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Atmospheric Measurement Techniques Discussions

Interactive comment on "MIAWARA-C, a new ground based water vapor radiometer for measurement campaigns" *by* C. Straub et al.

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Dear Referee, thank you for carefully reading our paper and for your comments and suggestions. They will help to improve the article. To answer your comments we will always print your comment first and then our answer to it.

In particular the fact, that the authors presenting parallel an intended version, which was unsatisfactory, a total power version, which seems to be even worse and the finally used version may lead to some confusion. My preference would be to become more obviously directed to the real version of operation. At the same time, some technical conclusions are not fully convincing and some terms are not used in a common way.

Answer: We change the structure of this section in a sense that we try to direct the reader more obviously towards the real version of operation, as you suggest.

The text in 2.3 states, that the correlation receiver configuration is more stable than the total power configuration. My understanding of Fig. 5 is the opposite. Please clarify!
Answer: This was a mistake in the legend of the figure. The labeling was the wrong way around. Thank you for noticing, this error has been corrected.

In 2.3.1 I'm unable to follow the arguments on cold noise sources. The (to my knowledge) only commercially available model of Colfet is specified to replace LN2 loads and should reach almost 80K. 77K is common from LN2 loads, lower radiation temperatures are difficult to achieve even from cryogenic systems. What are your stated requirements in terms of noise temperature?
Answer: Our stated requirement is: as close to 20K as possible. The goal is to use the correlation receiver to compare two input signals with similar noise temperatures. A noise temperature of 20K at 22GHz can not be reached with any uncooled noise source we know of and therefore we just use the best available. The Colfet we use is specified to 80K in the datasheet, but all our own measurements in MIAWARA-C and other test set-ups resulted in a temperature of 14.

What means "spectral non linearity"? Power linearity is of concern for all radiometers and frequency linearity is a basic feature of any digital FFT spectrometer. The frequency dependent feature was discussed in the community as being specific for the particular model of FFT spectrometer, which is used here. Could it be a simple (linear with power) baseline feature? It seems to be common praxis to subsume undetermined features as "nonlinearity". I would appreciate more specific wordings.
Answer: "Spectral non linearity" means spectrometer channel dependent power non linearity. We will change this expression for the final paper. It is true that this frequency

dependent feature was discussed in the community as being specific for the Acqiris 240 spectrometer, but there is no publication we could cite. In the final paper we will mention, that the observed features are characteristic for the used spectrometer as they are found in other radiometers using the same backend as well as in independent laboratory experiments.
Could it be a simple (linearwith power) baseline feature? - No it is not, because it disappears in the balanced measurements.

In view of the versatile calibration scheme a suitable illustration might be helpful.
Answer: We will include this in Fig. 2. The new version of this Figure is shown in the attachment.

The minor corrections you suggest are accounted for in the final paper.

Interactive comment on Atmos. Meas. Tech. Discuss., 3, 2389, 2010.

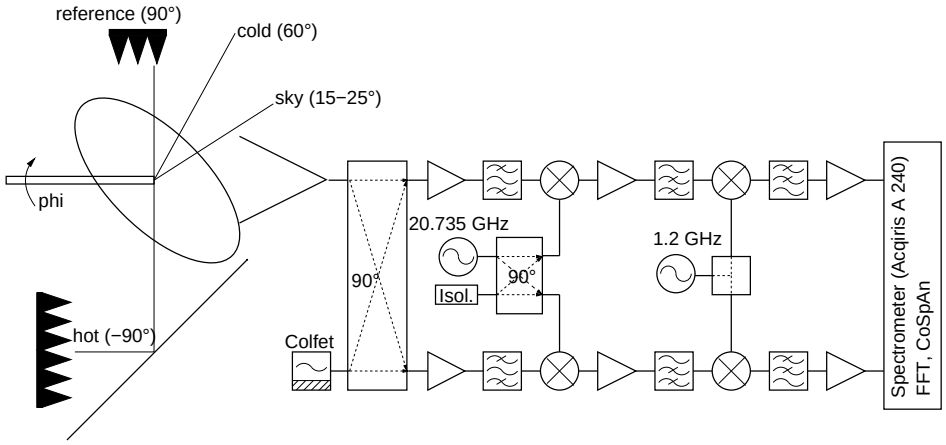

Fig. 1. Block diagram of the correlation receiver of MIAWARA-C.