

## ***Interactive comment on “Radio frequency interference mitigating hyperspectral L-band radiometer” by Peter Toose et al.***

### **Anonymous Referee #2**

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Review of paper GI-2016-27 Toose et al. "Radio Frequency interference mitigating hyperspectral L-band radiometer" General The authors describe an L-band radiometer system designed for ground based or airborne experimental studies on microwave remote sensing. The calibration and RFI mitigation method of the system are described. Examples of calibration accuracy and RFI mitigation are demonstrated by means of actual measured data. The limitations of the method regarding broadband RFI mitigation are acknowledged. The paper is well written and generally to the point. The described system is to my knowledge a unique piece of equipment, and many of the features incorporated in its design may be useful when planning for similar future systems (surface based or satellite). In this regard, the authors could add a block diagram of the system to improve the description of the hardware. The study should be of interest to the remote sensing community. I recommend publication in GI after the following

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minor comments have been addressed Minor comments 1. P2 lines 5-17. The authors could add some discussion regarding the sensitivity of the different spaceborne sensors (SMOS, SMAP, Aquarius) to RFI. SMOS is the most vulnerable due the applied imaging technique, and also because during design of SMOS, the RFI problem at L-band was not seen as acute. With SMAP, some precautions and mitigation steps could be undertaken (see Bradley et al., 2010; Misra et al., 2013). These could be acknowledged and shortly discussed. 2. Section 2.1, lines 10-20: could you add a block diagram of the radiometer? This would support the text which is now a bit hard to follow. 3. P3, lines 24-26: “Because of filter roll...are utilized” the sentence is a bit too complex and difficult to grasp. Please revise & clarify and maybe split in two. 4. P7 lines 18-19: 5 K is quite a crude approximation for sky TB at L-band. While this is fine for assessing the “sky contribution” via ground reflectance to observations of surface TB, for absolute calibration purposes one would prefer to use a precise value. The authors return to this subject in section 4.1. I would suggest calculating a precise value by means of a model of sky TB at L-band. If it is not possible for this study, the authors would need to provide more justification as to why  $\sim 5\text{K}$  is suitable. One possibility would be to apply a range of realistic values in the calibration and analyze the effects. 5. P7 lines 29-30 “...leading to a difference of 10 K,” difference in what? The measured TB (of the ambient target) I guess, but please specify for clarity. 6. Figure 4: please use the same range in y-axes for H and V pol figures. This would highlight larger  $T_{\text{NDTC}}$  and Offset peaks at H-pol. Is there any reason for this difference between the polarizations? Perhaps this is discussed somewhere but I missed it. 7. P10 lines 11-15. “Using the results...over course of the campaign.” Very long sentence and as a result quite difficult to grasp. Please revise.

Editorial 1. Figure 4: ‘T’ missing in y-axis label of  $T_{\text{NDTC}}$  (H-pol) vs. frequency

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