concistency.
8. Figure 1. Append the numbers with units.	Implemented in the caption.
9. Figure 3 The scheme is a repetition of parts of the scheme in figure 2 and should be removed.	Removed.
10. Figure 14 I would suggest to repeat the temperature at which those measurements were taken in the figure caption to further readability.	This is done. A note in the caption of Fig 14 is included and it's pointed out that the temperatures can be seen in Figure 15.
11. Figure 11 but also in the text. The standard deviation should become lower as the channel width become larger. This is actually reflected in the measurements, but not in the theoretical calculation.	The discussion in the text refers to the central channels with 67 kHz bandwidth. We have added a note in the figure caption.
12. The figure 27 is not mentioned anywhere in the article.	Page 289, Line 28: text reads ”Figs. 25 and 26” Should read ” Figs 26 and 27”. This is changed.