Interactive comment on “Time Series Analysis of Ground-Based Microwave Measurements at K- and V-Bands to Detect Temporal Changes in Water Vapor and Temperature Profiles” by Sibananda Panda et al.

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Please find attached the response as well as updated paper.

Please also note the supplement to this comment: http://www.geosci-instrum-method-data-syst-discuss.net/gi-2016-16/gi-2016-16-AC4-supplement.pdf


Response to Short Comments by Dr. J. Vivekananda

The authors would like to thank Dr. J. Vivekanandan for the comments. These comments have been very helpful to the authors in increasing the clarity of the paper to the reader.

Expand all of the acronyms e.g. SAPHIR-MADRAS, NN, AMSU, FLORA, MP-3000A...

Response: This has been fixed in the paper.


Response: The reference (Spuler et al., 2015) suggested by the reviewer has been added in Section 2 page 2 line 5 of the paper. In addition to that (Brogniez, et al.2013) has been replaced by Rao, T. N., Sunilkumar, K., and Jayaraman, A.: Validation of humidity profiles obtained from AIRS on-board Megha-Tropiques, Special Section: Megha-Tropiques, Current Sci. 104(12), 1635-1642, June 2013 on page 2 line 14.

Page 2, line 13: What is meant by 'window frequency?'

Response: The window frequency here means the frequency range between the absorption lines (or the peaks) where the atmosphere is transparent to microwave radiation and allows the microwave radiation to pass through without significant attenuation. For example, frequency ranges of 30-45 GHz, 70-110 GHz and 125-150 GHz are usually referred to as the window frequency ranges. The window frequencies are still affected by water vapor content and oxygen absorption but are not as sensitive as the absorption line peaks.

Page 3, line 18: Define 'oxygen complex.'

Response: The details of the oxygen complex have been added in Section 3.1 line 29 of page 4.

"Similarly, microwaves radiation from oxygen at the 80-85 GHz absorption complex can be used for retrieving temperature profile information because atmospheric absorption in the 50-75 GHz range is primarily due to oxygen molecules. The absorption due to oxygen molecules is due to its magnetic moment 15 spin rotational lines between 75.5-87.5 GHz. These lines are overlapped and together with water vapor due to the proximity to the 80 GHz absorption band centered at 80 GHz. However, the absorption due to oxygen molecules is significantly higher than that at 58 GHz, so the radiometer just observes the radiation emitted close to the ground surface. To..."