Atmos. Meas. Tech. Discuss., 5, C1910–C1913, 2012
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Atmospheric Measurement Techniques Discussions

Interactive comment on "First middle-atmospheric zonal wind profile measurements with a new ground-based microwave Doppler-spectro-radiometer" *by* R. Rüfenacht et al.

Anonymous Referee #1

Received and published: 24 August 2012

This paper is of significant interest to microwave radiometry investigators.

Specific Comments:

5108 Line 19: You state that the instrument does not rely on liquid nitrogen use which it clearly does as stated in section 2.2.2. Its use was even designed into the pointing for that reason. Furthermore liquid nitrogen use has little bearing on its use in campaigns.

The author states that this instrument will be used for both long term studies and short term campaigns. However instruments used for long term studies are designed differently than those used for short term campaigns. Long term measurements are usually

in terms of years not months and these instruments require a stability and maintainability to a level that is not necessary for monthly measurements. Having a more defined goal in mind would strengthen the validity of its design purpose and improve this papers standing, possibly its references.

The introduction is too long and contains too many details. AMT readers at this level are already familiar with the different types of measurements and their capabilities. It should be shortened to emphasize the point you are trying to make about the data gap in figure 2. This should also parse down the extraneously long list of references most of which appear in the introduction.

Page 5115 Line 29: "Noise is currently the most critical factor for wind radiometry, whereas high frequency resolution and stringent frequency stability can be achieved." This line does not make any sense. Consider revising.

5116 Line 6: change "impossible to use" to "impractical to regularly use" because you state in line 20 that a liquid nitrogen load is occasionally used.

5120 Line 18: "Therefore, in practice the altitudes in geometrical units corresponding to the five levels are attributed according to the pressure profile measured by MLS on the AURA satellite on the respective day." Does this mean the instrument relies on MLS? What happens when MLS goes down?

The mirror method assumes a mirroring frequency νtest close to the peak frequency of the spectrum. So how does this work for any level other than 1? Do you mean the close to the peak of the partial spectrum? Please clarify.

Figures:

Figure 5: Three of the four oscillators in this figure a labeled with the LO frequency. The oscillator in the backend box is labeled with the IF frequency 51 MHz instead of the LO frequency.

Editorial comments:

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1. 5108 Line 5: “be retrieved what makes WIRA” -> “be retrieved which makes WIRA”

2. 5108 Line 20: “what makes” -> “which makes”

3. 5108 Line 22: “and the used techniques for the wind retrieval” - > “and the techniques used for wind retrieval”

4. 5108 Line 25: “a first time series” -> “a time series”

5. 5113 Line 3: “In a first part, the present paper describes” -> “The first section describes”

6. 5113 Line 4: “The second part presents” -> “The second section presents”

7. 5113 Line 8: Consider removing the last sentence “The paper ends with a short conclusion.”

8. 5113 Line 24: “what is an advantage” -> “which is an advantage”

9. 5114 Line 4: “from an aircraft is not usable” -> “is not suitable”

10. 5114 Line 11: “This allows to retrieve altitude dependent information about the wind speed.” -> “This allows altitude dependent wind speed information to be retrieved.”

11. 5114 Line 14: “divided in three parts” -> “divided into two parts”

12. 5114 Line 15: ”backend electronics placed” -> backend electronics are placed”

13. 5114 Line 16: “WIRA is conceived in a way to be able to take measurements” -> “WIRA is designed to take measurements”

14. 5115 Line 2: “are no hindrance for wind measurements” -> “do not hinder wind measurements”

15. 5115 Line 15: “stabilisation” -> “stabilization”

16. 5115 Line 20: “The frequency stability over three days of the frequency sources used in our radiometer has been compared to a GPS reference signal and is sum-

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marised" -> "The stability of our frequency sources was compared to a GPS reference signal over a three day period and is summarized"

17. 5115 Line 22: "For the first two sources mentioned in this table the instability is largely dominated by long-term drifts rather than short time variabilities, what makes the error in the wind negligible because of the short duration of one measurement cycle that comprises the 25 observations in the opposite azimuthal directions." -> "For the first two sources mentioned in this table the instability is largely dominated by long-term drifts rather than short time variabilities. The short duration of one measurement cycle that comprises the 25 observations in the opposite azimuthal directions makes the error in the wind negligible."

18. 5115 Line 26: "what leads" -> "which leads"

19. 5119 Line 15: "what is" -> "which is"

20. 5142 Line 11: "what allows" -> "which allows"

21. 5125 Line 1: "did produce no significant biases" -> "did not produce any significant biases"

22. 5125 Line 4: "from the 10 000 sample ensemble on none of the five WIRA altitude levels was higher than" -> "on any of the five WIRA altitude levels from the 10 000 sample ensemble was not higher than"

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 5107, 2012.